

# EXTREME FIRE: A CHANGING THREAT LANDSCAPE AND IMPLICATIONS FOR NEW ZEALAND DEFENCE

As part of Defence's ongoing analysis to better understand the impacts of climate change on defence and security, this snapshot explores the growing frequency of extreme fire events, and their implications for Defence.



## Climate change and extreme fire

Climate change is creating a more permissive environment for wildfires with hotter, drier, and windier conditions, and increasing the frequency of extreme fires (fires that are difficult to control, spread quickly, and threaten life and property). This, in turn, is exacerbating accidental vectors. For example, in 2019 out-of-control campfires contributed to the destruction of 4,725 hectares of bird habitat in New Zealand. While vastly outnumbered by environmental and accidental causal factors, deliberate wildfires may also be magnified due to the permissive conditions caused by climate change.

Climate change has increased the risk of extreme fire. The wildfire season in New Zealand is becoming longer. What used to be one in ten year events may now be one in three. Just as some Pacific Island nations and their communities may experience a tropical cyclone for the first time in the coming years, New Zealand communities that have not experienced wildfires before are more likely to face one in the future. Furthermore, the impacts of climate change will likely result in more complex and concurrent natural disasters.

## Our security partners and extreme fires

Globally, wildfire seasons are 18.7 percent longer now than they were in 1979. Climate change is lengthening the wildfire season for many of New Zealand's key security partners, including Australia, the US, and Canada. The US fire season (extreme fires expected from October through to December) is increasingly overlapping with their Pacific hurricane season (May through to November). Australia's New South Wales has a bushfire danger period from October through to March which is nearly the entirety of the Southern Hemisphere's Pacific cyclone season. Militaries will be faced with more frequent and concurrent operational commitments, which will stretch resources and may reduce readiness for other requirements.

## New Zealand, extreme fire risk, and New Zealand Defence

Fire and Emergency New Zealand (FENZ) and Scion (a Crown Research Institute specialising in forestry, wood, and wood derived materials) have modelled potential future changes in fire danger. This shows that the number of very high and extreme (VH+E) fire danger days is likely to increase around the country by an average of 70 percent by 2040. The most marked relative changes are for Wellington and the Wairarapa, and coastal Otago, where the number of severe fire days is likely to double to around 30 and triple to 20, per year respectively.

The variable scale of an extreme fire and potential cascading effects mean that there is the potential for impact on a range of economic, cultural, environmental, and social dimensions to New Zealand's security. These include our economy, biodiversity, te ao Māori, our natural environment, and human health.

FENZ is the lead agency for responding to and addressing fire risk in New Zealand. The NZDF has the capabilities needed to undertake firefighting at short notice and is the only organisation outside of FENZ that can act as a firefighting authority. This allows the NZDF to support FENZ when needed.

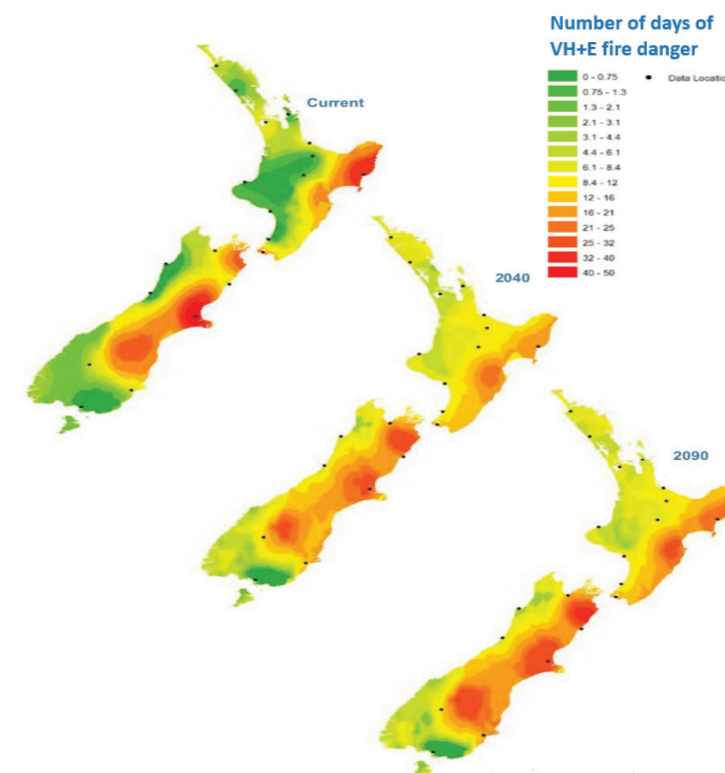


Image used courtesy of Scion Scion (2011) Future fire danger. Rural Fire Research Update, Issue 9 (November 2011). (Scion: Rotorua)

## Snapshot: NZDF Firefighting Capabilities

**11**  
domestic fire appliances  
spread across NZDF bases

**8**  
airfield response  
appliances

**17**  
rural firefighting appliances  
with Demountable Fire  
Pods (DFP)

Each DFP is equipped with rural firefighting equipment to include

**2,000L**  
of water, 40L of A class firefighting foam, firefighting hoses, portable pumps, and hand tools

Rural firefighting is a core competency for NZDF firefighters. Training is assessed against standards at each appropriate level, and meets the FENZ position guidelines for overseas deployments

Each base and camp has an establishment of firefighters to meet a base or camp incident response capability 24/7

## Reduction and Readiness

The NZDF maintains a pool of Emergency Responders trained to FENZ standards to provide emergency response and rural firefighting services (from the Army and Air Force) on Defence bases and camps. These capabilities are spread throughout various defence locations within New Zealand.

The NZDF operates with similar types of domestic fire appliances to FENZ for standard emergency response around camps and bases. The NZDF also holds rural fire appliances, which consist of a 'fire pod' sitting on a platform. These have good cross-country mobility and have been useful domestically in supporting FENZ during rural fires. The NZDF's C-130 Hercules aircraft have been used to support FENZ with long range reconnaissance in remote areas such as the Chatham Islands.

NZDF firefighters provide fire awareness training to other personnel on base. They maintain all rescue and firefighting equipment, and ensure continuation training of rescue and firefighting skills. This enables the NZDF to respond to emergencies in a flexible and scalable fashion.

## Response and Recovery

The primary role of NZDF firefighters is to provide support to military locations and training areas; therefore they also have capacity to support FENZ within local areas of responsibility. While NZDF firefighting capabilities are focused primarily on bases, training areas and their immediate environs, the NZDF has the ability to project small teams to support FENZ in larger scale domestic fires or overseas, and has done so recently.

The NZDF contribution in support of firefighting highlights the value it provides to New Zealand's communities, by assisting Fire and Emergency New Zealand with firefighting; to the nation, by assisting FENZ with large scale fire events in New Zealand; and to the world, by deploying overseas when needed. Alongside firefighting, the NZDF provides logistics including transport, medics, and emergency accommodation.

The NZDF supports recovery after an extreme fire event, by providing support to rebuild, transport, and other logistical assistance in alleviating the stress on communities.

## Implications for the NZDF

The increased frequency of extreme fire events is one example of the long-term effects of climate change. It is likely that in the future the NZDF will be called upon more often to assist with extreme fires domestically, within our region, and further abroad.

Other effects of climate change such as increased drought, flooding or other extreme weather events such as cyclones, may combine to place stress on particular parts of the NZDF's response and present concurrency challenges.

This highlights the growing importance of Humanitarian Assistance and Disaster Relief (HADR) capabilities and personnel for the NZDF to respond to a range of concurrent tasking when required.

Defence will continue to collaborate with other agencies to understand, monitor and assess developments in the strategic environment relating to fire.

As the risk of wildfires increase, the NZDF will need to ensure that it is prepared on camps and bases which are close to or within current and future fire risk areas.

There are major Defence projects under development that provide options to improve and enhance current levels of firefighting capabilities. Should enhanced firefighting-related options be approved and resourced, the NZDF could provide additional capacity to assist in national firefighting efforts. A potential example is the replacement of the Lockheed Martin C-130H aircraft with the C-130J-30 Super Hercules. Should firefighting capabilities be approved and resourced for the C130J-30 Super Hercules, the NZDF could:

- install mission specialist firefighting role equipment, and
- significantly increase the capacity of airborne dispensed containers filled with solutions to fight fires.

## CASE STUDIES



### Case study: Tasman Fires

In February 2019, the NZDF sent personnel to help control an out-of-control bushfire in Nelson. This support comprised NZDF firefighters working with FENZ to tackle the blaze. NZDF personnel helped the New Zealand Police and Civil Defence to enforce cordons, assist evacuations, provide roaming patrols, and escort people to check on farms and livestock. A large Army catering team supported emergency responders.

Alongside these personnel, the NZDF sent appliances from Linton Military Camp and RNZAF Base Woodbourne. Further logistical support included a Royal New Zealand Air Force C-130 Hercules aircraft transporting FENZ and Police personnel to Nelson.



### Case study: Operation Bushfire Assist

The NZDF sent personnel to Australia to support efforts to control the extreme fires during the 2019/2020 bushfire season.

Army engineers were deployed to Kangaroo Island, South Australia, clearing routes and removing trees that were blocking roads, allowing support services in to check buildings and infrastructure. Engineers also set up a reverse-osmosis water-purification unit to turn seawater into fresh drinking water for the community of Stokes Bay. Plant operators were also on Kangaroo Island to create more than 120 kilometres of firebreaks. An environmental health team ensured water was safe for communities and personnel to drink, and a primary health team provided medical support to Australian Army personnel responding to the bushfires in Adelaide Hills, while also clearing debris, water provision, and other tasks. Soldiers who encountered koala and other wildlife that survived the fires took the animals to wildlife centres to be cared for. They also carried out building work at wildlife centres.

Royal New Zealand Air Force NH90 helicopter crews carried out a range of tasks, from mapping active fire fronts and transporting emergency services personnel to delivering supplies such as water and fuel to isolated communities. C-130 Hercules aircraft also assisted by transporting firefighting foam to emergency services on Kangaroo Island.