O'Sullivan (Northcliffe) bushfire February 2015

O'Sullivan fire facts

- Burnt area 98 650 ha, perimeter 295 km
- Largest single fire in south-west forests since 1961
- Active as a Level 2 fire for 19 days
- 1670 personnel from multiple agencies
- South-West Hwy closed for several weeks causing significant disruption to community and economy
- No serious injuries, despite near-miss incidents
- One ignition point……..

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Fire 19 O'Sullivan – 10/03

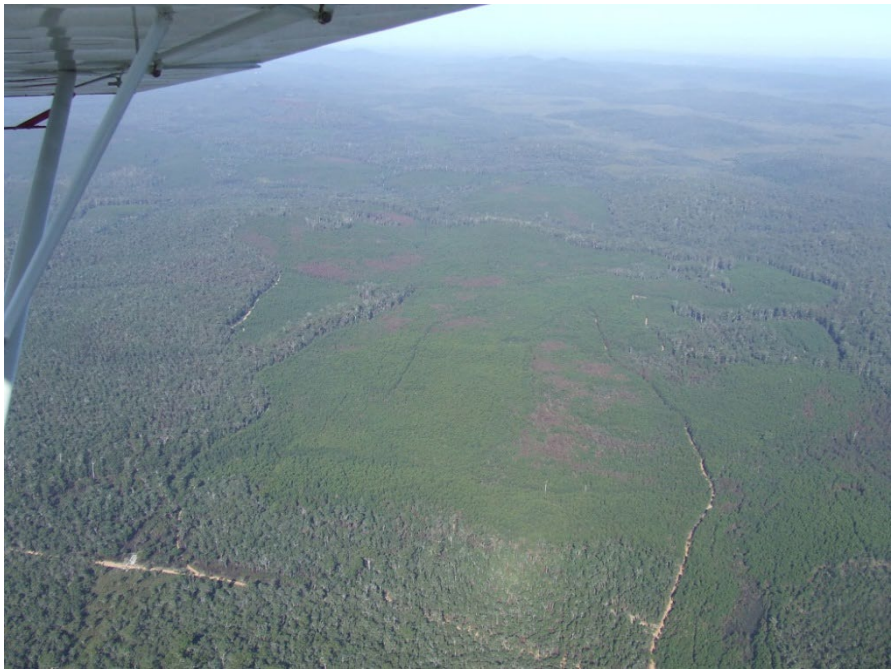
Jarrah-marri

Mature karri

Regrowth karri 30 years old

Regrowth forests

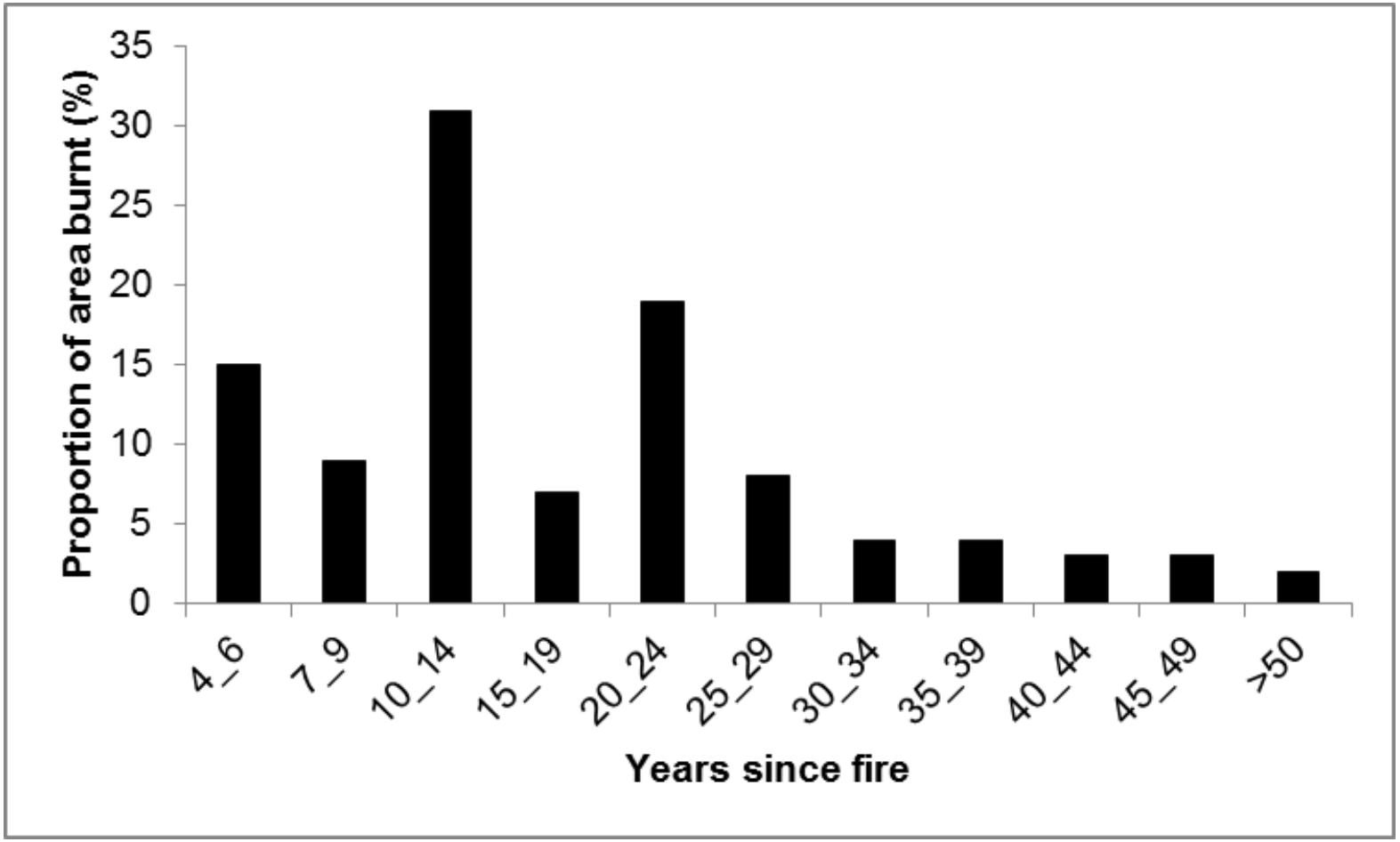
Jarrah regrowth



Mosaic of mature and regrowth forest created by harvesting

Karri regrowth

Time since fire (fuel age) for areas burnt by the O'Sullivan fire



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Fire 19 O'Sullivan – 10/03

Western end

Eastern end

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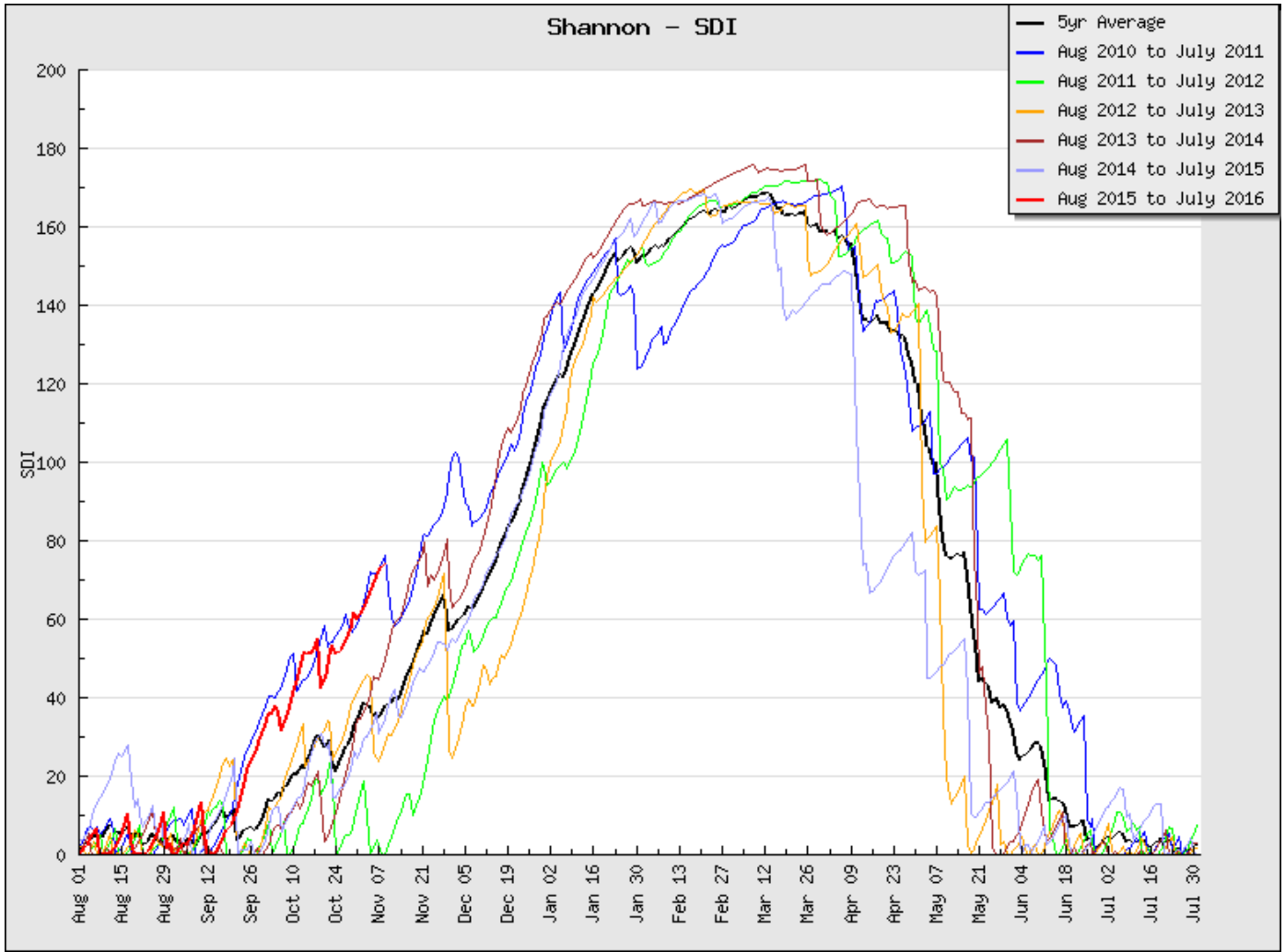
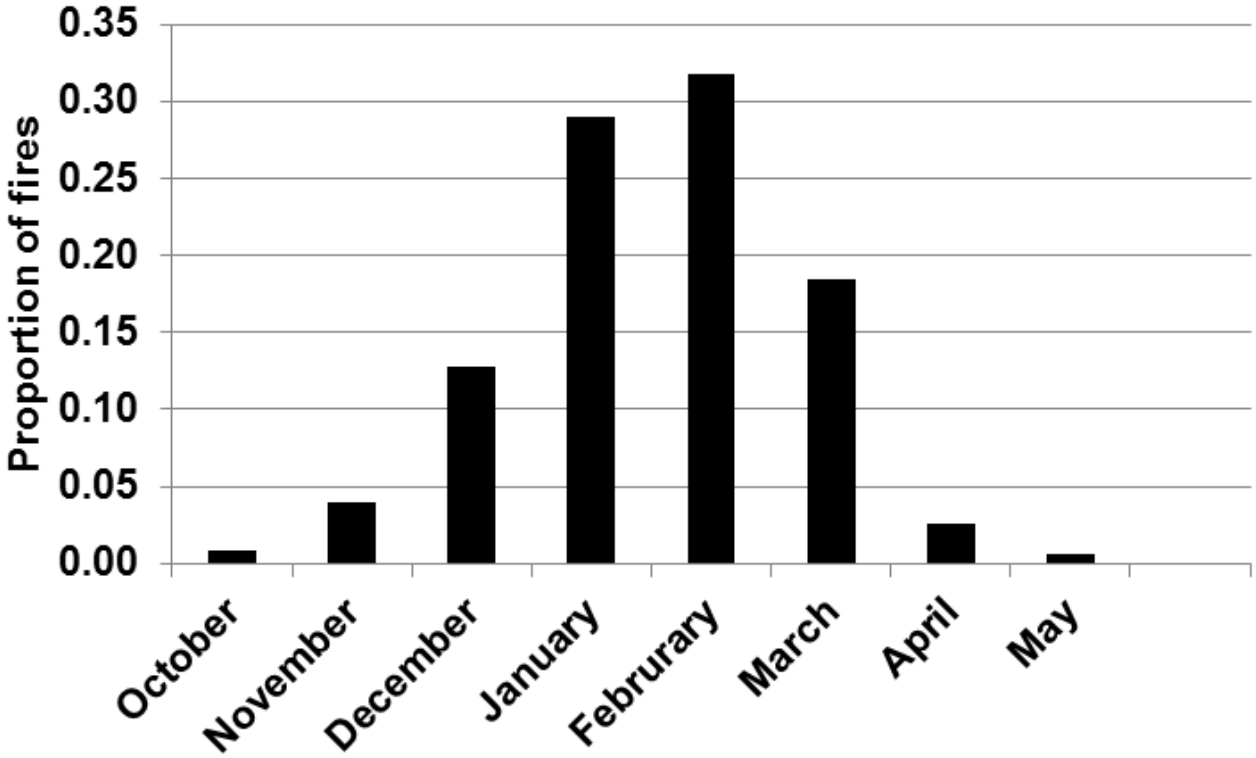
Seasonal dryness and fuel availability

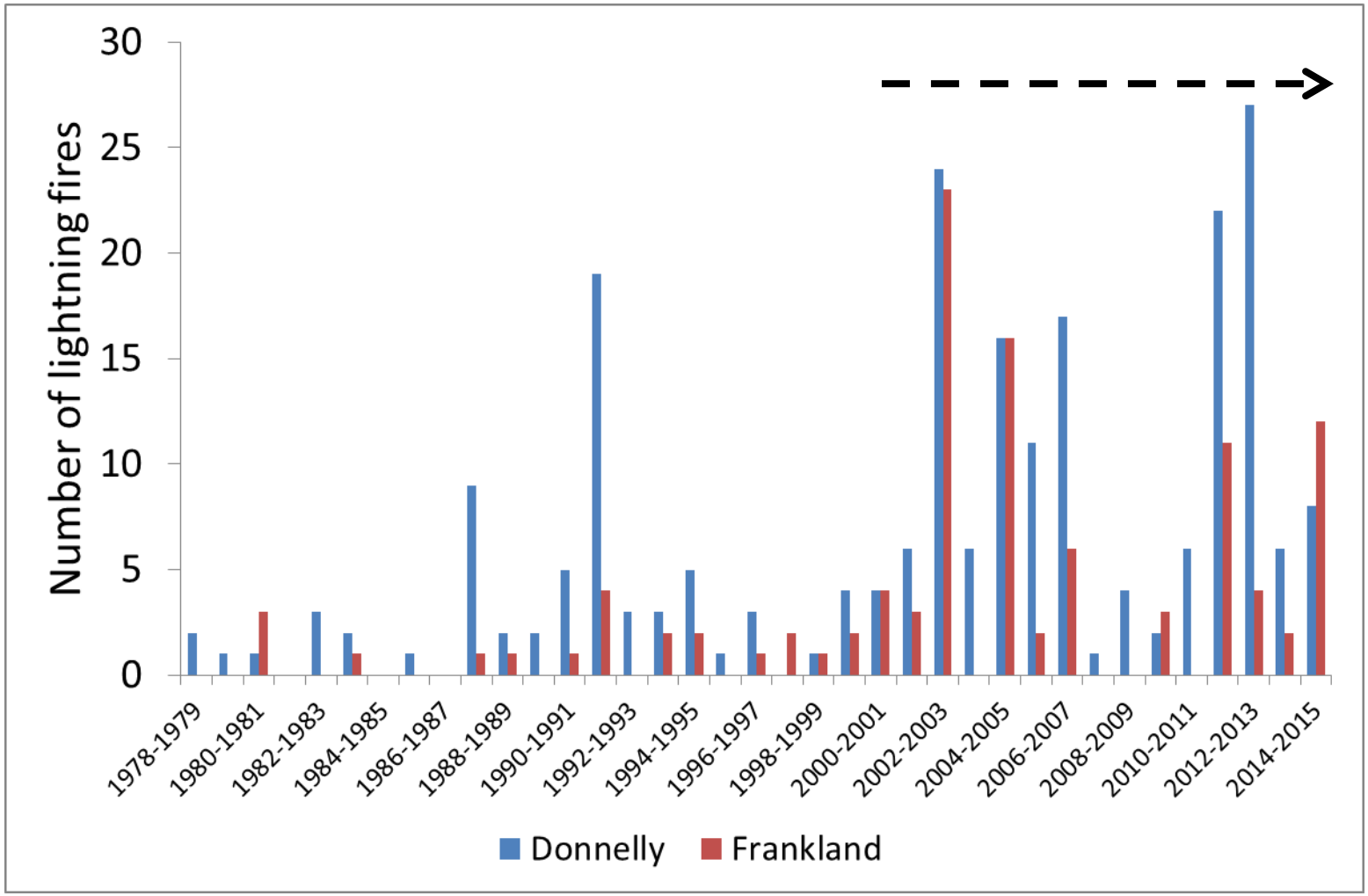


Seasonal pattern of lightning ignition for the Warren Region 1977-2015



Data are proportion of fires by month

Trend in number of lightning ignitions



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Widespread lightning on Wed 28 Jan

Donnelly (detected@)

- Don_016 (15:30 28/01)
- Don_017 (12:51 29/01)
- Don_018 (13:36 29/01)
- **Don_019 (09:55 30/01)**
- Don_020 (11:42 30/01) escalated to Emergency Warning @ 13:40 30/01
- Don_021 (13:00 30/01)

Frankland (detected@)

- Frk_011 (15:50 28/01)
- Frk_012 (11:30 29/01)
- Frk_013 (15:05 29/01)
- Frk_014 (10:34 30/01)
- Frk_015 (11:22 30/01)
- Frk_016 (11:51 31/01)
- Frk_018 (14:30 4/02)

Weather conditions: Fire 19 O'Sullivan

Ignition / Escalation / Trough passage

Date	T_{Max} (°C)	T_{1500} (°C)	RH_{1500} (%)	$Wind_{0900}$ (km h^{-1})	$Wind_{1500}$ (km h^{-1})	Max. wind gust (km h^{-1})	Jarrah[A] SMC (%)	Jarrah[B] FDI (m h^{-1})
28 Jan	37	23	74	NNE@20	WNW@13	N@48	4	94
29 Jan	28	26	61	SW@15	SSW@22	SSE@43	9	60
30 Jan	32	31	34	SE@19	SE@20	SSE@39	9	45
31 Jan	30	28	36	ENE@22	ENE@28	ENE@48	7	120
1 Feb	31	29	31	ENE@30	NE@20	ENE@46	7	90
2 Feb	34	30	35	NE@22	NNW@13	ENE@41	6	58
3 Feb	37	34	29	NE@9	S@20	NE@39	4	130
4 Feb	35	29	50	NNE@17	NNE@6	NNW@46	3	82
5 Feb	27	19	100	NNW@11	SW@17	WSW@33	9	45
6 Feb	24	22	65	SSW@13	SSW@24	SSW@37	22	16
7 Feb	25	24	53	ESE@15	S@15	SE@39	12	23
8 Feb	35	34	30	NE@22	W@13	NE@37	7	48

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Fire 19 O'Sullivan – 11:00 30/01

Photo: Greg Simpson

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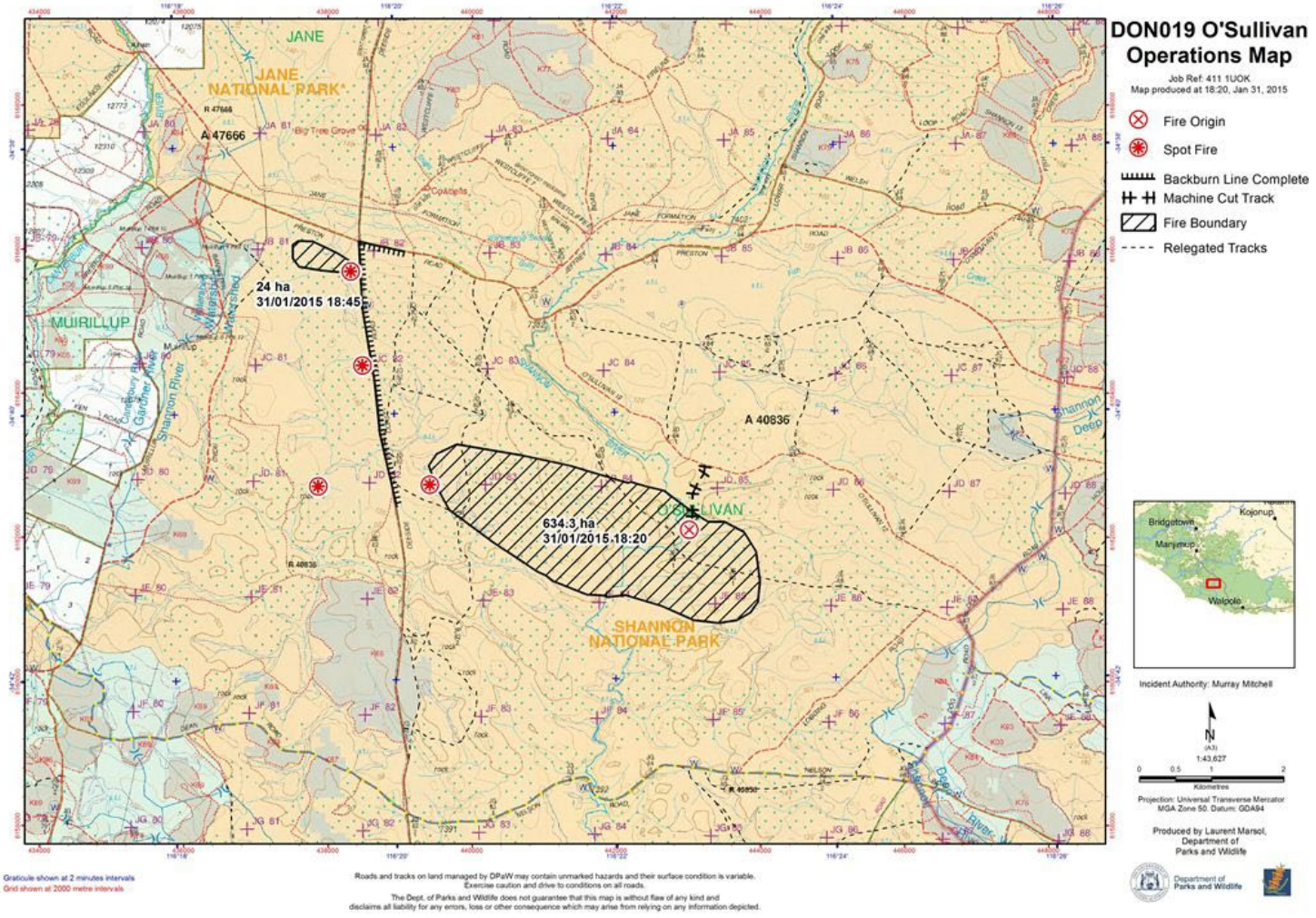
Fire 19 O'Sullivan – 18:30 31/01



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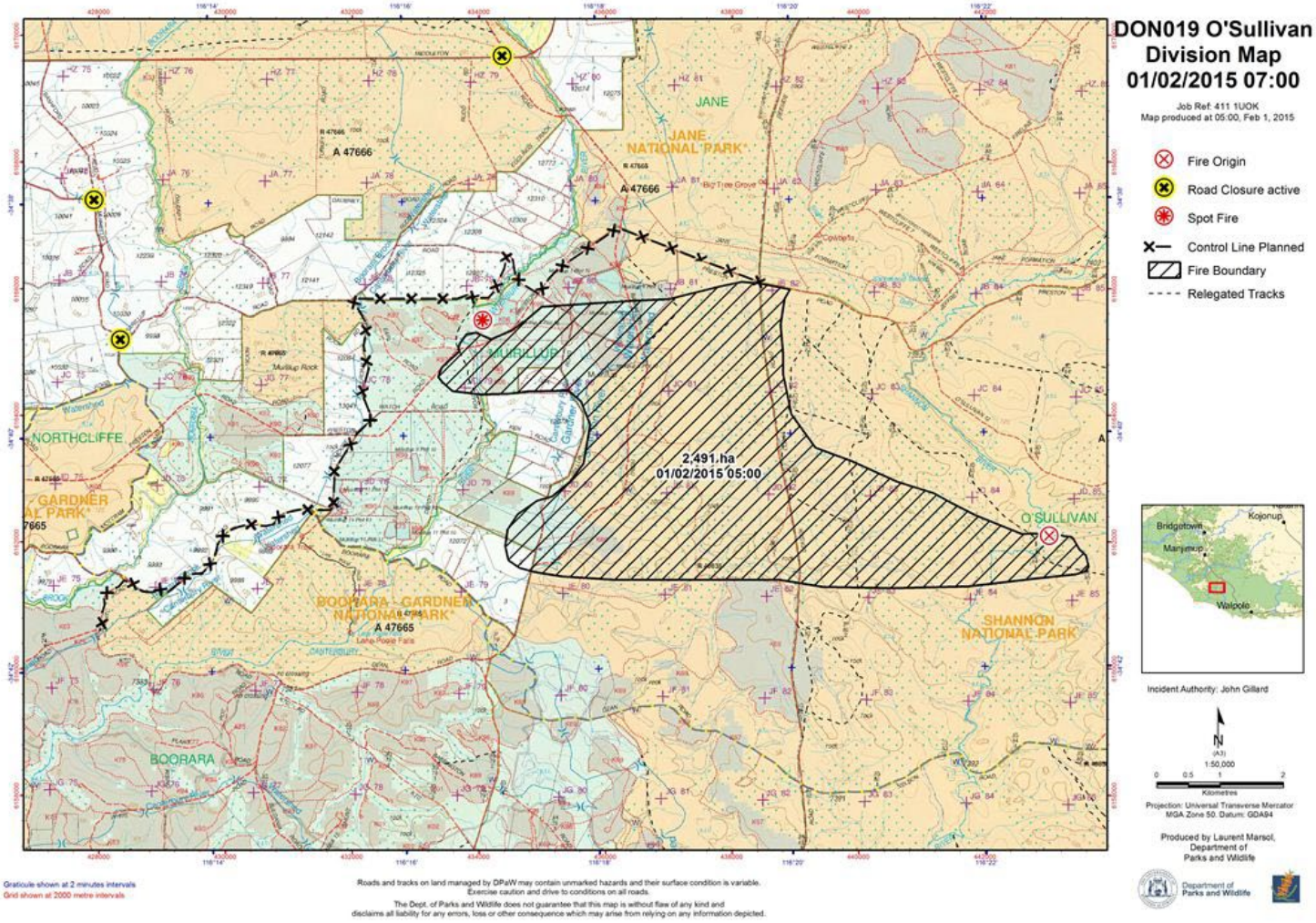
Fire 19 O'Sullivan – 07:00 1/02



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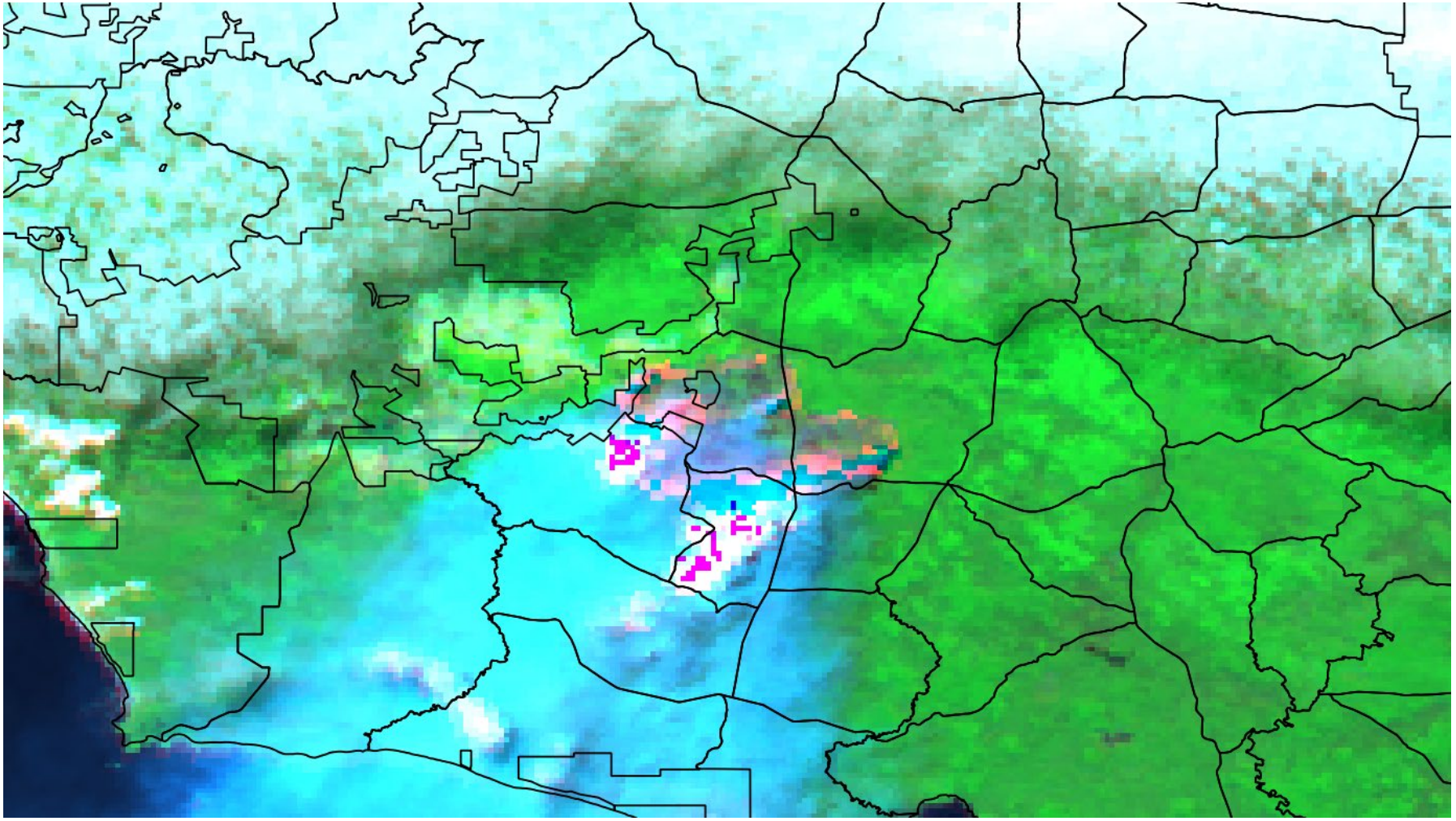
MODIS – 14:27 Sunday 1/02



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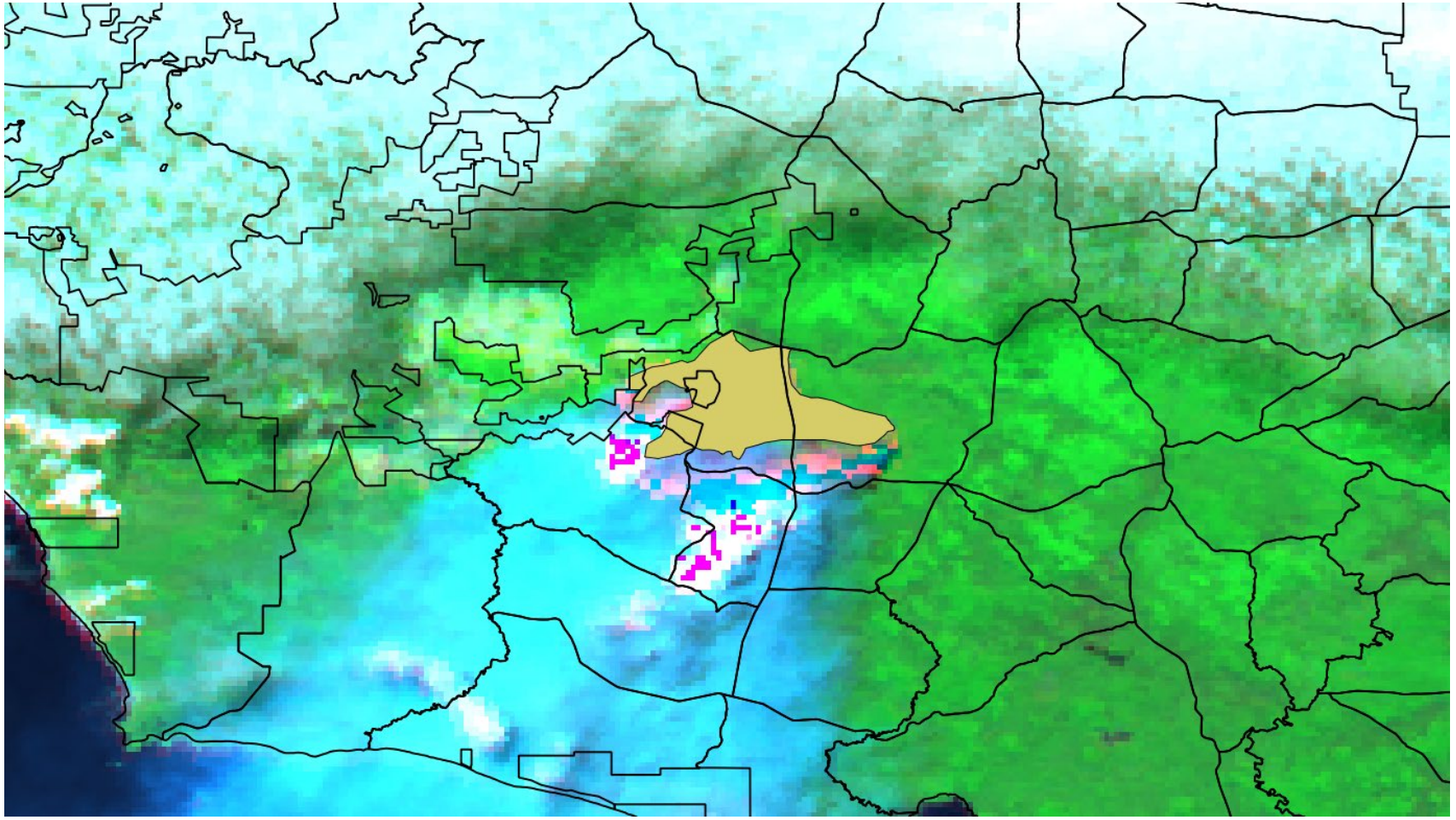
Fire shape – 10:30 Sunday 1/02



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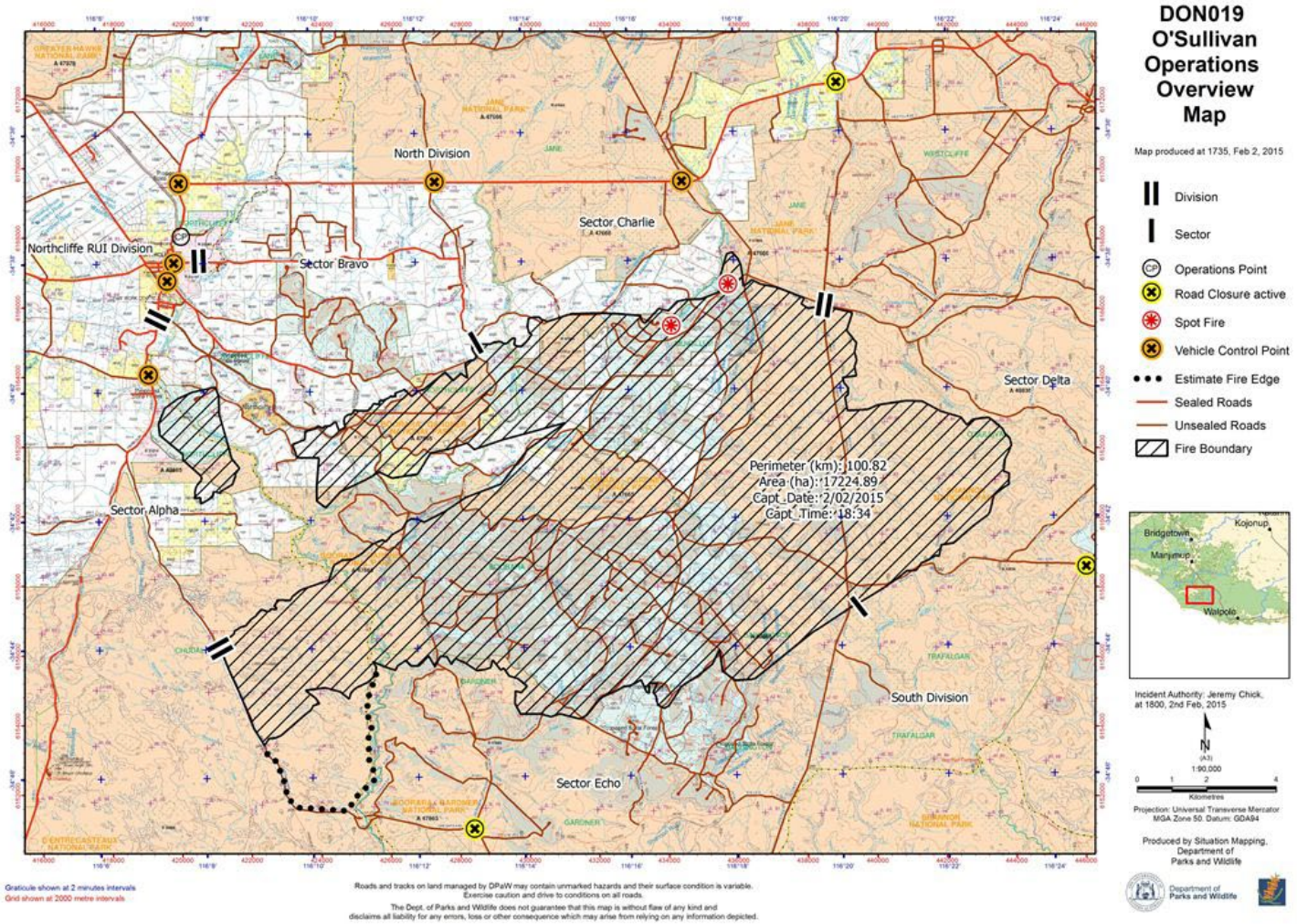
Fire 19 O'Sullivan – 17:30 2/02



Fire 19 O'Sullivan – 17:30 2/02

Convection column over the eastern end of the fire observed from Manjimup 60 km distant.

A similar but independent convection column existed at the western end of the fire…….

Red glow was visible from Manjimup in the evening.

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Fire 19 O'Sullivan – 08:30 4/02

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Lower south-west – 10:30 4/02

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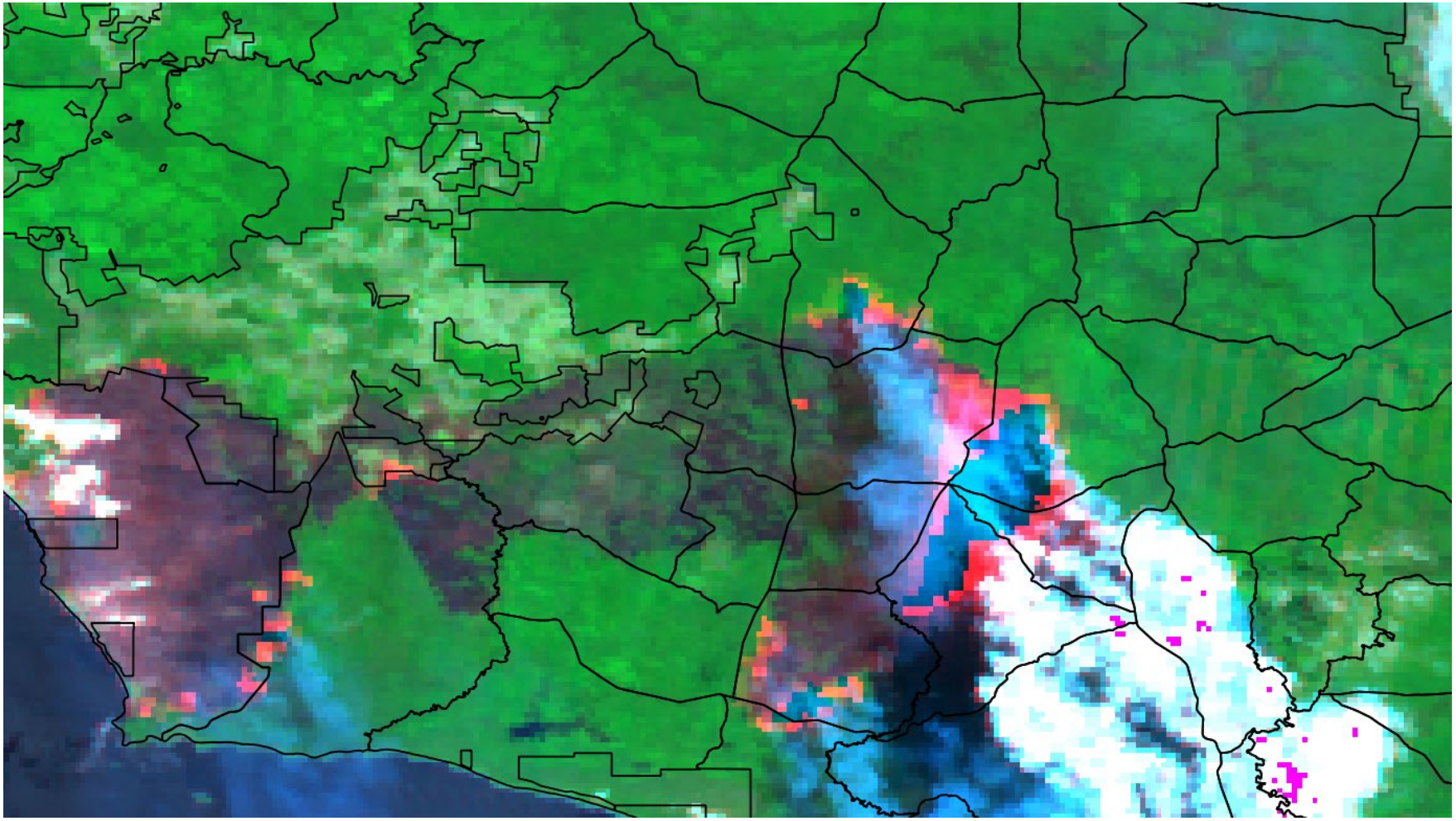
Fire 19 O'Sullivan – hotspots 10:40 4/02



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Fire 19 O'Sullivan – 19:30 5/02

Issues for fire weather and prediction

- Large scale of fire meant weather influences varied with time and place (eg. coastal vs inland)
- Spot forecasts required for multiple locations
- Three fixed weather stations plus a few portables to cover a very large area
- Spread predictions based on DEFM (Vesta) modified for wind ratio in karri forest types
- Strong gradient of temperature and moisture, conducive to strong convective activity

Related information:

- Report from BoM on weather conditions for periods of active fire growth
- Major incident review report
- Ongoing work to relate crown scorch and tree damage to fire spread and fuel age
- PhD study by Hannah Etchells (UWA) focused on fire severity, tree response and understorey species dynamics
- Early floristics responses studied by wardell-Johnson et al. (2018) *Pac. Cons. Biol.* 23