

Forest management: Shaping the future

Murray Dudfield says that understanding Zealand's challenges in wildfire management today is the best way to reduce their consequences tomorrow

NEW ZEALAND (NZ) IS IN OCEANIA IN the South Pacific Ocean. It has an area of 268,680km² (103,737 square miles), including the Antipodes Islands, Auckland Islands, Bounty Islands, Campbell Islands, Chatham Islands, and Kermadec Islands; it has a population of 4.2 million.

NZ has 15,134km (9,403 miles) of coastline and extensive marine resources. The South Island is the largest land mass of the two main islands and contains about one quarter of the population. The island is divided along its length by the Southern Alps, the highest peak of which is Aoraki/Mount Cook at 3,754 metres (12,316 feet). The east side of the island has the Canterbury Plains, while the West Coast has rough coastlines, and the Fox and Franz Josef Glaciers.

The North Island is less mountainous than the South, and is marked by volcanism. The island's tallest mountain, Mount Ruapehu (2,797m; 9,176 feet), is an active cone volcano. Lake Taupo is near the centre of the North Island and is the largest lake by surface area in the country. The geography of NZ is diverse, ie 1,600km long to 450km (994 to 279 miles) at the widest.

The climate is mostly cool temperate to warm temperate. Mean temperatures range from 8°C in the South Island to 16°C in the North Island. January and February are the warmest months, July the coldest. New Zealand does not have a large temperature range, apart from central Otago, but the weather can change rapidly and unexpectedly. Subtropical conditions are experienced in Northland. Peak summer temperatures are in the range of 24-28°C, although inland Central Otago often experiences 30-34°C. Winds in New Zealand are predominantly from the west and south-west, in winter, when the climate is dominated by regular depressions. In summer, winds are more variable with a northerly predominance associated with the regular large anticyclones which cover all the country.



A 2009 forest wildfire in Marlborough, New Zealand

The Marlborough Express

New Zealand's land cover has changed greatly over the past 200 years and is presently: 50 per cent native forest, native vegetation and other native land cover; 39 per cent pasture (high-producing and low-producing grassland land-cover classes); nine per cent exotic forest and exotic scrubland; 1.6 per cent horticulture (horticultural, viticultural and cropping land-cover classes); and the remainder comprising artificial surfaces, such as urban and built up areas, landfills and transport infrastructure.

In New Zealand, the Fire Service Commission is the statutory body for the NZ Fire Service and responsible for all urban fire protection, using paid and volunteer forces. The Commission also has a second role as the National Rural Fire Authority (NRFA) which is responsible for co-ordinating rural fire authorities throughout New Zealand and can fund fire suppression costs on private land where this cannot be recovered from the land owner. There are currently 76 rural fire authorities.

The legislation that establishes and empowers the roles of the NRFA is explicitly dovetailed with other legislation, particularly the *Forest and Rural Fires Act 1977*. This statute allocates powers and responsibilities for aspects of forest and land management and places obligations on land owners. Not only is this integrated approach efficient, but it ensures the involvement of land managers and foresters with their expertise and practical knowledge in responding to wildfire and incorporates their understanding of the use of fire (as prescribed burns) to achieve the forest and land management objectives.

Rural fire authority capability mainly comprises organisations involved in land management activities. These include forest owners and management contractors, local government authorities, and the national conservation agency, which has ownership of protected lands. These key agencies are supported by aviation firms operating in rural areas, and companies involved in road

construction, forest harvesting, silviculture and control of pests and weeds, etc. National co-ordination ensures a consistent approach with country-wide standards and assessment of performance of rural fire authorities, along with a national fire danger rating system, which is underpinned by both fire prevention (eg public education, restrictions around fire use) and fire suppression activities.

A La Niña weather event became firmly established in NZ during the winter of 2010 and continued through the fire season to the autumn of 2011. The fire season in western parts of both the North and South Islands was above average in terms of fire weather conditions, and the number of wildfire events.

During late November through December 2010, record high temperatures were experienced over much of the South Island, with dry conditions to much of central Canterbury and eastern Otago regions. Rains from early spring to a number of areas promoted a surge of spring vegetation growth in many areas. Conditions for the lead into summer produced significant areas with increased soil moisture deficits.

Capacity building

The total number of fires nationally for the 2009/10 year was 3,858, with 5,253 hectares burnt, compared with a ten average year of 4,350 fires and 2,400 hectares burnt. The majority of areas burnt in vegetation fires generally involves scrubland fuels, followed by plantation forest, grasslands (average 1,100ha/year) and indigenous forest.

A list of concerns has been identified by stakeholders for improvement over the next decade. Resourcing around capacity building, volunteers, the role that technology could play in supporting future fire suppression efforts are an example. Identification and the use of technology have the potential to improve the effectiveness and efficiency of fire response and suppression actions and increase firefighter safety. Concerns have also been raised around the long term sustainability of water as a fire suppressant. Water availability will be reduced as needs in some areas will be at a premium, so the use of water to suppress fires in water-constrained regions may be affected.

A focus on social based research is also required to improve understanding of the broader communities' perception of the threat and risk posed by forest and rural wildfires and the ongoing need to support communities before and after fire events.

NZ's land use continues to change progressively with time and this will continue



South Island Hill and hill country: In the last decade, increased land use changes have occurred; change will continue as different economic drivers change market dynamics and projected returns from land use

Dennys Guild, NZ

in the future as different economic and environmental drivers change market dynamics and projected returns from land use.

In the last decade, increased land use changes have occurred as some land owners convert from forestry into dairy farming. With the implementation of deforestation liabilities under the Kyoto Protocol's first commitment period, it is likely that the level of deforestation and conversion of forest land into dairy will decrease.

The ratification of the Emissions Trading Scheme (ETS) and value associated with carbon units is resulting in interest in the development and implementation of 'carbon farms' – trees grown primarily for carbon units rather than timber – both at a large-scale investor level and also at a smaller farm level.

Concerns have been raised around the long term sustainability of water as a fire suppressant; water availability will be reduced

The recent tenure review by the NZ Government has seen an additional estimated 600,000 – 700,000ha of high country land move from leased farm land to conservation administration. The administration of these lands and control over the fuel loadings is of concern to many respondents in the South Island.

All of these land use changes have implications for NZ's fire hazardscape as they result in changed fuels and fuel loadings across the landscape.

Climate change and its potential effects on NZ's landscape are emerging as key issues that would affect the broader fire management of forest and rural lands. Under climate change, some areas of NZ are predicted to

become hotter and drier, with weather patterns and events likely to increase in severity.

The effects of potential/forecast climate changes need to be understood against the NZ specific context with respect to fire management practices and land use. Key drivers going forward will be gaining a better understanding in the management of fuel loading, the fire risk over varying terrain, changing climate, and developing effective management plans to guide responses. These will remain issues that the forest and rural fire sector, and its broader stakeholders, need to focus on.

Demographic changes will be another emerging theme in the upcoming years. Demographic changes in NZ that may affect the fire hazardscape and the rural sector's ability to respond to the threat of fire are perceived to include: The increasing average age of New Zealanders; their increased ethnic blend; depopulation of rural areas; increased population of rural/urban fringe lifestyles; and more people in full-time/part-time paid employment with less volunteering.

Understanding the current effect of wildfires and the likely changes which will confront the forest and rural sector, places NZ in a very good position to look at options for the future. There are identified challenges facing the country in the short to long term. Understanding these well will ensure that the country is in the best possible position to take the necessary actions required to reduce the number and consequence of wildfires in its forest and rural environment into the future. **CRJ**

Author

Murray Dudfield is National Rural Fire Officer with the National Rural Fire Authority of New Zealand

