TRANZFOR

Wildfire 2013
Vale of Glamorgan
22nd & 23rd October

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Wildfire risk management in New Zealand - possible lessons for current and future wildfire risk in the UK

Andy Moffat and Grant Pearce

Forest Research
The Research agency of the Forestry Commission

AJ Moffat
& ASSOCIATES

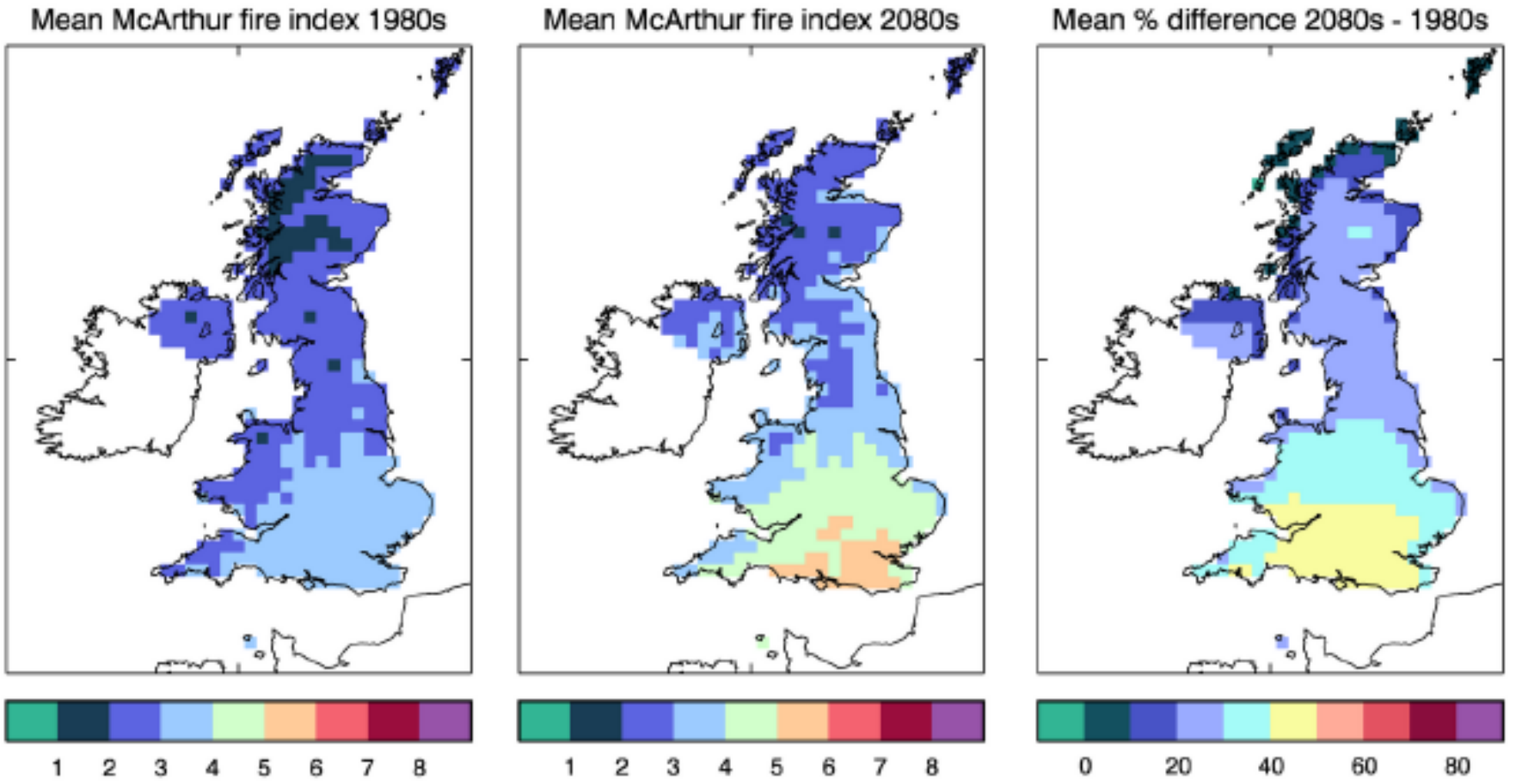
Talk contents

1. Study and geographical contexts
2. New Zealand wildfire legislative framework
3. Some examples of NZ support tools
4. Risk management philosophies
5. Conclusions

TRANZFOR study

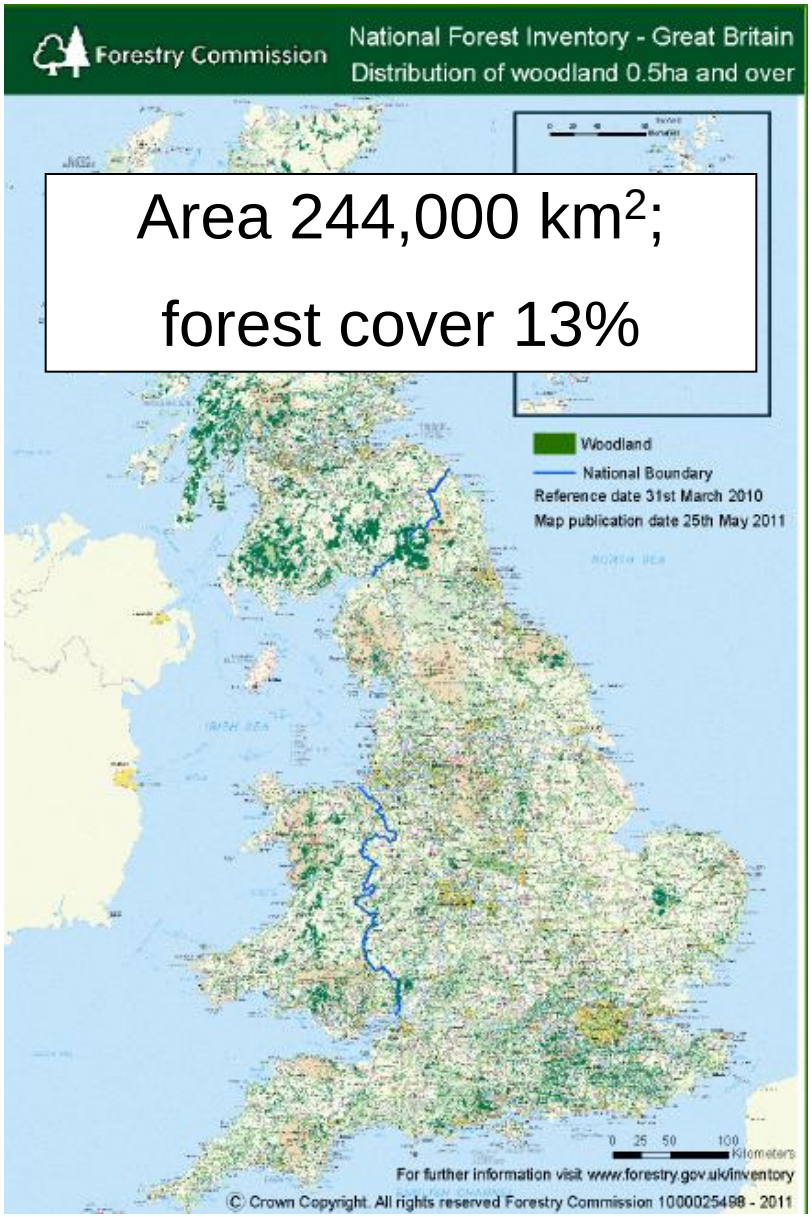
- Funded by the EU and Forestry Commission
- Met with key Scion and other NZ fire professionals
- Undertook a review of how NZ is managing wildfire risk, notably in the face of climate change
- Explored how Scion systems might suit UK needs
- Shared UK experiences as appropriate

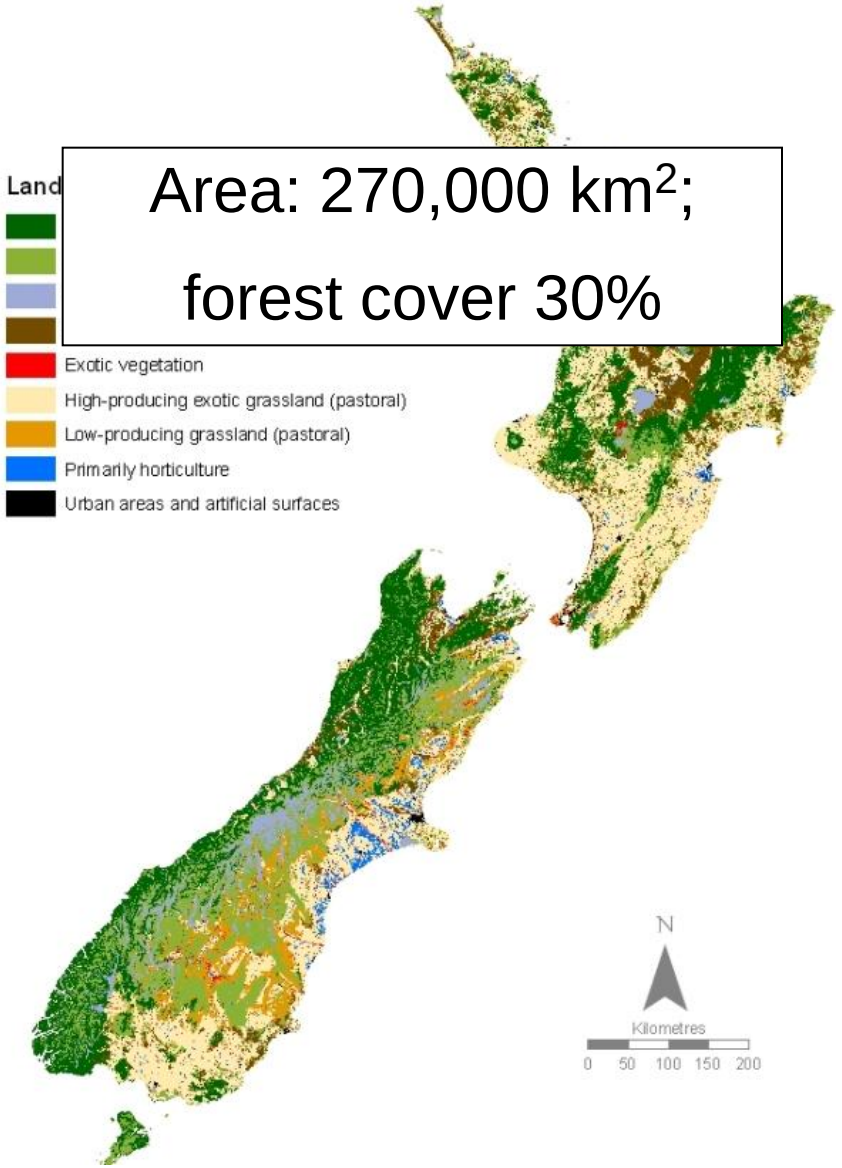
Climate change projections



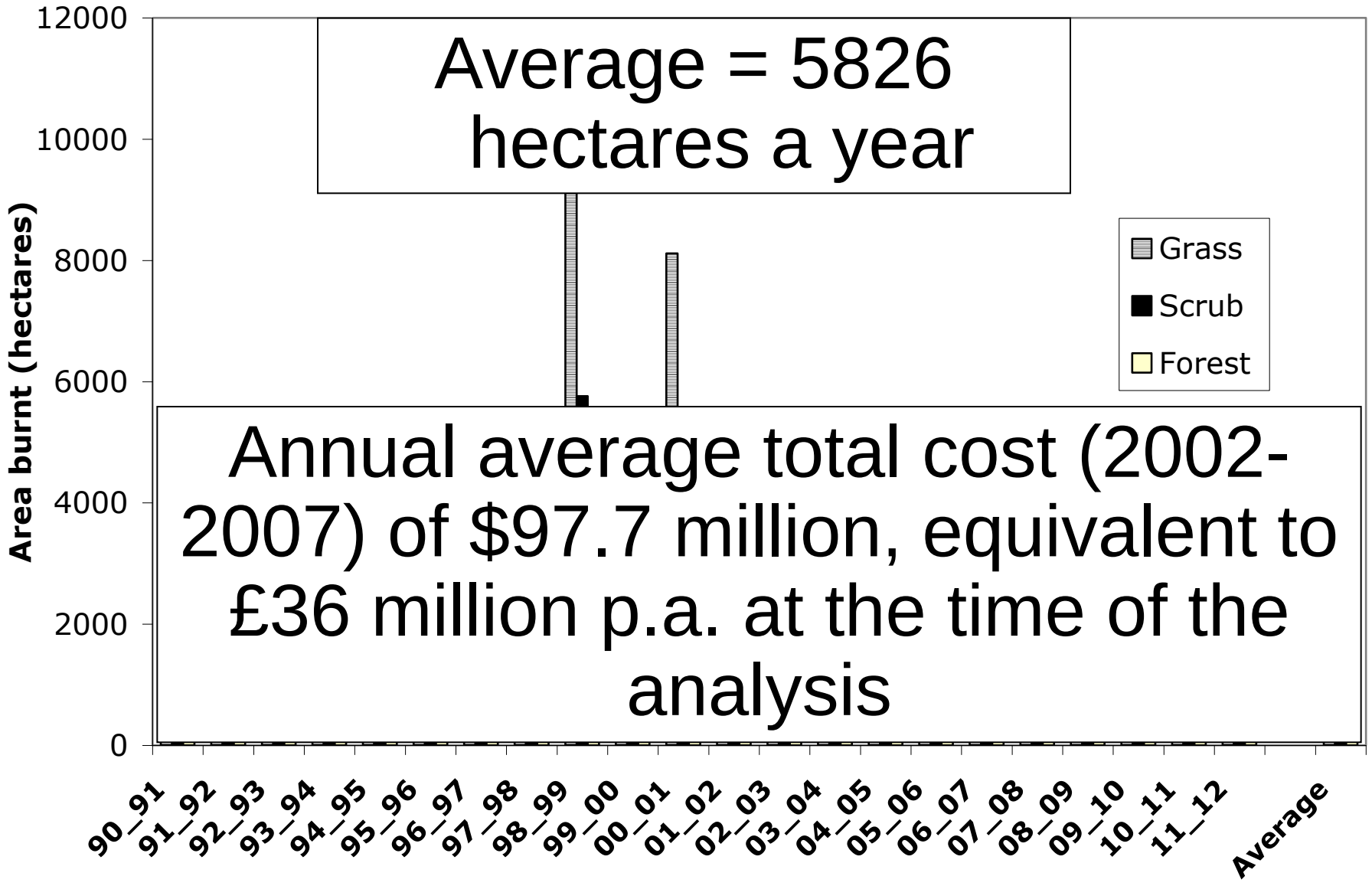
McArthur Forest Fire danger Index for UK using UKCP09 data

From Defra Climate Change Risk Assessment (2012)

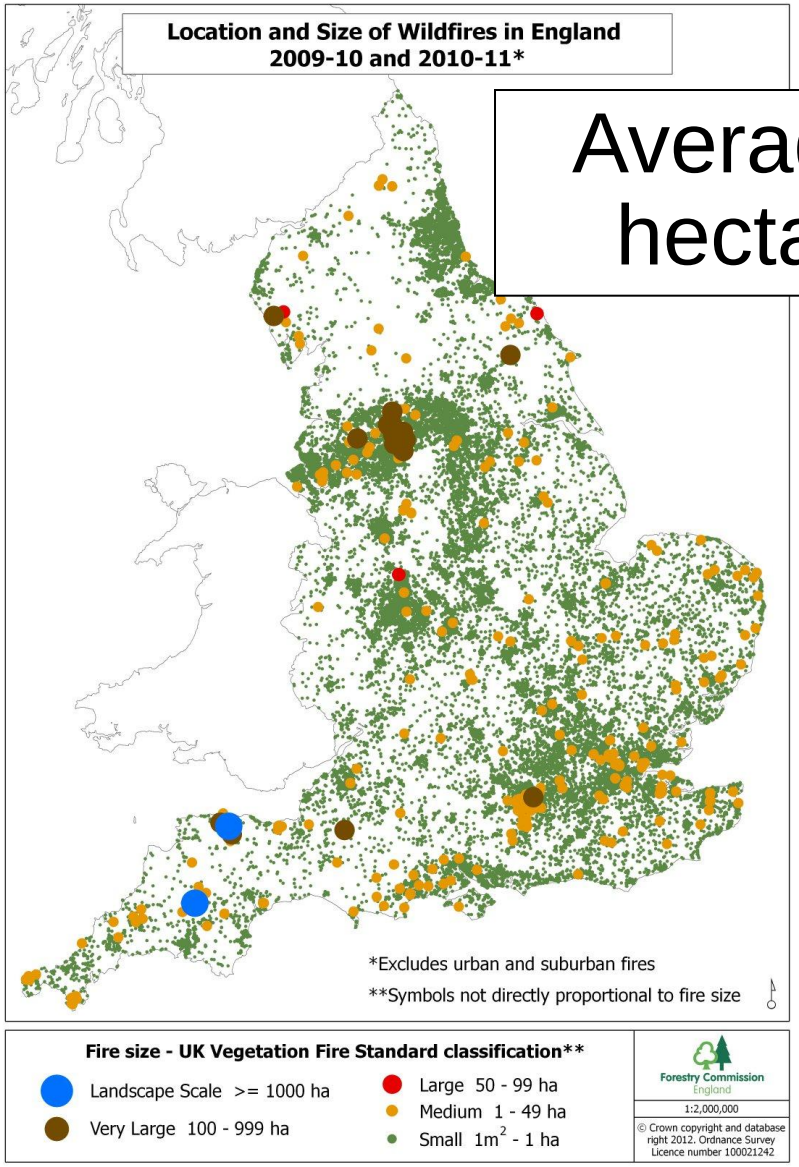

Forestry Commission
National Forest Inventory - Great Britain
Distribution of woodland 0.5ha and over
Area 244,000 km²;
forest cover 13%
Woodland
National Boundary
Reference date 31st March 2010
Map publication date 25th May 2011
0 25 50 100
Kilometers
For further information visit www.forestry.gov.uk/inventory
© Crown Copyright. All rights reserved Forestry Commission 1000025498 - 2011


Area: 270,000 km²;
forest cover 30%
Land
Exotic vegetation
High-producing exotic grassland (pastoral)
Low-producing grassland (pastoral)
Primarily horticulture
Urban areas and artificial surfaces
N
Kilometres
0 50 100 150 200

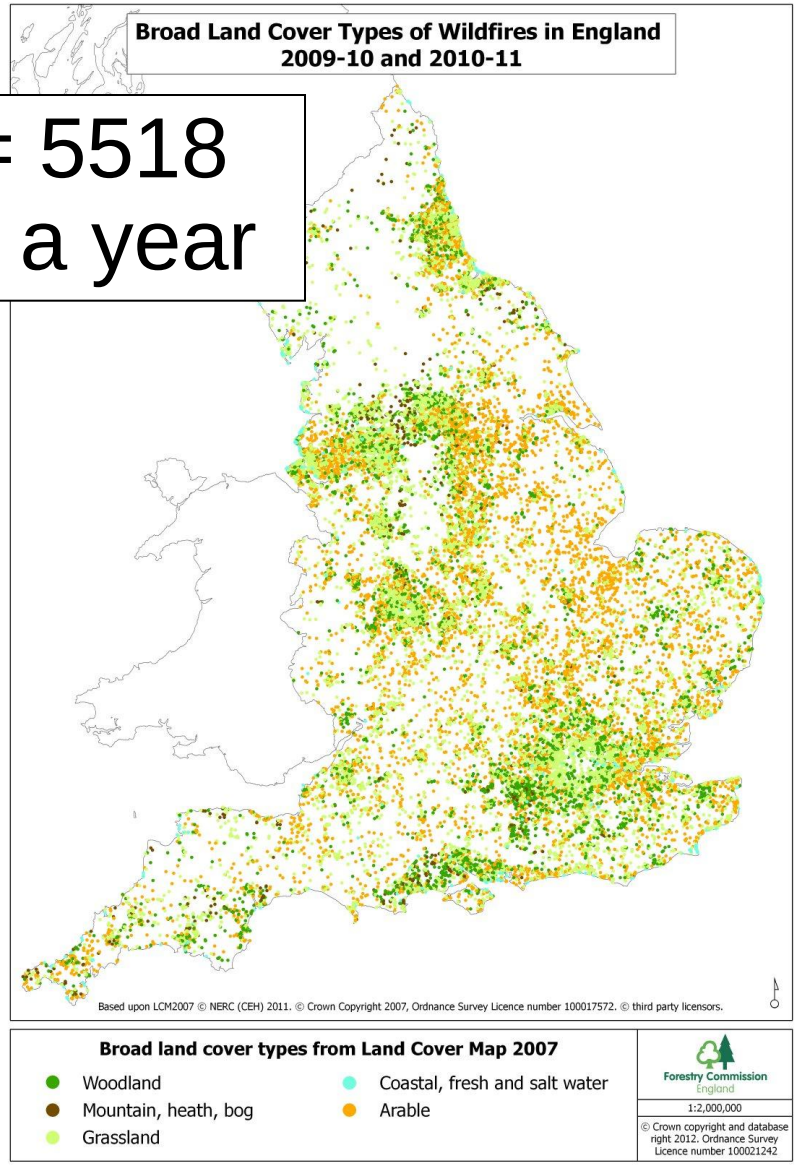
New Zealand wildfire extent



Occurrence of wildfires in England, 2009/10 to 2010/11

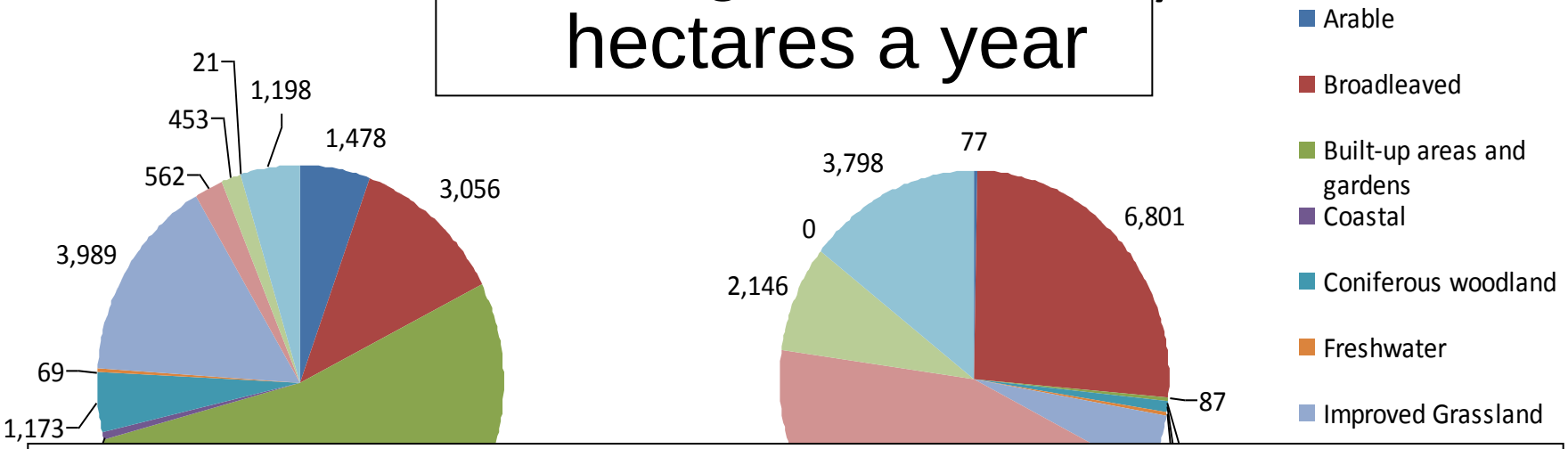


Average = 5518 hectares a year



Occurrence of wildfires in Scotland, 2009/10 to 2011/12

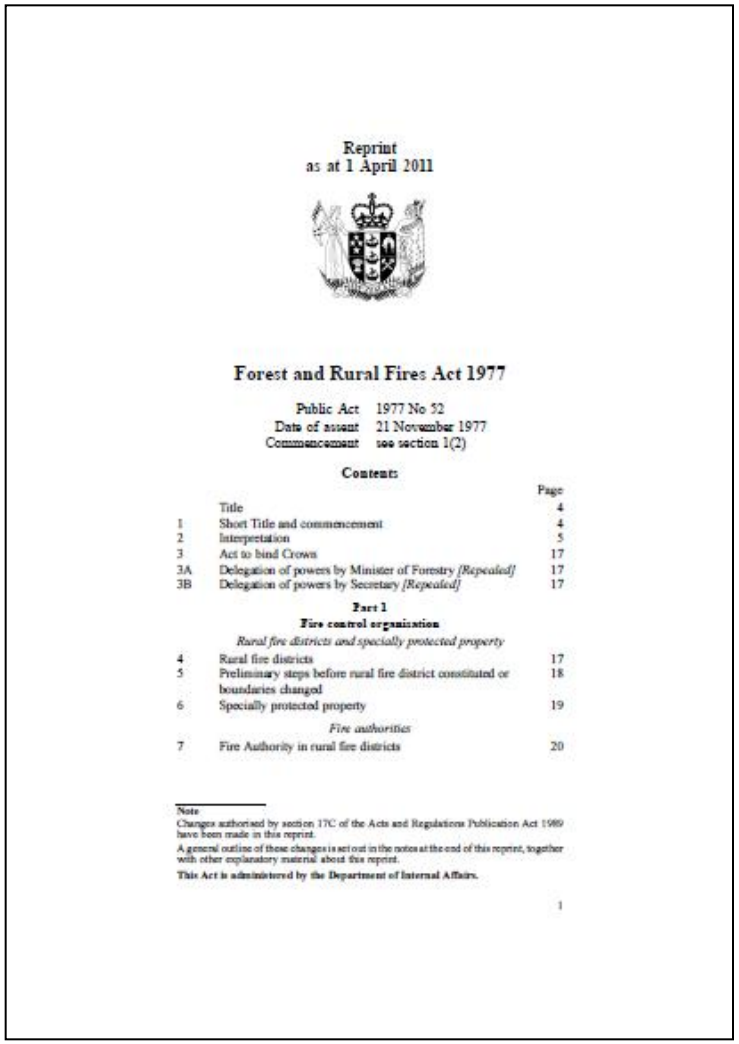
Average = 14832 hectares a year



The cost of *responding* to GB wildfire incidents (alone) has been estimated at up to £55 million per annum

Data c/o DCLG

NZ Rural Fire Jurisdiction



Reprint
as at 1 April 2011

Forest and Rural Fires Act 1977

Public Act 1977 No 52
Date of assent 21 November 1977
Commencement see section 1(2)

Contents

Note
Changes authorised by section 17C of the Acts and Regulations Publication Act 1989 have been made in this reprint.
A general outline of these changes is set out in the notes at the end of this reprint, together with other explanatory material about this reprint.
This Act is administered by the Department of Internal Affairs.

1

Forest and Rural Fires Act 1947 – first legislation dedicated wholly to rural fire

Forest and Rural Fires Act 1955 – all aspects of rural fire legislation delivered by the NZ Forest Service

Fire Service Act 1975 – Urban Fire Districts administered by Fire Service – (3% of NZ - respond operationally outside UFD)

Forest and Rural Fires Act 1977 – Rural Fire Authorities set up (97% of NZ)

Minister of Internal Affairs

NEW ZEALAND FIRE SERVICE COMMISSION

Chief Executive

New Zealand Fire Service (National Commander)

OUTPUTS
- Reduction
- Readiness
- Response
- Recovery

Fire Service Fire Brigades

National Rural Fire Authority (National Rural Fire Officer)

OUTPUTS
- Rural Fire Management
- Performance assessments
- Grants
- Rural Fire Fighting Fund
- Rural Fire Co-ordination

Regional Rural Fire Committees

Rural Fire Authorities (73)

- **Dept of Conservation**
- **Rural Fire Districts**
- **Territorial Local Authorities**
- **NZ Defence Force**
  - -Volunteer RFFs

OUTPUTS
- Reduction
- Readiness
- Response
- Recovery

Forest & Rural Fire Management

Forest and Rural Fire Act 1977

Relates to the safeguarding of life and property by the prevention, detection, control, restriction, suppression and extinction of fire in forest and rural areas and other areas of vegetation in New Zealand

Role of National Rural Fire Authority (NRFA)

Providing support and co-ordination

- develop & audit minimum national standards
- performance assessment of Rural Fire Authorities
- monitoring/reporting fire danger nationwide
- administer a National Rural Fire Fighting Fund
- providing technical advice
- providing grants for equipment, PPE, weather ob’s
- promote and encourage rural fire research
- coordinating national & international deployments

Role of Rural Fire Authorities (RFAs)

- Prevention, detection and suppression of vegetation fires
- Responsible for fire reduction & readiness activities including:
  - Monitoring daily fire danger
  - Declaring fire seasons
  - Issuing fire permits
- Principal Rural Fire Officer for a RFA has statutory powers under the Forest and Rural Fires Act 1977

Role of Rural Fire Authorities (RFAs) – con't

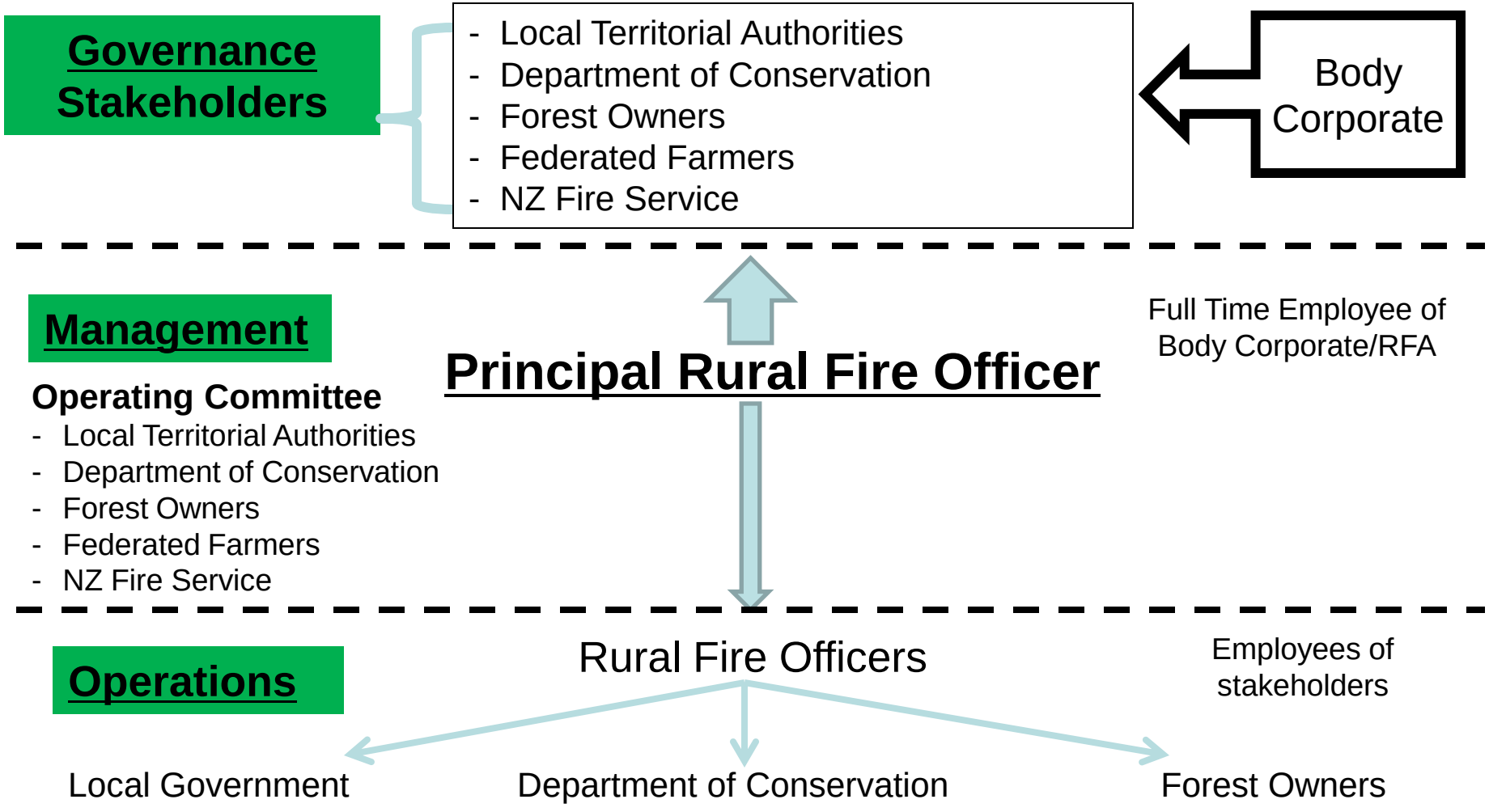
Section 12 – Forest and Rural Fires Act 1977

Rural Fire Authorities **must** promote and carry out effective fire control measures in their districts

Rural Fire Authorities **must** comply with the standards set by the NRFA

Rural Fire Authorities **must** keep and maintain a current fire plan for their districts

Management Structure: Rural Fire Authorities (RFAs)



4R's of emergency risk management in NZ

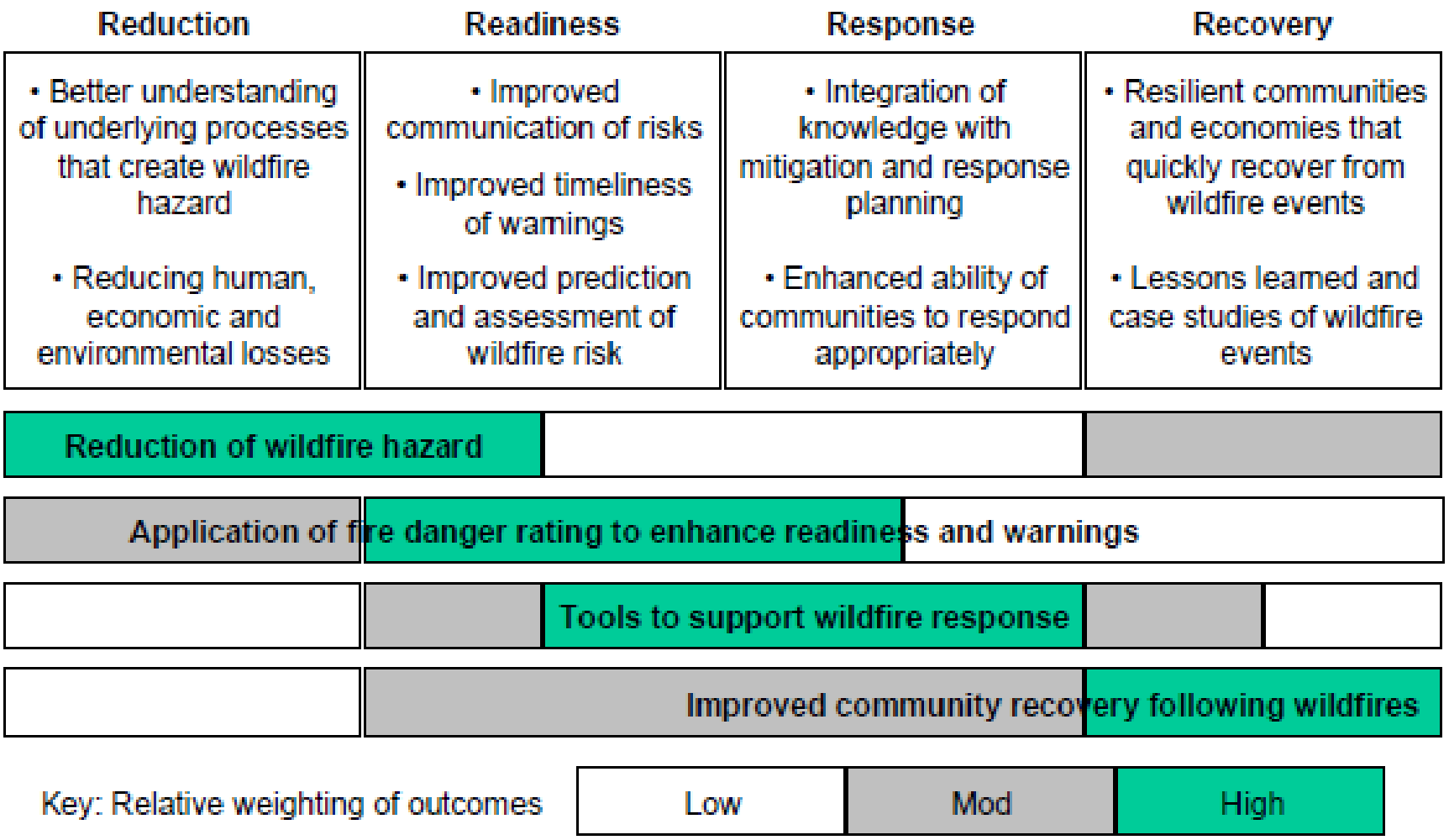
Reduction – fire mitigation and prevention, wildfire threat analysis, risk assessment and planning, and fuels management

Readiness – setting fire suppression preparedness levels, adequate resourcing of Rural Fire Authorities, and managing fire season status and activities

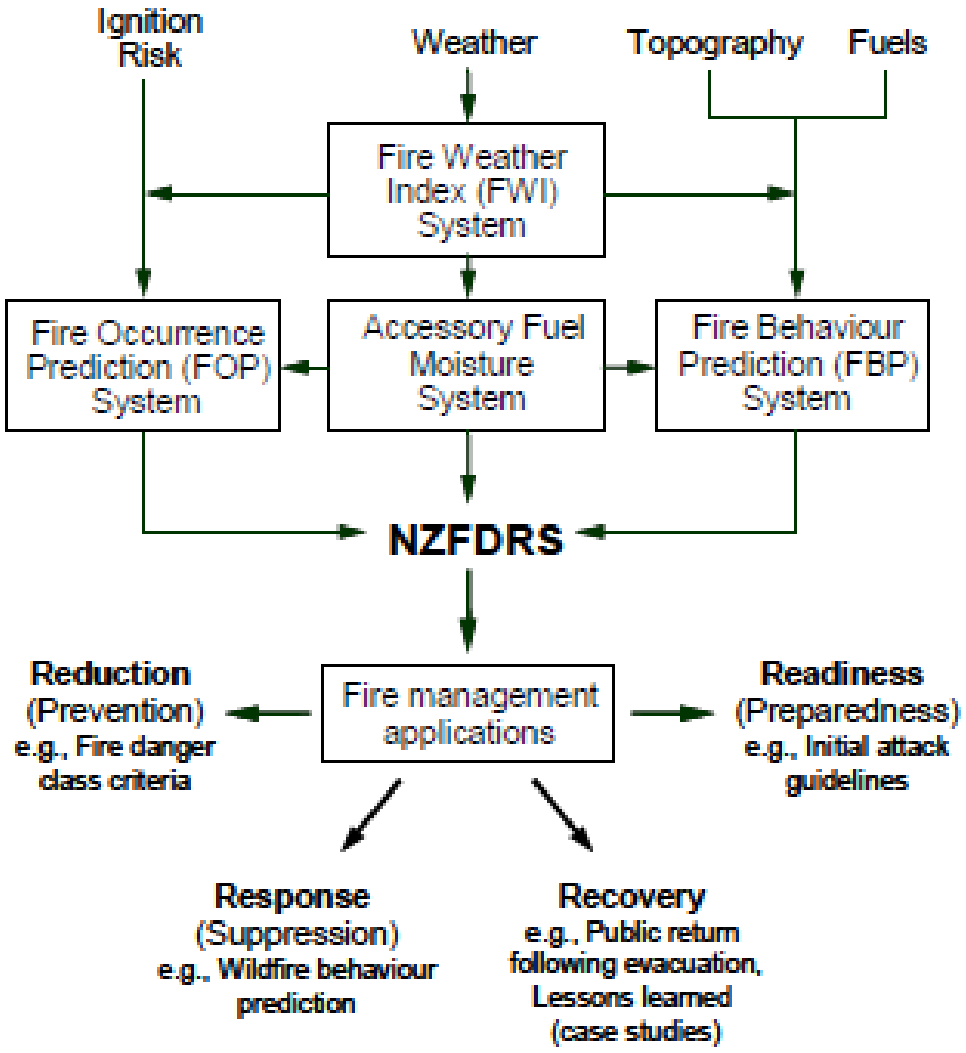
Response – responding to fires with adequate resources, safe and effective fire suppression, accurate predictions of fire behaviour, and decisions around evacuation or asset protection

Recovery – understanding and learning from fire events to reduce the impacts, prevent reoccurrence and increase community resilience

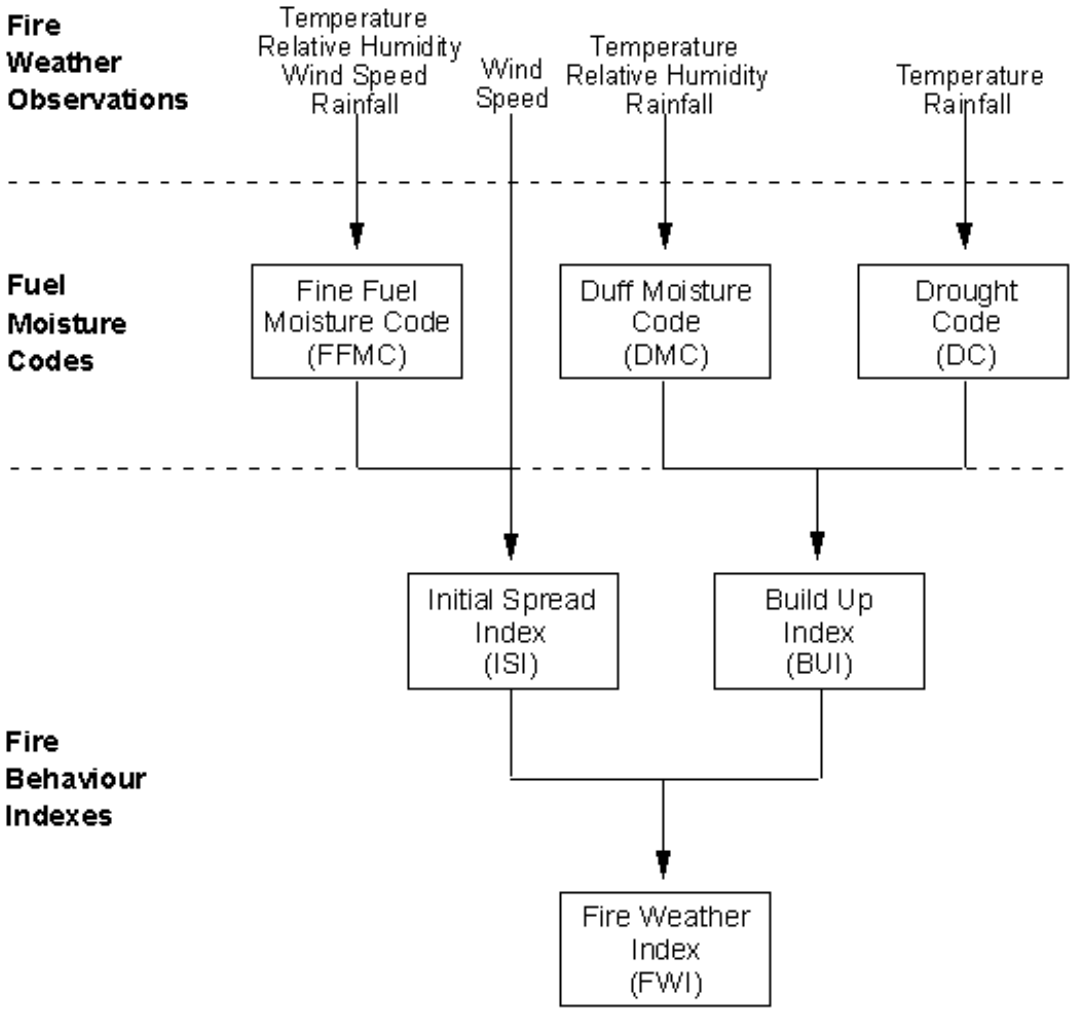
Relative contribution of research in support of the 4Rs of risk management



Structure of the NZ National Fire Danger Rating System



Structure of the NZ Fire Weather Index



Fire Weather System - Mozilla Firefox

File Edit View History Bookmarks Tools Help

National Rural Fire Authority Home | Fire Weather System

Back Forward fireweather.nrfa.org.nz Reload Stop AVG Secure Search Downloads Home Download Video

C'mon Keep it Green

Up-to-date weather forecasts are crucial for determining fire danger and fire behaviour

Fire weather information is available for the last six months

Find Out...

Up-to-date weather forecasts are crucial for determining fire danger and fire behaviour. Fire weather information is available for the last six months.

August 2013

			1	2	3	
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Fire danger 31 August 2013

Forest Fire Danger Class

Grass Fire Danger Class

Scrub Fire Danger Class

Fire Danger

Fire Danger Class

Indication of the ease of suppression (or the difficulty of control) of fire burning in forest, scrub-land, grassland or the predominant local fuel type – ex. LINZ Landcover DB.

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Fire Weather System

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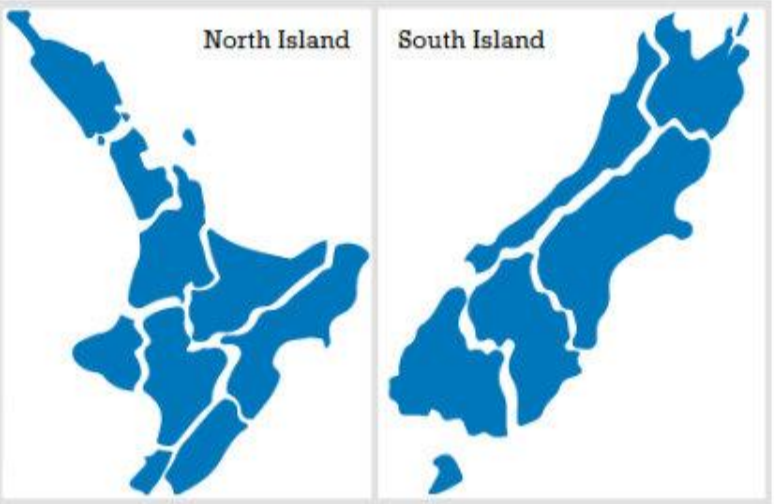
FIRE WEATHER MAPS

Fire Weather Data Tables

01 September 2013



View all regions | Download data

Fire Weather Data Tables

What is it?

The Fire Weather Data Table indicates the regional Fuel Moisture Codes, Fire Behaviour Indices, and Afternoon Weather conditions across New Zealand.

Key

- Fire weather class
- Fire Weather Data Tables
- Low
- Moderate
- High
- Very high
- Extreme

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View All

Central North Island

STATION NAME	FOREST	SCRUB	GRASS	FFMC	DMC	DC	ISI	BUI	FWI	TEMP	RH	DIR	WSP	RN24
Matea	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minginui	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rotoehu	L	VH	L	77	3	6	1.5	2	0.5	13.3	58	106	10	0.0
Goudies	L	E	M	77	2	4	2.5	2	0.7	10.6	60	121	21	0.2
Galatea	L	E	M	82	6	10	3.2	6	2.3	14.3	54	152	16	0.1
Kawerau	L	E	M	84	4	7	5.1	4	3.3	14.5	51	135	21	
Tahorakuri	L	VH	M	78	2	5	1.7	2	0.6	11.5	56	131	13	
Opotiki	L	E	M	82	4	21	4.2	5	3.1	14.3	53	150	21	
Te Puke	L	VH	L	78	3	7	1.5	3	0.5	14.3	60	137	10	
Waihau Bay	L	E	M	80	3	7	2.2	3	0.8	14.8	54	201	13	

FFMC	Fire fuel moisture code
DMC	Duff moisture code
DC	Drought code
ISI	Initial spread index
BUI	Build up index
FWI	Fire weather index
GC%	Grass curing
STAT	Aut, Sub, Est, For
TEMP	Temperature
RH	Relative humidity
DIR	Wind direction
WSP	Wind speed
RN24	24 hour rainfall

Fire Weather System - Mozilla Firefox

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Fire Weather System

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Up-to-date weather forecasts are crucial for determining fire danger and fire behaviour. Fire weather information is available for the last six months.

April 2013

	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

FIRE WEATHER DATA TABLES

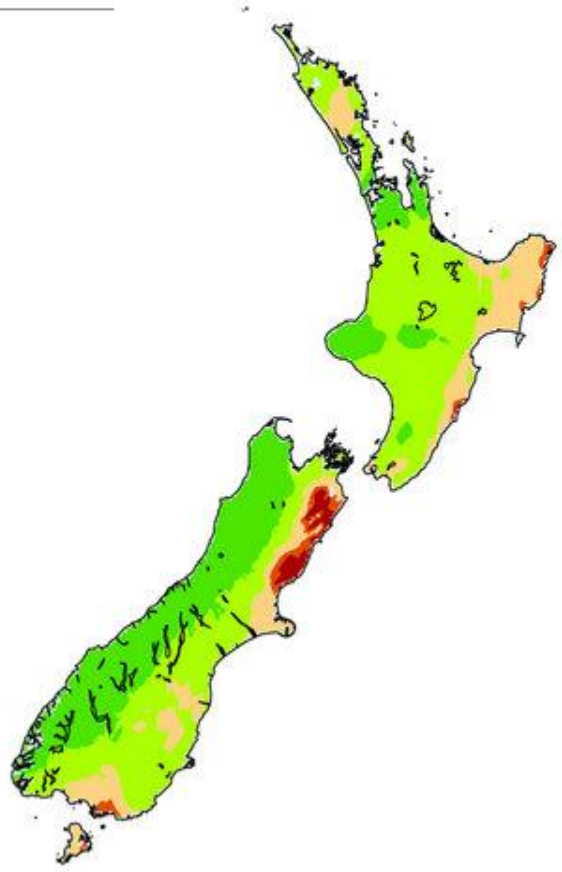
Register Now

To use the new Fire Weather Application

Licensed for use by NZFS Related Parties

Fire behaviour 02 April 2013

Fire Weather Index



Fire Weather Index

Combines the Initial Spread Index and Buildup Index to indicate the intensity of a spreading fire (on level terrain).

Key

- 0 - 3
- 3 - 13
- 13 - 23
- 23 - 28
- > 28

Scale

0 100 200 300

Valid At:

02 APRIL 2013 12:00 NZST

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Fire Weather System - Mozilla Firefox

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Fire Weather System

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28	29	30				

FIRE WEATHER DATA TABLES

Register Now

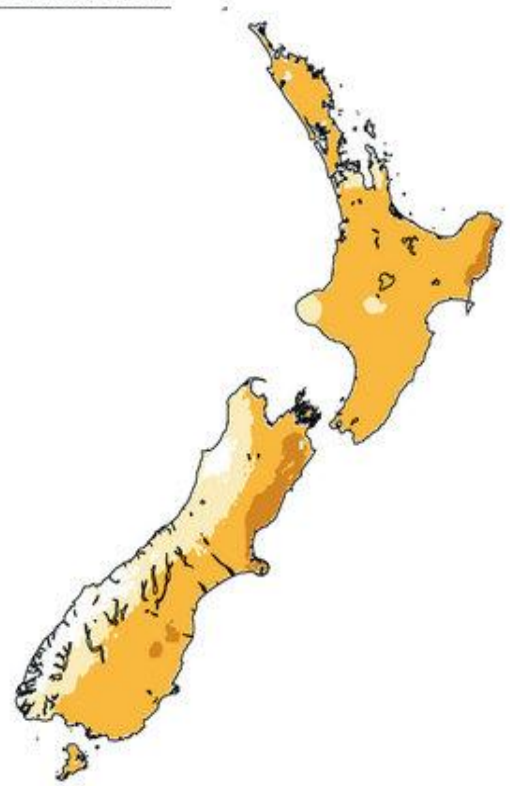
To use the new Fire Weather Application

Fire danger

Fire behaviour

Fuel moisture 02 April 2013

Fine Fuel Moisture Code



Fuel Moisture

Fine Fuel Moisture Code

An indicator of the relevant ease of ignition and flammability of fine fuels.

Key

- 0 - 60
- 60 - 75
- 75 - 88
- 88 - 92
- 92 - 100

Scale

0 100 200 300

Valid At:

02 APRIL 2013 12:00 NZST

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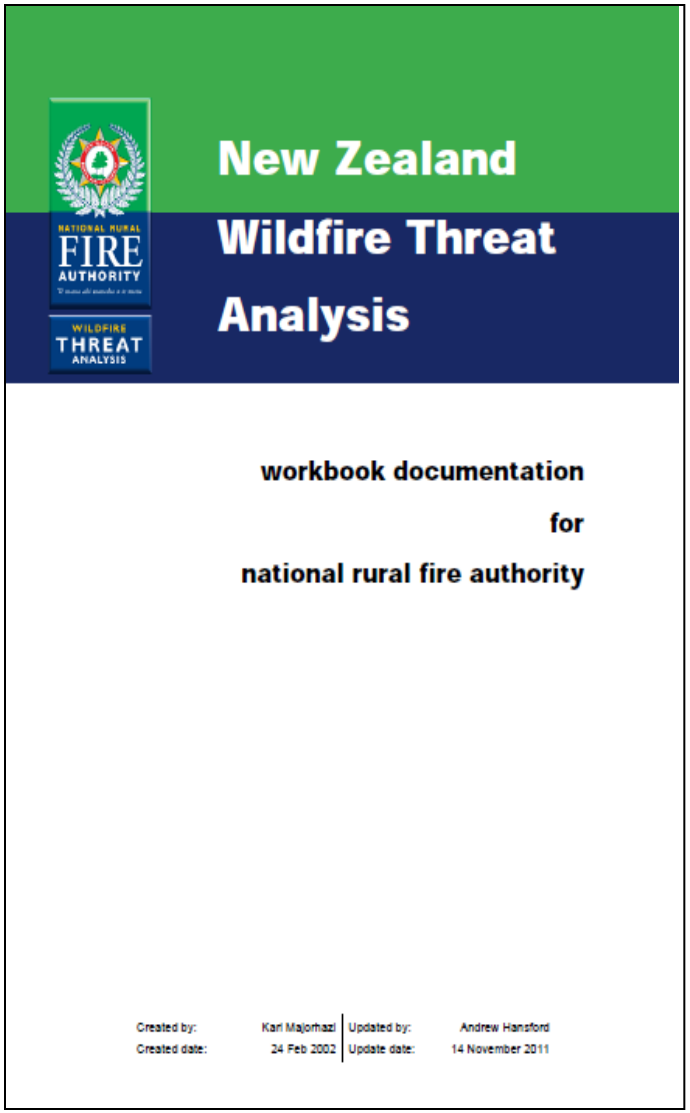
Fire Behaviour SmartPhone Apps

A SmartPhone application of the fire behaviour toolkit is currently under development. This mobile application was developed by Scion and Haumohio, and supported by the Forest and Rural Fire Association of New Zealand (FRFANZ) and the Ministry for Science & Innovation (MSI; now MBIE).

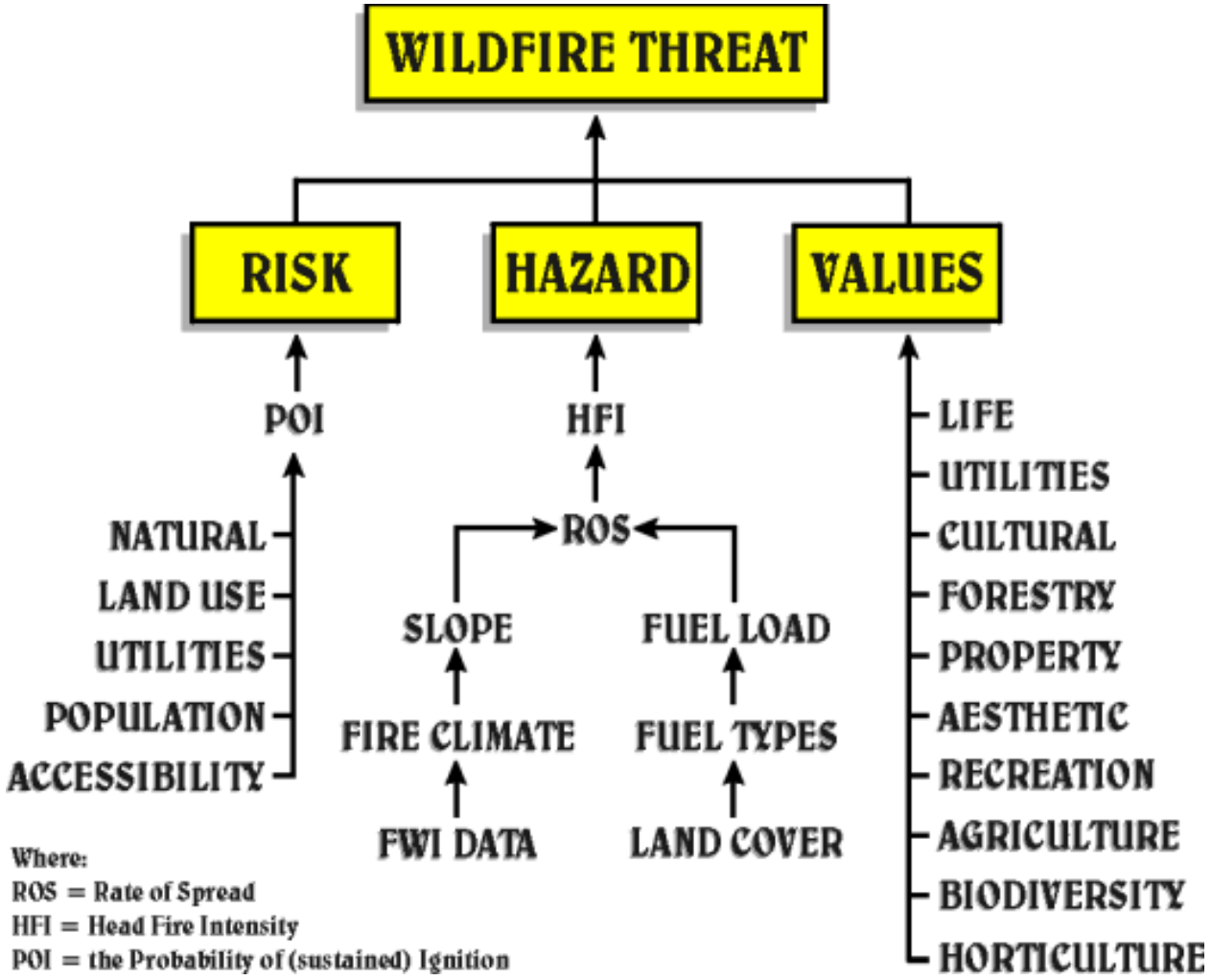
NZ Wildfire Threat Analysis System



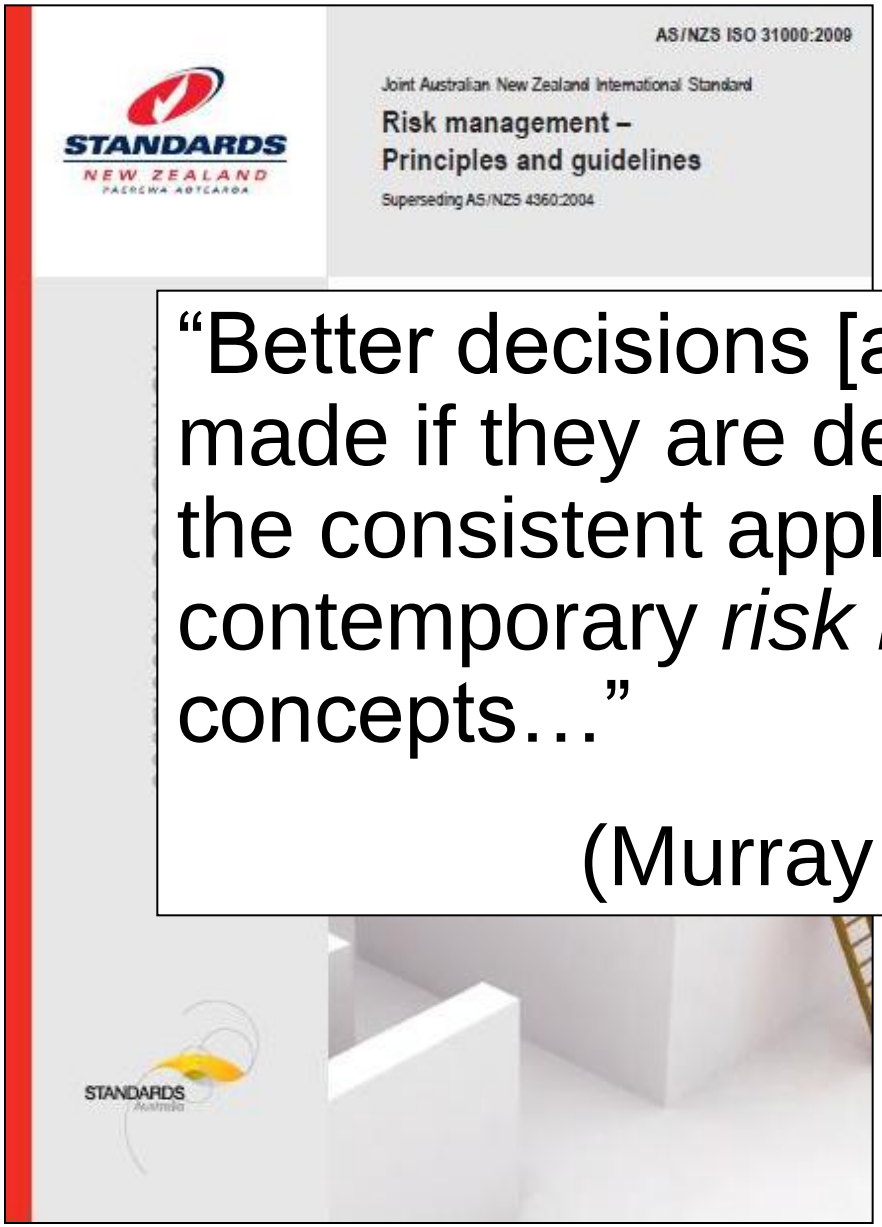
WTA is now the required basis for compliance with the NRFA Minimum Standard on the Assessment of Fire hazard, which became operative in July 2013.

WTA is defined as "*a systematic method of identifying the level of threat a particular area faces from wildfire. The level of threat is generally related to a combination of ignition potential, potential fire behaviour and the values threatened*."

WTA in New Zealand is a GIS-based spatial analysis model and strategic planning tool which enables fire managers to objectively identify the areas of greatest threat from wildfire at a strategic level.



RISK = ignition potential; HAZARD = potential fire behaviour; VALUES = values threatened

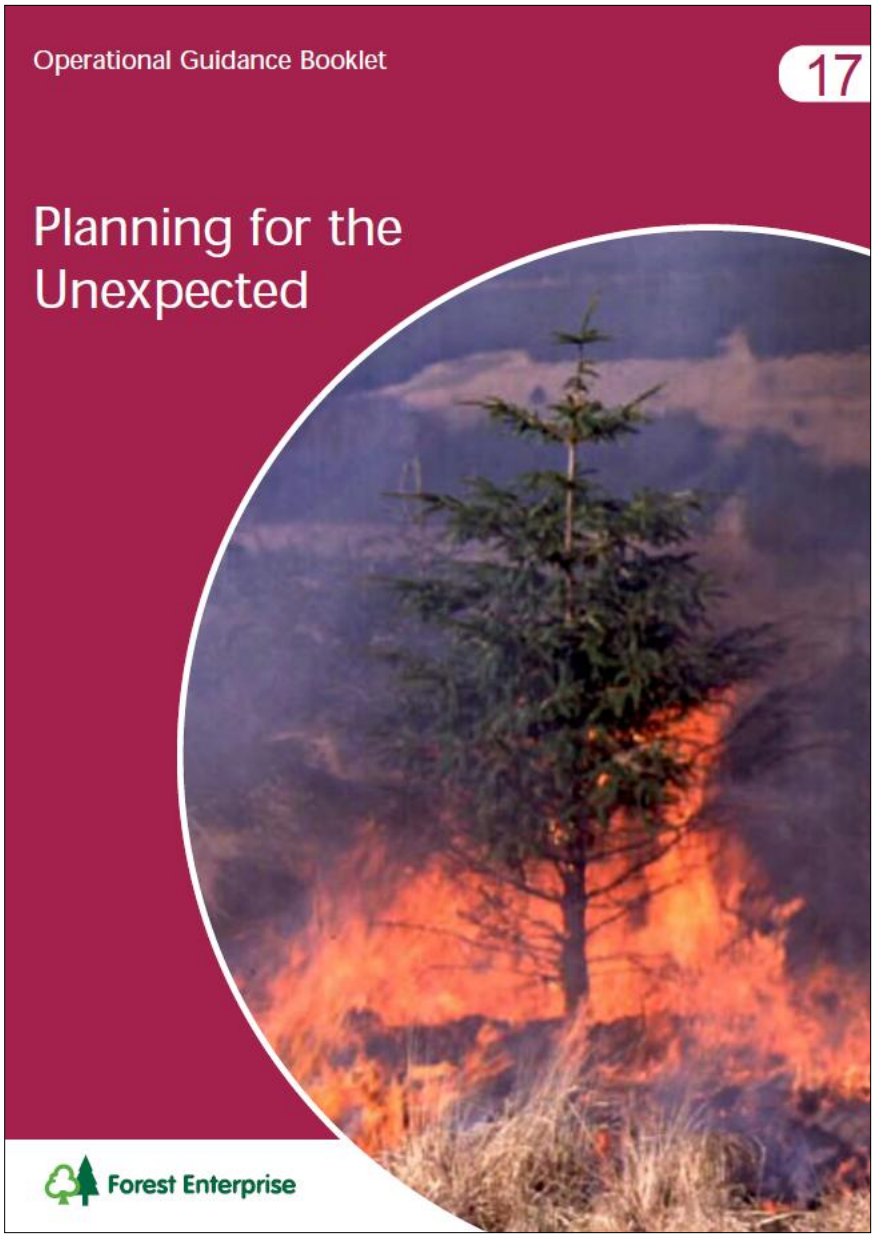


"Better decisions [about wildfire] will be made if they are developed through the consistent application of contemporary *risk management* concepts…"

(Murray Dudfield, NZ NRFA)

“managing fire-related risk to land is fundamentally an issue of land management and not fire management”

(Murray Dudfield, NZ NRFA)



High–level conclusions

- The UK could benefit from learning about wildfire risk management in countries like New Zealand – such experience and expertise is freely shared
- NZ wildfire risk and fire management systems, especially FWI, FBP and WTA, could form the basis of extending UK systems
- Wildfire systems are unlikely to succeed without appropriate policy/regulatory/legal infrastructure; NZ experience is to work across *all* rural land-uses
- Consider approaches like Wildfire Threat Analysis in context of International Disaster Risk Assessment principles and systems (e.g. ISO 31000:2009)

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Harmonising approaches to evaluation of forest fire risk

Result of a study tour to New Zealand supported by TRANZFOR

A J Moffat (Forest Research) and H G Pearce (Scion)

2013

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Tranferring Research between EU & Australia, New Zealand on Forestry and Climate Change

Acknowledgements

- Gary Lockyer (NZ NRFA)
- Murray Dudfield (NZ NRFA)
- Geoff Cameron (NZ Forestry Consultant)
- Julia McMorrow (Manchester University)

http://www.kfwf.org.uk/_assets/documents/Moffat_and_Pearce_2013_Harmonising_approaches_to_evaluation_of_forest_fire_risk.pdf

THANKS FOR LISTENING!
ANY QUESTIONS?

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