

RESILIENCE
TO NATURE'S
CHALLENGES

Kia manawaroa
– Ngā Ākina o
Te Ao Tūroa

National
SCIENCE
Challenges



Wildfire risk to forests and communities in a changing hazard environment

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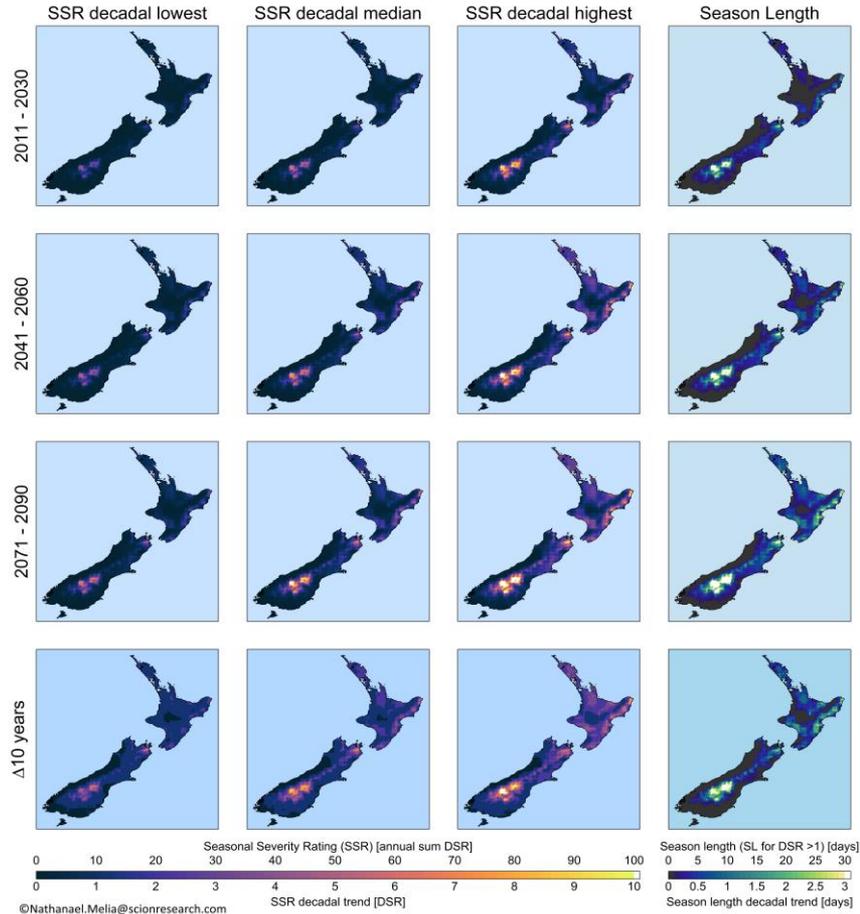


Wildfires in New Zealand

- Small frequent wildfires (10-year average 2005/06-2014/15)
 - about 4,100 fires per annum
 - about 5,500 ha of forest and rural lands per annum
- > 99% caused by human activity
- Fire widely used as land management tool, recreation and cultural purposes in rural areas



Changing hazard environment



- Wildfire prone areas
 - East coast North and South Islands
- Climate change modelling predicts
 - NZ will become hotter and drier
 - increase frequency and severity of wildfire events

N. Melia, Scion

Significant NZ forest fires (2000 – 2017)

Year	Fire	Location	Forest Type	Total Area Burnt (ha)
2001	Para Road	Marlborough	Exotic plantation	102
2003	Aupori	Northland	Exotic plantation	240
2004	Irvines	Nelson	Exotic plantation	200
2004	Papatotara	Southland	Native cut-over	300+
2005	Mohaka	Hawkes Bay	Exotic plantation	204
2006	Maringi	Wairarapa	Exotic plantation	189
2006	Canvastown	Marlborough	Exotic plantation	215
2007	Waipoua	Northland	Native + plantation	224
2008	Para Road	Marlborough	Exotic plantation	95
2008	Mt Cook	South Canterbury	Wilding pine	756
2010	Glenhope	Nelson	Beech + plantation	600
2010	Mt Allan	Otago	Exotic plantation	820
2010	Papatotara	Southland	Native forest	100
2010	Mt Allan	Otago	Exotic plantation	200
2010	Poutu	Northland	Exotic plantation	115
2011	Horeke	Northland	Exotic plantation	345
2013	Poutu	Northland	Scrub + plantation	208
2013	Hinakura	Wairarapa	Exotic plantation	~70
2015	Onamalutu	Marlborough	Exotic plantation	600
2015	Waikakaho	Marlborough	Exotic plantation	450
2015	Whareama	Wairarapa	Exotic plantation	200+
2015	Wairau Valley	Marlborough	Exotic plantation	1150
2017	Hasting Complex	Hawkes Bay	Native + plantation	520
2017	Port Hills complex	Christchurch	Plantation + grass/scrub	1661
2017	Hanmer springs	North Canterbury	Plantation + scrub	60

Other notable plantation forest fires

- 1946 Tahorakuri, Taupo - largest plantation forest fire recorded in NZ's history (30,738 ha, incl. indigenous forest)
- 1955 Balmoral forest fire (3155 ha)
- 1981 Hira forest fire (1972ha)
- 2019 Pigeon Valley fire (2300 ha - incl. 2000 ha pine plantation)



Historical fires affecting NZ communities

- 1918 Raetihi fire, central North Island
 - 120 houses, 60 commercial premises and 9 sawmills destroyed
 - 3 lives lost
 - many people severely burned



1918 Raetihi Fire Centenary

Increasing fires affecting NZ communities

Nelson, Feb 19 – 3000 people & 700 livestock evacuated, 1 house destroyed

Port Hills, Feb 17 – 1500 people evacuated, 9 houses destroyed & 5 damaged, pilot killed

Hastings, Feb 17 – 1 house destroyed & others threatened

Whitianga, Jan 17 – 4 houses destroyed & many evacuations

Karikari Peninsula, Jan 17 – 2 houses evacuated/ close to campground

Mahia Peninsula, Jan 17 – threatened homes.

Wildfire causes

- 25% escaped camp, bonfires and rubbish fires
- 19% unknown
- 18% land clearing burns
- 9% arson
- 7% fires involving vehicles
- 3% pyrotechnics/fireworks

(National Rural Fire Authority data 2016/17)



2017 Port Hills: extreme wildfire

- Margin of Christchurch
- 1400-2800 residents evacuated for 3-9 days
- 9 houses destroyed, 6 fire damaged
- 1660ha with a perimeter of 60km
- 83 ha remnant indigenous forest and plantation destroyed
- Believe fires were deliberately lit
- Police continuing criminal investigation
- State of emergency was declared to support emergency services
- Not officially extinguished for 66 days



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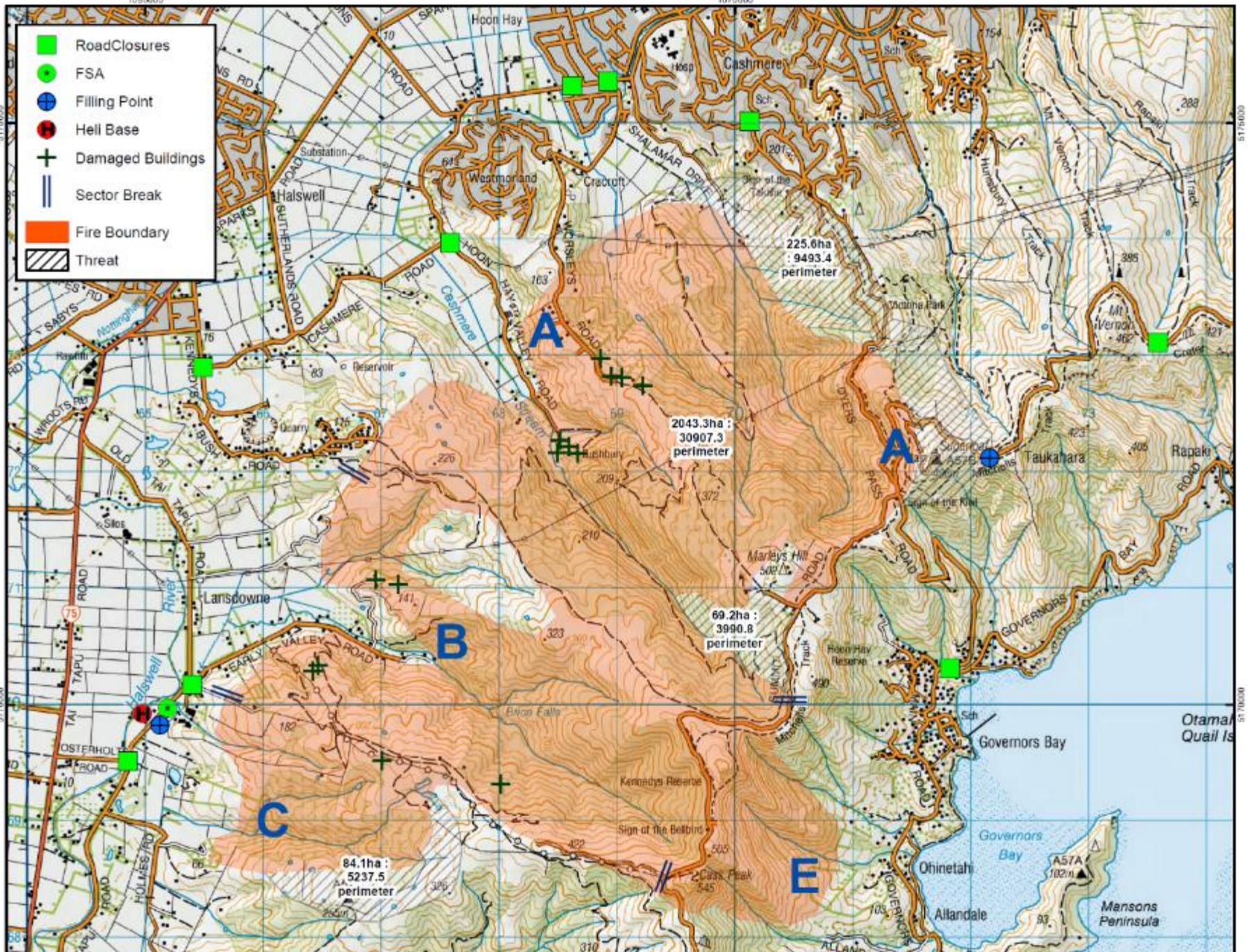
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- RoadClosures
- FSA
- Filling Point
- Hell Base
- Damaged Buildings
- Sector Break
- Fire Boundary
- Threat



Otama
Quail Is

Governors Bay

Ohinetahi

Allandale

Mansons Peninsula

Rural-urban interface, Port Hills wildfire

Interface / dense urban fringe properties (typically <0.15 ha)

Lifestyle properties (typically >2 ha)



Ongoing construction

Extent of wildfire

Sites of several lost homes

Rural-urban interface, Port Hills wildfire

Urban fringe /
interface

Current
development

Site of several
lost houses



Closest
point of
fire to
urban
fringe

Urban fringe /
interface

Lifestyle
properties

Managing wildfire in a different context

- Wildfires on suburban margins increasing worldwide trend risk to lives and property (e.g. Hobart, 1967; Canberra, 2003; and Fort McMurray, Canada, 2016).
- Previous emphasis on rural and lifestyle properties but urban fringe / interface is fundamentally different:
 - vegetation to structure → structure to structure
 - mitigation options may not be appropriate for urban fringe — e.g. defensible space
 - urban feel/expectations versus rural lifestyle feel/expectation
- Education for awareness and preparation, but no FireSmart communities



Management implications

- ➔ Port Hills fire one of most severe wildfires in recent years
- ➔ Greatest reported property loss in individual fire in almost 100 years
- ➔ New wildfire management and community preparedness concerns
- ➔ Proximity of forests to communities – 2-way risk

Every wildfire ignition prevented is one fewer for FENZ to respond to



K. Bayne, Scion

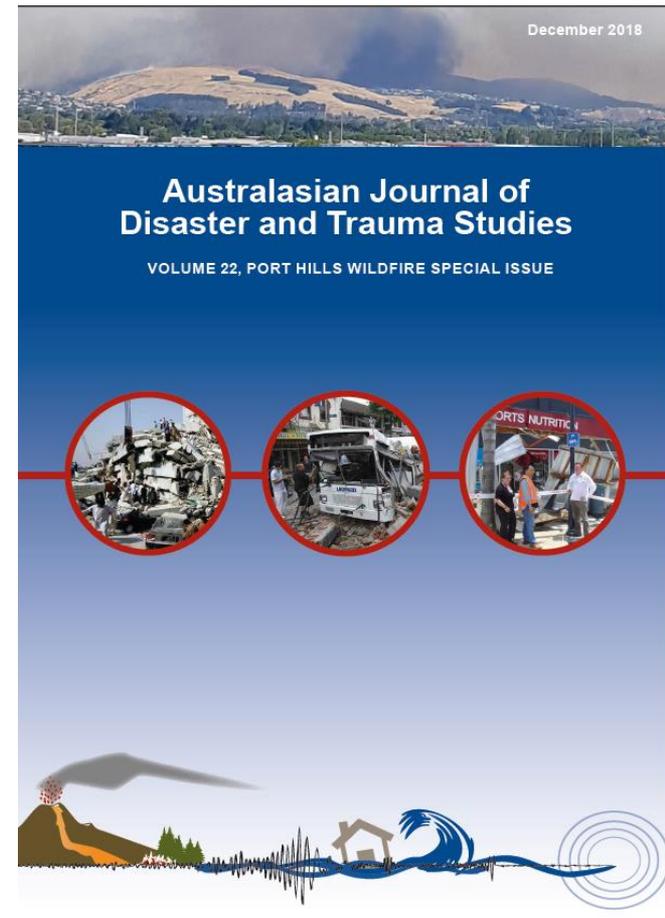
Study of news and social media

Examined

- 230 articles from local and national New Zealand news media outlets, 13 February 2017 - 1 May 2018
 - Associated social media
- Facebook pages of official organisations involved in fire response, e.g. Christchurch Civil Defence and Emergency Management
 - ➔ Provided illustration of social meanings and contexts which shape wildfire risk perception, preparation and response across general public

stuff

facebook



 **SCION**

Awareness and preparedness

- Linked to living in high-risk area, rural living or wildfire experience
- But perception of wildfire risk can have limited impact on preparedness, especially ongoing preparedness, heightened awareness quickly diminishes
- Socio-economic, cultural and demographic sub-community differences shape interpretations of fire experience and risk



Urban fringe wildfire risk awareness

- Apparently low wildfire risk awareness and preparedness of urban dwellers
- Surprise that wildfire could reach urban neighbourhoods
- Expectation that wildfires will be controlled by authorities

“When city people come to the country with no idea of the risk.”

“In this day and age, I can't believe that it's let to go that far. You know, so close to a central city like this. It's just unbelievable.”

“Finally urban dwellers might understand...”



Reflections on Port Hills Fire

- Wildfire risk reduction
 - House site, design & construction
 - Defensible space in urban context?
 - Low flammability plantings
- Local government planning
 - Few planning restrictions in place; limits on regulatory options
 - Need better wildfire considerations especially in new developments
- Community resilience
 - Uncertain risk ownership
 - Community engagement
 - Work with community networks



Lessons learned to date

- Lessons from other parts of the RUI may not be appropriate
- Urban fringe property owners will require greater focus to ensure:
 - Residents are aware of wildfire risk
 - Residents are adequately prepared for future wildfires
- Need:
 - To develop appropriate planning and mitigation options
 - To understand variation within urban fringe communities
 - New messages and engagement to work with communities.



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<http://www.ruralfireresearch.co.nz>
www.scionresearch.com



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Prosperity from trees *Mai i te ngahere oranga*

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