Extreme Wildfire: Legislative framework for managing wildfire risk in Aotearoa New Zealand

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ABSTRACT

In recent years, Aotearoa New Zealand has witnessed a significant increase in the occurrence of extreme wildfires. This trend is related to accelerated impacts of climate change, which have intensified the risks associated with such events. Of particular concern is the higher risk observed at the rural-urban interface, where urban development is close to rural vegetation.

This study aims to identify and analyse the regulatory, planning and decision-making systems relevant to wildfire management in Aotearoa New Zealand. To achieve this, consultations were conducted with programme partners and experts in the planning field to identify specific parts of the decision-making process that offer opportunities for reducing wildfire risk in the rural-urban interface.

The report underscores the importance of clear guidance and using consistent terms and guidelines in decision-making and planning processes. It furthermore emphasises the need for stricter building requirements, wildfire risk awareness programmes, pro-active planning and efficient co-ordination among authorities for effective wildfire risk management.

KEYWORDS

Wildfire, bush fires, natural hazards, rural-urban interface, land-use planning, zoning, community resilience, Aotearoa New Zealand legislation

KEY POINTS

1. Wildfires are extreme climatological events that can have profound implications for human wellbeing and ecosystem functioning and can lead to devastating consequences, including loss of human lives and decreased biodiversity.
2. Planners and decision-makers need to use consistent and commonly agreed-upon terms, definitions and guidelines in discussions related to the management of wildfires.
3. To consider wildfire as a hazard alongside other hazards, a comprehensive guidance document with building guidelines and detailed information about wildfire hazards and risks can serve as primary resource for planners, decision-makers and communities.
4. A guidance document could include a variety of elements to provide comprehensive guidance for planners, decision-makers and communities. Some key components are historical wildfire records, local wildfire hazard and risk evaluations, vulnerability assessments and prevention strategies. Additionally, a checklist within this document will help ensure that critical steps and measures are not overlooked during the planning process. Such a guidance resource should be made easily accessible online and at local government offices, as well as shared with relevant stakeholders.
5. Educational programmes can be used to help inform communities, planners and decision-makers about the hazards of wildfires, their underlying causes and the importance of wildfire preparedness. These initiatives not only help build valuable community networks for rapid emergency response but also facilitate pro-active planning efforts, thereby enhancing community resilience.
6. Government agencies at various levels play important roles in pro-active wildfire risk management. It is key to promote collaboration and coordination among various authorities and agencies involved in wildfire risk management to establish coherent and mutually aligned goals and objectives. This can reduce conflicts and promote unity in addressing wildfire challenges.

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1.0 INTRODUCTION

Wildfires are extreme climatological events (Ministry for the Environment 2020b) that can impact human wellbeing and ecosystem functioning. Wildfires play a natural role in many ecosystems by clearing out dead vegetation, promoting new growth and maintaining biodiversity. However, when wildfires occur more frequently or burn at an extreme intensity, they can negatively impact biodiversity and even destroy entire ecosystems. Additionally, wildfires at the rural-urban interface can result in loss of life and property, leading to impacts on human wellbeing and associated economic losses for affected communities.

In Aotearoa New Zealand, the number of large wildfires per year has increased over the last three to four years (Fire and Emergency New Zealand c2023i). It is predicted that this trend will continue due to the accelerated impacts of climate change, such as higher temperatures, longer drought periods and increased wind speed (Ministry for the Environment 2020a).

The New Zealand Wildfire Summary compiled by Scion (2021) showed a significant increase in the average area burnt between July 2020 and June 2021 (13,348 ha) compared to the historical 36-year average (1985–2021; 5754 ha per year). While June 2020 to June 2021 was a particularly hot period for Aotearoa New Zealand, the total number of wildfires per year increased from just over 3000 (36-year average) to 4586 fires in the period between June 2020 and June 2021 (Scion 2021).

In 2021, Scion was contracted by the Ministry of Business, Innovation & Employment (MBIE) to lead a research programme titled '*Extreme Wildfire: Our new reality – are we ready?*' The programme's key research objective (RA3.1) is to focus on wildfire risk within the planning and urban development context. This research aims to help planners, decision-makers and communities be better prepared for life with more extreme wildfire events. The findings presented in this report are derived from the research conducted by GNS Science.

This report provides background information to support other research steps taken or planned under RA1.3. For this purpose, a Wildfire Management and Planning flowchart visualising the legislative, planning and decision-making system concerning management of wildfires was developed. The legislative framework includes: the legislative and institutional structures at the national scale, the planning and consenting processes at the regional to local scale and design decisions at the development and property scales.

This report is divided into the following sections:

- **Section 1:** Introduction.
- **Section 2:** Wildfire-related concepts and terminology.
- **Section 3:** Research scope and methods.
- **Section 4:** Main legislative framework related to wildfire management.
- **Section 5:** Planning constraints and opportunities.

The subsequent sections in this report will delve into wildfire-related concepts and terminology, research scope and methods, the main legislative framework, and planning constraints and opportunities. The primary goal is to provide a more comprehensive understanding of the intricacies involved in wildfire management and planning, thereby helping communities to be better prepared for the challenges arising from the increasing frequency of extreme wildfire events.

2.0 WILDFIRE-RELATED CONCEPTS AND TERMINOLOGY

This section describes key terms and concepts that are commonly used in wildfire planning and management. It is included to facilitate the navigation of the following sections. The terms and concepts used in this report are grouped into three distinct categories, namely 'wildfire hazards and risk', 'legislation and regulation' and 'community resilience, adaptation and sustainability'.

2.1 Wildfire Hazards and Risks

Built environment is the physical world that is shaped and created by humans. It contains human-made structures such as buildings, vehicles, roads and other (infra-) structures "that provide people with living, working, and recreational spaces" (Ministry for the Environment [2023a]).

Climate change adaptation is:

> *"the process of adjusting to actual or expected climate and its effects, in order to moderate harm or take advantage of beneficial opportunities."* (Ministry for the Environment [2023a])

Climate extreme is:

> *"the occurrence of a value of a weather or climate variable above (or below) a threshold value near the upper (or lower) ends of the range of observed values of the variable. By definition, the characteristics of what is called extreme weather may vary from place to place in an absolute sense."* (IPCC 2023)

Some examples are extremes in temperature (heatwaves), droughts, severe storms, severe floods (IPCC 2023) and wildfires (Ministry for the Environment 2020b).

Defensible space is:

> *"a carefully managed area around houses or structures where flammable materials are removed or minimised. An important component of defensible space is the planting of low flammability species."* (Fire and Emergency New Zealand c2023f)

Clearing vegetation, debris and other flammable materials from the area immediately surrounding buildings helps to reduce the likelihood of ignition. This space acts as a buffer, giving firefighters and residents more time to respond to an approaching wildfire.

Disaster risk is defined in the National Disaster Resilience Strategy (MCDEM 2019) as:

> *"the potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined as a function of hazard, exposure, vulnerability and capacity".*

Ecosystem is defined as "a dynamic complex of plant, animal, and microorganism communities and the non-living environment interacting as a functional unit" (Millennium Ecosystem Assessment 2005) or the biological community and its physical environment.

Extreme wildfires are:

> *"difficult to predict and behave erratically. They exhibit hard-to-control fire behaviours such as fire whirls, spotting, and rapid-fire spread."* (Scion 2022)

Fire management is:

> *"the process of planning, preventing and fighting fires to protect people, property and the forest resource. It also involves fire to attain forestry, wildlife and land-use objectives."* (Government of Canada 2021)

In Aotearoa New Zealand, fire management is primarily governed by the Fire and Emergency New Zealand Act 2017 and is carried out by Fire and Emergency New Zealand, the country's unified fire and emergency service. Fire and Emergency New Zealand aims to promote fire safety; reduce the impact of fires by preventing them where possible; respond effectively when they occur; and minimise the risk to lives, property and the environment (Fire and Emergency New Zealand c2023h).

Fire-resistant landscaping, also known as fire-smart landscaping or defensible landscaping, refers to the strategic design and management of vegetation around structures to reduce the risk of wildfire damage. The primary goal of fire-resistant landscaping is to create a buffer zone that can help protect buildings from the spread of wildfires and minimise the potential for ignition (Fire and Emergency New Zealand c2023f). A few examples of fire-resistant landscaping include the careful selection of fire-resistant or lower-flammability plant and tree species, creating defensible space and installing fire breaks (Fire and Emergency New Zealand c2023f).

Fire-smart building designs refer to architectural and construction practises that aim to reduce the vulnerability of structures to wildfires (Fire and Emergency New Zealand 2022b). Examples of such designs are using non-combustible materials that are fire-resistant, such as brick walls or fire-resistant windows, roofs and doors. It can also include creating defensible space around buildings (Fire and Emergency New Zealand 2022b).

Green infrastructure is:

> *"the interconnected network of waterways, wetlands, woodlands, wildlife habitats, and other natural areas; greenways, parks, and other conservation lands; working farms, ranches and forests; and wilderness and other open spaces that support native species, maintain natural ecological processes, sustain air and water resources and contribute to the health and quality of life for America's communities and people"* (the Conservation Fund's definition in McDonald et al. [2005]).

In the Natural and Built Environment Act 2023 (NBA; Part 9 s511), natural and green infrastructure means:

> *"… infrastructure that uses natural systems such as plants or soil, or mimics natural processes, to avoid, minimise, or remedy the environmental impacts of activities".*

Grey infrastructure refers to the human-made network in the built environment (USEPA 2023). Under the NBA 2023 (Part 1 s11), infrastructure:

> *"means the structures, facilities and networks required to support the functioning of the economy, communities, the health and safety of people, or the protection of the environment."* (NBA 2023)

In this report, 'grey infrastructure' includes structures, facilities and networks in the built environment such as sewage pipes, gutters, drains, retention basins, telecommunications and electricity grids, roads, cycleways, and hiking trails.

Natural environment:

> *"encompasses indigenous and non-indigenous species in natural and modified terrestrial, freshwater and marine environments. It includes all ecosystems in environments from mountains to the sea (ki uta ki tai)."* (Ministry for the Environment [2023a])

Natural hazards as defined in NBA 2023 (Part 1 s11) are:

> *"any atmospheric or earth or water related occurrence (including earthquake, tsunami, erosion, volcanic and geothermal activity, landslip, subsidence, sedimentation, wind, drought, fire, or flooding) the action of which adversely affects or may adversely affect human life, property, or other aspects of the environment …"*

The Building Act 2004 uses a more limited interpretation when referring to natural hazards. It focuses on erosion, falling debris, subsidence, inundation and slippage but does not encompass wildfire and other similar natural hazards within its definition.

Planning is:

> *"a profession that builds communities, protects the environment, enhances economic value and improves the choices for where and how people live, work and spend their leisure time."* (NZPI c2023)

A 'planner' is defined here as someone who works in the planning profession.

Prescribed burns, or prescribed burning or land-clearing burns, is a commonly used land management tool in Aotearoa New Zealand "… for controlled burning to achieve planned objectives" (Fire and Emergency New Zealand c2023d).

Risk in NBA 2023 (Part 1 s11) refers to the definition listed in the Civil Defence and Emergency Management Act (CDEM) 2002 and is "the likelihood and consequences of a hazard" (Part 1 s4).

Risk reduction refers to:

> *"… activities which seek to identify and analyse long-term risks to human life and property; taking steps to eliminate those risks if practicable and, if not, reducing the magnitude of their impact and likelihood of them occurring."* (Fire and Emergency New Zealand 2019).

Rural-urban interface is:

> *"where houses and other urban development are adjacent to or intermixed with rural vegetation."* (Langer et al. 2021)

In other countries, such as the United States of America, this zone is referred to as the 'Wildland Urban Interface' and is defined as "the location where structures and communities meet or intermingle with undeveloped wildland" (NIST 2011). In Aotearoa New Zealand Fire and Emergency New Zealand defines the rural-urban interface as an area "where homes and other structures are near forest, bush, scrub or grasslands" (Fire and Emergency New Zealand [2019]). In the case of wildfire, the rural-urban interface is *"…* where people and buildings are located in close proximity to flammable vegetation" (Pearce et al. 2014). The rural-urban interface consists of three contributing components: human presence, wildland vegetation and a buffer distance (Stewart et al. 2007). Almost 17% of Aotearoa New Zealand is within the rural-urban interface and "… potentially at high risk from wildfires" (Langer et al. 2021).

Stakeholders are defined here as those entities or persons that could play an active role or have a position within the wildfire planning and management process. Examples of stakeholder groups are government agencies (e.g. councils and districts), emergency management agencies, non-profit organisations, businesses and wider communities.

Wildfires are uncontrolled fires that occur in wildland areas such as forests, grasslands and brushlands. The fundamental elements of a fire are fuel, oxygen and heat (Fire and Emergency New Zealand 2020). Enough oxygen is needed to sustain combustion and heat to raise the temperature of the fuel to its ignition point (Fire and Emergency New Zealand 2020).

Wildfire is considered a national risk and registered in New Zealand's National Risk Register (DPMC 2022). It is defined by Fire and Emergency New Zealand as:

> *"an unwanted, uncontrolled fire which occurs within an area of combustible vegetation. Wildfires often move rapidly across the landscape causing destruction to life, property, and the environment. Although wildfires most commonly occur in rural areas, they also may occur within urban environments."* (DPMC 2022)

Wildfires can be natural or human-caused and can spread rapidly across large areas of land and vegetation (Ministry for the Environment 2020b). Wildfires typically start when a source of ignition, such as lightning strikes or human activities (e.g. discarded cigarettes), ignites dry vegetation. Once ignited, wildfires can spread quickly, especially in hot, dry and windy conditions (Ministry for the Environment 2020b). Fuel in the case of wildfire consists of vegetation such as trees, shrubs, grass and leaves that provides material for the fire to burn.

The Ministry for the Environment (2020b) defines wildfires as:

> *"an extreme climatological event* [that] *can be ignited by non-climate sources such as arson, machinery usage or power line faults".*

Wildfires are also known as 'vegetation fires', 'bushfire' in Australia and 'wildland fire' or 'forest fire' in the United States of America and Europe (Agbeshie et al. 2022). Fire and Emergency New Zealand mostly uses the term 'wildfire' in its reporting. A search on its website for the term 'wildfire' yielded 177 results, whereas the term 'bushfire' resulted in 26 hits (search results from 18 July 2023). When the term 'bushfire' is used, it is mostly used to describe Australian firefighting efforts.[3]

Wildfire buffer zones are designated areas aimed at minimising damage to buildings and sensitive areas caused by wildfires (Bentrup 2008). The term 'wildfire buffer zone' is related to the concept of 'defensible space' (Fire and Emergency New Zealand c2023f) as defined above.

Wildfire hazard is:

> *"a process, a phenomenon or a human activity that may cause loss of life, injury, or other health impacts, property damage, social and economic disruption or environmental degradation."* (UNISDR 2017)

Factors that determine "… the fire spread and intensity in space and time are fuel availability and fuel conditions, topography, atmospheric conditions and the presence of firefighting." (UNISDR 2017).

Wildfire management can be defined similarly to 'fire management' above as:

> *"the process of planning, preventing and fighting [wild]fires to protect people, property and the forest resource."* (Government of Canada 2021)

Wildfire mitigation activities encompass a range of measures such as "… fire prevention, fuel reduction, development of 'FireSmart' communities" and other forms of wildfire risk planning (Pearce et al. 2014). In this context, the term 'wildfire mitigation' refers to the actions taken by individuals, communities and governments to reduce the adverse effects of wildfires on people, structures and the environment.

Wildfire planning involves strategic activities to help communities "grow and develop" while minimising wildfire risk (after Wildfire Risk to Communities c2023).

> *"Land use planning tools such as zoning, plans, regulations, and building codes can influence the design, layout, and placement of homes built in wildfire-prone areas."* (Wildfire Risk to Communities c2023)

Although a standardised definition of 'wildfire planning' is not used in Aotearoa New Zealand, the concept and practises related to wildfire planning are established within the field of emergency management and firefighting. In Aotearoa New Zealand, Fire and Emergency New Zealand is the agency responsible for wildfire readiness and prevention. It is a government organisation that oversees firefighting, emergency response and fire prevention efforts throughout the country (Fire and Emergency New Zealand c2023h).

Wildfire preparedness involves a range of actions aimed toward being ready to respond to wildfires in order to avoid or minimise wildfire risk (after Fire and Emergency New Zealand [c2023e, c2023i]). Some key components of wildfire preparedness efforts include creating defensible space, using fire-resistant landscaping and fire-smart building designs, developing emergency evacuation plans, staying informed, collaborating with neighbours and community, practising fire safety and providing education on fire prevention.

Wildfire-prone areas:

> *"An area of the rural-urban interface where wildfire poses an increased risk to people and buildings due to high vegetation fuel hazard and fire spread potential."* (Pearce et al. 2014).

Wildfire risk is:

> *"the likelihood of a fire occurring, the associated fire behaviour, and the impacts of the fire."* (UNISDR 2017)

Wildfire risk can be measured by the fire weather index, daily severity rating and seasonal severity rating (Ministry for the Environment 2020b). There are four main drivers of wildfire risk: increased temperature, decreased relative humidity, increased wind speed and decreased rainfall (Ministry for the Environment 2020b).

Wildfire risk assessment is a comprehensive process that evaluates the potential threat and consequences of wildfires in a specific area. The goal of a wildfire risk assessment is to identify and understand the factors that contribute to the risk of wildfires and the potential impacts on human lives, property, infrastructure and natural resources (after Pearce et al. [2014]).

Wildfire risk management is the overall process of guiding and controlling human-environment interactions to reduce wildfire risk. This process extends from the planning to the execution phase and takes places from the local or property level (e.g. a buyer or seller) to the government (national [e.g. Fire and Emergency New Zealand], regional or district) level. The term 'wildfire risk management' focuses on strategies and actions aimed at mitigating the risks associated with wildfire, protecting communities and enhancing preparedness.

NZFOA (2018) wrote guidelines for comprehensive forest-fire risk management. Essential components of the guidelines are reduction, readiness, response and recovery. These principles form a systematic approach to mitigating the impact of forest fires and ensuring the safety of forested areas and surrounding communities. Reduction focuses on pro-actively minimising the likelihood of forest fires and reducing their potential intensity and spread. It involves evaluating and assessing fire risk, educating the public and planning fire reduction. Readiness refers to "actions a forest manager can take to ensure the most effective fire suppression before any wildfire event" (NZFOA 2018). The response phase comes into action when a forest fire occurs. As the primary agency responsible for fire management and emergency response, Fire and Emergency New Zealand is responsible for fire prevention and identifying potential fire hazards and responding to reports of wildfires to prevent their escalation and minimise their impact (Fire and Emergency New Zealand c2023h). Once the forest fire has been contained and extinguished, the recovery phase begins. Recovery involves assessing the damage caused by the fire and initiating measures to rehabilitate and restore the affected forest areas (NZFOA 2018).

Wildfire risk mapping involves creating maps that not only predict where wildfires are likely to happen but also consider the potential impact and severity of those wildfires on people, property and the environment. It incorporates elements such as the presence of critical infrastructure (e.g. hospitals, schools), population density, land-use patterns, evacuation routes, emergency-response capabilities and other vulnerability indicators (after Pearce et al. [2014]). The goal is to assess the overall risk of a wildfire event and identify areas that may suffer the most severe consequences in the event of a fire. It combines both the likelihood of a fire occurrence (susceptibility) and the potential consequences (vulnerability).

Susceptibility factors may include fuel availability (the presence and type of vegetation that can act as fuel for wildfires), weather conditions, topography and human activities (e.g. proximity of human settlements and roads) (Verde and Zêzere 2010; Oliveira et al. 2021).

Wildfire risk perception is the social dimension of wildfire risk and relates to how a person perceives, comprehends and evaluates wildfire risk of urban areas and green spaces (after Champ and Brenkert-Smith [2016]).

Wildfire setback is the minimum distance that new and re-planted vegetation must be set back from existing principal buildings and vice versa (after Selwyn District Council [2020]).

2.2 Legislation and Regulation

The legislative and regulatory framework in the context of wildfire management involves a set of laws, rules and policies established by government authorities to govern and guide actions related to wildfire prevention, response and recovery. To gain a better understanding of this framework, the definitions, terms and concepts related to the legislative framework and regulatory system are briefly described below.

Acts are bills passed by Parliament and have received royal assent (New Zealand Parliament 2015).

Bills are acts that are being proposed (Parliamentary Counsel Office [2023]).

Formal rules are typically established and enforced by authoritative bodies or institutions (New Zealand Government 2017). The constitution of Aotearoa New Zealand draws from various sources such as legal documents, common law and established constitutional practises (Governor-General c2023).

Informal rules are defined here as unwritten norms and expectations in a particular setting or context. Informal rules can be based on shared understandings or community traditions. In the context of wildfire planning, there can be unspoken guidelines and practises that planners follow when it comes to dealing with natural hazards. For example, in areas prone to wildfires, experienced planners may have developed informal rules over time based on their knowledge of the local environment, historical patterns of wildfires and effective strategies for prevention and response. These rules may not be explicitly written down but are understood and followed as part of the shared understanding within the planning community.

Legislation refers to acts of Parliament (statutes) and secondary legislation (Parliamentary Counsel Office [2023]). Secondary legislation is:

> *"law made by someone other than parliament under a power that Parliament has formally delegated in a particular Act."* (Parliamentary Counsel Office [2023])

Legislative framework as used in this report refers to legislation, regulations, plans and guidance documents specific to wildfire planning and management in Aotearoa New Zealand. The legislative framework "consists of policies, legislation (and by-laws), and governance structures" (Connell 2016).

Policy is, according to the Oxford English Dictionary, "a principle or course of action adopted or proposed as desirable, advantageous, or expedient; especially one formally advocated by a government, political party, etc." or a "method of acting on matters of principle, settled practice". Policies are instruments used within the regulatory framework to guide decision-making and achieve specific objectives. Policies can be developed by government agencies or other entities to address specific issues such as wildfire risks.

Regulations are a "law-making action made under the delegated authority of an Act" and "not actions of parliament" (New Zealand Parliament 2015). They include rules within regional, unitary and district plans, as well as bylaws (New Zealand Parliament 2015).

Regulatory framework is derived from the laws passed through the legislative framework. The regulatory system:

> *"is a set of formal and informal rules, norms and sanctions, given effect through the actions and practices of designated actors, that work together to shape people's behaviour or interactions in pursuit of a broad goal or outcome."* (New Zealand Government 2017; Ministry of Justice [2023])

Thus, the regulatory framework includes the rules, guidelines and procedures established by government agencies or regulatory bodies to enforce and implement specific laws.

Standards are technical details and become mandatory once these are referenced in an Act (Standards New Zealand c2023).

2.3 Community Resilience and Adaptation

Prior to human settlement, native forest covered a significant portion of Aotearoa New Zealand's land. This was estimated to be around 80% (MPI 2022a). However, due to various factors such as deforestation, agriculture, urbanisation and introduced species, the extent of native forest has declined, and it is currently estimated to cover approximately 38% of Aotearoa New Zealand's land area (MPI 2022a).

A decline in native forest cover and the subsequent conversion of forested land to weed vegetation and grasses can have implications for wildfire risk. Although only a few native species possess specific fire-adaptations, many have the capacity to endure infrequent fire (Burrows 1999) and exhibit the ability to regenerate after wildfires (Perry et al. 2014). It is worth noting that fire-adapted native species are primarily of Australian origin (Perry et al. 2014). Compared to exotic weeds and overgrown grasslands, these species may exhibit a higher level of fire resistance, contributing to decreased fire risk.

The growing occurrence of extreme wildfire events, driven by the impacts of climate change and population growth, exerts pressure on both forests and communities residing in the rural-urban interface. Communities in these areas will have to adjust to a life characterised by more frequent and intense wildfires, highlighting the importance of community resilience and adaptability. These terms, along with related concepts, are described below to clarify what they mean in the context of wildfire management and planning.

Adaptation in human systems is defined by the IPCC as:

> *"the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects."* (IPCC 2023)

An illustrative example of this phenomenon is a community in the rural-urban interface that removes high-flammability native plant species from a nearby forest. While this intervention might initially seem like a positive step to mitigate fire risk, it could have adverse effects on the natural environment and compromise the forest's resilience. Invasive plant species may overtake the ecosystem, leading to a decline in biodiversity, further diminishing its ability to cope with disturbances. Examples of highly flammable and invasive plant species are broom and gorse. They can quickly spread fires, making it difficult for firefighters to contain them (Joy et al. 2021). Thus, the seemingly adaptive action in one area (the human system) could result in reduced adaptability and resilience in parts of the natural system.

Fire adaptation means:

> *"communities take mitigation actions so they can live with wildfire without harm and without extensive wildfire suppression efforts."* (US Forest Service [2023])

Fire resilience strategies are methods used by people, communities and governments to improve the resilience of natural and human systems to extreme wildfire events.

Resilience is defined in the National Disaster Resilience Strategy (MCDEM 2019) as:

> *"the ability to anticipate and resist the effects of a disruptive event, minimise adverse impacts, respond effectively post-event, maintain or recover functionality, and adapt in a way that allows for learning and thriving."*

The IPCC (Intergovernmental Panel on Climate Change) defines resilience as:

> *"The capacity of interconnected social, economic and ecological systems to cope with a hazardous event, trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure. Resilience is a positive attribute when it maintains capacity for adaptation, learning and/or transformation."* (IPCC 2023)

In the context of wildfire risk, a more-resilient community anticipates, monitors, plans and prepares for extreme wildfire events. When we extend this definition to communities, a more-resilient community is a community that is flexible and better able to adapt and overcome perturbations (after Walker et al. [2004], Folke [2006] and Beatley [2009]) such as wildfires. Such a community is well-informed and pro-active, as it takes measures to reduce wildfire risk before an extreme event occurs. For example, building homes that are more fire-resistant, incorporating considerations of wildfire risk into road design, ensuring that there are sufficient water supplies, using fire-resistant landscaping practises and developing essential neighbourhood infrastructure all contribute to effective mitigation efforts. Another effective strategy is to take pro-active measures and avoid development in wildfire-prone areas. By implementing these measures, communities can improve wildfire preparedness and their overall resilience.

Sustainable development is:

> *"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs and balances social, economic and environmental concerns."* (IPCC 2023)

Unsustainable land use in wildfire-prone areas, such as land degradation and urban expansion, reduces the capacity and adaptability of ecosystems and communities to adapt to extreme wildfire events and causes negative socio-economic and environmental impacts.

The Resource Management Act (RMA) 1991 (Clause 5) defines sustainable management as:

> *"managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while –*
>
> *(a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
>
> *(b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
>
> *(c) avoiding, remedying, or mitigating any adverse effects of activities on the environment."*

The NBA references sustainable development as follows by stating that the purpose of the NBA:

> *"… must be achieved in a way that–*
>
> *(a) protects the health of the natural environment; and*
>
> *(b) subject to paragraph (a), enables the use and development of the environment in a way that promotes the well-being of both present and future generations."* (NBA 2023, Part 1 s3)

3.0 RESEARCH PROGRAMME

3.1 Scope of Study

This study focuses on the main legislative framework relating to wildfire management at the rural-urban interface. For this reason, we reviewed numerous legislative, regulatory and planning documents that referenced fire and wildfire. Special attention was given to instruments and documents where wildfire risk was considered. By analysing these sources, we aimed to gain more comprehensive insights into how wildfire is managed in Aotearoa New Zealand and integrated into the existing planning field.

3.2 Methods

The methods section serves as a roadmap, as it provides a brief overview of the key elements involved in this research. It starts by introducing the research questions that guided the investigation. Next, it outlines the study design, detailing the approach taken to collect and analyse the data. Lastly, it describes the specific methods employed during the study, along with the type of analysis that was conducted to derive meaningful insights from the gathered information.

3.2.1 Research Questions

The primary goal of this research is to explore the main legislative framework and planning processes underlying the management of extreme wildfires at the rural-urban interface. By doing so, the study aims to pinpoint the specific steps involved in the planning and decision-making processes pertaining to wildfire management in regions susceptible to severe wildfires and highlight areas for improvement.

3.2.2 Study Design and Methods

Three steps were carried out to identify the main legislative framework and planning processes applicable to extreme wildfire management at the rural-urban interface; namely, consultations, document analysis and flowcharting to visualise the primary legislative framework.

3.2.2.1 Consultations

Multiple consultations with various actors were conducted to support the research objectives in the following ways:

1. Monthly Research Group meetings were organised with programme partners, consisting of researchers from the University of Canterbury, Massey University, Royal Melbourne Institute of Technology University (Australia), United States Forest Service (USA) and Crown Research Institutes Scion and GNS Science.
2. Two collaborative Expert Working Group (EWG) meetings were held. During these sessions, wildfire experts and the aforementioned researchers provided guidance and input on the research progress and steps outlined in this report. The EWG (five persons) consisted of a planner; fire engineer; architect; landscape architect; and a natural hazard recovery expert.

3. One-on-one meetings were conducted with:
    a. Seven professionals identified by the EWG and researchers as individuals who have specialised knowledge, skills and experience in the field of planning (experts). This allowed for additional insights into the planning processes underlying the management of extreme wildfires.
    b. Four professionals with experience in regional and/or local planning, who provided feedback on the Wildfire Management and Planning flowchart.

The consultation procedures were discussed with the research team and Scion's ethics committee. It was determined that the procedures aligned with Scion's ethics guidelines and were low risk. The interviews were audio recorded, except for one interview, and all of them were conducted with the participants' consent while adhering to confidentiality procedures.

3.2.2.2 Document Analysis

The document analysis aimed to gather comprehensive background information on the regulatory, planning and decision-making systems related to the management of extreme wildfires at the rural-urban interface. The analysis involved a review of various documents, including those directly associated with the primary legislative framework and mechanisms that address wildfires, such as national acts and standards. The analysis also examined other tools and resources related to wildfire management, such as general policies, strategies, plans and guidance documents specifically focused on wildfires. By assessing these diverse sources, a comprehensive understanding of the regulatory and planning landscape surrounding wildfires at the rural-urban interface could be obtained.

Various sources, including wildfire experts and researchers in Aotearoa New Zealand, Australia and the United States of America, as well as online search engines, were utilised to find documents relevant to the document review. Also included were databases such as Google Scholar, national and local government sites (e.g. New Zealand Legislation), and United States of America government publications (e.g. from the United States Department of Agriculture).

During the document analysis, each document was investigated to identify instances of the following term(s): 'wildfire risks', 'wildfire', 'wild fire', 'rural fire', 'bushfire', 'fire', and/ or 'hazard'. A distinction was made between documents that implicitly (I) or explicitly (E) referred to these terms, as shown in Tables 4.1 and 4.2. An implicit reference to wildfire in legislation refers to the inclusion or mention of wildfire-related matters within a document without explicitly using the term 'wildfire'. Instead of directly using the term 'wildfire', the document may use related terminology such as 'fire' or related terms that indirectly address wildfire issues, such as 'hazard', 'safety' or 'resilience' (see Section 4 for specific examples). When the terms were not found in the researched documents, the mechanisms or tools are labelled 'none' (N).

The document analysis was an iterative and dynamic process, as the insights and discussions derived from the consultations with the Research Group, EWG and planning experts played an important role in shaping the understanding and interpretation of the documents' content. This iterative approach ensured that the document analysis incorporated diverse perspectives and allowed for a more comprehensive and nuanced understanding of the main legislative framework and planning processes related to wildfire management.

3.2.2.3 Flowchart Creation

Based on the document analysis, a Wildfire Management and Planning flowchart (Figure 5.1) was created, visualising the legislative framework related to wildfire management. Input from planning experts, programme partners and the EWG provided additional insights on wildfire management processes and key legislative and regulatory tools.

During the document analysis, eight predominant domains emerged: Te Tiriti o Waitangi, Climate Change, Health, Emergency Management, Resource Management, Conservation and Forestry, Local Government and Housing and Infrastructure. The researchers consulted four professionals with experience in regional and/or local planning to provide additional information and feedback on the flowchart and help identify: (1) how national, regional and local regulations, institutions and professional processes shape their decision-making in the planning field; and (2) how the different domains are linked.

The document analysis, flowchart creation and consultations were carried out iteratively, representing a continuous and evolving process, as shown by Figure 3.1. The figure illustrates the diverse components of the analysis and emphasises how the research steps are interconnected and informed one another.

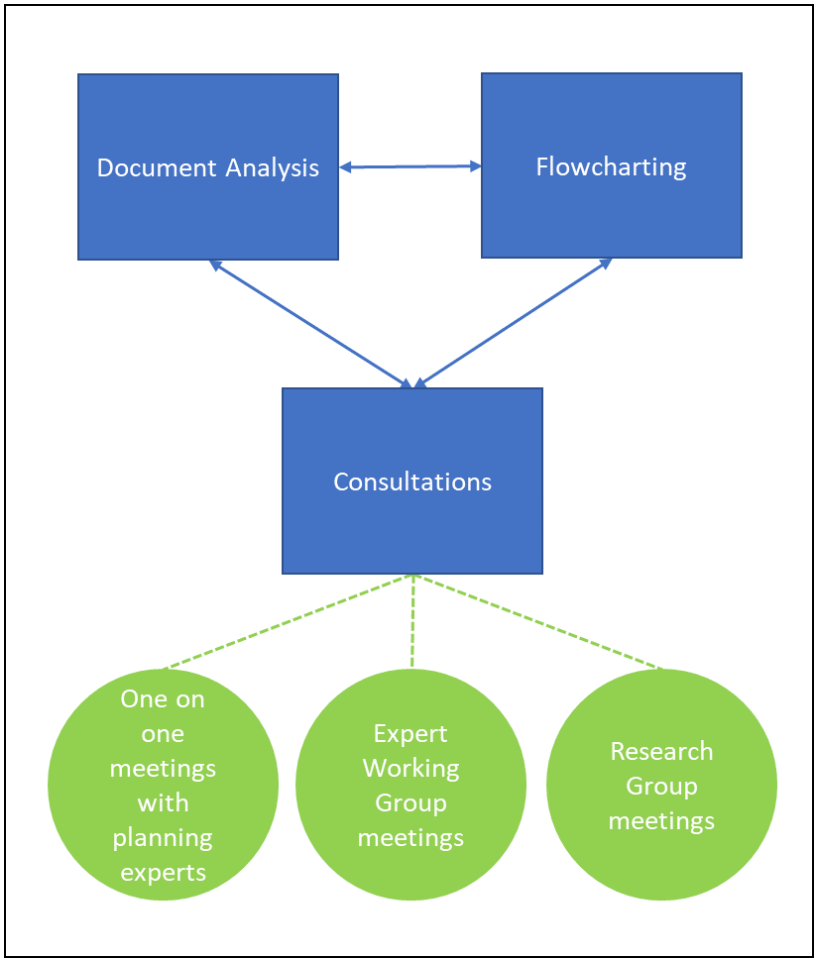

Figure 3.1 Illustration of the different components of the research analysis and inter-relationships among the various research steps, showcasing how the steps informed one another.

3.2.3 Research Analysis

The purpose of this research is to gain a better understanding of the primary legislative framework and planning processes underlying the management of extreme wildfires at the rural-urban interface. The first part of this research included document analysis, consultations with professionals and the development of a flowchart. The information and insights obtained from these activities were then used to create a preliminary list of planning constraints and opportunities, as described in more detail in Section 5.

The document analysis consisted of a comprehensive review of documents pertaining to wildfire risks and assets, infrastructure or property potentially affected by such risks. This review encompassed over 170 publications from various countries such as Aotearoa New Zealand, Australia, Canada, the United States of America, and the United Kingdom. These documents included key statutes; policies; publicly available agency documents and guidance; academic publications; case studies; and planning documents at the national, regional and local levels.

As aforementioned, meetings with programme partners and experts were conducted to discuss and refine steps and nodes for mapping purposes. Together with the literature review, this resulted in an extensive list of approximately 30 documents related to Aotearoa New Zealand legislation-related documents and over 40 general policies, strategies, plans and guidance documents related to wildfire management. These documents were coded by topic. Documents not relevant to wildfire management at the rural-urban interface were excluded from this report. This led to two condensed lists of documents to fit into our analysis, as shown in Tables 4.1 and 4.2.

Consultations with the EWG and planning professionals further enhanced the document analysis. Involving these groups ensured the relevance of the document analysis within the context of wildfire management in Aotearoa New Zealand. Additionally, these consultations aided the validation and fine-tuning of the interpretations derived from the analysed documents. Moreover, the consultations provided valuable insights into the practical application of the analysed documents.

The document analysis formed the basis of the Wildfire Management and Planning flowchart. The flowchart was then refined through discussions with the Research Group, EWG and planning experts. This iterative process focused on highlighting the connections between various domains and decision-making processes within the flowchart.

Following the analysis of documents; consultations with experts, researchers and professionals; and visualisation of the wildfire management framework, multiple planning constraints and opportunities were identified. These planning constraints and opportunities were systematically coded by topic and consolidated into a comprehensive list within eight different domains, or systems. This list is not meant to include every possible constraint or opportunity but rather is an initial foundation for future research and exploration in this area.

4.0 MAIN LEGISLATIVE FRAMEWORK RELATED TO WILDFIRE MANAGEMENT

4.1 Introduction

This section describes the main legislative framework and mechanisms that reference wildfires, such as Acts and Standards from the national to local level. Other tools such as general policies, strategies, plans and guidance documents are discussed if they were deemed relevant after consultation with the EWG and document analysis as described below.

As described in Section 3, each document was searched for the term(s) ‘wildfire risks’, ‘wildfire’, ‘wild fire’, ‘rural fire’, ‘bushfire’, ‘fire’ and ‘hazard’. Documents that reference the search terms are labelled ‘explicit’ (E), ‘implicit’ (I) or ‘none’ (N) (see also Section 3.2.2.2 and Tables 4.1 and 4.2).

The authors identified eight categories or domains that make up the core of the legislative framework linked to wildfire management. Therefore, this section is divided into eight domains: Te Tiriti o Waitangi, Climate Change, Health, Emergency Management, Resource Management, Conservation and Forestry, Local Government and Housing and Infrastructure. In this report, the term ‘infrastructure’ refers to both green and grey infrastructure (Section 2). There is no specific order in which these categories are described in this document. Table 4.1 at the end of this chapter summarises the legislative mechanisms, while Table 4.2 summarises other management tools for each domain.

4.2 Te Tiriti o Waitangi

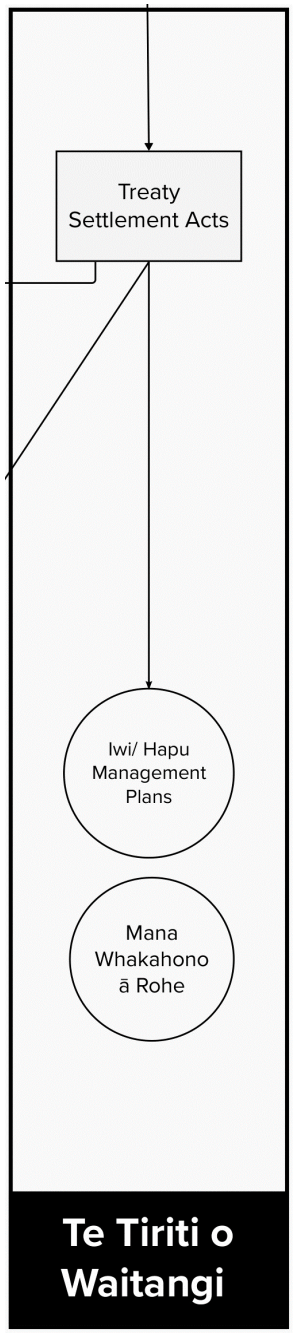

Figure 4.1 The main legislative framework within the Te Tiriti o Waitangi domain. Legislative tools are encased in rectangles and other tools in circles. Lines and arrows that point to areas outside the domain box represent presumed connections between domains (see also Figure 5.1).

Te Tiriti o Waitangi plays an important role in New Zealand's constitution and is Aotearoa New Zealand's founding document (Governor-General c2023). This section describes the regulatory and legislative tools and provisions that provide the mechanisms by which Tiriti partners are engaged in Aotearoa New Zealand land-use planning and management (Figure 4.1). Furthermore, it shows to what extent Te Tiriti o Waitangi is linked to wildfire management, how iwi/hapū participation is recognised in resource management and how Tiriti principles are incorporated into the RMA (Figure 5.1). Related concepts such as te ao Māori (the Māori worldview), Mana Whakahono ā Rohe (iwi and hapū participation arrangement) and mātauranga Māori (Māori knowledge system) are also briefly described. The Te Tiriti o Waitangi domain is presented here as over-arching the other domains (Figure 5.1).

This section is intended as a summary and not a comprehensive overview of these Māori concepts. Readers are encouraged to consult other references for a more comprehensive description. Some such references are listed below, but many more may be appropriate.

Wildfire planning must "give effect to the principles of Te Tiriti o Waitangi" principles and is subject to existing resource management mechanisms embedded in the RMA and NBA, which replaces the RMA (Section 4.6). This means providing greater recognition of te ao Māori and mātauranga Māori, as well as taking into account Iwi/Hapū Management Plans (IHMPs) (Ministry for the Environment 2022b; NBA 2023).

The main stakeholders discussed within this domain in this report are Te Tiriti o Waitangi partners (Crown, iwi and hapū), government departments such as Te Arawhiti (Office for Māori Crown Relations) and LINZ (Land Information New Zealand). Property and building owners are also listed as stakeholders, as they can be directly impacted by the consequences of increased wildfire risk (Table 5.1).

4.2.1 Te Tiriti o Waitangi Obligations

Te Tiriti o Waitangi (the Treaty of Waitangi) was signed in 1840 between the British Crown and a large number of Māori rangatira (chiefs). Te Tiriti o Waitangi is regarded as "New Zealand's founding document" (NZ History 2017). The Crown has a duty to meet its Te Tiriti o Waitangi obligations. Council or Crown responsibilities in relation to Te Tiriti o Waitangi are stated in many statutes, specifically, in the context of wildfire management, the Local Government Act 2002, RMA 1991, Conservation Act 1987 and iwi settlement legislation (Christchurch City Council 2017).

Te Tiriti o Waitangi empowers kaitiakitanga (guardianship) by mana whenua / tangata whenua over their taonga (possessions), including waters, lands, fisheries and mahinga kai (food sources) (Christchurch City Council 2017).

4.2.2 Iwi and Hapū Participation

The RMA and NBA recognise other legislation that provide for iwi/hapū participation in resource management. The legislation pieces include the acts listed in the Treaty of Waitangi Act 1975 and those listed in Schedule 14 of the NBA. The iwi and hapū participation legislation guarantees iwi/hapū participation in resource management matters and natural hazards planning because the legislation's requirements must be considered and implemented in the area of interest under the Mana Whakahono ā Rohe (see Section 4.2.5.2 for more details). However, power imbalances and a lack of partnership with iwi/hapū remain barriers to Māori engagement and input (Koolen-Bourke and Peart 2022).

Schedule 14 of the NBA lists the acts that include statutory acknowledgements. A statutory acknowledgement is included in the relevant Te Tiriti o Waitangi settlement act. Statutory acknowledgements are intended to recognise "the mana of tangata whenua groups in relation to identified sites and areas", including "areas of land, geographic features, lakes, rivers, wetlands and coastal marine areas" (Ministry for the Environment [1999]; Quality Planning c2017a). It acknowledges the distinct "cultural, spiritual, historical, and traditional connections of an iwi or hapū" with the designated site, established under statutory law (Ministry for the Environment [1999]; Northland Regional Council 2018). Multiple hapū or iwi may be acknowledged as "having associations with a given area" (Northland Regional Council 2018).

4.2.3 Te Ao Māori and Mātauranga Māori

Mātauranga Māori is the Māori knowledge system underpinned by kaupapa and tikanga Māori (Kukutai et al. 2021) and the "unique Māori way of viewing the world" (Waitangi Tribunal 2011). Internationally and domestically, there is growing recognition of indigenous knowledge for addressing complex environmental and social issues (Kukutai et al. 2021).

The resource management reform aims to "provide greater recognition of te ao Māori including mātauranga Māori" (Ministry for the Environment 2022b). The NBA (Part 1 s8) requires all persons exercising powers to:

> *"… recognise and provide for the responsibility and mana of each iwi and hapū to protect and sustain the health and well-being of te Taiao in accordance with the kawa, tikanga Māori (including kaitiakitanga), and mātauranga Māori in their rohe or takiwā."*

4.2.4 Te Tiriti o Waitangi Principles and the Resource Management Act 1991

All persons acting under the RMA should "take into account" Te Tiriti o Waitangi principles, which include the principles of partnership, mutual benefit, active protection, redress; and the duties to act reasonably, honourably and in good faith and to make informed decisions (Te Puni Kōkiri 2001). Local governments also must meet Te Tiriti o Waitangi obligations under the Local Government Act 2002.

The RMA, as the main legislation managing resources and the effects of land-use activities, has incorporated some key mechanisms to provide for "better" engagement with Māori in resource development decision-making (Bargh and Van Wagner 2019). Such mechanisms include recognising Māori relationships with "ancestral lands, water, sites, wāhi tapu, and other taonga" as a matter of national importance according to the RMA, requiring the preparation of National Policy Statements (NPS) to have regard to issues significant in Te Tiriti o Waitangi terms and Mana Whakahono ā Rohe – a statutory agreement between tangata whenua and local authorities under the RMA.

The RMA requires all persons exercising powers under it "to take into account the Treaty principles" (Ministry for the Environment 2022b). This language changed to "give effect to" when the Natural and Built Environment Bill was enacted into law in August 2023. The Act's full implementation will take place over a 10-year period (Ministry for the Environment 2023a). Part 4 of the RMA provides for the power transition from a local authority to an iwi authority and the creation of a joint management agreement.

The RMA mandates that regional and territorial authorities must incorporate statutory acknowledgements into applicable district and regional plans and policy statements. Additionally, they are required to consider relevant statutory acknowledgements made under settlement legislation while making decisions on resource consents. The RMA also requires local councils to take into account IHMPs during the preparation of Regional Policy Statements (RPS), regional and district plans or plan changes.

Te Tiriti o Waitangi settlements aim to resolve historical claims of Crown treaty breaches. Te Arawhiti (previously the Office of Treaty Settlements) leads the settlement process, and LINZ provides a regulatory role and is involved in the land transaction process (LINZ [2023b]). Once the terms of a settlement have been agreed upon, the Crown will make a law to confirm the settlement. Te Arawhiti promotes Māori engagement across Government and negotiates settlement claims. In principle, settlements provide an avenue for addressing historical grievances and establishing a more balanced relationship between the Crown and iwi in terms of the management and governance of land and resources.

Regarding wildfire planning, general recommendations include:

- Engage in early and continuous consultation with local iwi/Māori.
- Involve mana whenua / tangata whenua in decision-making.
- Implement measures to protect and restore the natural environment and sites of cultural significance to mana whenua (Christchurch City Council 2017).
- Take into account relevant IHMPs and any other relevant planning documents recognised by the appropriate iwi/hapū.

4.2.5 Other Tools

4.2.5.1 Statutory Acknowledgments in Accordance with Schedule 11 of the Resource Management Act 1991

Statutory acknowledgements are an acknowledgement by the Crown of an iwi/hapū's cultural, spiritual, historical and traditional association with specified areas. Under the RMA, this requires consideration of whether a resource consent application will result in the iwi/hapū being an affected party. Taking into account effects of a statutory acknowledgement could include consideration of wildfire effects.

4.2.5.2 Mana Whakahono ā Rohe

Mana Whakahono ā Rohe is a statutory agreement between tangata whenua and local authorities (RMA 1991). Introduced in 2017, it is a mechanism to overcome the challenges of the RMA and help tangata whenua better participate in resource management decision-making through more structured discussion with local government (Ministry for the Environment 2018).

Mana Whakahono ā Rohe must contain certain matters including "how an iwi authority may participate in the preparation or change of a policy statement or plan" (RMA 1991), which offers tangata whenua an opportunity to get involved in their regional natural hazards management (Ministry for the Environment 2018).

An example is the Mana Whakahono ā Rohe between Northland Regional Council and hapū of Te Tai Tokerau, which specifically lists 'natural hazards' as a matter covered during the regional plan process and participation (Northland Regional Council 2020).

4.2.5.3 Iwi or Hapū Management Plans

An IHMP is a "… resource management plan prepared by an Iwi, Iwi authority, rūnanga or Hapū" (Quality Planning c2017c) and supported by participating authorities (NBA 2023). These plans reflect the expression of kaitiakitanga and rangatiratanga (Jolly and Ngā Papatipu Rūnanga Working Group 2013) and "help Iwi and Hapū exercise their kaitiaki roles and responsibilities" (Quality Planning c2017c).

In theory, IHMP provide an opportunity for iwi/hapū to identify issues regarding resources (Saunders 2017) in an area. This means that IHMPs could be valuable tools for natural-hazard management and be influential within council planning (Saunders 2017). However, an EWG member (10 October 2022) voiced the concern that there may not always be sufficient capacity within local communities to respond to wildfire preparedness and management issues.

4.3 Climate Change

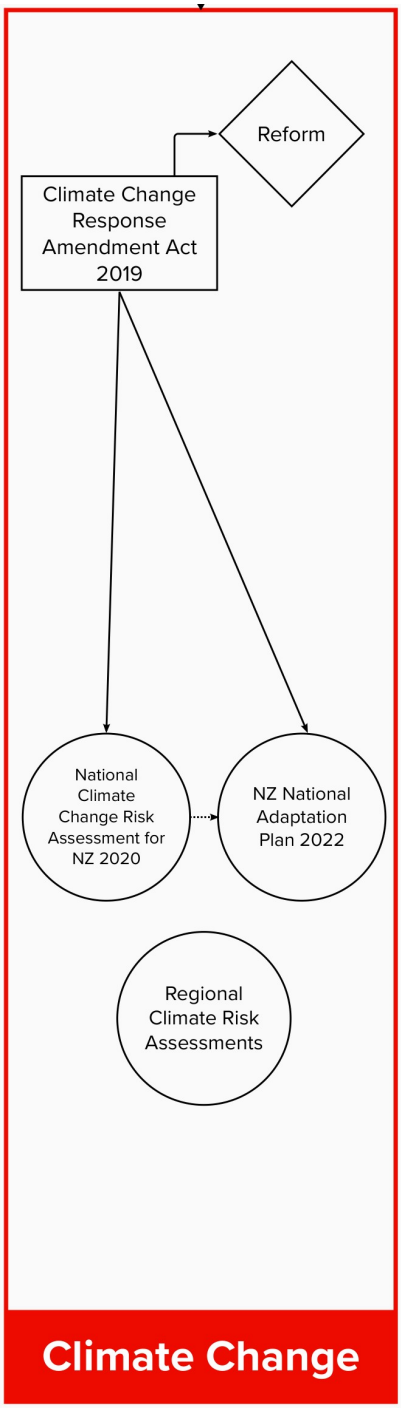

Figure 4.2 The main legislative framework within the Climate Change domain. Legislative tools are represented by rectangles, reforms by diamonds and other planning tools by circles. Figure 5.1 visualises the connections between domains.

Climate-change projections show that many parts of Aotearoa New Zealand face “a hotter, drier and windier” future (Ministry for the Environment and Stats NZ 2020), which will increase the wildfire risks in these areas (Langer et al. 2021). Aotearoa New Zealand’s current major legislative pathway to reduce the impacts of climate change is through the Climate Change Response (Zero Carbon) Amendment Act 2019 (Figure 4.2). This Act amends the Climate Change Response Act 2002, strengthening the country’s commitment to addressing climate change and setting a target of net-zero emissions of greenhouse gases (except biogenic methane) by 2050.

Other tools are Aotearoa New Zealand's first National Adaptation Plan 2022 (Ministry for the Environment 2022a), as well as national and regional climate-change risk assessments. Figure 5.1 provides an overview of how the researchers envision the Climate Change domain to reside within the larger legislative framework associated with wildfire management.

The responsibility for adaptation planning is typically shared among multiple entities to ensure comprehensive and effective strategies. While regional councils play a crucial role in adaptation planning for climate-change-related hazards, the process often involves collaboration with various stakeholders, including the Crown, Ministry for Primary Industries (MPI), Ministry for the Environment, Department of Conservation (DOC), Climate Change Commission, civil engineering firms and property owners (Table 5.1).

4.3.1 Climate Change Response (Zero Carbon) Amendment Act 2019

The Climate Change Response (Zero Carbon) Amendment Act (2019) provides a framework for climate-change policy development that allows Aotearoa New Zealand "to prepare for, and adapt to, the effects of climate change" and to meet its obligations to the New York Convention (1992), the Kyoto Protocol (1997) and the Paris Agreement (2015). The Act provides for greenhouse-gas-emission trading schemes and levies on certain greenhouse gases.

In addition, the Act establishes a Commission to consider, advise, recommend or report on target emission budgets and reductions, pricing for emission trading and phase-out, preparation of national climate-change risk assessments, implementation of the National Adaptation Plan, and primary sector commitments. The Act focuses on the causes of climate change. The effects of climate change on wildfires are primarily covered through the requirement to prepare the National Adaptation Plan and national climate-change risk assessments (see Section 4.3.2).

4.3.2 Other Tools

4.3.2.1 National Climate-Change Risk Assessment for Aotearoa New Zealand

The Climate Change Response (Zero Carbon) Amendment Act 2019 requires a National Climate Change Risk Assessment (NCCRA) at least every six years, and, in response to each NCCRA, the Minister for Climate Change must prepare a National Adaptation Plan. In the first risk assessment report, 43 priority risks have been identified (Ministry for the Environment 2020a). One of the 10 most significant risks in terms of risks to buildings is "increased fire weather", with a consequence rating of 'Extreme' and an urgency rating of 90, which is the second-highest urgency rating (Ministry for the Environment 2020a). The identification of "increased fire weather" as one of the 10 most significant risks indicates that wildfire is prioritised at the national level in Aotearoa New Zealand.

The NCCRA lists the 43 priority risks across the following domains: "human domain, natural environment domain, economy domain, built environment domain and governance domain" (Ministry for the Environment 2020a). The natural, human and built environments and economy domain all include references to increased fire (weather) as an example of extreme events. For risks to terrestrial, freshwater and marine ecosystems in the natural environment domain, reference is made to management of invasive species following fires. For the human domain (Māori and European cultural heritage sites), reference to wildfire is included in climate-change effects on physical health, domestic violence and the vulnerability of heritage sites. For the economic domain, reference to wildfire is included in the effects on insurance cover and insurability of assets (Ministry for the Environment 2020a).

For the built environment domain, reference is made to wildfire disrupting communities and temporarily or permanently damaging buildings, and exposure to this risk, particularly in the rural area, is projected to increase (Ministry for the Environment 2020a). The sensitivity of buildings to wildfire includes the density per hectare of buildings, the size and shape of groups of buildings, the type and amount of vegetation nearby, the distance between structures, the width and layout of roads and reserves, the climate zone and the materials used.

In terms of electricity infrastructure, the transmission and distribution networks are considered to be at risk (Ministry for the Environment 2020a). High winds can cause trees or vegetation to come into contact with power lines, leading to sparks or arcing that can ignite nearby flammable materials (Tse and Fernandez-Pello 1998; Mitchell 2013; Kiessling et al. 2003; Wang and Bocchini 2023). In areas where power lines are in close proximity to dry or combustible vegetation, there is increased risk of ignition. Falling branches or trees can also damage power lines, resulting in exposed electrical wires that pose a fire hazard (Tse and Fernandez-Pello 1998; Mitchell 2013; MBIE 2023b; Wang and Bocchini 2023).

4.3.2.2 Regional Climate-Change Risk Assessments

Regional climate-change risk assessments are developed by regional councils to understand climate-change risks for a specific region. Examples of regional assessments are the Waikato regional climate-change risk assessment (Waikato Regional Council c2022), the Bay of Plenty climate-change risk assessment (Bay of Plenty Regional Council 2023) and the Otago climate-change risk assessment (Tonkin & Taylor 2021).

Councils anticipate that these assessments will guide adaptation planning projects for the different regions by assessing the region's vulnerability and risk for climate-change-related hazards. The Bay of Plenty, Waikato and Otago reports mention increased wildfire risk for the regions and how this may lead to adverse impacts (Bay of Plenty Regional Council 2023; Waikato Regional Council c2022; Tonkin & Taylor 2021). The reports highlight the potential impacts of wildfires, necessitating local councils to address these challenges in future planning efforts (Bay of Plenty Regional Council 2023; Waikato Regional Council c2022; Tonkin & Taylor 2021).

4.3.2.3 Aotearoa New Zealand's First National Adaptation Plan 2022

Aotearoa New Zealand's first National Adaptation Plan shows how the Aotearoa New Zealand government anticipates adapting to the impacts of climate change (Ministry for the Environment 2022a). The plan specifies how proposed actions can build community resilience.

Developments in areas prone to wildfires could expose communities to greater wildfire risk. The National Adaptation Plan document guides development away from high-risk areas such as "exposure to sea-level rise, flooding, heat stress, coastal inundation, and wildfire". Guiding development away from hazard-prone areas requires collaboration, effective governance, stakeholder engagement and careful consideration of various factors (e.g. vulnerability assessments and exposure mapping to identify hazard prone areas).

In urban development planning, councils must consider both adaptation and mitigation for communities. This means that councils must strive for "compact urban form that is well linked to public transport and jobs, and in areas with less exposure to climate impacts", "directing development away from areas exposed to flooding or wildfire" and "requiring additional water storage in urban and rural areas as part of adapting to drought" (Ministry for the Environment 2022a).

4.4 Health

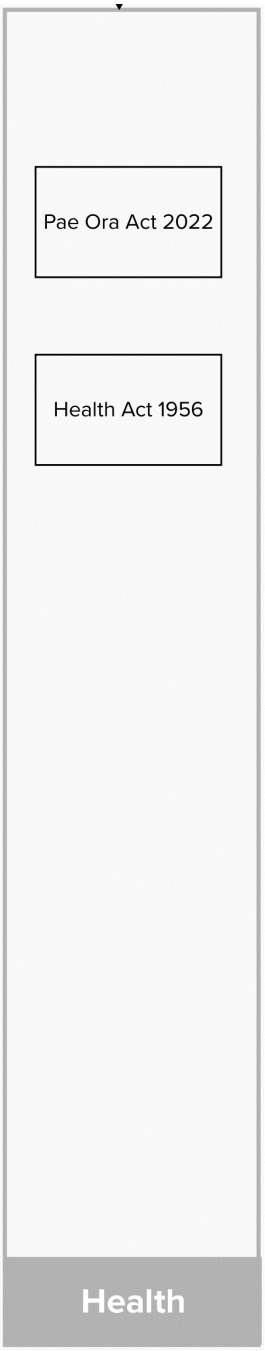

Figure 4.3 The main legislative framework within the Health domain. Legislative tools are represented by rectangles. Figure 5.1 visualises the connections between domains.

The Health Act 1956 and Pae Ora (Healthy Futures) Act 2022 are shown in the Health domain (Figure 4.3). Figure 5.1 visualises how the Health domain is envisioned to be part of the larger legislative framework associated with wildfire management. Health insurance documents and policies can be examined as well to explore how these address health impacts and financial consequences associated with wildfire events. However, these documents are beyond the scope of this study and so not included in this report.

The main stakeholders that were identified within this domain are the Ministry of Health, Te Whatu Ora Health New Zealand, Te Aka Whai Ora (Māori Health Authority) and Public Health Agency (Table 5.1).

4.4.1 Health Act 1956

The Health Act 1956 is a piece of legislation in Aotearoa New Zealand that provides a framework for protecting public health and addressing various health-related issues. While the Act does not specifically focus on wildfires, it can be relevant in the context of wildfire events due to the associated health risks. Wildfires can lead to the release of harmful smoke, particulate matter and other pollutants into the air, which can have adverse effects on respiratory health and exacerbate existing respiratory conditions.

USEPA (2022) recognises wildfire smoke as a significant health concern. With respiratory illness expected to become an increasing challenge in the future, this can burden the healthcare system. Regulating wildfire smoke under the existing Health Act 1956 is a potential avenue to address the lack of specific regulation in Aotearoa New Zealand pertaining to wildfire smoke. Currently, the Act limits smoke nuisances to smoke originating from chimneys or the "burning of any waste material, rubbish, or refuse in connection with any trade, business, manufacture, or other undertaking".

4.4.2 Pae Ora (Healthy Futures) Act 2022

The Pae Ora (Healthy Futures) Act 2022 was enacted to ensure that people in New Zealand have access to equal and quality health care (Ministry of Health [2023]).

The Act does not specify wildfire or natural hazards. However, it states that, as a principle, the health sector must "protect and promote people's health and wellbeing" by addressing the wider determinants, including climate change [s7(1)(e)]. This provides an opportunity for the health sector to consider the effects of climate change, including natural hazards such as wildfires.

4.5 Emergency Management

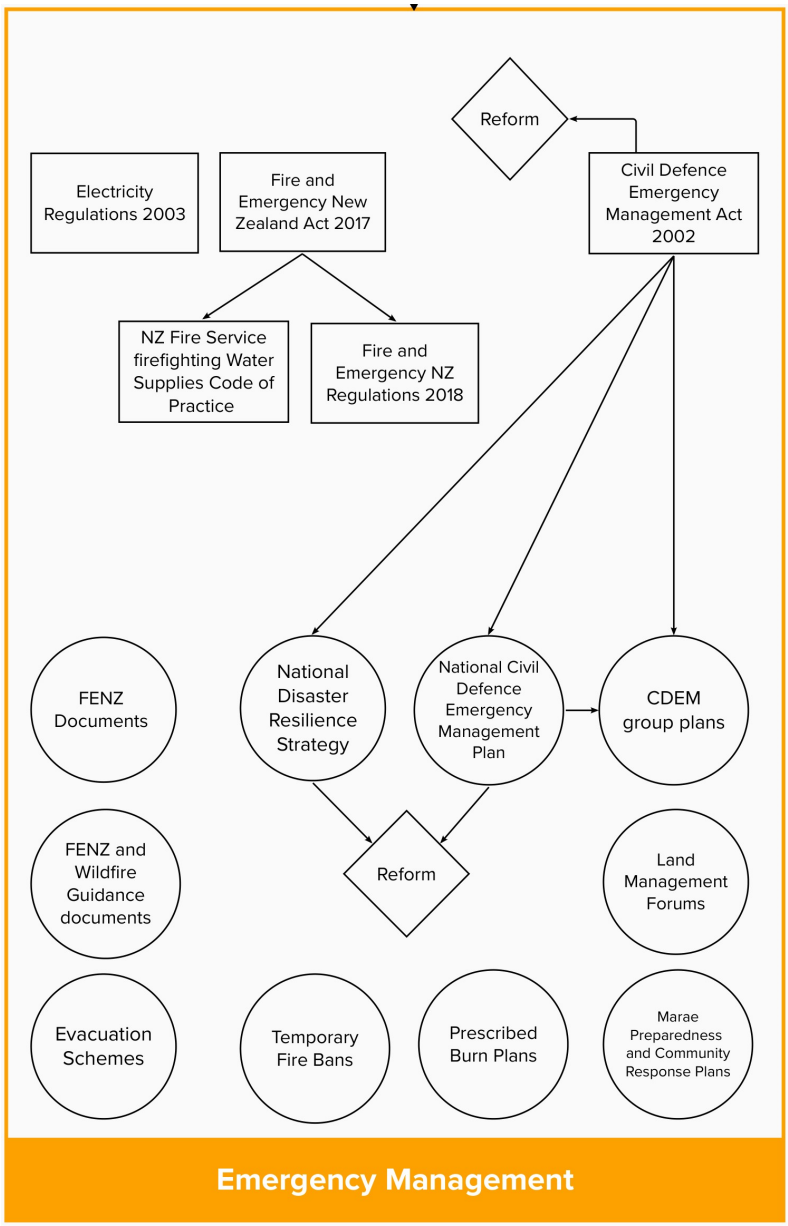

Figure 4.4 The main legislative framework within the Emergency Management domain. Legislative tools are represented by rectangles, reforms by diamonds and other planning tools by circles. Figure 5.1 visualises the connections between domains.

The Fire and Emergency New Zealand Act 2017 is a major piece of legislation in terms of wildfire risk reduction. Other legislative and regulatory mechanisms that are described in the Emergency Management domain are the New Zealand Fire Service Firefighting Water Supplies Code of Practice, the Fire and Emergency New Zealand regulations, the CDEM Act 2002, the reform of the emergency management system and the Electricity (Hazards from Trees) Regulations 2003. Additional planning tools that are worth mentioning are community response plans, marae preparedness Plans, Fire and Emergency New Zealand local fire plans and standards, the National Disaster Resilience Strategy, the National Civil Defence Emergency Management Plan 2015, evacuation schemes, Fire and Emergency New Zealand and wildfire guidance documents, and land management forums, as well as fire bans and prescribed burns (Figure 4.4). Figure 5.1 visualises how the Emergency Management domain is believed to reside within the larger legislative framework associated with wildfire management.

The authors identified the following main stakeholders within the Emergency Management domain: Fire and Emergency New Zealand, NEMA (National Emergency Management Agency), CDEM groups, the Ministry of Defence, the New Zealand Defence Force, Waka Kotahi New Zealand Transport Agency (NZTA), LINZ, iwi/hapū and property owners (Table 5.1).

4.5.1 Fire and Emergency New Zealand Act 2017

The Fire and Emergency New Zealand Act 2017 (FENZ Act) repealed the Forest and Rural Fires Act 1977. The FENZ Act established the firefighting organisation Fire and Emergency New Zealand, which is responsible for reducing fire risk to life and property and limiting damage to property and the environment.

The FENZ Act primarily focuses on fire management rather than comprehensive risk management. While the Act does not explicitly refer to 'wildfire', 'wild fire', 'bushfire' or 'bush fire', it does empower Fire and Emergency New Zealand to use various policy tools for mitigation of wildfire risks by issuing local fire plans, declaring prohibited or restricted fire seasons and providing feedback on fire bylaws made by territorial authorities. Under the Act, regulations can be made relating to fire plans, permits for fires in the open air, operation processes for local advisory committees and levies on fire insurance contracts for properties.

In accordance with s62 of the FENZ Act, Fire and Emergency New Zealand can require landholders to create firebreaks on their land for the purpose of fire control. This is not limited to emergencies. Section 65 of the same Act allows Fire and Emergency New Zealand to:

> *"require the occupier or (if there is no occupier) the owner of land to remove or destroy any vegetation or other thing on the land if Fire and Emergency New Zealand reasonably considers that the vegetation or other thing is likely to endanger persons or property by increasing the risk of the outbreak or spread of fire."*

Fire and Emergency New Zealand and the New Zealand Defence Force are required to have a three-yearly operational service agreement that sets out the services they provide to each other. The Defence Force exercises control over certain Defence Areas listed in such an agreement, where they have their own fire plans. In other Defence Areas, the Defence Force's activities are subject to Fire and Emergency New Zealand's fire permit requirements. Local fire plans are a new mechanism under the FENZ Act and can become a valuable tool for mitigating wildfire risks.

4.5.1.1 Fire and Emergency New Zealand Local Fire Plans

Local fire plans are part of a new and essential mechanism under the FENZ Act 2017. Fire and Emergency New Zealand issued its first 16 local fire plans in 2021 and it is required to review the plans every three years (Fire and Emergency New Zealand 2021b). These plans have the potential to serve as a powerful policy tool if they are well prepared and integrated with other wildfire risk management mechanisms. It is important to note that their effectiveness has not yet been tested, so their effectiveness remains uncertain. Ideally, these plans should encompass the utilisation of skills and capabilities in risk planning and response management to maximise their overall value. The fire plans include "policies and procedures for fire control" (FENZ Act 2017), consider relevant national strategies and advice from local emergency management groups and advisory committees, zone the covered area according to its fire risk conditions, and set out the procedures for fire control, as seen in current local fire plans (Fire and Emergency New Zealand 2021a).

The delineation of zones in the fire plans does not align with territorial authority boundaries. Instead, these zones are based on various factors such as climatic conditions, geographical features or wildfire threat analysis (Fire and Emergency New Zealand 2021b). The fire plans also include the current use of the land. This can pose a challenge, because it demands the co-operation of various stakeholders with different objectives who may not typically collaborate across territorial authority boundaries. This requires the ability to bring diverse groups together to ensure both efficient planning and successful implementation of wildfire management strategies.

The FENZ Act does not clearly outline how these plans should link to RPSs and regional or district plans. While the fire plans ask plan users to follow council bylaws and regional plan rules relating to smoke and air pollution, it remains unclear how this Fire and Emergency New Zealand mechanism can be incorporated into the land-use planning system.

EWG members (4 October 2022, 9 December 2022) also noted that Fire and Emergency New Zealand is primarily focused on emergency response rather than pro-active and long-term planning, particularly in the context of new subdivisions. Therefore, if Fire and Emergency New Zealand is to assume responsibility of supporting wildfire planning mechanisms, it would require the development of new skill sets, the capacity to do so and a shift toward a more comprehensive approach to encompass preventative and long-term wildfire risk considerations.

4.5.1.2 Evacuation Schemes

The purpose of evacuation schemes is to facilitate safe and timely evacuation from the scene of a fire or an alarm of fire to a designated place of safety within a reasonable time (FENZ Act 2017; Fire and Emergency New Zealand c2023b). Wildfires are not the primary focus of evacuation schemes. Instead, the schemes are focused on fires within buildings and ensuring the prompt evacuation from those buildings. Under s75 of the FENZ Act, most buildings, other than private homes, require evacuation schemes. The Fire and Emergency New Zealand (Fire Safety, Evacuation Procedures, and Evacuation Schemes) Regulations 2018 describe the requirements for evacuation schemes and procedures.

4.5.1.3 Fire and Emergency New Zealand and Wildfire Guidance Documents

Various Fire and Emergency New Zealand guidance documents reference wildfires. These documents are listed below:

- The ‘Farms, rural properties and rural businesses’ webpage is “for those who live or work on a farm, rural property or rural business” (Fire and Emergency New Zealand c2023c). It includes content on planning for fires and preventing fires by using machinery safely. It links to other webpages covering both house fires and wildfires, including comments on landscaping, removing flammable material and a diagram showing 10 m and 30 m safety zones.
- The ‘Protect your home from outdoor fires’ webpage covers wildfire, with comments on risks to the home and how to protect homes (Fire and Emergency New Zealand c2023g). The guidelines include a reference to checking everything within 60 m of homes (Fire and Emergency New Zealand c2023g).

- Fire and Emergency New Zealand's 'Check it's alright'[1] website includes links for 'How to prevent wildfires' and 'Protect their homes and yours', which link to other webpages, including those with information on plant flammability.
- The 'Wildfire Safer Housing Guide' focuses on the house construction zone (Fire and Emergency New Zealand 2022b). This guide focuses on safer building design and the building components or elements of a house as it relates to fire hazards, such as roof material, windows, vents and home sprinkler systems (Fire and Emergency New Zealand 2022b). The guide excludes housing construction requirements covered by building regulations and additional guidance that may involve factors such as site selection, vegetation types, outbuildings or community infrastructure.
- The 'Get Fire Safe at the Interface' brochure (Fire and Emergency New Zealand [2019]) describes the most common fire hazards that rural-urban interface properties face and offers effective strategies for homeowners to protect their homes from the dangers of wildfires. The document provides checklists for inspecting the exterior of homes, guidelines for safely lighting open fires and information on creating safety zones, as well as evacuation and preparedness measures.
- The NZFOA Forest Fire Risk Management Guidelines (NZFOA 2018) provide guidance for forest owners to manage wildfire risk. The core elements of the guidelines encompass reduction, readiness, response and recovery. These fundamental principles constitute a methodical strategy for minimising the consequences of forest fires and safeguarding both forested regions and nearby communities. Additional information on wildfire risk management can be found in Section 2n which describes wildfire terms and concepts.

Many of these webpages contain overlapping information. While multiple documents ensure that the information is covered, there is a need for clarification due to the abundance of documents and frequent cross-referencing between webpages. The degree to which the provided information is used effectively and meets the needs of stakeholders remains uncertain.

4.5.1.4 Wildfire Risk-Reduction Strategy and Land Management Forums

Fire and Emergency New Zealand refers to a 'Wildfire Risk Reduction Strategy' on one of its webpages titled 'Climate change and wildfire risk' (Fire and Emergency New Zealand c2023a). The risk-reduction strategy prioritises collaboration with rural communities and those residing in the urban fringe. Its aim is to improve fire risk awareness in the communities' living and working environments while equipping them with effective strategies to mitigate such risks. As part of the risk-reduction efforts, research plays a crucial role, which involves "improving the wildfire risk assessment tools used by many land managers and Local Authorities" (Fire and Emergency New Zealand c2023a).

Apart from research and general inter-agency work, the risk-reduction strategy refers to Land Management Forums. There is a National Land Management Forum, as well as a Regional Land Management Forum. The purpose of the National Land Management Forum is to foster greater collaboration with land managers and landowner representatives. The collaboration focuses on delivering joint workplans and effective communication relating to rural fire issues (Fire and Emergency New Zealand c2023a).

1 https://www.checkitsalright.nz/

4.5.1.5 Temporary Fire Bans and Prescribed Burns

Fire is often used as a land management tool in Aotearoa New Zealand (Bayne et al. 2019). Section 52 of the FENZ Act allows Fire and Emergency New Zealand to issue fire bans, which can be used to manage risks such as fireworks (Fire and Emergency New Zealand 2022a).

Fire and Emergency New Zealand's prescribed burn plan template is a useful tool for managing wildfire risks associated with prescribed burns (Fire and Emergency New Zealand 2021c, c2023d). The template aims to make application easier and more effective and is used together with Fire and Emergency New Zealand's land-clearing burns guide (Fire and Emergency New Zealand 2018, c2023d).

4.5.2 New Zealand Fire Service Firefighting Water Supplies Code of Practice

The New Zealand Fire Service Firefighting Water Supplies Code of Practice (SNZ 2008) is originally published under s30(3) of the Fire Service Act 1975. This Act was repealed by s195(a) of the FENZ Act 2017. Under s73 of the FENZ Act, the Code continues to apply until the Minister approves a new code of practise for firefighting water supplies.

The Code offers guidance on what constitutes "a sufficient minimum supply of water pressure and volume for firefighting in structures in urban fire districts" (SNZ 2008). Furthermore, it outlines the criteria for ensuring that fire trucks have access to the water supply. Alternative water supply may be from sources such as dams, rivers, water tanks, wells, (human-made) pools and lakes (SNZ 2008).

The requirements outlined in the Code of Practice (SNZ 2008) may be used to offer recommendations for similar water-supply systems in rural areas. It serves as a foundation for the conditions of water supply set by territorial and water supply authorities and informs district plans' rules on subdivisions. However, it is primarily designed to address fire suppression within structures, rather than wildfires (SNZ 2008).

4.5.3 Fire and Emergency New Zealand Regulations 2018

The Fire and Emergency New Zealand Regulations are established under ss187, ss191 and ss192 of the FENZ Act 2017. The regulations outline procedures to improve fire safety and facilitate effective evacuation procedures in the case of an alarm or fire. Their primary objective is to enhance the safety of occupants in buildings. The evacuation scheme requirements apply to buildings described in Schedule 2, which are applicable to most workplaces and publicly accessible structures. These regulations cover various aspects, such as exit strategies, equipment and appliances, control of open flames, packing and unpacking of goods, storage of certain materials (e.g. firewood) and firefighting equipment. It is important to note that these requirements focus on evacuations from buildings and not on evacuating individuals from the area.

4.5.4 Civil Defence Emergency Management Act 2002

The purpose of the CDEM Act 2002 is to prepare for and recover from emergencies, hazards and risks (MCDEM [2002]). The Act also requires local authorities to co-ordinate CDEM activities across four areas, known as the '4 Rs' – reduction, readiness, response and recovery (CDEM Act 2002).

The Act covers ‘serious fire’ as one of the emergency events that it addresses. The term ‘wildfire’ is only indirectly referred to by the term ‘serious fire’. The Act encourages and enables communities to achieve acceptable levels of risk and self-reliance, and regional coordination is the cornerstone of the Act (MCDEM [2002]). This indicates that local governments play an important role as a bridge or intermediary to facilitate communication, coordination and implementation of the Act’s requirements at the local level.

The declaration of a state of emergency serves as a crucial response mechanism, granting Controllers and other relevant parties with substantial authority to effectively manage and coordinate response efforts (NEMA [2023b]). During a national emergency declaration, the Director is empowered to coordinate resources that are made available by various stakeholders, including departments, CDEM groups, emergency services, the New Zealand Defence Force, and other persons (CDEM Act 2002). Other stakeholders that can be involved are Waka Kotahi New Zealand Transport Agency (NZTA), LINZ and iwi/hapū, as well as property/building owners.

During previous incidents such as the Christchurch Port Hills (2017) and Hawke's Bay (2017) and the Nelson-Tasman Pigeon Valley (2019) fires, local emergencies were declared (NEMA [2023b]). This declaration of a local emergency gives CDEM groups emergency powers to take response actions (NEMA [2023b]).

4.5.4.1 Emergency Management System Reform

Following the 2016 Kaikōura earthquake and 2017 Port Hills fires, the government reviewed its emergency management system. As a result of the review, the government has established NEMA and started the Emergency Management System Reform (EMSR) in August 2018. The EMSR proposes to replace the CDEM Act 2002 with a new Emergency Management Bill, which provides a framework for a fit-for-purpose emergency management system.

The new Bill will shift toward a community-led response and focus on building community resilience. Iwi and Māori will be enabled to have decision-making roles across the emergency management system (DPMC 2021). The Bill will clarify roles and responsibilities at the national, regional and local levels. As a more flexible mechanism, NEMA’s chief executive will have the power to authorise “emergency management rules” (DPMC 2021).

Although the Port Hills fires is one of the events that triggered the review, wildfire has only been mentioned once as a more-frequent future hazard due to the changing climate (DPMC 2018). This could be a result of the comments on the Port Hills fires focusing heavily on the lack of good information during the response. Reducing risk as a general principle has been mentioned in the reform discussions (DPMC 2018, 2021); however, this has only been brief.

4.5.5 Electricity (Hazards from Trees) Regulations 2003

The Electricity (Hazards from trees) Regulations 2003 address the trimming of trees near power lines and help to promote safety and maintain electricity supply in Aotearoa New Zealand (MBIE [2023]). This regulation does not specifically refer to fire, although protection of lines from trees will indirectly reduce the risk of fire. This regulation has been under review since 2019, and the review recognises the need to consider bushfire risks (MBIE 2023b).

4.5.6 Other Tools

As stated earlier in this section, Fire and Emergency New Zealand and the CDEM groups play essential roles in fire preparedness and emergency response planning. In addition, community response plans and marae preparedness plans can be important planning tools for local communities responding to and/or recovering from wildfires (EWG member, 4 October 2022).

4.5.6.1 Community Response Plans and Marae Preparedness Plans

Many communities in Northland have developed Community Response Plans with assistance from the regional council and CDEM (Northland Regional Council [2023a]). The Northland region showcases completed response plans on their website. These plans outline simple emergency procedures to help prepare communities for risks such as major storms, flooding, tsunami and rural fire. Steps vary from prevention preparation, such as installing smoke alarms, planning an escape, clearing vegetation, storing firewood and safe handling of liquid fuels, to instructions on what to do in a fire emergency (Northland Regional Council [2023a]).

NEMA leads emergency management efforts and helps communities to get started with their emergency planning activities (NEMA [2023c]).

Te Puni Kōkiri (Ministry of Māori Development), NEMA and regional and district councils can help iwi/hapū prepare Marae Preparedness Plans to improve marae resilience and safety (Gisborne District Council 2022; NEMA c2023; Northland Regional Council [2023b]). To facilitate this process, Te Puni Kōkiri has a Marae Emergency Preparedness Plan toolkit to help marae prepare for emergencies (Te Puni Kōkiri 2018). Among the emergencies highlighted in the toolkit are forest and scrub fires, along with flooding, pandemics, volcanic ash and tsunami (Te Puni Kōkiri 2017).

4.5.6.2 National Disaster Resilience Strategy 2019

The National Disaster Resilience Strategy (MCDEM 2019) describes the goals and vision for CDEM in Aotearoa New Zealand for the next 10 years. It sets out to improve the nation's resilience "by managing risks, being ready to respond to and recover from emergencies, and by enabling, empowering and supporting community resilience" (MCDEM 2019). The report considers wildfires to be disruptive events and a risk to wellbeing and prosperity. Serious fire is listed in the definition of 'emergency', along with storms, cyclones, plagues and other such events (MCDEM 2019).

This strategy is part of the EMSR that was started in August 2018 (discussed in Section 4.5.4.1).

4.5.6.3 National Civil Defence Emergency Management Plan 2015

The National Civil Defence Emergency Management Plan (NCDEMP) 2015:

> *"sets out the roles and responsibilities of everyone involved in reducing risks and preparing for, responding to, and recovering from emergencies. This includes central and local government, lifeline utilities, emergency services and non-government organisations"* (NEMA [2023d]).

In the NCDEMP, wildfire and urban fires are considered to be emergencies that require national intervention. The CDEM Act and NCDEMP are currently underway as part of the Regulatory Framework Review (aka Trifecta) Programme. The Trifecta programme aims to align the Emergency Management Act, the NCDEMP (and associated) Order and the National Disaster Resilience Strategy Roadmap (NEMA [2023f]).

"CDEM Groups are responsible for implementing local CDEMPs" and coordinating efforts to ensure local "reduction, readiness, response, and recovery" from emergencies (DPMC 2020). CDEM groups are local agencies such as "councils, emergency services, lifeline utilities and other agencies with responsibility" (WREMO c2023). In addition to civil defence and emergency management, CDEM groups also monitor and report on compliance with the CDEM Act (DPMC 2020).

4.6 Resource Management

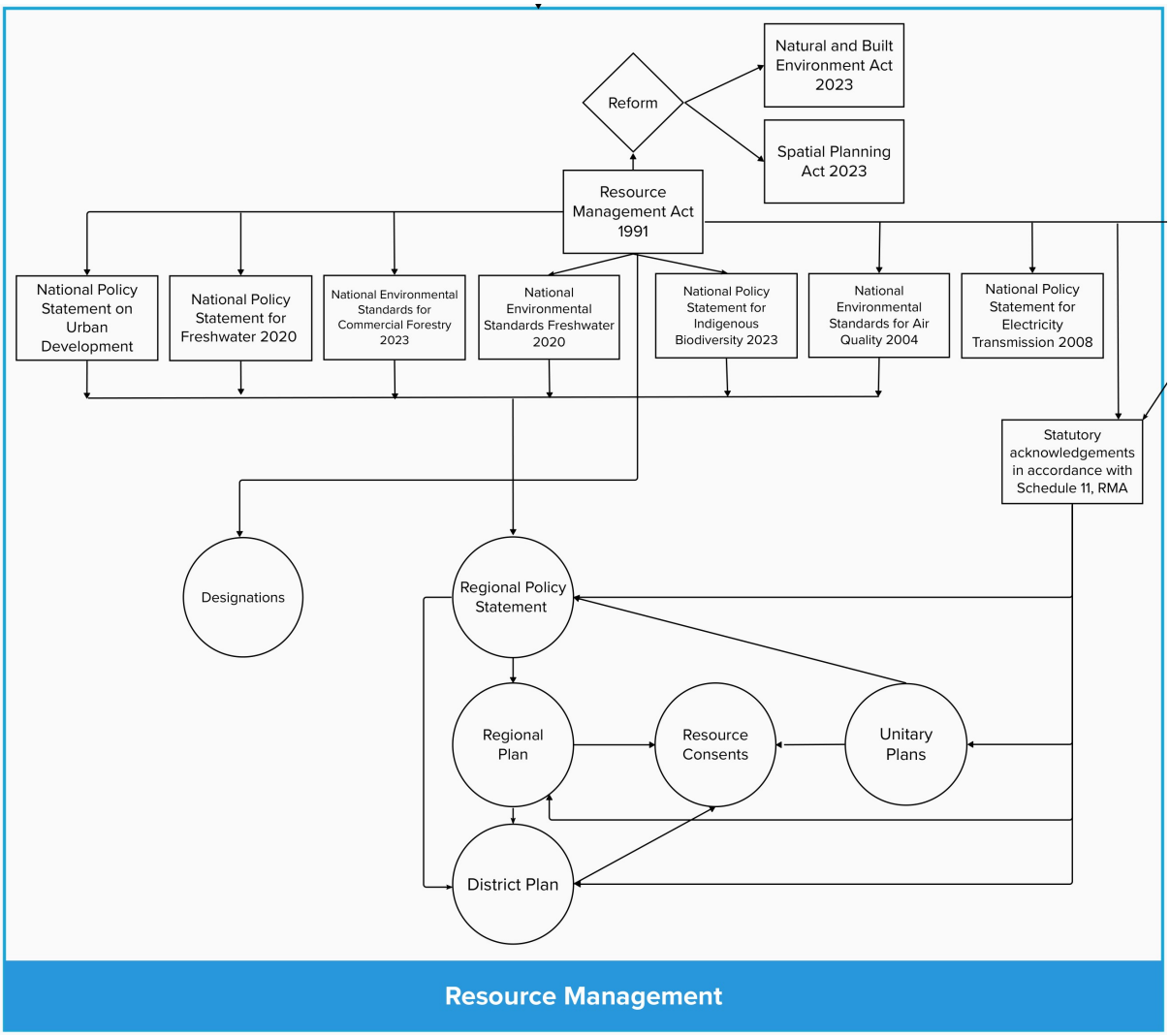

Figure 4.5 The main legislative framework within the Resource Management domain. Legislative tools are represented by rectangles, reforms by diamonds and other planning tools by circles. Lines and arrows that point to areas outside the domain box represent presumed connections between domains (see also Figure 5.1).

This section describes the main legislative and regulatory pieces under Aotearoa New Zealand's resource management system and the government's ongoing resource management reform (Figure 4.5). Figure 5.1 visualises how the resource management system is envisioned to be part of the larger legislative framework associated with wildfire management.

Aotearoa New Zealand's resource management system is centred around the RMA 1991. Both natural and physical resources are components of Aotearoa New Zealand's resource management system. The NBA 2023 and Spatial Planning Act (SPA) 2023 replace the RMA and had their third reading on 15 August 2023 (New Zealand Parliament 2023). The full

implementation period of the reform is expected to take 10 years (Ministry for the Environment [2023b]). Another important component will be the Climate Adaption Bill. The intent of this bill is to address managed retreat.

The Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021 amends the RMA by strengthening the National Policy Statement on Urban Development to increase the housing supply.

NPS for freshwater, electricity transmission, plantation forestry and indigenous biodiversity, as well as national standards for freshwater and air quality, could possibly be used in the management of wildfire risk and are briefly discussed within the resource management system. The proposed National Policy Statement for Natural Hazard Decision-making 2023 (NPS-NHD) was released for consultation as this report was finalised (Ministry for the Environment 2023f). Therefore, the NPS-NHD is not analysed in this report. Should it be put into effect, the NPS-NHD could impose requirements on decision-makers when evaluating wildfire risks.

Other management tools discussed in this section are RPSs, regional plans, unitary plans, air quality rules in regional and unitary plans, district plans and resource consents and designations.

The main stakeholders within the resource management system are: the Ministry for the Environment; Environmental Protection Authority (EPA); MPI; regional, unitary and district councils; and property owners (Table 5.1).

4.6.1 Resource Management Act 1991

The RMA 1991 is Aotearoa New Zealand's main legislation to regulate how we should manage the environment, including air, soil, freshwater and coastal marine areas, as well as land use and infrastructure. The RMA is based on the concept of sustainable development (Part 2), which involves considering the effects of activities on the environment for current and future generations during decision-making. Public participation in decision-making is essential, and all decision-makers under the RMA must take into account the principles of Te Tiriti o Waitangi.

One of the matters of national importance in the RMA is to provide for "the management of significant risks from natural hazards" to achieve sustainable management of the environment. 'Natural hazards' is defined in the RMA as:

> *"any atmospheric or earth or water related occurrence (including earthquake, tsunami, erosion, volcanic and geothermal activity, landslip, subsidence, sedimentation, wind, drought, fire, or flooding) the action of which adversely affects or may adversely affect human life, property, or other aspects of the environment."*

While the definition of 'natural hazards' does not explicitly include wildfires, the mention of 'fire' in the definition establishes a connection to wildfire management.

Under the RMA, both regional and territorial governments have responsibilities relating to natural hazards, with hazards mainly managed at the regional level and the effects of hazards managed at the territorial level (Saunders et al. 2007). Although the RMA does not have explicit provisions on managing developments in hazard-prone areas (Saunders et al. 2007), planners at territorial councils can use RMA tools to manage natural hazards, including subdivision and building consents, district plans, hazard registers and resource consents (Saunders et al. 2007).

Wildfire falls within the definition of a natural hazard in the RMA but has had limited attention in regional or district plans (EWG member, 10 April 2022). Some district plans have provisions that are indirectly related to wildfire management (Section 4.6.4.5). Examples of such provisions are: requiring water storage for firefighting purposes, clearing vegetation around buildings, building setbacks and ensuring adequate property access for emergency vehicles. The Building Act 2004 also requires building separation and adequate water connections for commercial/industrial sites. A few district plans (e.g. the proposed Selwyn District Plan, proposed Far North District Plan and operative Hurunui District Plan; Section 4.6.4.5) refer to wildfire hazard and risk directly and have rules to decrease fire risk.

All subdivision activities are subject to the 'catch all' provisions of s106 of the RMA in terms of natural hazards, whereby a consent authority may refuse to grant a subdivision consent if it considers that there is a significant risk from the natural hazard. The 'catch all' provision does provide a safety net in that wildfire risk assessment could be required at the subdivision consent stage. However, it should be noted that s106 has been amended to refer to significant risk without any definition of 'significant', and there is no case law that aids in interpretation. All subdivisions require consent; therefore, a district plan can require a wildfire risk assessment through its subdivision policy and rules. Fire and Emergency New Zealand uses land-cover vegetation datasets of highly flammable species to support these kind of assessments (Joy et al. 2021).

4.6.2 Resource Management Reform

The NBA and SPA are important components of the new resource management system (Ministry for the Environment 2023a). In August 2023, these two Acts were passed into law (New Zealand Parliament 2023). The new resource management system aims to make the resource management system more efficient and better placed to address new environmental and social challenges, including the pressures of urban growth, natural hazards and climate change (Resource Management Review Panel 2020).

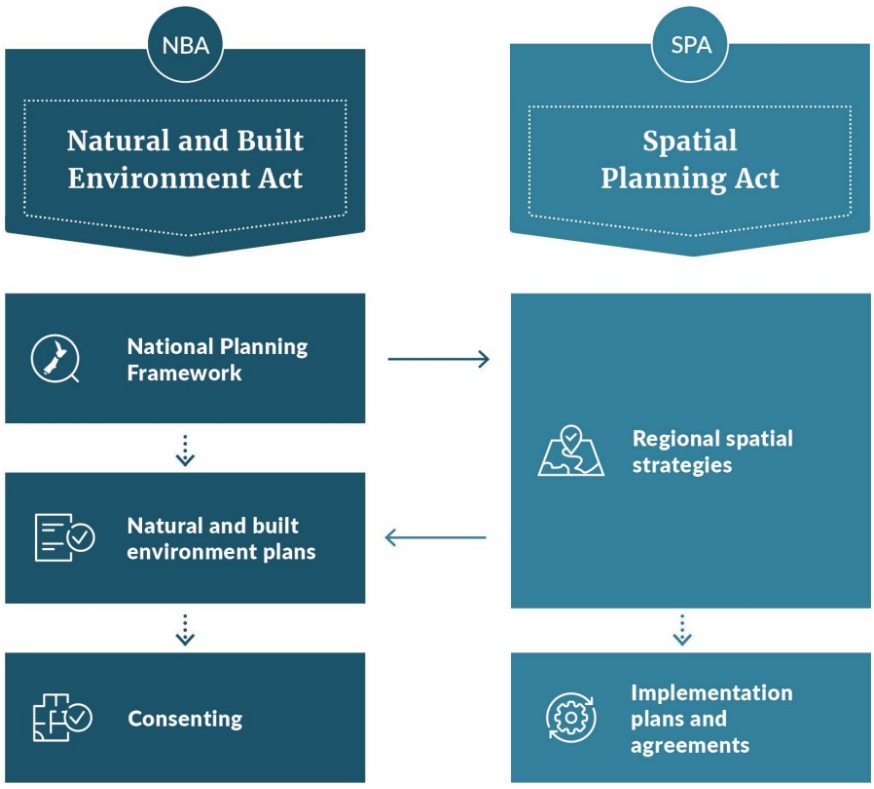

Figure 4.6 Key components of the new resource management system. Source: Ministry for the Environment (2023b).

The updated system is thought to better protect the natural environment and address natural hazards and climate-change effects through the new National Planning Framework (NPF) and Regional Spatial Strategies (Parker 2022), as well as by linking it to other tools such as national adaptation plans relevant to the NBA or SPA.

A fast-track consenting process through the EPA has been retained (Ministry for the Environment 2023b). This means that some large-scale projects that cross boundaries could potentially conflict with the regulations and guidelines laid out in the plans established by local councils.

The NBA provides opportunities for effectively managing wildfire risks. The responsibility for developing plans does not lie solely with councils. Instead, a joint planning committee consisting of representatives from hapū, iwi, Māori and local government will be involved in the process (Ministry for the Environment 2022b).

The development of a NPF proposal is required under the NBA. The NPF is meant to offer guidance regarding issues of "national significance, environmental limits and targets …" and will incorporate the functions of NPS and National Environmental Standards (NES). It will provide integrated direction by setting environmental limits, providing strategic directions for consistency of outcomes and aiding in the resolution of environmental matters. This integration could improve the management of wildfire risks across different systems.

The anticipated Climate Change Adaptation Act is designed to offer additional tools to empower society in re-directing assets and activities away from regions facing high risks associated with climate change and natural disasters. To inform policy making, the Ministry for the Environment opened an inquiry into options for community-led retreat and adaptation funding in mid-2023 (Ministry for the Environment 2023c). The Ministry for the Environment is exploring ways to help communities in Aotearoa New Zealand move away from places that might be impacted because of the effects of climate change, and it is looking at how this could be financed (Ministry for the Environment 2023c).

It is important to note that the reform programmes listed in this report may undergo changes in response to the 2023 change in government.

4.6.3 National Policy Statements and National Environmental Standards

NPS and NES are developed under the RMA. There is no NPS or NES for specific wildfire hazards, but they are important RMA tools to manage natural hazards (Quality Planning c2017b).

NPSs state objectives and policies for matters of national significance and direct local government as to how competing national benefits and local costs should be balanced (Quality Planning c2017b). NESs set technical standards, methods or requirements for particular issues.

Local government must incorporate NPSs and NESs into RMA plans where the NPS or NES directs such action or where there is duplication or conflict (see also Section 5). Regardless of whether an NPS or NES has been incorporated into an RMA plan, these must be considered in any consent process as soon as they come into force.

Note that the New Zealand Coastal Policy Statement (NZCPS) 2010 has not been included in the discussion below. Although the NZCPS includes objectives and policies regarding natural hazards and relies on the RMA definition of 'natural hazard', which includes fire, the NZCPS is more focused on coastal hazards, such as coastal erosion and tsunami.

4.6.3.1 National Policy Statement on Urban Development 2020

The National Policy Statement on Urban Development (NPS-UD) 2020 replaces the National Policy Statement on Urban Development Capacity 2016. The NPS-UD directs councils to remove overly restrictive barriers to residential development in order to allow greater height and density of buildings so that more houses can be built, particularly in areas with high demand and access (Ministry of Housing and Urban Development c2023). It refers to both intensification and greenfield development.

Minimal clearances between dwellings can increase fire risk and result in inadequate water supply and pressure for firefighting purposes as overall water demand increases. Fire concerns are implicitly acknowledged in the NPS-UD through objectives such as safety and resilience to climate change (Part 2). To mitigate wildfire risk, it is important to avoid development in wildfire-prone locations and ensure sufficient distance between dwellings. The NPS-UD could provide opportunities for reducing wildfire risk, provided that such risk considerations are integrated into land-use planning decision-making using "qualifying matters" (see Section 4.6.3.2).

The NPS-UD identifies regional councils, territorial authorities and urban environments according to Tiers 1, 2 and 3. Tier 1 corresponds to urban environments that are facing the greatest development pressure. These include Auckland, Hamilton, Tauranga, Wellington and Christchurch. Tier 2 local urban environments are Whangārei, Rotorua, New Plymouth, Napier/Hastings, Palmerston North, Nelson/Tasman, Queenstown and Dunedin. Tier 3 is all urban environments not listed in Tiers 1 or 2. Tiers 1 and 2 are generally required to implement specific objectives and policies, with greater requirements for Tier 1, whereas Tier 3 urban environments are encouraged to implement the objectives and policies.

4.6.3.2 Resource Management Amendment Act 2021

The NPS-UD is enhanced by the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021 (the Enabling Housing Act). The Enabling Housing Act requires medium-density residential standards (MDRS) for specified urban areas and requires councils to include the MDRS in their plans (Ministry for the Environment 2022b). The MDRS enable up to three dwellings and up to three stories per site in more urban areas. When applying MDRS, councils are required to consider qualifying matters (s77I), which include natural hazards such as wildfire. The council must demonstrate that the qualifying matter is incompatible with the level of development required by the NPS-UD and Enabling Housing Act.

4.6.3.3 National Policy Statement for Freshwater Management 2020 and National Environmental Standards Freshwater 2020

The National Policy Statement for Freshwater Management (NPS-FM) 2020 requires regional councils to identify Freshwater Management Units (FMU) and manage them in a way that 'gives effect' to Te Mana o te Wai through (Ministry for the Environment 2020c):

- *"involving tangata whenua";*
- *"working with tangata whenua and communities to set out long-term visions in the regional policy statement"; and,*
- *"prioritising the health and well-being of water bodies, then the essential needs of people, followed by other uses."*

The National Environmental Standards for Freshwater 2020 (NES-FW) include regulations that cover the functions of regional councils and are designed to protect streams, wetlands and fish passage and control some farming and mining activities.

There are no references to wildfire in the NPS-FM and NES-FW and no specific mention of taking water for controlling wildfires. Presumably, the emergency provisions of s14 of the RMA, which permits taking water for emergency purposes, over-rides the NPS-FM and NES-FW.

4.6.3.4 National Environmental Standards for Commercial Forestry 2023

The National Environmental Standards for Commercial Forestry (NES-CF) has amended the Plantation Forestry (NES-PF) 2017 in November 2023. It controls the environmental effects of forestry (plantation and exotic continuous-cover forests) larger than 1 ha and increases the efficiency and certainty of managing plantation forestry. The amended regulations now include exotic continuous-cover forests. These are defined as forests consisting of exotic tree species "… that will not be harvested or replanted or are intended to be used for low-intensity harvesting (where a minimum of 75% canopy cover is maintained at all times) or replanted". As a result of these modifications, the title of the principal regulations has changed to *Resource Management (National Environmental Standards for Commercial Forestry) Regulations 2017*.

4.6.3.5 National Policy Statement on Electricity Transmission 2008

The National Policy Statement on Electricity Transmission (NPS-ET) 2008 sets out the goals and policies for management of the electricity transmission network and is currently under review "to strengthen national direction for renewable electricity generation and electricity transmission" (Ministry for the Environment 2008). The statement "requires local authorities to manage adverse effects caused by development near high-voltage transmission lines". To protect transmission lines, it can provide the means to include policy and rules in a RPS or district plan to control vegetation within national grid corridors. Protection of the transmission lines through clearing of vegetation also reduces the risk of fire (Ministry for the Environment 2008).

4.6.3.6 National Policy Statement for Indigenous Biodiversity 2023

As part of the legislative consultation process, an exposure draft National Policy Statement for Indigenous Biodiversity (NPS-IB) was released in June 2022 for targeted consultation, gazetted in July 2023 and in force from 4 August 2023 (Ministry for the Environment 2023d). The objective of the NPS-IB is to protect, maintain and restore indigenous biodiversity. There is no specific reference to fire in the draft NPS-IB, although the preparation of mandatory regional biodiversity strategies will require taking account of co-benefits, including hazard mitigation.

A specific method for achieving the objective of the draft NPS-IB is by identifying and managing Significant Natural Areas (SNA). Appendix 1 of the draft NPS-IB provides nationally consistent criteria for identifying SNAs. It does not specifically mention the creation of potential wildfire hazards when protecting a SNA. Appendix 1 cross-references to the list of threatened and at-risk species that is regularly updated by DOC. For example, the myrtle family is on the threatened and at-risk species list due to myrtle rust, which means that mānuka and kānuka are potentially protected under the draft NPS-IB.

A local authority must amend its plan or policy statement to give effect to the NPS-IB and consider the regional biodiversity strategy. Certain policies and approaches, such as connectivity and percentage targets for indigenous vegetation cover in urban and non-urban

areas, may increase wildfire risks. Hence, it is necessary to establish vegetation clearance requirements and fire breaks in and around forested areas at the rural-urban interface to create defensible spaces. Clause 3.10(6)(a) of the NPS-IB may resolve this issue, as it allows for "any use or development required to address a high risk to public health or safety".

4.6.3.7 National Environmental Standards for Air Quality 2004

The National Environmental Standards for Air Quality (NES-AQ) 2004 controls deliberate burning. The NES-AQ requires regional councils to define airsheds based on PM_{10} standards (standards that regulate particulate matter with a diameter of 10 microns or less) so that rules (such as control on wood burners) can focus on areas most affected. The NES-AQ also requires monitoring of those airsheds. There is no specific reference to wildfire, given that the NES-AQ is focused on burning that can be controlled. The NES-AQ has been reviewed by the government, including using $PM_{2.5}$ (standards that regulate particulate matter with a diameter of 2.5 microns or less) as a better indicator. A consultation document was released in February 2020, and the public submissions received were summarised in December 2020. However, this review process has not been completed and there is no confirmed date for an updated NES-AQ.

The NES-AQ is not particularly relevant to wildfires, as wildfires cannot be controlled, even though a wildfire may cause PM_{10} standards to be temporarily exceeded. The NES-AQ does provide for regional councils to apply to the Minister for an exceedance of the PM_{10} standard to be formally recognised as caused by an exceptional circumstance, such as for wildfire. However, prescribed burns (Section 4.6.4.2) of vegetation to reduce the risk of wildfires may be managed under a regional air plan. A regional air plan provides for the control of discharges of contaminants into the air for the region, and maps of airsheds may possibly be utilised in the management of prescribed burns.

4.6.4 Other Tools

The RPS, regional plans, district plans and unitary plans discussed here are mechanisms under the RMA. These will be replaced by Natural and Built Environment plans (NBE plans) under the NBA, one of the laws replacing the RMA (Ministry for the Environment 2023e). NBE plans are discussed in Section 4.6.4.5.

4.6.4.1 Regional Policy Statement

The RMA requires that each region must have an RPS. An RPS provides an overview of the resource management issues of the region and "policies and methods to achieve integrated management of the natural and physical resources of the whole region" (RMA 1991). An RPS is prepared in accordance with its functions, which include controlling land use "… for the purpose of the avoidance or mitigation of natural hazards" [RMA 1991, Part 4 s30(1)(c)(iv)].

RPSs have the over-arching role of setting out policy, including policy relating to natural hazards, which must be given effect to through regional and district plans. Regional plans should include land-use provisions where there are significant risks, including in developed areas. However, most provisions relating to wildfires can be expected to be embedded in district plans through subdivision and land-use provisions alongside other detailed land-use controls such as vegetation clearance. The provisions can also include standards for vehicle access, both escape routes and access for emergency vehicles and access to water supplies for fighting wildfires. A RPS will also address discharges to air, which may include consideration of activities related to wildfires, such as prescribed burns.

Some RPSs mention wildfire, but there are few specific provisions (e.g. the Tasman RPS has specific reference to fire in Issues 5.4 and 11.5; Objective 11.3; and Policies 5.4, 6.4 and 11.6). However, wildfires will be covered by general provisions referring to natural hazards and, possibly, climate change. There are very few explicit references to 'wildfire', but 'fire' is included in the RMA definition of natural hazard. This means that any relevant natural-hazard objectives and policies in an RPS will apply to wildfires where the same definition has been used.[2] An RPS can also provide the framework for addressing risk, including identification of what may be considered an intolerable risk (e.g. the Bay of Plenty RPS and proposed Otago RPS), and this could be applied to wildfires.

4.6.4.2 Regional Plans

Under the RMA, regional plans are not mandatory (except a Coastal Regional Plan), but one consideration for preparing a regional plan is to address any risks from natural hazards (RMA 1991). Regional plans have yet to be prepared to specifically address wildfire, but those that address natural hazards generally could cover wildfires if the RMA definition of 'natural hazard' is used. A regional air plan, on the other hand, will address discharges to air, which may result in some control over activities related to wildfires, such as prescribed burns.

4.6.4.3 District Plans

Under the RMA, district plans are mandatory, and natural hazards are a matter of national importance. Therefore, all district plans must recognise and provide for the management of significant risks from natural hazards, as it is a function of territorial authorities to control:

> *"… any actual or potential effects of the use, development, or protection of land, including for the purpose of the avoidance or mitigation of natural hazards."* [RMA 1991, Part 4 s30(1)(d)(v)]

Few district plans have specific mention of wildfires (EWG member, 9 December 2022). Where they do address wildfire risk, this is primarily focused on requiring the building of setbacks from vegetation (or vice versa) and sprinkler systems. Many district plans include subdivision performance standards that require sufficient water supplies and emergency-vehicle access (based on SNZ [2008]). As mentioned in Section 4.5.2, this firefighting water supplies Code of Practice is based on requirements to fight fires within buildings rather than wildfires, and other aspects of fire risk are not addressed.

The proposed Far North District Plan (Far North District Council 2023) includes specific reference to wildfire, with a policy and rules to manage land uses and subdivisions susceptible to wildfire, including 20 m setbacks for buildings from the drip line of any contiguous scrub, shrubland, woodlot or forestry.

The Matamata-Piako District Plan identifies a 'High Fire Risk Bush and Fire Hazard Buffer' on its planning maps, and the erection of habitable buildings within the mapped area is a controlled activity (Matamata-Piako District Council 2015). The mapped areas are based on high-risk areas of the council's rural fire plan (Kaimai Ranges and western foothills) with a 200 m buffer. The intention is to protect the forest resource from accidental fires caused by nearby dwellings and to provide a safety factor for homes and public buildings near forest areas should a fire occur (Matamata-Piako District Council 2015).

2 A newly gazetted plan must adhere to the National Planning Standards, which share the same definition of 'natural hazards' as the RMA. However, earlier plans might have a slightly different definition.

The proposed Selwyn District Plan restricts planting if it increases fire risk for any neighbouring residential unit or principal building and requires consideration of fire risk when planting for visual screening (Selwyn District Council 2020). There are 30 m setbacks for woodlots and shelterbelts from neighbouring residential units or principal buildings and from non-rural zones. There is also a 5 m setback for woodlots and shelterbelts from accessways that access a residential unit or principal building (Selwyn District Council 2020).

The Hurunui District Plan includes a policy requiring new subdivisions within the Mt Lyford area, appropriately addressing the risk of uncontrolled wildfire to provide for residents' and visitors' health and safety (Hurunui District Council 2022).

4.6.4.4 Unitary Plans

Unitary plans control development within a region. They are a combination of district and regional plans, and the comments regarding regional and district plans above apply to unitary plans.

The Auckland Unitary Plan (operative in part) includes a note in its Natural Hazards and Flooding chapter that "areas of high wildfire risk may be determined applying the National Rural Fire Authority New Zealand Wildfire Threat Analysis" (Auckland Council 2016).

4.6.4.5 Natural and Built Environment Plans

The NBA requires regional and territorial authorities to develop NBE plans (Part 5). NBE plans will replace the current regional policy statements and regional and district plans and contain "… the rules for land and resource use and the rules and methods for consenting" (Ministry for the Environment 2023e).

An NBE plan must provide for system outcomes outlined in Section 6 of the NBA [s171(3)(d)], including "the risks arising from natural hazards and the effects of climate change are reduced and other measures are taken to achieve an environment that is more resilient to those risks" [s6(4)]. This is a stronger requirement compared to that stated in the RMA [s62(1)(i)(i)].

The NBA also provides more power for local authorities to take more effective mitigation responses by establishing NBE plan rules to manage existing uses (s30).

4.6.4.6 Air Quality Rules in Regional and Unitary Plans

Regional and unitary authorities can make air quality rules in regional and unitary plans (RMA 1991). Under the RMA, regional councils are responsible for the control of discharge of contaminants into the air (RMA 1991). NES-AQ 2004 sets the air quality standards for certain pollutants, and regional councils are required to monitor air quality where a contaminant might exceed the permitted level (Ministry for the Environment 2004).

4.6.4.7 Resource Consents

Resource consents are required when a use of land does not meet s9 of the RMA, i.e. the use contravenes a NES, a regional rule or a district rule; and the use does not have existing use rights. Consent is also required for subdivision of land, which results in more intensive development. Very few resource consents will explicitly reference wildfire (EWG member, 9 December 2022). If the regional, district or unitary plans require assessment of natural hazards, then wildfire can be considered. However, it might be challenging to defend the consideration of wildfire as a natural hazard in court without a specific set of rules.

Resource-consent conditions may also refer to setback requirements for buildings from vegetation, or vice versa. Both land-use and subdivision consents may include covenants or consent notices on the titles. These could be used to notify future owners of wildfire risks and the need to maintain building setbacks from vegetation.

In an Environment Court decision regarding construction of a multi-level car-parking building, previously agreed conditions regarding fire were challenged (Decision No. [2018] NZEnvC242). However, the conditions were considered acceptable and retained. These conditions included a Fire Risk and Evacuation Management Plan, as well as firefighting supply systems for the parking building. The plan required a detailed management strategy for controlling fire risk over the reserve where the proposed development was situated. In addition, a Hazards Works Maintenance Plan addressed the situation where a wildfire could destroy vegetation, resulting in adverse effects on slope stability. This plan required engineering re-assessment of rockfall hazard if a fire destroyed more than 25% of baseline vegetation cover.

In an Environment Court decision regarding the re-development of Queenstown's gondola facilities (Decision No. [2017] NZEnvC124), the Court considered what the appropriate response to fire risk was. It found that fire risk is an RMA s5 matter and, if it was not satisfied that fire risk was properly managed, the Court could not be satisfied that granting consent would promote the RMA's sustainable management purpose. In addition to the conditions mentioned above in Decision No. [2018] NZEnvC242, a condition was sought by a party to the hearing that the existing overhead power lines to the gondola's upper terminal be under-grounded, due to their fire risk. While the Court agreed that this would eliminate the risk, it did not consider such a response was necessary under a risk-management framework.

Kaipara District Council provides a subdivision consent checklist in its district plan to identify any potential fire risk. The checklist covers the following questions: is the site location more than 15 km from the fire station; are there slopes below the proposed building platform, noting that for every 10° of slope, the rate of fire spread will be double; what is the accessibility of firefighting water supply in relation to the building platform; what ground cover / vegetation is within 10 m and 30 m of building platform; is there flammability of vegetation; what is the location of power lines and other infrastructure from vegetation; what is the prevailing wind direction; and what is the fire history of the area.

4.6.4.8 Designations

Designations provide a Minister of the Crown, a local authority or a network utility operator to designate land for a public work, project or work and to restrict other activities for the safe or efficient operation of the public work, project or work.

The restriction of other activities to protect a designated activity would allow some protection of the asset from wildfire sources if it was considered necessary, such as controlling vegetation on properties adjacent to infrastructure. However, it is unlikely that such restriction has been used in terms of wildfire risk management.

4.7 Conservation and Forestry

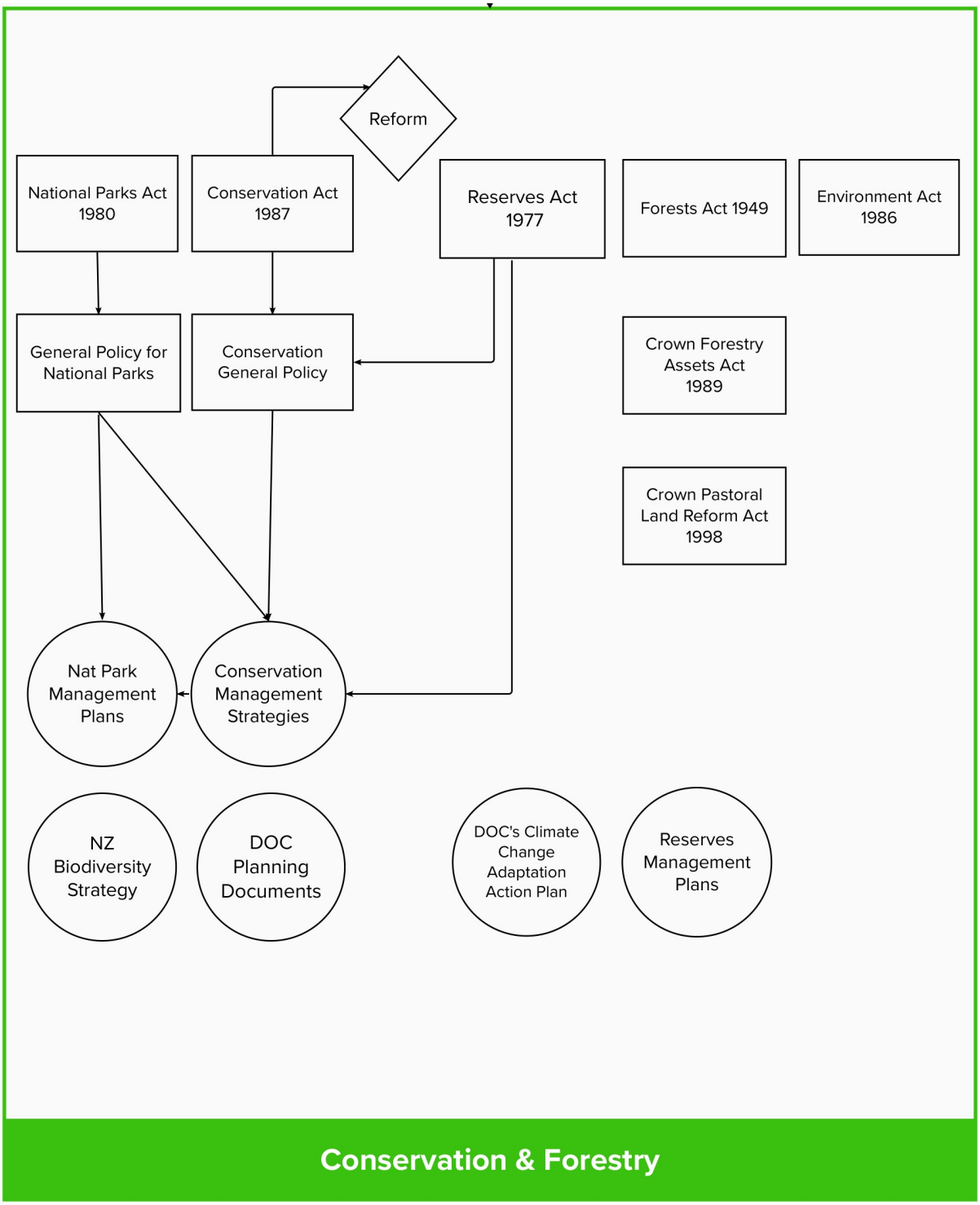

Figure 4.7 The main legislative framework within the Conservation and Forestry domain. Legislative tools are represented by rectangles, reforms by diamonds and other planning tools by circles. Figure 5.1 visualises the connections between domains.

Wildfire presents a challenge to conservation and the management of ecosystems such as forests and shrubland (Agee and Skinner 2005). The Conservation Act 1987 provides legislation to conserve natural and historic resources within Aotearoa New Zealand. This piece of legislation is currently being reformed. Other important regulatory tools within the Conservation and Forestry domain are the National Parks Act 1980, Reserves Act 1977, Environment Act 1986, Forests Act 1949, Crown Forest Assets Act 1989, Crown Pastoral Land

Reform Act 2022, Crown Pastoral Land Act 1998 and Land Act 1948 (Figure 4.7). These are briefly discussed below, along with other tools such as Aotearoa New Zealand's Biodiversity Strategy, the Conservation General Policy, the General Policy for National Parks, DOC's Climate Change Adaptation Action Plan and conservation strategies and management plans. Figure 5.1 shows how the Conservation and Forestry domain is envisioned to be linked to other parts of the legislative framework associated with wildfire management.

DOC is responsible for conservation management in Aotearoa New Zealand (Conservation Act 1987). Other stakeholders that were identified by the research team as having a conservation or forestry focus are the Crown, MPI (e.g. agriculture and forestry), reserve administering bodies, the New Zealand Institute of Landscape Architects, landscape designers, councils and private property owners (Table 5.1).

4.7.1 Conservation Act 1987

The Conservation Act was created to establish DOC and promote the conservation of Aotearoa New Zealand's natural and historic resources (DOC [2023a]). Under the Act, DOC manages "all land, and all other natural and historic resources" held under the Act for conservation purposes (Conservation Act 1987), fosters recreation, allows tourism on conservation land and provides educational and promotional conservation information.

Wildfire is not mentioned in the Act, though two provisions refer to 'fire'. Section 48 states that regulations can be made under the Act for the prevention of fires in conservation areas. Under s24H, the manager of a marginal strip[3] (designated area of land) may request the Minister to temporarily close the strip due to fire hazard conditions.

Natural hazards are not provided for, apart from the brief mention of fire hazards in s24H. Climate change is not mentioned in the Act.

4.7.2 Conservation Law Reform

The government is reforming conservation law in phases. The purpose of the reform is to address the biodiversity crisis (OMC 2021).

Among the projects involved in the reform, the proposed Conservation Management and Processes (CMAP) Bill aims to improve conservation management planning, which provides opportunities for wildfire risk mitigation. The legislation will adopt partial review or amendment so that it is easier for conservation planning documents to respond to new issues such as "impacts of climate change" (DOC 2022). Planning documents that may benefit from this project include conservation management strategy, conservation management plans and National Park management plans (Section 4.7.8.5).

4.7.3 National Parks Act 1980

National parks cover approximately 11% of Aotearoa New Zealand (Molloy 2007). There is no reference to fire or hazard in the National Parks Act (1980). Specific management of the national parks is through a conservation management strategy or management plan, similar to the Reserves Act.

3 Marginal strip is "any strip of land reserved or deemed to be reserved by section 24 or section 24E(3) or section 24G" for conservation purposes, to enable public access or public recreational use (Conservation Act 1987).

4.7.4 Reserves Act 1977

The Reserves Act was created “to acquire, preserve and manage areas for their conservation values or public recreational and educational values” (DOC [2023d]). While wildfire is not mentioned in the Act, Part 5 does address damage by fire and penalties related to fire. ‘Fire’ in the Act refers to unauthorised fires lit by people and the spread to “any bush or natural growth” or damages to the reserve (Reserves Act 1977). The creation and removal of reserves follow strict legal processes. Reserve land can be repurposed, for example, for housing, which may expose future developments to wildfire risks and so requires proper consideration during planning.

4.7.5 Environment Act 1986

The Environment Act 1986 “established the Ministry for the Environment and the Office of the Parliamentary Commissioner for the Environment”. The Act sets out the Ministry for the Environment’s functions, including advising the government and other public authorities on the likelihood of natural hazards and the mitigation of the effects of hazards.

Under the Act, the term ‘natural hazards’ includes fire. The Act makes the Ministry for the Environment an agency relevant to the management of wildfire risks and effects.

4.7.6 Forests Act 1949

The Forests Act 1949 regulates native forests on private land, so the harvesting, milling and exporting of native timber from existing or regenerating native forest is managed sustainably. The Forests Act is administered by Te Uru Rākau – New Zealand Forest Service, a unit under the Ministry for Primary Industries (MPI 2020).

To encourage the sustainable forest management of indigenous forest land (s67B), landowners are asked to prepare sustainable forest management plans (ss67E–67L). Matters to be included in a sustainable forest management plan include specific measures to protect the forest from fire (s8, Schedule 2). However, it does not provide for the management of fire risk from such forests to the surrounding environment.

4.7.7 Crown Forest Assets Act 1989

The Crown Forest Assets Act 1989 was enacted to facilitate the settlement of historical Te Tiriti o Waitangi claims related to forests and land. It was created to allow the Crown to transfer, sell or lease Crown forestry assets to entities while retaining the underlying land and preserving it for use in future settlements (Caddie 2003).

Crown forestry assets are forests “that comprises principally exotic trees” on Crown Forest land and all improvements (Crown Forest Assets Act 1989). Wildfire is not directly referenced, but fighting of fire and fire breaks are mentioned under crown forestry assets.

The Crown Forest Assets Act 1989 is closely related to the Forests Act 1949, as the former complements the latter. While the Forests Act 1949 primarily focuses on the management and development of forestry resources, the Crown Forest Assets Act 1989 specifically deals with the transfer and disposal of Crown-owned forestry assets, particularly in the context of Te Tiriti o Waitangi settlements.

4.7.8 Crown Pastoral Land Reform Act 2022, Crown Pastoral Land Act 1998 and Land Act 1948

The Crown Pastoral Land Act 1998 provides for the tenure review of Crown pastoral land. In 2022, the Crown Pastoral Land Reform Act became law. The Reform Act amends the Crown Pastoral Land Act 1998 and Land Act 1948. Its primary purpose is to remove the tenure review process and promote sustainable pastoral farming practises.

In terms of the Crown Pastoral Land Act 1998, s15 requires that any burning of vegetation requires consent from the Commissioner of Crown Lands. Under the Land Act 1948, the lessee or licensee must fully insure all Crown buildings against loss or damage from fire, and regulations can be made to protect forests, bush or growing timber and prevent fires within them.

4.7.9 Other Tools

4.7.9.1 Te Mana o Te Taiao / New Zealand Biodiversity Strategy 2020

The purpose of Te Mana o Te Taiao / New Zealand Biodiversity Strategy 2020 is a national strategic conservation plan to restore biodiversity and protect natural resources. The document only mentions ‘fire risk’ once and from a climate change perspective (DOC 2020b).

4.7.9.2 Conservation General Policy 2005, Revised 2007 and 2019

The Conservation General Policy (DOC 2019a) was first published in 2005. It was revised in 2007 and again in 2019 and provides a unified policy to implement the Wildlife Act 1953, Marine Reserves Act 1971, Reserves Act 1977, Wild Animal Control Act 1977 and the Marine Mammals Protection Act 1978 as listed under the Conservation Act 1987 (Schedule 1).

Subsection 4.3 of this policy includes fire control and management requirements for conservation management strategies and plans. According to it, conservation management strategies and plans must include provisions for fire management. These provisions should address aspects such as fire risk assessment, fire protection measures, fire control strategies and “the use of prescribed burning for ecosystem management” (DOC 2019a).

Section 8 of the policy defines natural hazards as “events which affect or may affect people, property or the environment”, and this definition includes fires (DOC 2019a). This section requires DOC to provide information regarding natural-hazard risks to public conservation lands and waters (DOC 2019a).

4.7.9.3 General Policy for National Parks 2005, Revised 2019

The purpose of the General Policy for National Parks 2005 (DOC 2019b) is to implement the National Parks Act 1980. It is managed by DOC and is meant to guide conservation management of national parks (DOC 2019b). Like the Conservation General Policy 2005, the General Policy lists fire as a natural hazard.

This policy stipulates that natural risk management should be undertaken with minimal impact to national park ecosystem processes and values but that risk “to people, places, taonga or property” should be minimised (DOC 2019b). Fire management requirements are described in Section 4.7 of the General Policy. Prescribed burning is allowed to manage fuel loadings, reduce risks and preserve ecosystems and species (DOC 2019b).

4.7.9.4 Climate Change Adaptation Action Plan (Department of Conservation)

DOC's Climate Change Adaptation Action Plan (Christie et al. 2020) outlines DOC's actions to protect biodiversity and infrastructure managed by DOC from the impacts of climate change. The plan is part of DOC's effort to inform the National Adaptation Plan and NCCRA as part of the Climate Change Response (Zero Carbon) Amendment Act 2019 (Christie et al. 2020).

The document stresses the importance of changes in fire frequency to ecosystems, people, and infrastructure (Christie et al. 2020). In order to improve resilience to climate change, the document lists DOC's responsibilities with respect to adaptation and mitigation strategies, as well as recovery strategies after extreme climate-change events such as fire.

4.7.9.5 Conservation Strategies and Management Plans

Many conservation strategies and management plans include fire management from a conservation and natural-hazard risk perspective. DOC provides an overview of the range of strategies and plans (both statutory and non-statutory) that the department is responsible for (DOC [2023c]).

Management plans are important tools for wildfire risk management. National Park management plans "are 10-year plans that provide management objectives" for national parks and their natural and historic resources and give effect to general policy (DOC [2023c]). The management plans for national parks refer to fires and the associated risk, generally in terms of policy to prevent fires (e.g. Policy 4.1.1.8.4 of the Abel Tasman National Park Management Plan [DOC 2008]).

Conservation management strategies (prepared under the Conservation Act 1987) are 10-year regional strategies and give effect to general policy (DOC [2023c]). Conservation management plans and reserve management plans (prepared under the Reserves Act 1977) can apply to specific reserves or a group of reserves. These management plans can be prepared by DOC or local authorities. Through reserve management plans, local councils or managing authorities can establish guidelines and strategies to reduce fire risks within protected areas. These plans often include measures to prevent wildfires, manage vegetation and implement fire safety protocols. Examples are the Carterton District Council Reserve Management Plan (Carterton District Council 2021) and the Oruaiti Reserve Management Plan (Wellington City Council 2011).

4.8 Local Government

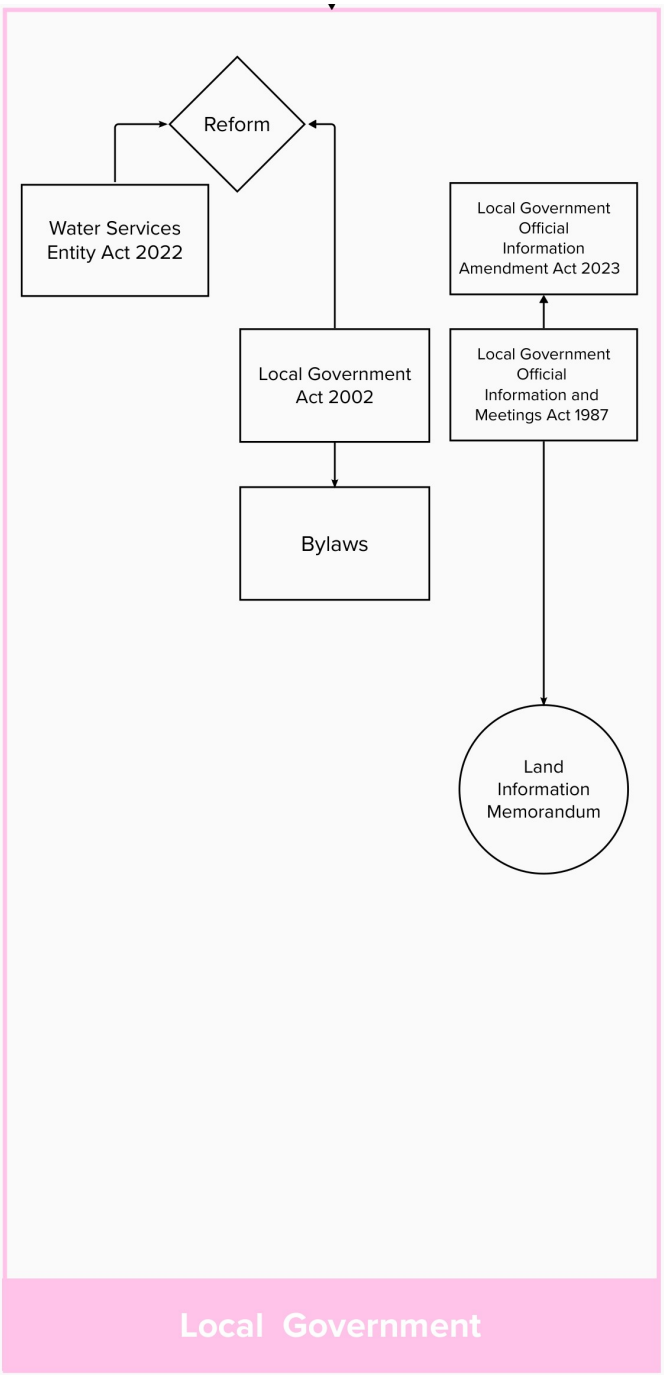

Figure 4.8 The main legislative framework within the Local Government domain. Legislative tools are represented by rectangles, reforms by diamonds and other planning tools by circles. Figure 5.1 visualises the connections between domains.

This section describes legislative and regulatory documents in relation to the responsibilities of local governments. Local governments are empowered to make decisions and act by, and on behalf of, communities. The authority is primarily enabled by the Local Government Act 2002. The Water Services Entities Act 2022, Three Waters reform, bylaws, Local Government Official Information and Meetings Act 1987, Local Government Official Information Amendment Act 2023, Land Information Memorandum (LIM) and long-term and strategic plans are also worth mentioning within the Local Government domain (Figure 4.8). Figure 5.1 shows how the domain is envisioned to be linked to other parts of the legislative framework associated with wildfire management.

Implementing the RMA 1991 and its regulations is part of a local government's responsibilities. Regional councils are responsible for matters such as land use to avoid natural hazards; water supply; discharges to air, water or land; ensuring development capacity to meet future demands of the region; and making RPSs. Matters concerning territorial councils include the effects of land use, subdivision and ensuring development capacity to meet future demands of the district or city (RMA 1991).

Local Government New Zealand (LGNZ) put local issues on the national agenda, together with local councils (LGNZ c2023). The local government branch of the Department of Internal Affairs also provides expertise to local government agencies. Crown and property building owners are additional stakeholders to consider within the local government system (Table 5.1).

4.8.1 Local Government Act 2002

The Local Government Act 2002 states the purpose of local government and provides powers for democratic local decision-making. Wildfire is not mentioned in the Act but is implicitly referred to by the term 'fire'. Wildfire also falls within the definition of natural hazard.

Under the Act, local governments are required to take a sustainable development approach to consider a community's social, economic, environmental and cultural interests during decision-making (Local Government Act 2002). Local governments need to make a Long-Term Plan every 10 years. Section 101B of the Local Government Act requires local authority to develop an infrastructure strategy as part of its Long-Term Plan (Section 4.8.5.2). The Long-Term Plan does not override RMA plans, although the outcomes identified in the Long-Term Plan should inform other plans, and a key means of delivering the outcomes is through RMA planning (Quality Planning 2012).

Central government reviewed the future of local government report (Review into the Future for Local Government 2022). The review report stresses the importance of local government in natural-hazards response and climate adaptation, which does not explicitly address risk mitigation but does open up opportunities for future discussions. A climate-change fund is being proposed to invest in long-term mitigation and adaptation approaches.

4.8.2 Water Services Entities Act 2022 and Three Waters Reform

The Water Services Entities Act 2022 is one of three pieces of legislation that form the foundations of the Three Waters reform. It "establishes four publicly owned water services entities that will provide safe, reliable, and efficient water services in place of local authorities".

Wildfire is not mentioned in the Water Services Entities Act, although the Act is relevant to wildfire management, as it requires the delivery of water services entities in a sustainable and resilient manner to mitigate climate-change effects and natural hazards. The Act is also relevant to firefighting water supplies, which are covered by the definition of 'water supply'. Community ownership and oversight of the new entities are guaranteed through local governments' role as stakeholders.

It should be noted that that this piece of legislation may undergo changes in response to the 2023 change in government.

4.8.3 Bylaws

A local authority has the power to make bylaws to enforce local rules to protect the public and promote health and safety (Local Government Act 2002). Territorial authorities can make fire bylaws to control outdoor burns. Section 152B also specifies the effects of the FENZ Act 2017 on fire bylaws, which ensures that such bylaws are consistent with the FENZ Act and that proposed changes are consulted with Fire and Emergency New Zealand (Local Government Act 2002).

Bylaws can also be used to manage smoke nuisances under the Health Act 1956. However, the Health Act's definition of 'nuisance' currently does not include wildfire smoke, which presents an opportunity for future improvement.

4.8.4 Local Government Official Information and Meetings Act 1987 and Local Government Official Information and Meetings Amendment Act 2023

The Local Government Official Information and Meetings (LGOIM) Act 1987 enables the public to access official information held by local authorities, which includes LIMs. A LIM must include certain matters, including potential erosion, subsidence or inundation (LGOIM Act 1987).

In 2023, the Local Government Official Information Amendment Act improved the provision of natural hazard information in LIMS. This makes it easier for councils to share concise information in LIMs, which helps with property/building owners' and buyers' decision-making relating to natural hazard risks (McAnulty 2022). It also requires regional councils to provide territorial authorities with hazard information and protects local authorities against civil or criminal proceedings when providing natural hazard risk information in good faith.

4.8.5 Other Tools

4.8.5.1 Land Information Memorandum

A LIM is a report prepared by a local council (Real Estate Authority 2019) that contains "matters affecting any land in the district of the authority" (LGOIM Act 1987). Provided LIM reports must now include more detailed information about the natural hazards applying to a property following a recent law change (Local Government Official Information and Meetings Amendment Act 2023). Amendments to the LGOIM Act 1987 include:

- A requirement for regional councils to share with city and district councils natural hazard information. This includes information on climate change hazards.
- Specific requirements for councils around adding "understandable information" on natural hazards to LIMs (Section 44B).
- A new limitation of liability that protects councils when they add natural hazard information to LIMs.

These changes will mean that homeowners buying a property, as well as other involved parties, such as architects and designers designing a building for the property, will be better informed about potential risks. The Act also provides important background information for organisations planning work around resilience and adaptation.

4.8.5.2 Long-Term and Strategic Plans

Under the Local Government Act 2002, all local authorities must prepare long-term plans (of a 10-year period) every three years and include in the purpose of the long-term plan: the activities, the community outcomes, integrated decision-making and coordination, a long-term focus and accountability for the local authority (Local Government Act 2002). It is up to the regional or territorial authorities to determine the direction of their long-term plan, what will be invested in, how much it may cost and how funds will be raised through rates. The financial aspects are addressed in detail through annual plans (Local Government Act 2002).

Local authorities can also prepare Strategic Plans. These are currently non-statutory documents (except in Auckland), and councils are using growth strategies and plans to coordinate land-use, infrastructure and financial needs (Waka Kotahi NZTA c2023).

Christchurch City Council's Long-Term Plan (Christchurch City Council 2021) includes a budget for the year 2021 of $72,000 for the 'Port Hills Fires Recovery'. This is an example of a targeted Civil Defence initiative (Christchurch City Council 2021).

4.9 Housing and Infrastructure

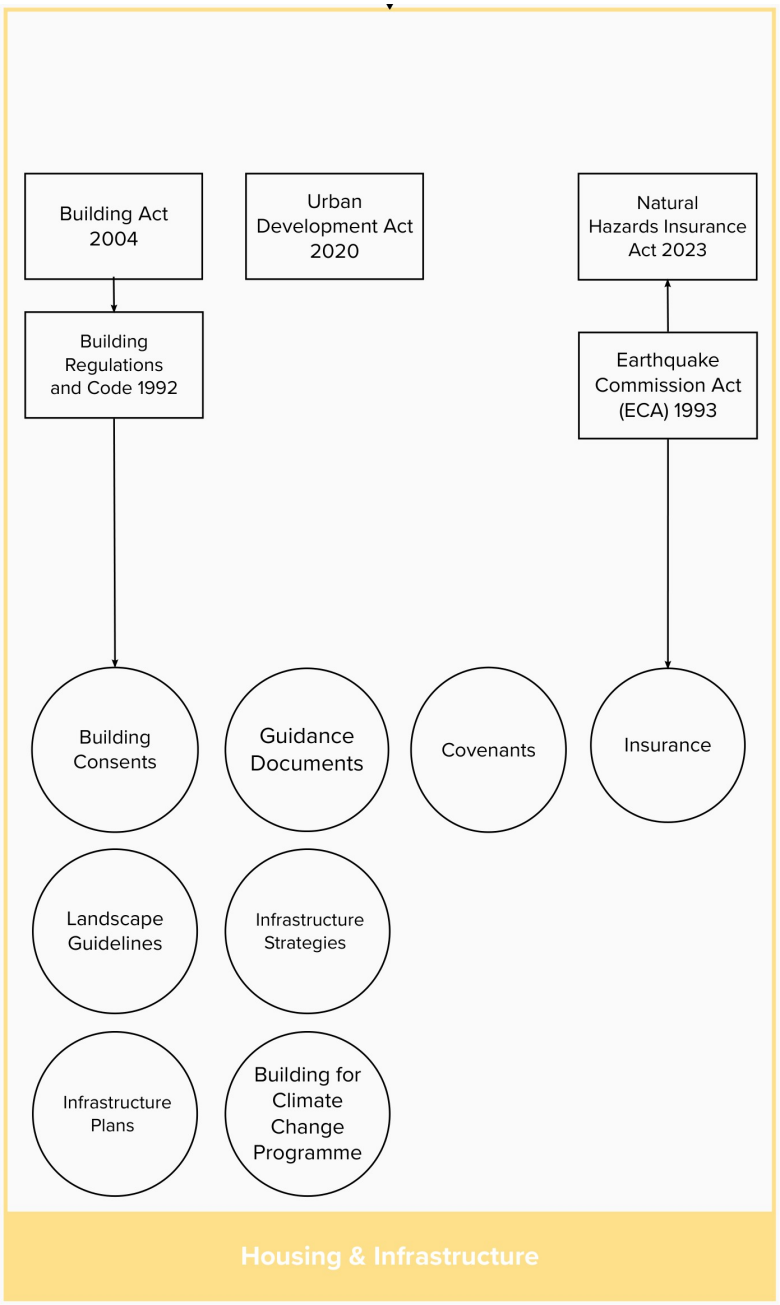

Figure 4.9 The main legislative framework within the Housing and Infrastructure domain. Legislative tools are represented by rectangles and other planning tools by circles. Figure 5.1 visualises the connections between domains.

This section discusses the main legislative framework relating to buildings, housing and infrastructure (Figure 4.9). Where we locate houses and infrastructure and how we build them is crucial to wildfire risk management. By locating houses and infrastructure away from areas prone to wildfires, we can reduce their exposure to potential wildfire hazards (O'Neill and Handmer 2012) and reduce the chances of human-caused fires in rural and rural-urban interface areas (Syphard et al. 2012). The Building Act 2004, Building Regulations 1992 and Urban Development Act 2020 are key legislative mechanisms that regulate building work. Building consents, covenants, landscape guidelines and infrastructure strategies and plans, as well as the Building for Climate Change Programme, can also be useful in wildfire risk management. Figure 5.1 shows how the Housing and Infrastructure domain is envisioned to be linked to other parts of the legislative framework associated with wildfire management.

Key actors that are involved with housing and infrastructure are MBIE, councils, Toka Tū Ake EQC, Waka Kotahi NZTA, Insurance Council of New Zealand, Transpower, the building sector (e.g. developers, engineers and architects) and property owners (Table 5.1).

4.9.1 Building Act 2004

The Building Act 2004 regulates building activities and establishes guidelines for building performance to guarantee the safety and wellbeing of occupants, particularly during fire emergencies. The Act emphasises fire prevention and safety measures within buildings, as well as efficient escape routes in case of a fire. However, it does not include regulations for wildfire hazards. Its primary focus is to ensure that people can use buildings safely without health risk and focuses on fire within a building, its potential to spread to other buildings and the safe evacuation of individuals. While the Act's definition of natural hazards includes various elements such as erosion, falling debris, subsidence, inundation and slippage, it does not encompass fire-related hazards (Building Act 2004).

The Building Code (Part 2 of the Building Act 2004, see Section 4.9.2) is a set of building requirements and performance criteria that provide detailed specifications for construction practises, materials and design elements. It is developed based on the objectives and principles set forth in the Building Act. The chief executive of a local authority can specify what building consent applications must be sent to Fire and Emergency New Zealand for advice, including means of escape. However, that advice cannot exceed the requirements of the Building Code.

Section 47 of the Building Act 2004 allows Fire and Emergency New Zealand to request consenting authorities to submit certain building consent applications to them for comment. However, the advice provided by Fire and Emergency New Zealand is limited to addressing evacuation and fire-fighting access requirements, which are already part of the Building Code.

It should also be noted that legal opinions differ about how certain parts of the Building Code are interpreted (Tonkin & Taylor 2016). While the Building Act limits councils from imposing standards higher than those in the Building Code (s18), there may be exceptions defined in other laws (Tonkin & Taylor 2016).

Furthermore, s47 explicitly prohibits Fire and Emergency New Zealand from recommending building performance criteria that exceed the standards outlined in the Building Code. As a result, when Fire and Emergency New Zealand provides advice on building consent applications, they cannot "set out advice that provides for the building to meet performance criteria that exceed the requirements of the building code" (Building Act 2004).

The government has proposed changing the Building Act's principles and purposes so that climate change is a key consideration (Building Performance 2022b). The proposed changes aim to make climate change a central consideration in building regulations and practises. As part of this initiative, new principles will be introduced to improve the resilience of buildings against future climate-related events, such as wildfires (MBIE 2022).

4.9.2 Building Regulations 1992, Schedule 1

Building Regulations 1992, Schedule 1, also known as the Building Code, regulates building work and sets performance standards for buildings, and updates to this are the responsibility of MBIE. Clause C focuses on fire-protection measures. Currently, the Building Code is undergoing a revision to incorporate the latest industry standards around smoke and fire alarms, as well as fire sprinklers (MBIE 2023a).

While the Building Code lacks explicit provisions for addressing wildfire concerns, it does include fire protection and safety procedures within Clauses C1–C6. Clause C1 covers the objectives of Clauses C2–C6. These objectives are focused on the building's safety and are as follows (Clause 1):

- *"Safeguard people from an unacceptable risk of injury or illness caused by fire";*
- *"Protect other property from damage caused by fire"; and*
- *Facilitate firefighting and rescue operations.*

Clauses C2–C6 cover the following aspects: (C2) requirements to prevent fire, (C3) measures to reduce the spread of fire to areas beyond the fire source, (C4) effective means to move to a safe place, (C5) access and safety for firefighting operations, (C6) and structural stability requirements so that buildings remain stable during and after a fire event.

4.9.3 Urban Development Act 2020

The Urban Development Act 2020 grants Kāinga Ora (Homes and Communities) significant development powers to undertake large-scale comprehensive urban development. Under the Act, Kāinga Ora is the consenting and requiring authority for the Special Development Projects that it establishes. However, the Act's natural hazard and climate provisions, such as s32(1)(d)(i), s32(2)(b) and s57(b)(iii), are more general and weaker compared to those under the RMA 1991. This may result in management of wildfire risks being overlooked in Kāinga Ora's developments. Conversely, the full control that Kāinga Ora has over its projects may also provide opportunities for improvement in wildfire risk management. Under the Act, Fire and Emergency New Zealand is recognised as a "key stakeholder with whom engagement must be sought" during the urban development process.

4.9.4 Natural Hazards Insurance Act 2023

The Natural Hazards Insurance Act 2023 is a piece of legislation in Aotearoa New Zealand that aims to improve insurance coverage for natural hazard risks, including wildfires. As of July 2024, the Act replaces the Earthquake Commission Act 1993 and provides some insurance (up to $300,000, Part 2 s35) for residential buildings and parts of residential land against natural disaster damage. Any additional coverage is provided through private insurance (Russell 2023).

The Act was intended to enable better community recovery from natural hazards, to clarify the role of the Earthquake Commission (now Toka Tū Ake EQC) and insurance cover provided and to enhance the durability and flexibility of the legislation. The Earthquake Commission Act 1993 specifically referred to "natural disaster fire", and the Natural Hazards Insurance Act 2023 refers to a natural hazard fire as "a fire occasioned by, though, or in in consequence of any other natural hazard" (Part 1 s5). The other natural hazards listed in the Act are earthquakes, hydrothermal activity, landslide, tsunami, volcanic activity, floods and storms. Therefore, the source of the wildfire will play an important role in determining whether Toka Tū Ake EQC partially covers the wildfire damage to the residential property or if it is covered partially or entirely by private insurance.

4.9.5 Other Tools

4.9.5.1 Building Consents

A building consent is needed for most building work, which confirm that the building work complies with the Building Code (Building Act 2004). According to the Building Act 2004 (see also Section 4.9.1), buildings need to be safe and provide "adequate means of escape from fire" (Building Act 2004). The 'fire' reference primarily relates to fires within buildings and the spread to other buildings (Building Act 2004) rather than from wildfire.

4.9.5.2 Covenants

Covenants are rules or restrictions for landowners within a subdivision or development that outlines or controls how they can use their property (Property Law Act 2007; LINZ [2023a]). A restrictive covenant prohibits a landowner from doing something with their property, such as not allowing certain types of farming practises (LINZ [2023a]).

Restrictive covenants provide an opportunity to address wildfire risk by including provisions for the maintaining of firebreaks, specific vegetation requirements (e.g. use of non-flammable vegetation species) and wildfire setbacks. These measures can help to mitigate the potential impact of wildfires on neighbourhoods, particularly in rural-urban interface areas. Conversely, restrictive covenants can also limit wildfire-smart decisions by imposing limitations on the placement of a house within a property or by mandating specific types and amounts of vegetation cover. For example, covenants may dictate the placement of structures in a way that hinders the creation of defensible spaces or restricts access for fire-fighting efforts.

Developers can establish private covenants, and councils can require covenants (called consent notices for subdivision) through land-use and subdivision consents, as noted in Section 4.6.4.6.

4.9.5.3 Landscape Guidelines

Landscape guidelines can be a useful tool to address wildfire risks. For example, if provided with the right information, planners can be guided to look at wildfire risks and to assess landscape effects for resource consent (as required under Schedule 4 of the RMA).

Two guidelines are briefly reviewed in this section: *Te Tangi a te Manu – Aotearoa New Zealand Landscape Assessment Guidelines* (NZILA 2022) and the Waka Kotahi NZTA *Landscape Guidelines* (Bourne and Collins 2018).

Te Tangi a te Manu – Aotearoa New Zealand Landscape Assessment Guidelines focuses on assessing landscapes through a bi-cultural lens and the interaction of the physical, associative and perceptual dimensions. However, there is no mention of 'flammability', 'wildfire', 'natural hazards' or 'climate change'.

The Waka Kotahi NZTA *Landscape Guidelines* were developed nearly a decade ago and updated in 2018 (Bourne and Collins 2018). They provide some essential information that is helpful in addressing wildfire risk. The document is created for those involved in highway landscape planning, design, implementation and maintenance. 'Fire break' or 'firebreak' is defined as "a vegetation restriction area of 20 m (min) including the highway within fire prone areas" (Bourne and Collins 2018). It is mentioned six times with graphics throughout the document. Vegetation-free zones that serve as firebreaks are mentioned three times. The guidelines also recommend using the New Zealand Fire Service Commission's guide to flammability (Fogarty 2001).

Natural hazards and sea-level rise are mentioned under the coastal environments section of the Waka Kotahi NZTA *Landscape Guidelines*, which recommends users to regard landscape as 'green infrastructure'. Green infrastructure should benefit both communities and the environment, for example, by increasing biodiversity and positively affecting human health and wellbeing. The *Landscape Guidelines* link landscape requirements with relevant statutes, such as the RMA and New Zealand Coastal Policy Statement.

4.9.5.4 Infrastructure Strategies and Plans

Both central and local government can address wildfire risk in their infrastructure strategies. Waka Kotahi NZTA released a 30-year plan in March 2023 to guide its land transport infrastructure priorities (Waka Kotahi NZTA 2023). Regional directions will guide regional planners to set long-term land transport infrastructure priorities for their regions (Waka Kotahi NZTA 2023).

Under the Local Government Act 2002, local government should develop an infrastructure strategy as part of its long-term plan (Section 4.8.1). An infrastructure strategy must outline how local authority manages its infrastructure assets with consideration to natural hazard risks and infrastructure resilience (Local Government Act 2002). This means that the strategy should take into account potential risks posed by natural hazards, such as wildfires, and how to ensure that infrastructure is resilient to withstand or recover from such events. By incorporating considerations of natural-hazard risks, including wildfires, in their infrastructure strategies, local authorities can create a framework that addresses the specific challenges posed by these hazards.

The *Rautaki Hanganga o Aotearoa: New Zealand Infrastructure Strategy 2022–2052* (NZIC 2022) has a specific focus on climate change, natural hazards and wellbeing, which provides opportunities for wildfire to be addressed in future government infrastructure initiatives guided by the national direction. However, the strategy makes no direct mention of wildfire.

4.9.5.5 Building for Climate Change Programme

The Building for Climate Change programme (MBIE 2021) aims to help the building and construction sector adapt to the impacts of climate change, decrease greenhouse gas emissions and adhere to Aotearoa New Zealand's emission reduction targets. This is accomplished by adapting building standards and practises needed during the construction and operation of buildings (MBIE 2021).

The current Building Code does not mention wildfires or natural hazards, but this may change, as MBIE consulted with stakeholders to discuss modifications to Building Code requirements regarding fire protection (Building Performance 2022a).

4.9.5.6 Insurance

There are opportunities within private insurance policies to address wildfire risk (EWG member, 2 December 2022). If a homeowner purchases private insurance, EQC coverage is automatically included to safeguard homes "… against loss or damage caused by natural disasters" (Toka Tū Ake EQC c2022). Natural disasters that are listed are:

> *"… earthquake, natural landslip, volcanic eruption, hydrothermal activity, tsunami, storm (residential land cover only), flood (residential land cover only), natural disaster fire which occurs as a consequence of any of the above."* (Toka Tū Ake EQC 2022)

Private insurance policies may provide coverage for certain risks that are not covered by Toka Tū Ake EQC (EWG member, 2 December 2022). However, the specific coverage and inclusion of risks such as wildfire can vary between policies and insurance providers.

Banks also play a part in insurance to address wildfire risk, as a bank will require insurance on properties when providing a mortgage. Private insurance companies and banks often require information about the risks associated with assets, which make LIM reports valuable documents (see Section 4.8). These reports can be lengthy and complex and might require specific expertise to interpret the technical and legal implications (McAnulty 2022).

Insurance can increase premiums or withdraw insurance for houses located in hazard-prone areas, guiding growth and reducing risk in those areas. However, redirecting growth in this way is slow, and some researchers point out that this might have a small impact and only re-distribute risks (Boston and Lawrence 2018).

The Insurance Council of New Zealand has repeatedly urged the Aotearoa New Zealand government to fund long-term measures to adapt to sea-level rise so that the country remains insurable (INCZ 2020). If not, large regions will become un-insurable. As the Insurance Council states in the context of sea-level rise: “Good development choices are fundamental to ensuring resilience and future insurability” (ICNZ 2020). The same applies to development in areas with high wildfire risk. Without insurance, developers can still develop in these areas and decide it is worthwhile to accept the risk. Government and tax-payers might have to bear the consequences, and a community’s resilience declines.

Table 4.1 The main legislative mechanisms related to wildfire management and the extent to which these terms are referenced in the listed documents. Documents with an explicit reference to the wildfire-related terms are labelled as 'explicit' (E) or 'implicit' (I). Where the terms were not found in the searched documents, the mechanisms are labelled 'none' (N).

Mechanisms	Year	Description	Reference to Wildfire
Te Tiriti o Waitangi			
Te Tiriti o Waitangi	1840	Provides an agreement to enable Māori to keep authority over their resources and culture and the British Crown to govern Aotearoa New Zealand.	I
Treaty settlement acts	-	Aim to resolve Te Tiriti o Waitangi claims.	N
Climate Change			
Climate Change Response (Zero Carbon) Amendment Act	2019	Provides a framework for climate policy development. The effects of climate change on wildfires are primarily covered through the requirement to prepare the National Adaptation Plan and national climate-change risk assessments.	I
Health			
Health Act	1956	Provides a framework for protecting public health and addressing various health-related issues.	I
Pae Ora (Healthy Futures) Act	2022	Established to ensure that people in New Zealand have equal and quality access to health care.	I
Emergency Management			
Fire and Emergency New Zealand Act	2017	Established to reduce unwanted fires and better manage fire services. While it does not address wildfire, it does empower Fire and Emergency New Zealand to use policy tools for mitigating wildfire risks.	I
New Zealand Fire Service Firefighting Water Supplies Code of Practice (SNZ PAS 4509:2008)	2008	Provides advice as o what constitutes sufficient water supply for firefighting purposes in urban areas.	I
Fire and Emergency New Zealand Regulations	2018	Provides a framework for the management of fire safety, evacuation procedures and evacuation schemes of buildings.	I
Civil Defence Emergency Management Act	2002	Promotes sustainable management of hazards and enable communities to manage associated risks. The Act covers 'serious fire' as one of the emergency events that it addresses.	I
Emergency Management Bill	-	Focuses on building community resilience and community-led responses.	I
Electricity (Hazards from Trees) Regulations	2003	To protect electricity supply and public safety.	I

Mechanisms	Year	Description	Reference to Wildfire
Resource Management			
Resource Management Act	1991	Strives for sustainable management of natural and physical resources and the management of significant risks from natural hazards.	I
Resource Management reform	2022	Aims to streamline Resource Management processes. The Natural and Built Environment Act, Spatial Planning Act and Climate Change Adaptation Act replaces the Resource Management Act 1991.	I
Natural and Built Environment Act	2023	Main component of the Resource Management reform. It introduces the National Planning Framework to provide clearer direction in safeguarding the natural environment.	I
Spatial Planning Act	2023	Works together with the Natural and Built Environment Act. It requires that every region create a long-term regional spatial strategy outlining opportunities and challenges concerning regional development and the environment.	I
Climate Change Adaptation Act	Anticipated	Intends to provide additional tools for managed retreat and funding options to guide activities away from regions susceptible to climate change and natural hazards.	I
National Policy Statement Urban Development (NPS-UD)	2020 (updated 2022)	Promotes development in areas that have good access to existing services, public transport networks and infrastructure.	I
National Environmental Standards for Commercial Forestry (NES-CF); and review	2017; 2023	Provides standards to control environmental effects of forestry larger than 1 ha and improve management of plantation and exotic continuous-cover forests. The review proposes specific wildfire risk management.	E
National Policy Statement for Freshwater (NPS-FW)	2020	Requires regional councils to identify freshwater management units and manage these.	N
National Environmental Standards for Freshwater (NES-FW)	2020	Outlines standards to protect streams, wetlands and fish passage and to control some farming activities.	N
National Policy Statement on Electricity Transmission (NPS-ET)	2008	Sets out the goals and policies for management of the electricity transmission network.	I
National Policy Statement for Indigenous Biodiversity (NPS-IB)	2023	To protect, maintain and restore indigenous biodiversity by identifying and managing Significant Natural Areas.	N

Mechanisms	Year	Description	Reference to Wildfire
National Environmental Standards for Air Quality (NES-AQ)	2004	Provides standards to control air quality and protect human health.	N
Conservation			
Conservation Act	1987	Promotes the conservation of Aotearoa New Zealand's natural and historic resources. Section 48 allows regulations for fire prevention in conservation areas, and s24H allows closure of a marginal strip due to fire hazard conditions.	I
National Parks Act	1980	Preserves national parks in perpetuity.	N
Reserves Act	1977	Created "to acquire, preserve, and manage areas for conservation, public, recreational, and educational values" (DOC [2023d]). Wildfire is not mentioned in the Act, but Part 5 does address damage by fire and penalties related to fire.	I
Environment Act	1986	Established the Ministry for the Environment and the Office of the Parliamentary Commissioner for the Environment. Under the Act, the term 'natural hazards' includes fire.	I
Crown Forest Assets Act	1989	Provides for the management of the Crown's forest assets. Wildfire is not directly referenced, but fighting of fire and fire breaks is mentioned under Crown forestry assets.	I
Forests Act	1949	Provides guidelines for sustainable management of indigenous forest land.	E
Crown Pastoral Land Reform Act	2022	Regulations and standards to better manage Crown pastoral land. The Reform Act amends the Crown Pastoral Land Act 1998 and Land Act 1948. Its primary purpose is to remove the tenure review process and promote sustainable pastoral farming practises.	I
Crown Pastoral Land Act	1998	Provides for the tenure review of Crown pastoral land. Section 15 requires that any burning of vegetation requires consent from the Commissioner of Crown Lands.	I
Land Act	1948	Covers the management of Crown lands. Under the Act, the lessee or licensee must fully insure all Crown buildings against loss or damage from fire, and regulations can be made to protect forests, bush or growing timber and prevent fires within them.	I
Local Government			
Water Services Entities Act	2022	Provides safe, reliable and efficient water services in place of local authorities.	N
Local Government Act	2002	A framework for local governments to promote social, economic, environmental and cultural wellbeing of communities.	N

Mechanisms	Year	Description	Reference to Wildfire
Bylaws	-	Under s146 of the Local Government Act 2002, territorial authorities may make bylaws to manage water supply. Territorial authorities can make fire bylaws to control outdoor burns. Bylaws can also be used to manage smoke nuisances.	I
Local Government Official Information and Meetings Act	1987	To improve availability and access to official information held by local authorities and protect this information.	N
Housing and Infrastructure			
Building Act	2004	Regulates building work and sets performance standards for buildings. The Act emphasises fire prevention and safety measures within buildings, as well as efficient escape routes from buildings in case of a fire.	I
Building Regulations, Schedule 1 (Building Code)	1992	Regulates building work and sets performance standards for buildings. Clauses C1–C6 outline fire protection and safety procedures.	I
Urban Development Act	2020	Grants significant development powers to Kāinga Ora to undertake large-scale comprehensive urban development. Fire and Emergency New Zealand is recognised as a “key stakeholder with whom engagement must be sought” during the urban development process.	I
Natural Hazards Insurance Act	2023	To reduce the impact of natural hazards on people and property. Replaced the Earthquake Commission Act 1993.	I

Table 4.2 Other tools related to wildfire management, such as policies, strategies, plans and guidance documents, and the extent to which these terms are referenced in the listed documents. Documents with an explicit reference to the wildfire-related terms are labelled as 'explicit' (E) or 'implicit' (I). Where the terms were not found in the searched documents, the mechanisms are labelled 'none' (N). Some documents vary and may or may not include a reference to the term 'wildfire'. These are marked with a dash.

Mechanisms	Description	Reference to Wildfire
Te Tiriti o Waitangi		
Iwi/hapū management plans (IHMPs)	"A resource management plan prepared by an iwi, iwi authority, rūnanga or hapū" (Quality Planning c2017c) to help iwi and hapū exercise their kaitiaki roles and responsibilities.	-
Climate Change		
National Climate Change Risk Assessment (NCCRA)	Assesses Aotearoa New Zealand's climate-change risk and identifies increased fire weather as one of the 10 most significant risks.	E
Regional climate-change risk assessments	Guide adaption planning projects for different regions. Some refer to increased wildfire risk for their regions and how this may lead to adverse impacts, which the councils need to address in future planning efforts.	E
National Adaptation Plan	A first step toward meeting the Government's long-term vision and goals for a climate-resilient Aotearoa New Zealand. It guides development away from high-risk areas, such as those that might be affected by wildfire.	E
Health		
Health insurance documents and policies	Provide financial protection and access to healthcare services for individuals and their families.	-
Emergency Management		
Community response plans	These plans outline emergency procedures to help prepare communities for risks such as major storms, flooding, tsunami and (forest) fires. Steps and procedures vary from prevention preparation, such as escape planning and clearing of vegetation, to instructions on what to do in a fire emergency.	E
Marae preparedness plans	Used to improve marae resilience and safety. The Te Puni Kōkiri Marae Emergency Preparedness Plan toolkit helps marae to prepare for emergencies. Among the emergencies highlighted in the toolkit are forest and scrub fires, along with flooding, pandemics, volcanic ash and tsunami.	E
Fire and Emergency New Zealand local fire plans	Identifies and analyses fire risks and outlines policies and procedures for fire control. Local fire can be a valuable policy tool if prepared well and integrated with other risk-management tools.	E

Mechanisms	Description	Reference to Wildfire
National Disaster Resilience Strategy 2019	Outlines the vision and long-term goals for civil defence emergency management in Aotearoa New Zealand. It considers wildfires to be disruptive events and a risk to wellbeing and prosperity. Serious fire is listed in the definition of 'emergency'.	I
National Civil Defence Emergency Management Plan (NCDEMP) 2015	"Sets out the roles and responsibilities of everyone involved in reducing risks and preparing for, responding to and recovering from emergencies" (NEMA [2023e]). Wildfire and urban fires are considered emergencies requiring national intervention.	E
Evacuation schemes	Helps building owners develop an evacuation scheme for relevant buildings. It covers aspects such as exit strategies, control of open flames, storage of certain materials (e.g. firewood) and firefighting equipment. The focus is on evacuation from buildings and not on evacuating individuals from the area.	I
Fire and Emergency New Zealand and wildfire guidance documents	Used to help people plan for fires and preventing fires. Multiple Fire and Emergency New Zealand guidance documents reference 'wildfire'.	E
Wildfire Risk Reduction Strategy and land management forums	Promote greater collaboration with land managers and landowner representatives to deliver joint work plans and communication to improve fire risk awareness in communities' living and working environments, while equipping them with effective strategies to mitigate such risks.	E
Prescribed burn plans	Prescribed burn plans are a tool for managing wildfire risks associated with prescribed burns.	E
Temporary fire bans	Local directions to manage fire risks.	E
Resource Management		
Regional Policy Statements (RPS)	Provides an overview of the resource management issues of the region and "policies and methods to achieve integrated management of the natural and physical resources of the" whole region (RMA 1991). While these can cover policy on natural hazards, provisions for wildfires are expected to be embedded in district plans.	I
Regional plans	Regional plans are not mandatory (except a Coastal Regional Plan), but one consideration for preparing a regional plan is to address any risks from natural hazards. Regional plans have yet to be prepared to specifically address wildfire.	N
District plans	District plans are mandatory and address land use, development and subdivision. Wildfires are rarely mentioned in district plans, and, if they are, the emphasis is mainly on regulations regarding building setbacks from vegetation and the use of sprinkler systems.	N
Unitary plans	A combination of regional and district plans that address land use, development and subdivision.	N

Mechanisms	Description	Reference to Wildfire
Resource consents	Required when a use of land does not meet s9 of the RMA, a regional rule or a district rule; and the use does not have existing use rights.	N
Designations	Provides a Minister of the Crown, a local authority or a network utility operator with the right to designate land for a public work, project or work, as well as to restrict other activities for the safe or efficient operation of the public work, project or work.	N
Conservation		
Conservation General Policy 2005 (revised in 2007 and 2019)	Provides unified policy to implement the Conservation Act 1987 and Reserves Act 1977. Natural hazards are defined as "events which affect or may affect people, property or the environment", and this definition includes fires (Section 8). Section 4.3 outlines the fire control and management obligations for conservation purposes, which include the use of prescribed burns.	E
General Policy for National Parks 2005 (revised in 2019)	Provides guidance for the management of national parks. Section 7 lists fire as a natural hazard. Prescribed burning is allowed for ecosystem management.	E
National Park management plans	Ten-year plans that provide management objectives for national parks. Management plans for national parks refer to fires and the associated risks, generally with policies aimed to prevent fires.	E
Climate Change Adaptation Action Plan	Plan to improve resilience to climate-change impacts of Department of Conservation lands. The document stresses the importance of changes in fire frequency to ecosystems, people and infrastructure.	E
Conservation management strategies	Ten-year plans that provide management direction for specific areas of public conservation lands and waters: *"implement general policies and establish objectives for the integrated management of natural and historic resources, and for recreation, tourism, and any other conservation purposes."* (DOC [2023b]) Conservation strategies may include fire management from a conservation and natural hazard risk perspective.	--
Conservation management plans	These plans implement the conservation management strategy. Conservation management plans include fire management from a conservation and natural hazard risk perspective.	--
Te Mana o Te Taiao / New Zealand Biodiversity Strategy 2020	Halts the decline of biodiversity and protects natural resources. Fire risk is mentioned from a climate-change perspective.	I

Mechanisms	Description	Reference to Wildfire
Reserves Management Plan	Prepared under the Reserves Act 1977 and contains objectives and policies for the management, protection and future development of a reserve or protected area. These plans often include measures to prevent wildfires, manage vegetation and implement fire safety protocols.	I
Department of Conservation planning documents	Sets out how the Department of Conservation and Te Tiriti o Waitangi partners manage natural and historic resources.	--
Local Government		
Land Information Memorandum (LIM)	A comprehensive report that includes all relevant information that Council possesses regarding a property or section. LIMs do not deliver all key natural hazard information for properties.	--
Housing and Infrastructure		
Building consents	A formal approval granted by local council under the Building Act 2004 that allows a person to carry out building work.	--
Covenants	Rules or restrictions for landowners that specify how they can use their property. Restrictive covenants provide an opportunity to address wildfire risk.	--
Waka Kotahi NZTA Landscape Guidelines	Establishes landscape best practises. Landscape best practises can cover various aspects, including wildfire management.	--
Infrastructure strategies	Section 101B of the Local Government Act 2002 requires local authority to prepare and adopt an infrastructure strategy. These strategies provide a framework that local authorities can use to address potential hazards and consequences of wildfires in their specific area.	--
Infrastructure plans	Guide long-term land transport infrastructure priorities.	--
Building for Climate Change programme	Aims to help the building and construction sector adapt to the impacts of climate change and decrease greenhouse gas emissions. See also the Building Code (Table 4.1).	I
Home insurance	Insures houses against sudden, unforeseen and accidental damage from exposure to serious danger. The specific coverage and inclusion of risks such as wildfire can vary between policies and insurance providers.	-

5.0 PLANNING CONSTRAINTS AND OPPORTUNITIES

This study explores the main legislative framework and planning processes underlying extreme wildfire management at the rural-urban interface. Wildfires are “extreme climatological events” and can be “ignited by non-climate sources” (Ministry for the Environment 2020b). The rural-urban interface represents development that is close to “forest, bush, scrub, or grasslands” (Fire and Emergency New Zealand [2019]).

During consultation with programme partners and experts, the planning challenges, solutions and directly related stakeholders were identified as shown in Table 4.1. The interviews and analysis of the legislative framework also led to the creation of the Wildfire Management and Planning flowchart (Figure 4.1). This flowchart was used to identify those parts in the planning and decision-making process that may limit or provide opportunities to reduce wildfire risks in rural-urban areas.

This section provides an overview of the key findings and explores some of the policies, management strategies and adaptive responses that can be used to reduce wildfire risk and improve community resilience in the face of increasing occurrences of extreme wildfire events. It is important to mention that this compilation is not exhaustive, instead serving as an initial framework to promote discussions on this subject. The following key findings are explored below: regulatory guidance, building requirements, wildfire risk awareness, pro-active planning and sustainable land management. The findings are summarised in Table 5.1.

5.1 Regulatory Guidance

Analysis of the legislative framework shows that, with respect to wildfire management in the rural-urban interface, Aotearoa New Zealand’s law provides limited guidance for planners, as it includes few explicit references to wildfire risk or the management of assets, infrastructure or property that may be exposed to wildfire risks. In addition, the term ‘rural-urban interface’ is not often mentioned and, when it is used, the definition varies and can include different types of developments, ranging from urban to rural and forested areas. As wildfire knows no boundaries, it can inherently crosses jurisdictions and spread from one territory into another less-prepared territory. If wildfire is considered by one authority but not another, this could lead to cross-boundary issues.

The observation that there is limited regulatory guidance aligns with both the literature findings (Kornakova and Glavovic 2018) and the EWG’s notion (4 October 2022) that Aotearoa New Zealand does not have a comprehensive legal system in place to address extreme wildfire risk. To encourage the consideration of wildfire risk in planning processes, the legislative framework could offer more explicit guidance by establishing commonly agreed-upon terms, definitions and guidelines for best wildfire management practises.

Te Tiriti o Waitangi is Aotearoa New Zealand’s founding document, and decision-makers are required to “give effect to the principles of Te Tiriti o Waitangi” through involvement of mana whenua / tangata whenua in decision-making and ongoing engagement of local iwi/hapū. However, there is insufficient guidance on how to apply Te Tiriti o Waitangi principles in the context of wildfire risk planning and management.

More specific guidance can be found in the RMA 1991 and reform, CDEM Act 2002, Building Act 2004, Climate Change Response (Zero Carbon) Amendment Act 2019 and FENZ Act 2017. The FENZ Act establishes the Fire and Emergency New Zealand organisation, outlines its functions and sets out the framework for fire management, emergency response and related

services. The CDEM Act establishes the legal framework for civil defence and emergency management in the country. It provides guidance on how agencies and organisations should respond to emergencies, including wildfires. The Climate Change Response (Zero Carbon) Amendment Act establishes a framework for climate policy development. The impact of climate change on wildfires is primarily addressed through the mandate to create the National Adaptation Plan and conduct national climate-change risk assessments. The RMA governs the management of natural and physical resources and includes provisions related to fire risk management, land-use planning and environmental protection. The Building Act deals with the regulation of building construction, safety and compliance.

The RMA regulates management of the environment, land use and infrastructure. While it acknowledges fire as a natural hazard, and the FENZ Act, CDEM Act and Building Act address fire-related issues through different provisions and mechanisms, none of these acts explicitly focus on wildfires as a distinct type of natural hazard. Further consideration and more specific legislation is needed to comprehensively address the complexities and challenges associated with wildfires as a distinct natural hazard.

The resource management reform offers an opportunity to enhance the efficiency and effectiveness of the resource management system. Such reforms can provide a platform to address natural hazards, such as extreme wildfires, and the impacts of climate change in a more pro-active and integrated manner. The contents of the Climate Change Adaptation Bill and NPF, which will provide more in-depth information regarding potential hazards, have not been made available at this time. Consequently, it is too early to assess the full extent of the reforms.

As shown in Section 4, other management tools, such as Fire and Emergency New Zealand documents, can provide more guidance on wildfire risk management. Strategies and guidance documents are useful but, as some EWG members noted, these are not always used by planners (10 October 2022), and it is up to the planners to use these tools (EWG member, 9 December 2022). This is a common issue in the planning field (Kilvington and Saunders 2013).

Furthermore, some Fire and Emergency New Zealand guidance documents use inconsistent terminology or present overlapping information, which can create confusion among readers. To address this issue, it would be helpful to consolidate relevant information into a comprehensive guidance document with a user-friendly checklist for planners to readily access. This document should be succinct and incorporate clear and concise definitions that effectively convey the fundamental meaning of wildfire-related concepts and terms.

Complex, unclear, and sometimes contradictory, wildfire law can lead to ambiguous direction for planners involved in natural hazard risk management. The complexity is exacerbated due to the fact that authorities from the national to the local level may have different agendas, management objectives, jurisdictions and responsibilities. For example, under the NPS-UD, territorial authorities must plan to ensure that there is sufficient residential and commercial development capacity within Tier 1 and 2 urban environments (see Section 4.6.3.1). However, there are ‘qualifying matters’ (see Section 4.6.3.2), including significant natural hazards, that determine when authorities should not increase capacity. Some councils have put forward significant natural hazard risk as a reason not to increase capacity in some areas.

5.2 Building Requirements

This section discusses three additional challenges in wildfire management concerning building requirements: insufficient guidance and standards, conflicting objectives among government institutions and other stakeholders, and a lack of incentives for pro-active measures.

Although the NCCRA acknowledges the threat of wildfires to the built environment, building codes and design standards presently lack provisions for addressing wildfire risks. Nevertheless, existing frameworks can be used to establish fire-smart standards with the assistance of organisations like the New Zealand Green Building Council (NZGCB) Building Research Association of New Zealand (BRANZ) (EWG member, 2 December 2022).[4] Important criteria to consider are building materials, site layout, landscape and flammable vegetation species (EWG, 10 October 2022). However, developers may be hesitant to adopt wildfire reduction strategies, such as using fire-resistant building materials, due to the potential increase in building costs (EWG, 10 October 2022).

It should be noted that government agencies' planning and management goals may conflict. What works from one agency's perspective may not work from another perspective (EWG, 10 October 2022). For example, Fire and Emergency New Zealand may require removal of flammable vegetation, which include species on DOC's threatened species lists. Another example is the change from building with concrete and steel toward timber-framed buildings (EWG members, 10 October 2022; 2 December 2022). Compared to steel and concrete structures, timber-framed buildings use less fossil fuel in the manufacturing process, but these buildings do increase fire risk. From a climate-emissions-reduction and earthquake-rupture perspective, a government may favour timber buildings but, from a wildfire risk perspective, steel and concrete is preferred.

The Building Code sets minimum standards for building safety and construction across the country. This helps maintain a consistent baseline of requirements that apply uniformly to all regions. However, in some cases, local conditions such as wildfire hazards may require standards or regulations that go beyond the minimum requirements in the Building Code. Prohibiting such modifications or adjustments may restrict the ability of local authorities to address specific local needs adequately. So, there is a need to balance the need for nationwide consistency, avoid overly complicated or conflicting rules between councils and preserve the flexibility necessary to adapt to local conditions. Communication between different agencies, sectors and other stakeholders will be key for aligning stakeholders objectives and needs.

In addition, currently there are no incentives in place for property owners or developers to implement wildfire reduction strategies for new housing developments (fire-smart designs). To offset additional building costs and encourage homeowners to safeguard their properties from wildfires, various measures can be taken. These incentives include the provision of government grants or rebates, home loan interest rebates and reductions in home insurance premiums.

Government grants or rebates could help property and building owners pay for wildfire risk reduction measures or fire-smart building designs for new constructions or renovations. In addition, banks can offer interest rebates for homes that have fire-smart designs incorporated. Furthermore, insurance could potentially re-direct growth from hazard-prone areas by increasing premiums or withdrawing insurance. However, some experts argue that these actions might not have a significant impact (Boston and Lawrence 2018). Furthermore, developers might choose to accept the risk, potentially leading to governments and tax-payers bearing the long-term consequences of such decisions.

4 NZGBC was created by the building sector and advocates for more sustainable and healthier buildings (NZGBC [2023]). BRANZ is an independent research organisation that facilitates collaboration between the building industry and government to promote safe and healthy building (BRANZ 2023).

5.3 Wildfire Risk Awareness

Low wildfire awareness among stakeholders was a concern that was highlighted by EWG members (10 October 2022). Researchers have found that an individual's perception of wildfire risk can significantly impact their adoption of mitigation measures (Asfaw et al. 2022). Stakeholders exhibit varying degrees of wildfire risk perception, influenced by factors such as past wildfire experiences, social pressure and the perceived severity of wildfire events (Champ and Brenkert-Smith 2016; Asfaw et al. 2022).

Various tools can be employed to enhance wildfire awareness among communities and stakeholders at different stages of the wildfire planning process. For example, education and awareness campaigns (EWG, 10 October 2022), such as FireSmart[5], a national programme in Canada; Firewise[6] in the United States of America (Asfaw et al. 2022); and Get Firewise[7] for schools in Aotearoa New Zealand, contribute to building valuable community networks crucial in rapid emergency response. Additionally, establishing safe evacuation routes, providing evacuation planning guidelines as outlined by CDEM and conducting training sessions for communities all aid in facilitating swift evacuation during wildfire emergencies.

Other tools, such as wildfire risk monitoring, early warning systems and data sharing, can also play an important role in improving wildfire awareness and preparedness. Monitoring programmes help to quantify and qualify wildfire risk, identifying wildfire-prone areas and vulnerable communities. Early warning systems quickly alert people during wildfire emergencies, while open data sharing and public platforms disseminate information on extreme wildfire events, similarly to what is being done with other natural hazards such as GeoNet for geohazards (see https://www.geonet.org.nz/).

Furthermore, wildfire risk maps can show wildfire-prone areas based on a set of factors such as weather conditions and fuel (Verde and Zêzere 2010; Oliveira et al. 2021). However, there is at present a lack of comprehensive wildfire risk mapping that meets the required level for planning purposes at the local scale. Generating these maps and establishing a clear demarcation between areas with and without wildfire risk in a legally sound manner is challenging due to the multitude of variables and intricate local complexities involved. As an EWG member (15 February 2022) noted, the focus is generally on other risks such as flooding, land instability and erosion.

When fire risks are not visible or known, this can lead to low awareness of hazards and related risks. Development can be more easily directed away from wildfire-prone areas if planners, decision-makers and developers are better informed. Wildfire risk maps in district plans and LIM reports could be useful tools in achieving this objective.

District plans could include firefighting water provisions and wildfire hazard overlays. These overlays can be developed through risk assessments, incorporating factors such as extreme wind speeds, prevailing winds, temperatures, fuel load, topography (slope), building setbacks and more. The assessment should also consider existing and proposed land-use types and the evolving location of the rural-urban interface over time. However, further study is needed to understand the effectiveness and efficiency of using wildfire hazard overlays in district plans.

5 https://firesmartcanada.ca/
6 https://www.readyforwildfire.org/prepare-for-wildfire/firewise-communities/
7 https://www.fireandemergency.nz/teachers-and-schools/get-firewise/

Bringing about successful changes in the context of wildfire risk management requires the active involvement and commitment of communities and institutions. While developing strategies and action plans is crucial, it is equally important to recognise that effective implementation relies heavily on the availability of adequate resources.

5.4 Pro-Active Planning

Government agencies at various levels play important roles in fire risk management (EWG member, 10 October 2022). However, it has been observed that wildfire has not been given significant consideration in the planning process (EWG member, 7 December 2022). Aotearoa New Zealand emergency agencies often focus on the impacts of wildfire events rather than pre-disaster investment activities (EWG member, 10 October 2022). Consequently, government intervention primarily occurs post-disaster and after urban form has already been established, missing opportunities for pro-active wildfire risk prevention and mitigation.

Literature review and discussions with EWG members indicate that long-term planning and investment to prevent natural hazards is mainly left to local authorities, which may have limited resources and planners who lack the capacity and place-based understanding to assess and address all disaster risks. As noted by an EWG member (9 December 2022), planning consultants typically prioritise other hazards such as earthquakes, flooding, land instability and erosion over wildfire when considering new subdivisions. It is uncertain to what extent this prioritisation is due to informal rules and the accumulation of knowledge about the local environment within the planning profession over time, or other factors. Even in wildfire-prone areas, wildfire risk assessments are often not required in building consent applications (EWG member, 9 December 2022). Unfortunately, when a government agency does get involved, it is often too late, after homes have been built and disasters have occurred (EWG member, 9 December 2022). Moreover, there is often more political support to spend money on disaster relief than on prevention of disasters (Boston and Lawrence 2018), even though the former is generally more costly than the latter (Deloitte Access Economics 2013; Boston and Lawrence 2018) and hazard mitigation measures can decrease casualties and prevent property loss (NIBS 2019).

Aotearoa New Zealand's first National Adaptation Plan emphasises pro-active planning by directing development away from high-risk areas such as those that might be affected by wildfire. Additionally, regional and district plans are required to address significant risk from natural hazards. Several planning tools could be used to plan pro-actively and improve a community's wildfire resilience. These include providing wildfire and building guidelines, implementing more stringent building standards, utilising wildfire risk assessments and strategies, incorporating wildfire hazard overlays and requiring restrictive covenants for rural-urban interfaces (EWG members, 2 December 2022; 10 October 2022). Other potential planning methods to manage wildfire risk include regional rules, building consents and LIM reports.

The purpose of NEMA is to provide "leadership in reducing risk, being ready for, responding to and recovering from emergencies" (NEMA [2023a]). This indicates opportunities for authorities and agencies specialised in wildfire risk management and emergency preparedness planning to collaborate on incorporating wildfire preparedness practises, standards and guidelines.

Standards and guidelines similar to the ones available for other natural disasters, such as earthquakes and tsunami, that planners can consult in the resource and building consent application process will help facilitate planners to better plan for new developments at the rural-urban interface. Standards that are used to ensure that sufficient water supplies are available for fighting house fires could also be used to set standards for wildfire firefighting

purposes (EWG member, 9 December 2022). These standards can then be included in wildfire risk reduction plans. In addition, community response plans and marae preparedness plans can become key to communities responding to and recovering from wildfire, but there needs to be sufficient resources and capacity to prepare such plans.

Apart from establishing evacuation routes, councils should consider several factors such as site selection, fire-resistant building designs and materials, adequate water supplies, fire-resistant landscaping (Galimidi et al. 2020) and wildfire setback requirements. It is important to note that fire evacuation plans generally focus solely on evacuating individuals from buildings. They do not include wildfire risk or evacuation of people out of a neighbourhood that is threatened by wildfire.

To ensure that wildfire risk is considered in resource consent applications, wildfire risk provisions should be included in proposed land-use changes or subdivision plans if the location is in wildfire-prone area. For new developments in areas prone to wildfire, councils could require fire risk assessments, wildfire risk maps and Wildfire Readiness and Response plans (e.g. NFPA c2022) as part of the building consent process. This could be similar to the geotechnical assessments that are being used in a resource or building consent process to check for geotechnical hazards such as slope instability and liquefaction.

The current definition of ‘natural hazard’ in the Building Act 2004 primarily focuses on the direct impact of hazards like flooding, erosion and subsidence on buildings and infrastructure. However, it does not explicitly include wildfire, which is a significant omission. By amending the definition to include wildfire, councils could pro-actively manage wildfire risk through more thorough assessments for proposed building projects and could also implement limitations and restrictions on construction in wildfire-prone areas. Such measures would safeguard both properties and individuals residing or working within those areas.

Councils can govern density through zoning, allowing only low-density development in wildfire-prone areas and limiting new development. Transferable development rights are a tool that could be considered to re-direct growth from high- to low-risk areas by transferring development rights from the former to the latter (Hodgson 2012). Land covenants can also be used to restrict or modify development in areas prone to hazards (e.g. LINZ [2023a]). Building consents can be used to put restrictions on certain activities.

Acquisition of housing in hazard-prone areas (also known as buy-out programmes) can also be used post-disaster (Smith et al. 2021). Use of these programmes in Aotearoa New Zealand is uncommon, and frameworks for this are still evolving. Pro-active buy-out programmes in which houses are acquired pre-disaster are even less common due to a lack of funding, low local government capacity, and constrained by national support (Smith et al. 2021). The call by the Environment Committee of Parliament for public input regarding funding for community-led retreat and adaptation will help Aotearoa New Zealand explore feasible retreat strategies (Ministry for the Environment 2023c).

Plan rules are part of the regulatory framework to manage and mitigate risks associated with natural hazards. They can be used to remove existing use rights if the risk is found to be too high. However, this action is often considered to be a last resort, involving legal challenges and used only when no alternative options exist and risks are deemed unacceptable. Section 30 of the NBA now provides more power for local authorities to take effective risk mitigation responses.

5.5 Sustainable Land Management

Sustainable landscape management refers to the practise of responsibly and holistically managing natural and human-made elements within a landscape to ensure long-term ecological balance, social wellbeing and economic viability. It relates to landscape and conservation management, as well as forestry practises. The main topics that are highlighted in this section are trade-offs between land uses, fire-smart forestry practises and incentives to facilitate implementation of practises.

As more trees are planted to address climate change and biodiversity loss, there is a concern that wildfire risk and mitigation is not adequately taken into consideration. New forests can increase wildfire risks and introduce pests and diseases. To ensure a well-informed strategy, it is important to promote transparent discussions involving the public and various stakeholders to explore the costs and benefits of different planning scenarios.

Landowners and investors are often motivated to plant exotic forests for higher economic returns, including carbon credits and other incentives (MPI 2022c). Compared to Aotearoa New Zealand native trees, exotic trees sequester more carbon dioxide but can also be more susceptible to fire, have a relatively short lifespan and introduce pests (MPI 2022c). On the other hand, mānuka and kānuka, which are both native species, are also highly flammable.

As a member of the EWG noted (28 November 2022), we do not zone where forests can go, and there are only limited regulatory controls at the local level, such as landscape requirements. For example, building setback requirements may be required but not wildfire buffer zones (e.g. gravel roads), which could help reduce wildfire risk in rural-urban interfaces. In addition, certain activities that increase fire risk or are sensitive to the risk may need to be limited, prohibited or managed through plan provisions in wildfire-prone areas. Again, this requires collaborative planning efforts and strong relationships between the different sectors involved and government agencies that specialise in (wild)fire risk management and emergency preparedness work.

At the national and regional level, governments could favour planting of native forests over exotic forests for carbon farming. A push for native afforestation might come from incentives such as tax credits and subsidies. The new rules that are being proposed to exclude exotic forests from the Emissions Trading Scheme (MPI 2022b) may also prove to be useful.

Governments can use integrated assessments, such as ecosystem services assessments, in the decision-making process to show trade-offs between different users. These planning tools are useful to show the socio-economic and ecological costs and benefits of different land-use scenarios and improve stakeholder awareness. However, these are often labour-intensive and may need extensive resources when data is not readily available (Forkink 2019). This indicates a need for rapid assessments that achieve the same outcome.

Promoting and investing in fire-smart forestry management and practises can reduce ecosystem damage from wildfires once forestry land-use has been established (Business Development Task Force 2019). Each forest has a unique fire-risk profile that requires specific wildfire risk-reduction strategies (NZFOA 2018). Some examples are installation and maintenance of strategically located firebreaks (e.g. forestry roads), sufficient natural water sources (e.g. stormwater basins), no-burn policies and prescribed burns to reduce uncontrolled wildfire risk.

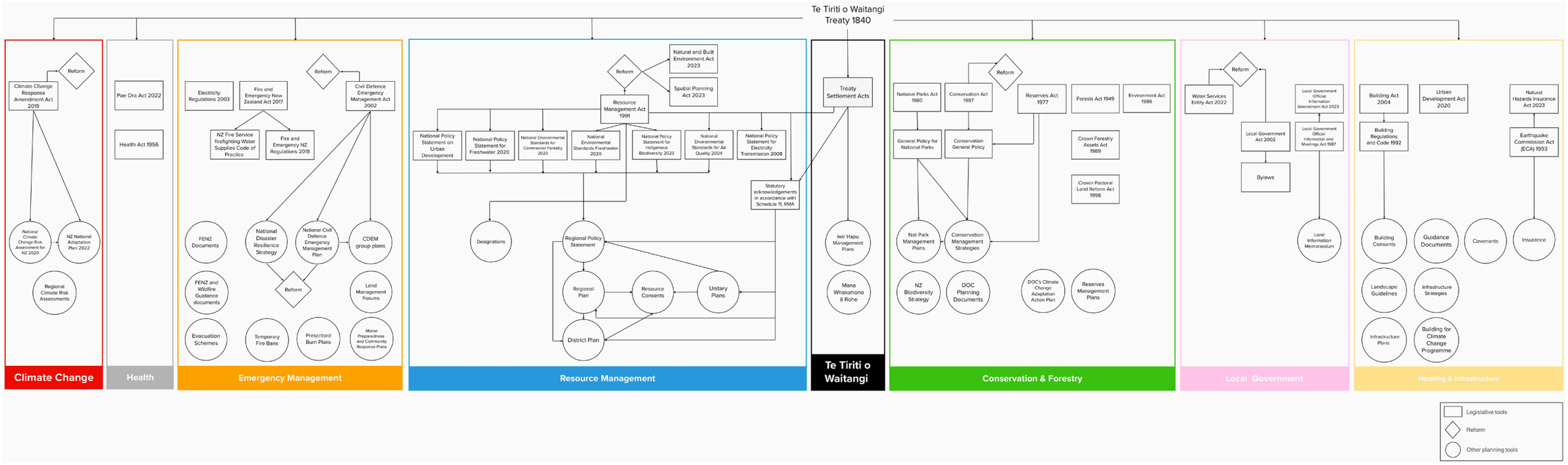

Figure 5.1 Wildfire Management and Planning flowchart that visualises the main legislative framework related to wildfire management and eight domains: Climate Change, Health, Emergency Management, Resource Management, Te Tiriti o Waitangi, Conservation and Forestry, Local Government and Housing and Infrastructure. Connectors (lines and arrows) represent presumed connections between domains.

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Table 5.1 Planning challenges, opportunities and main stakeholders.

System	Planning Challenges	Planning Opportunities	Main Stakeholders
Te Tiriti o Waitangi	• Decision-makers are directed to "give effect to the principles of Te Tiriti o Waitangi", but there is no specification as to what this means with respect to wildfire risk • There is limited capacity and resources within communities and institutions to address wildfire risk.	• Use an integrated planning and management approach. • Focus on building partnerships with iwi/hapū and local government. • Provide resources and support iwi/hapū partnership at the national, regional and local government levels.	• Crown • Iwi/hapū • Te Arawhiti (Office for Māori Crown Relations) • Land Information New Zealand • Civil engineering firms • Property owners
Climate Change	• There is unclear guidance and support from central government with respect to wildfire risk. • Slow to change. • There is low community awareness about the impacts of climate change on wildfire risk.	• Create new legislation and directions through strategies and guidance documents to direct development away from areas exposed to wildfire.	• Ministry for Primary Industries • Ministry for the Environment • Department of Conservation • Climate Change Commission • Property owners
Health	• Unclear guidance and support for wildfire-related health impacts.	• Improve guidance.	• Ministry of Health • Te Whatu Ora Health New Zealand • Te Aka Whai Ora (Māori Health Authority) • Public Health Agency
Emergency Management	• Unclear guidance and support. • Focus on post-disaster assistance.	• Create standards for firefighting water supplies. • Focus on pre-event response and preparedness. • Hold collaborative planning between local authorities and agencies that specialise in wildfire risk management and emergency preparedness planning.	• Fire and Emergency New Zealand • National Emergency Management Agency • Civil Defence Emergency Management groups • Ministry of Defence • New Zealand Defence Force • Waka Kotahi New Zealand Transport Agency • Land Information New Zealand • Iwi/hapū • Property owners

System	Planning Challenges	Planning Opportunities	Main Stakeholders
Resource Management	• Unclear guidance and support. • Conflicting goals.	• Improve guidance. • Improve consenting process.	• Ministry for the Environment • Environmental Protection Authority • Ministry for Primary Industries • Regional and district councils • Property owners
Conservation and forestry	• Insufficient guidance and support. • More people move closer to national parks / rural areas, which will see an increase in wildfires. • Investors favour exotic forests.	• Address pre-event adaptation measures in forest management plans. • Provide funding mechanisms and incentives for native forests and restrict use of exotic forests	• Department of Conservation • Reserve administering bodies • Ministry for Primary Industries • New Zealand Institute of Landscape Architects • Landscape designers • Property owners
Local Government	• Insufficient guidance and support. • Lack of long-term planning.	• Focus on long term planning. • Raise fire risk awareness within local government.	• Local governments • Local Government New Zealand • Department of Internal Affairs • Property/building owners
Housing and Infrastructure	• Insufficient guidance and support. • Population growth causes density increase in rural areas. • Lack of wildfire building code or design standard, lack of enforcement. • Low community wildfire risk awareness. • Focus on post-disaster assistance instead of pre-event response and preparedness. • Limitations of insurance markets.	• Improve building guidelines and standards. • Improve landscape guidelines and standards. • Consider evacuation routes and water-supply priorities. • Raise public wildfire risk awareness of planners, decision-makers and the public. • Focus on pre-event response and preparedness.	• Toka Tū Ake EQC • Ministry of Business, Innovation & Employment • Councils • Waka Kotahi New Zealand Transport Agency • Insurance Council of New Zealand • Transpower • Building sector • Ministry for Primary Industries • Property owners

6.0 SUMMARY

Wildfires are extreme climatological events that can have profound implications for human wellbeing and ecosystem functioning, including loss of human lives, damage to property and a decrease in biodiversity. In Aotearoa New Zealand, the number of large wildfires has been on the rise, and this trend is expected to continue due to the accelerated impacts of climate change such as higher temperatures and longer drought periods. Increased development at the rural-urban interface exacerbates these issues.

In response to the growing concern of the rise of large wildfire events, MBIE commissioned a research programme titled 'Extreme Wildfire: Our new reality – are we ready?'. Led by Scion, this programme aims to enhance wildfire preparedness and support decision-makers and communities in adapting to more extreme wildfire events. This report focuses on the legislative framework related to wildfire management and is conducted by GNS Science as part of the Extreme Wildfire research programme.

The report provides an overview of the research scope and methodology, followed by an examination of the legislative framework surrounding wildfire management. It encompasses legislative and institutional structures at the national scale, planning and consenting processes at the regional and more local scale and design decisions at the development and property scales. This last section provides insights into the planning challenges posed by increasing wildfires in Aotearoa New Zealand, along with potential opportunities to address these challenges.

Regulatory Guidance

The legislative framework surrounding wildfire management in Aotearoa New Zealand is multi-faceted and its components are interconnected. Some key components are Te Tiriti o Waitangi, the RMA 1991 and reform, the CDEM Act 2002, the Climate Change Response Amendment Act 2019, the Building Act 2004 and the FENZ Act 2017.

Te Tiriti o Waitangi is Aotearoa New Zealand's founding document, signed in 1840 between the British Crown and Māori rangatira. Te Tiriti guarantees Māori sovereignty and guardianship over their possessions, including lands, waters and food sources. It recognises the role of mana whenua / tangata whenua in decision-making and underscores the need for early and ongoing consultation with local iwi/hapū, protection and restoration of the natural environment and cultural sites and collaborative planning with multiple stakeholders.

The RMA governs the resource management system in Aotearoa New Zealand and has undergone major reform with the introduction of the NBA and SPA. The RMA focuses on sustainable development and encourages public participation in decision-making while considering the principles of Te Tiriti o Waitangi. While wildfire is not explicitly mentioned in the RMA, fire is deemed a natural hazard, highlighting the importance of addressing fire-related-matters in planning decisions.

The resource management reform aims to make the system more efficient and better equipped to address environmental and social challenges. The introduction of the NBA and SPA presents an opportunity to integrate wildfire considerations more effectively into planning practises. It should be noted that these reform initiatives could be modified in response to the 2023 change in government.

The Climate Change Response (Zero Carbon) Amendment Act 2019 and Aotearoa New Zealand's first National Adaptation Plan 2022 offer a framework for addressing the challenges posed by climate change, including issues related to wildfires. This framework can be an important tool in effectively managing and mitigating wildfire hazards.

The emergency management system in Aotearoa New Zealand is governed by various regulatory mechanisms and planning tools and aims to reduce fire risks and effectively respond to emergencies. The key legislation in this domain is the FENZ Act 2017, which establishes the Fire and Emergency New Zealand agency tasked with managing fire risks and protecting life and property. The Act empowers Fire and Emergency New Zealand to issue local fire plans, declare fire seasons and regulate fire permits.

Fire and Emergency New Zealand has developed various guidance documents addressing wildfires, covering topics such as fire prevention, protection of homes and safer housing design. However, the abundance of these documents and frequent cross-referencing between them may require clarification to ensure effective use and meet stakeholders' needs. There are various other tools, such as local fire plans, evacuation schemes, guidance documents and land management forums that can be used in wildfire risk management and emergency response.

Local fire plans under the FENZ Act can be valuable policy tools if prepared well and integrated with other risk-management tools. However, their effectiveness is yet to be tested, and their integration with the land-use planning system remains unclear.

The CDEM Act 2002 provides a framework for preparing for and recovering from emergencies, including serious fires, and emphasises regional coordination. The ongoing EMSR will replace the CDEM Act with a new Emergency Management Bill. Its objective is to transition toward a community-led response and prioritise the development of community resilience.

Conservation and wildfire management efforts are guided by legislation such as the Conservation Act 1987, National Parks Act 1980, Reserves Act 1977, Environment Act 1986, Crown Forest Assets Act 1989, Crown Pastoral Land Reform Act 2022, Crown Pastoral Land Act 1998 and Land Act 1948. While wildfire is not explicitly mentioned in these acts, provisions for fire prevention and temporary closures due to fire hazards are included. Ongoing conservation law reform, such as the proposed Conservation Management and Processes Bill, aims to enhance conservation management planning and provides opportunities for wildfire hazard mitigation.

The Local Government Act 2002 is relevant to mitigating wildfire hazards, as it empowers local government authorities to play a significant role in decision-making and implementing regulations related to land-use planning, resource management and community wellbeing. In the context of wildfire management, local governments play an important role in land-use planning. They can exercise their decision-making authority to identify areas that are more susceptible to the rapid spread of wildfires and develop strategies to manage and reduce the risk of wildfires.

Planning Constraints and Opportunities

This study identifies several needs concerning wildfire risk management. It emphasises the need for clearer guidance in regulatory and planning documents and encourages the consistent use of terminology related to wildfires in order to effectively address cross-boundary issues.

By incorporating universally accepted wildfire terms, definitions and guidelines, the legislative framework will promote more efficient and uniform wildfire planning and management practises. Commonly agreed-upon terms and definitions ensure a shared understanding among various stakeholders, such as government agencies, emergency responders and community members, and facilitate effective communication and collaboration. They also eliminate confusion and ambiguity, allowing for clear communication and better understanding of practises within wildfire risk management.

The focus on post-disaster response rather than pro-active planning is another constraint within wildfire hazard and risk management. Government agencies may prioritise the consequences of wildfires instead of wildfire prevention, and a shift toward a more pro-active approach can be useful. This could involve creating a consolidated guidance document and website to make it easier for planners, developers, designers and other stakeholders to access wildfire hazard information.

Additionally, implementing strategies such as wildfire hazard and risk assessments and imposing stricter building standards and requirements for new developments in wildfire-prone areas can help mitigate risks. Encouraging the adoption of fire-smart design standards and providing incentives for developers and property owners who incorporate fire-resistant measures can also reduce wildfire risks.

While it is common practise in Aotearoa New Zealand land-use planning to identify and consider natural hazards such as earthquakes, landslides, flooding and erosion for new development, wildfire risk is often overlooked. Nevertheless, it is important to consider wildfire risks, especially in wildfire-prone areas, when re-zoning land or expanding urban areas. To address these concerns, the use of natural hazard overlays can play an important role during the consenting process for new developments and subdivisions.

In addition, local authorities can collaborate with residents, community groups and stakeholders to promote fire preparedness, educate regarding fire-safe practises and encourage community involvement in prevention efforts. Continuous wildfire monitoring initiatives and early warning systems can help improve wildfire awareness and preparedness within communities.

Initial consultations with planning professionals show a need and willingness to include wildfire risk management in land-use decision making. This will require sufficient resources and government support to implement changes at the national, regional and local level. The establishment of a comprehensive regulatory framework is required first. This must be sufficiently resourced and supported (e.g. funding, staff, time, expertise and education) at all levels to achieve the desired outcome of mitigating wildfire risk.

Conclusion

Planning decisions made today will have long-lasting impacts for future generations. As wildfires become more frequent, effective wildfire preparedness and management strategies are key to safeguard human wellbeing and ecosystem functioning. This report shows that there are multiple planning tools available that can help decrease wildfire risk, but these are not always used for a variety of reasons. Opportunities for improvement exist in the areas of regulation, the built environment and landscape management.

Aotearoa New Zealand's legislative system is complex, with multiple agencies involved in administering regulations on a variety of legislative matters. As wildfire management crosses many sectors and jurisdictions, stakeholders will have to work together to fill these gaps. Measures to improve communication between agencies, sectors and other stakeholders

are key. These will facilitate knowledge transfer between stakeholders, improve wildfire awareness within communities and provide opportunities for communities to be better prepared for extreme wildfire events.

This research report underscores the importance of pro-active planning and collaboration among stakeholders to address gaps in the legislative framework surrounding wildfire management. By considering wildfire risks in land-use planning and drawing from the experiences of other countries, Aotearoa New Zealand can pave the way for more effective wildfire management, ensuring the safety and resilience of its communities for generations to come.

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APPENDICES

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APPENDIX 1 TE REO GLOSSARY

Hapū	"Kinship group – section of a large kinship group and the primary political unit in traditional Māori society. A number of related hapū usually share adjacent territories forming a looser tribal federation (iwi)." (OAG 2016)
Iwi	"Extended kinship group, tribe – often refers to a large group of people descended from a common ancestor and associated with a distinct territory." (OAG 2016)
Kaitiaki	'Guardian, steward' (OAG 2016).
Kaitiakitanga	"The exercise of guardianship by the tangata whenua of an area in accordance with tikanga Māori in relation to natural and physical resources." (RMA 1991; NBA 2023)
Kaupapa	'Topic, policy, initiative.' (DOC 2020a)
Ki uta ki tai	'From the mountains to the sea' (Ministry for the Environment [2023a]).
Mahinga kai	'Garden, cultivation, food-gathering place' (OAG 2016).
Mana Whakahono ā Rohe	"An iwi and hapū participation arrangement entered into under subpart 2 of Part 5" (RMA 1991) or subpart 6 of Part 3 (NBA 2023).
Mana whenua	"Authority over land or territory – also refers to the people who exercise that authority." (OAG 2016)
Mātauranga Māori	"Māori knowledge system underpinned by kaupapa and tikanga Māori." (Kukutai et al. 2021)
Rangatira	'Māori chief' (OAG 2016).
Rangatiratanga	'Chieftainship, right to exercise authority, chiefly autonomy, chiefly authority, ownership, leadership of a social group' (OAG 2016).
Rohe	'Boundary, district, region, territory, area' (DOC 2020a).
Rūnanga	'Iwi authority' (Quality Planning c2017c).
Tangata whenua	"People of the land; the indigenous people of New Zealand. In relation to a particular area, it means the iwi or hapū that holds mana whenua over that area." (DOC 2020a)
Taonga	'Treasure, anything prized' (OAG 2016).
Te ao Māori	'Māori worldview' (Ministry for the Environment and Stats NZ 2021).
Te Tiriti o Waitangi	'The Treaty of Waitangi' (Resource Management Act 1991).
Tikanga Māori	"Māori customary law, customary values, and customary practices." (NBA 2023).
Tino rangatiratanga	'Sovereignty' (Christchurch City Council 2017).

Wāhi tapu	“A place sacred to Maori in the traditional, spiritual, religious, ritual, or mythological sense.” (Heritage New Zealand Pouhere Taonga Act 2014)
Whakapapa	‘Genealogy, genealogical table, lineage, descent’ (DOC 2020a).

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