

Saving our water supply through prescribed burning



**Saving our (insert
value) through
prescribed burning**



Water Services – Melbourne Water

- **Responsible for the supply of affordable, high quality water**

Melbourne Water – Primary Objectives

- **To safeguard the quality and quantity of the water supply for the greater area of Melbourne.**
- **Supply affordable water**

Melbourne Water – How they do it

- **Manage Melbourne's water supply catchments – 162,000 ha (1600 sq. km)**
- **1,825,000 ML storage (currently about 87% full)**
- **450,000 ML /year supplied to 5 million consumers via three Government retail water companies**
- **Water from protected catchments comprises up to 80% of the annual supply**
- **Bulk of supply is unfiltered and disinfected (fluoride and chlorine)**
- **Restricted access to catchments**

Water Supply – Primary Risks

- **Bushfire is the greatest risk to water system**
- **Pathogens from humans and animals**

Dams and Catchments

— Water mains and aqueducts

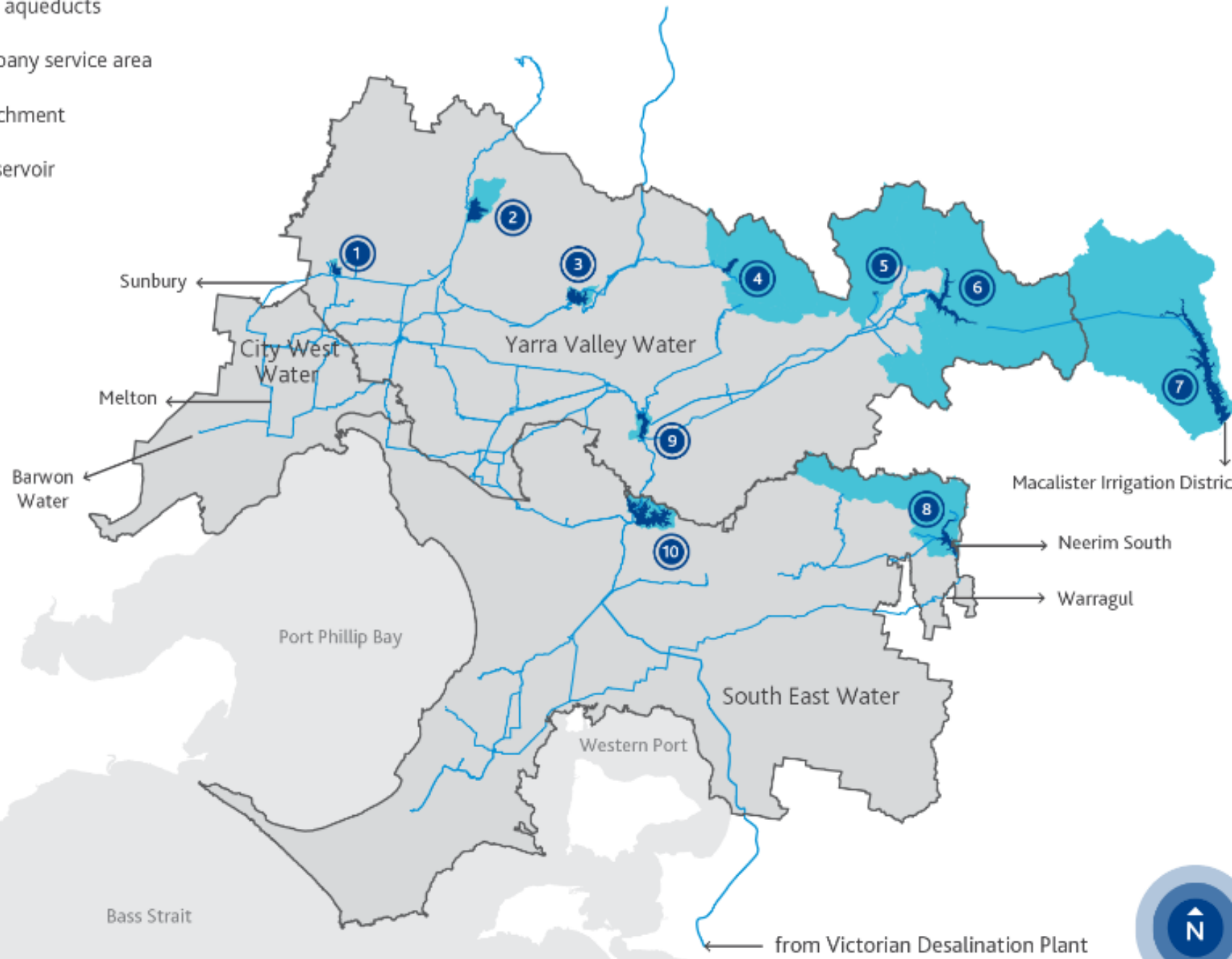
○ Retail water company service area

● Water supply catchment

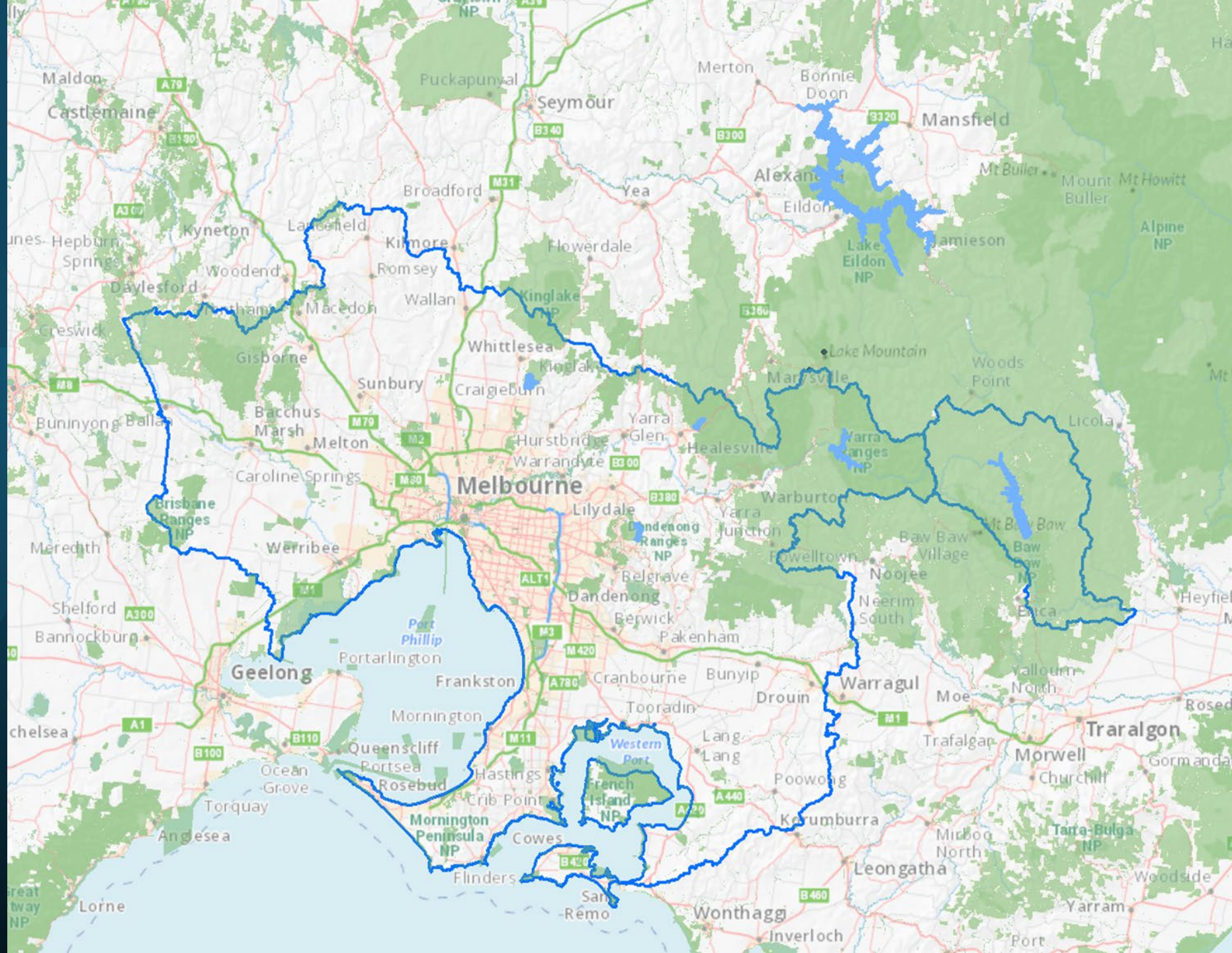
● Water storage reservoir

Reservoirs:

- ① Greenvale
- ② Yan Yean
- ③ Sugarloaf
- ④ Maroondah
- ⑤ O'Shannassy
- ⑥ Upper Yarra
- ⑦ Thomson
- ⑧ Tarago
- ⑨ Silvan
- ⑩ Cardinia



Bushfire Context – Fuel



Bushfire Context – Fuel



Bushfire Context - Fuel

Statement of Hazardous Nature

SUSMP Classification: S5

ADG Classification: Class 3: Flammable liquids.

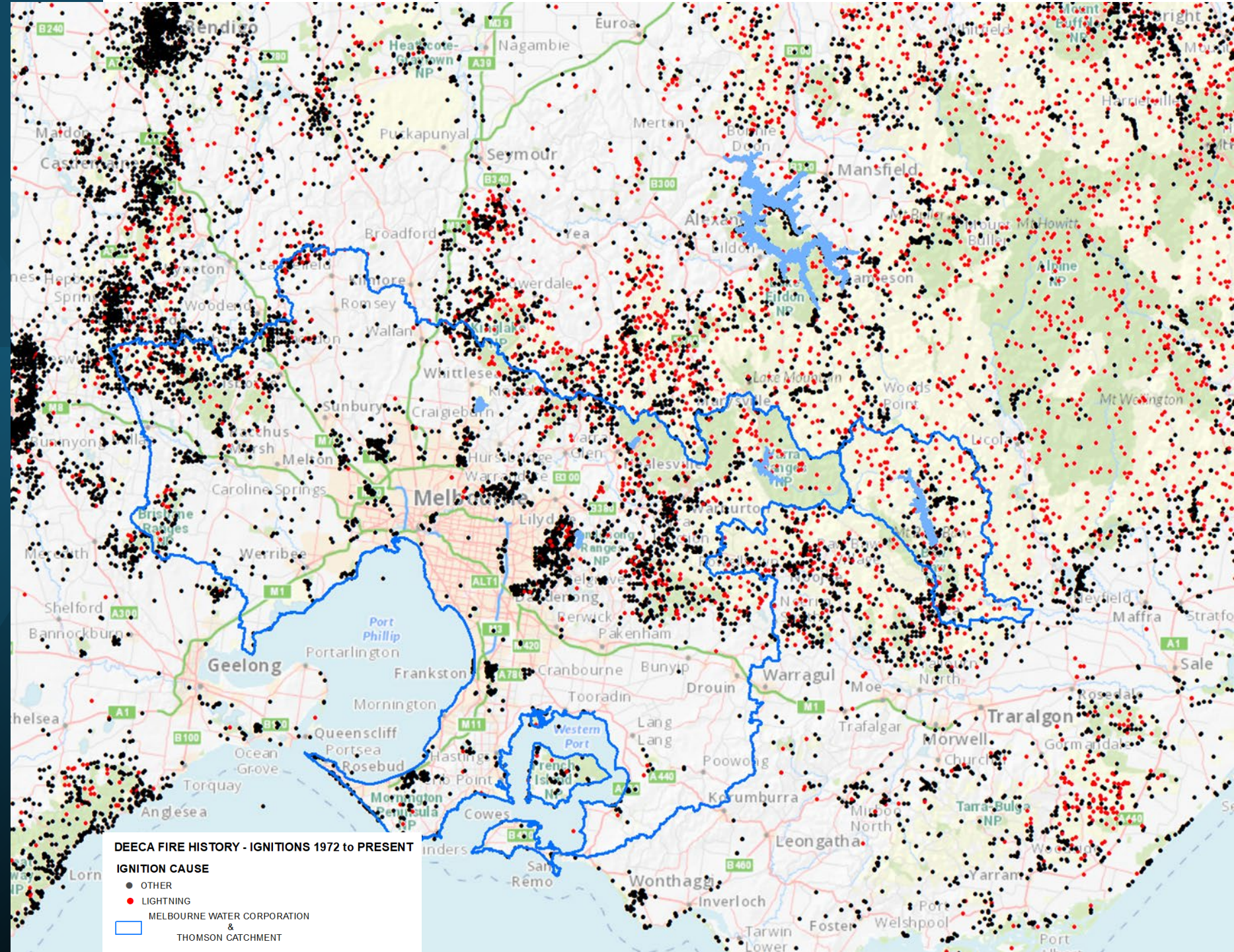
UN Number: 1993, FLAMMABLE LIQUID, N.O.S.



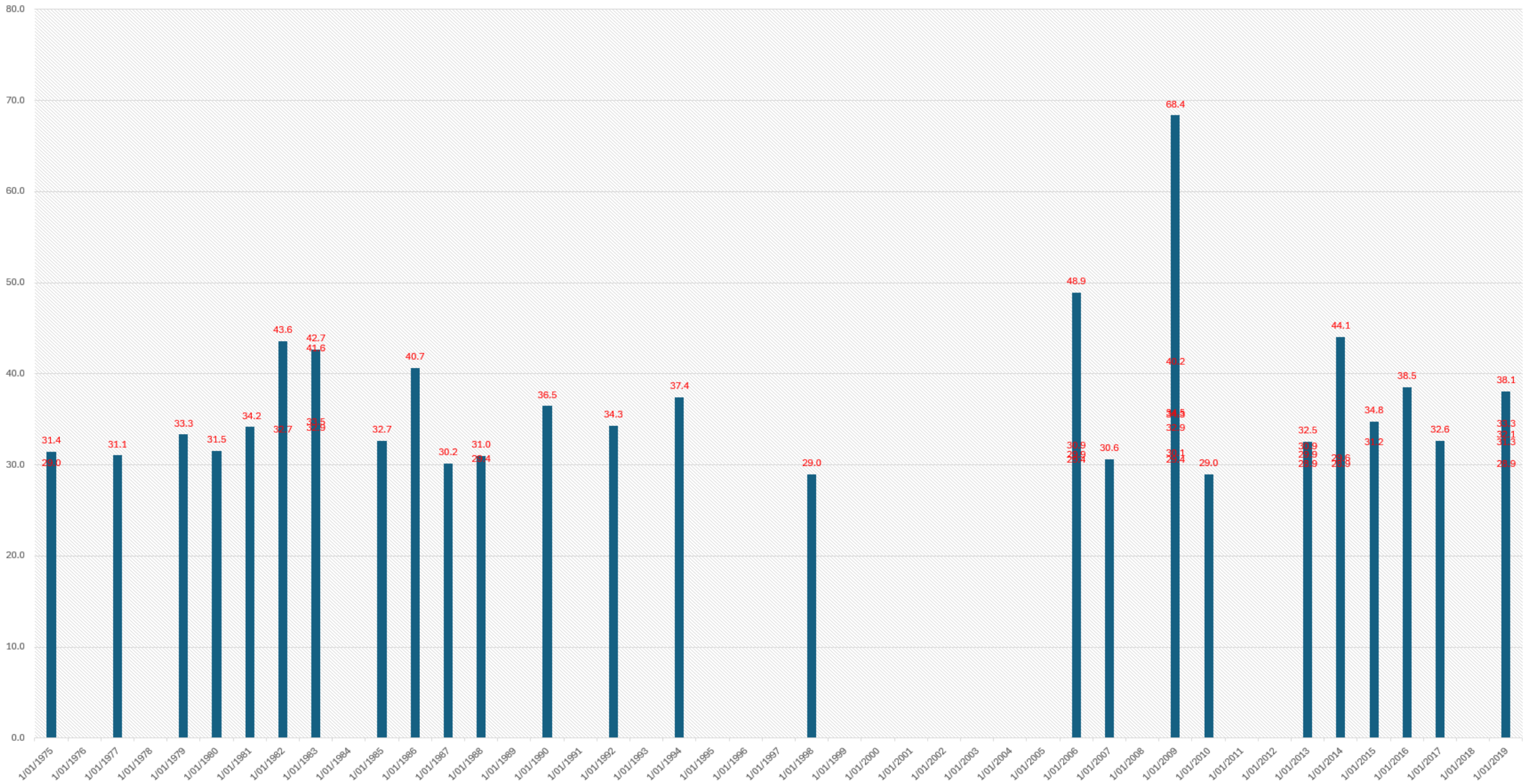
GHS Signal word: WARNING

Flammable liquids Category 3

Bushfire Context – Ignition



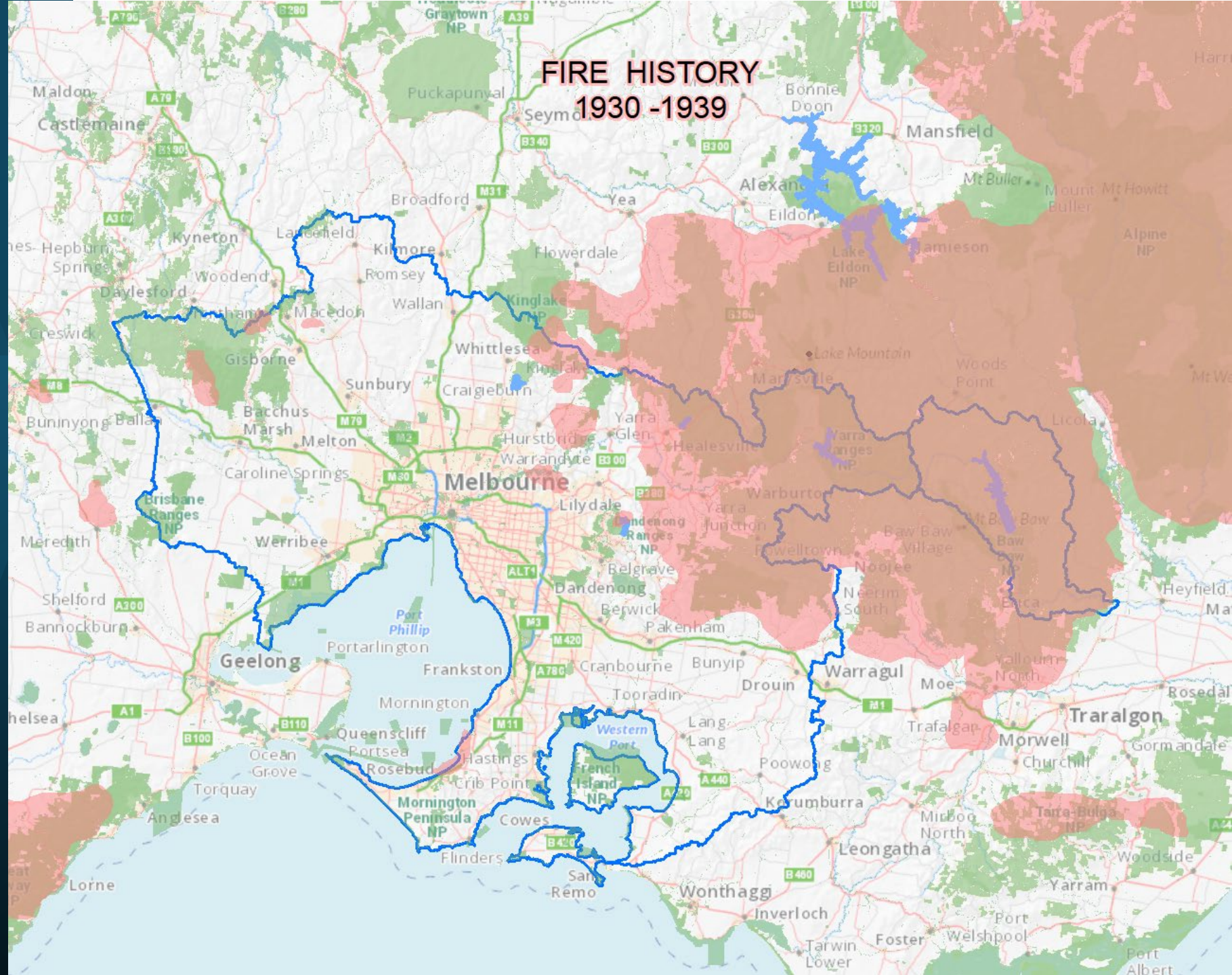
MARYSVILLE fdi_maximum- HIGHEST 50 DAYS 1975 - 2020



Bushfire Context

- **In Australia, between 1901 and 2011 there have been 825 civilian and firefighter fatalities caused by bushfires.**
- **Of these fatalities, 92 have been firefighters and 733 civilians.**
- **Victoria accounts for 61.3 percent of all fatalities (474 civilian, 32 firefighters), which is nearly four times more than the next nearest State (NSW with 99 civilian and 40 firefighters).**
- **Of the ten major fire days in Australia involving fatalities, eight occurred in Victoria**

Bushfire Context



Bushfire Context



Bushfire Context



Bushfire Context



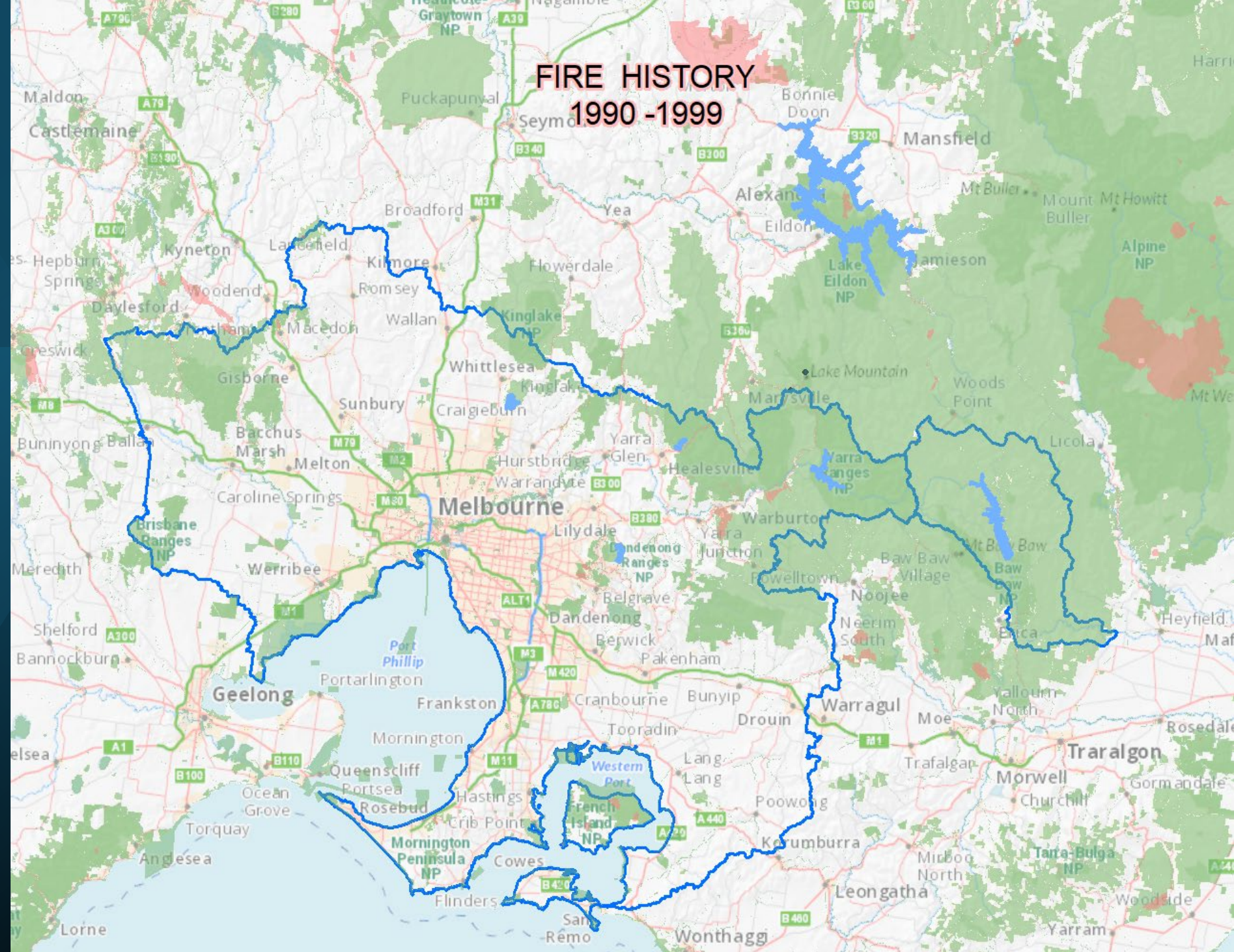
Bushfire Context



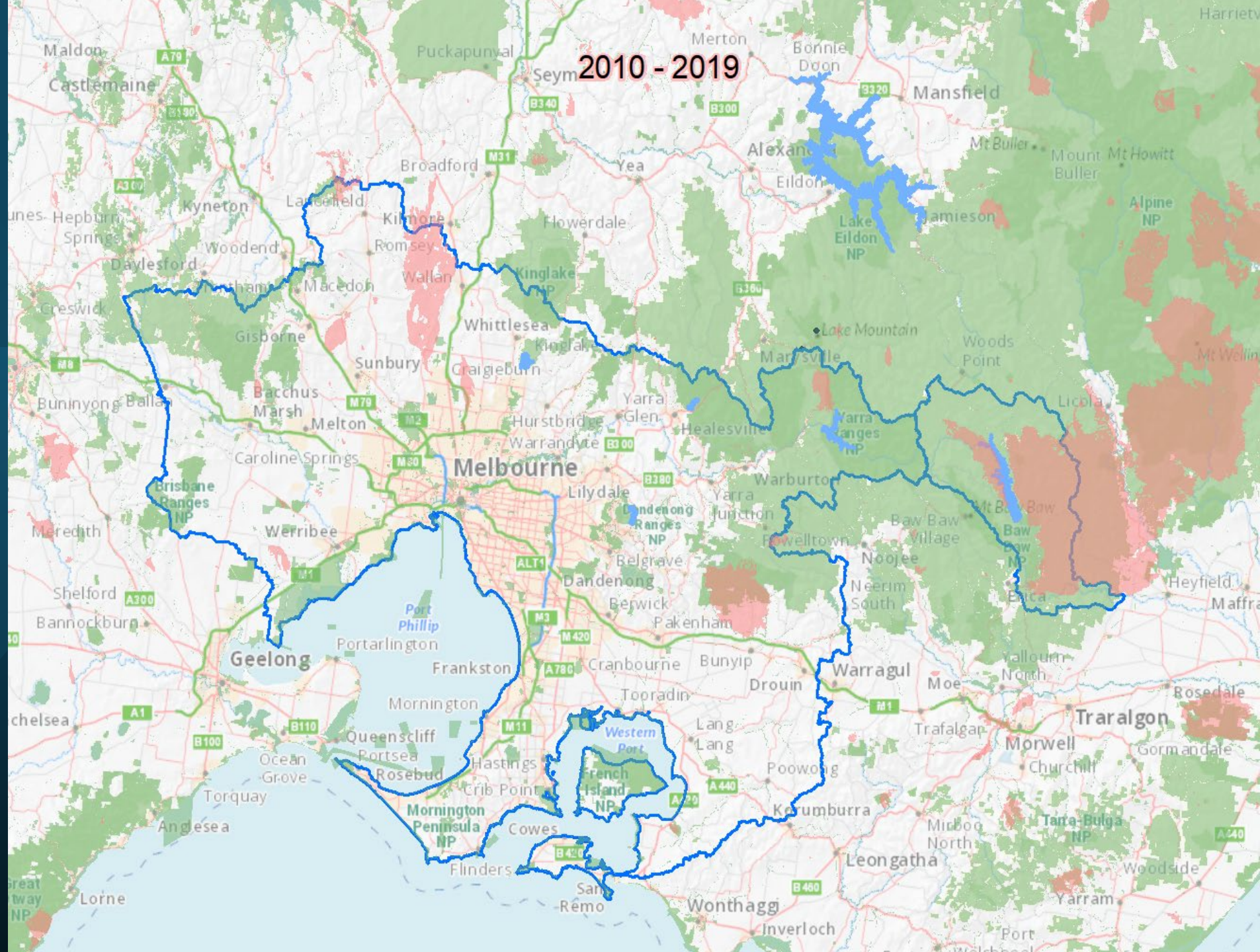
Bushfire Context



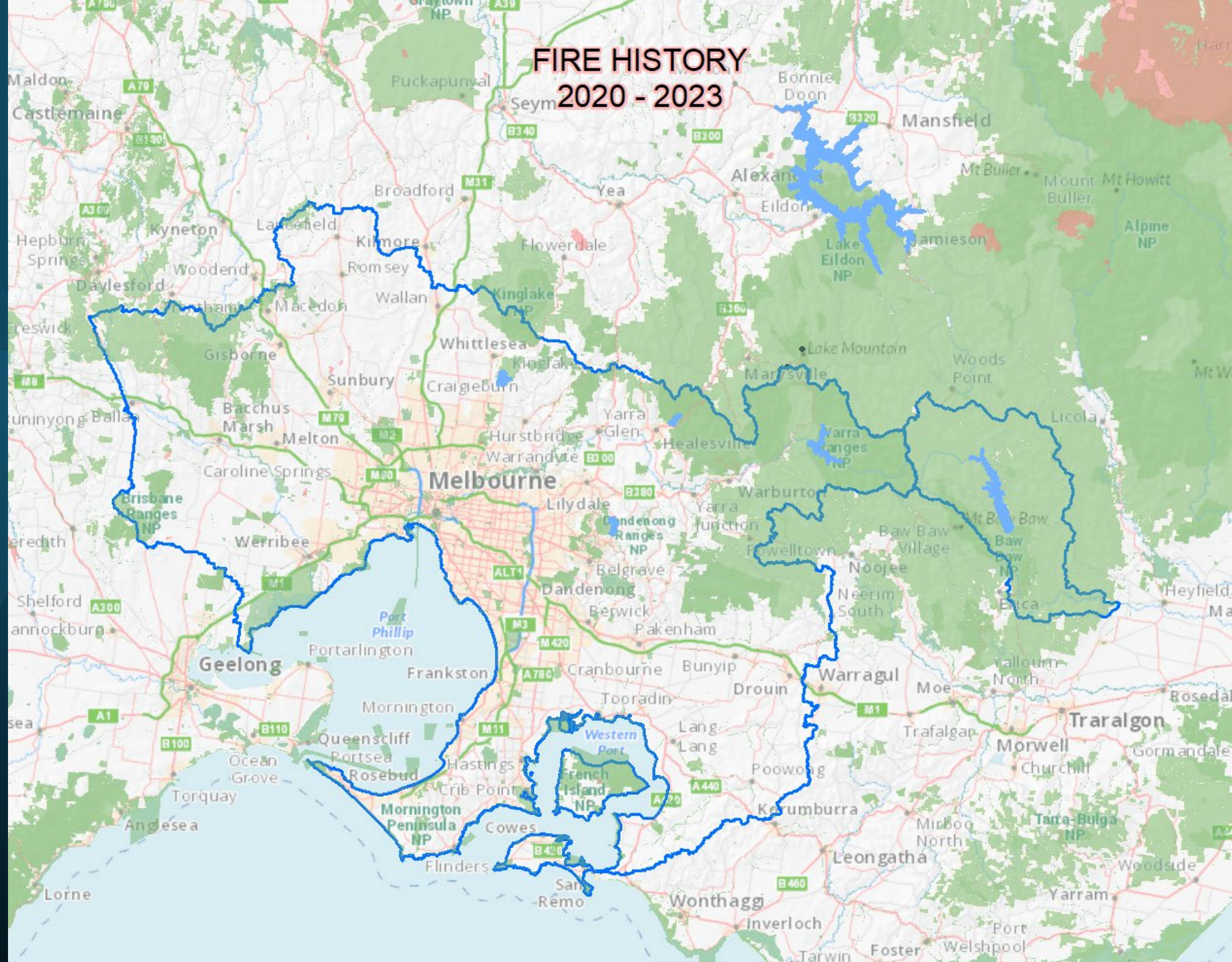
Bushfire Context



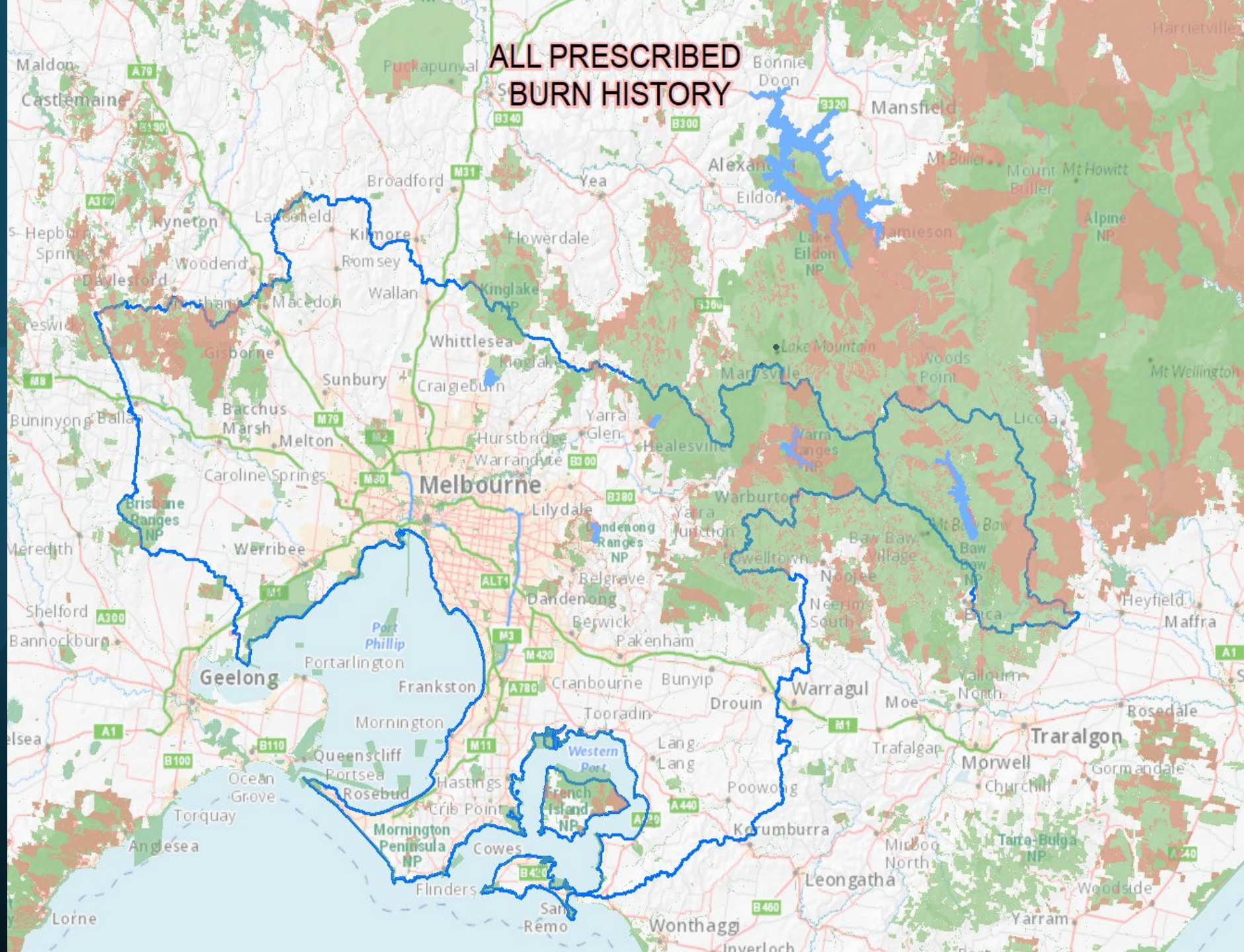
Bushfire Context



Bushfire Context



Bushfire Context



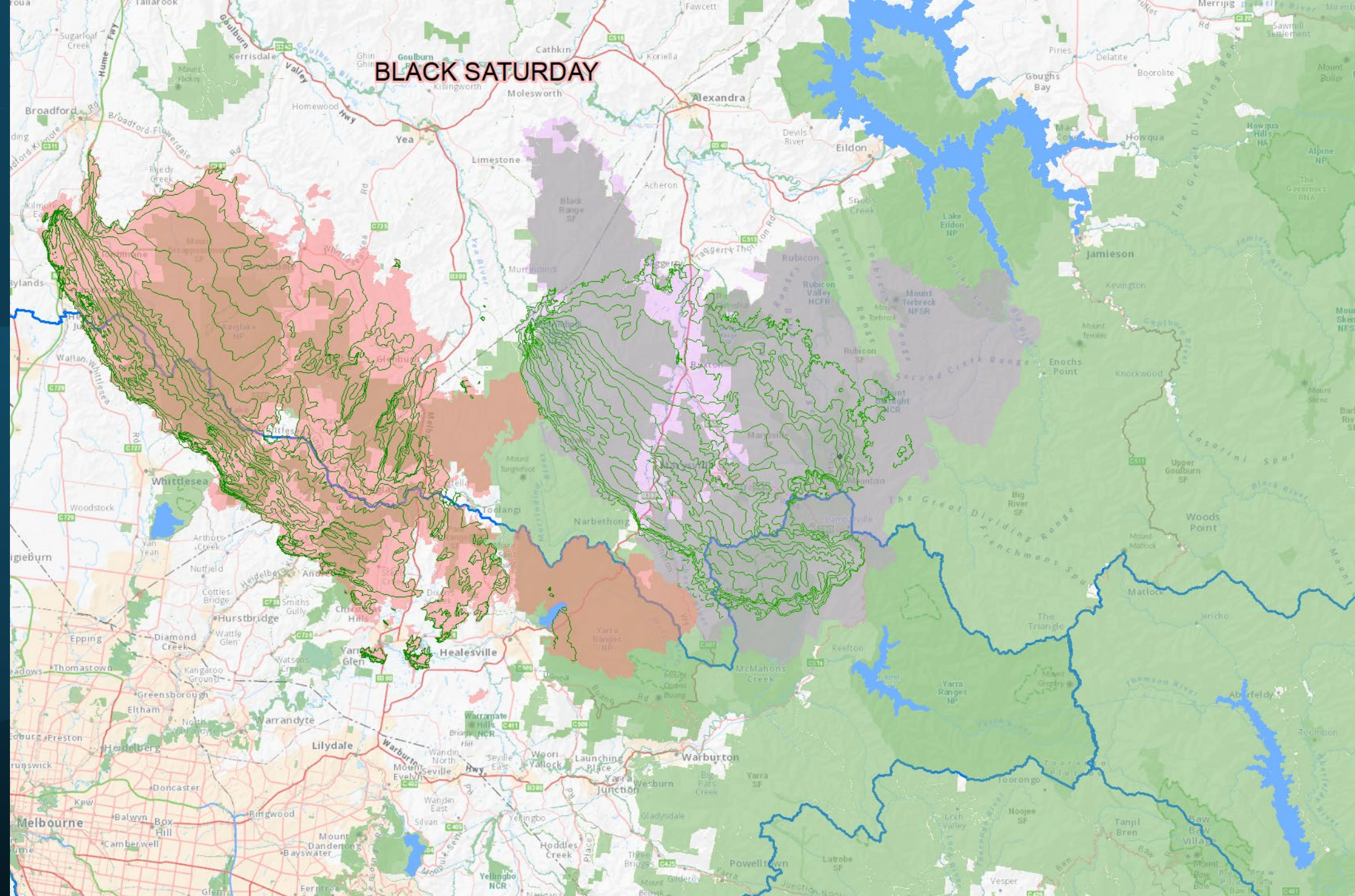
Melbourne Water – Contingency Plans

- **Melbourne Water invest heavily in bushfire prevention and preparedness**
- **Contingency and redundancy plans exist for a range of scenarios**
- **Location and scale of disturbance is important**
- **Some worst-case scenarios can't be excluded and consequences would be significant**

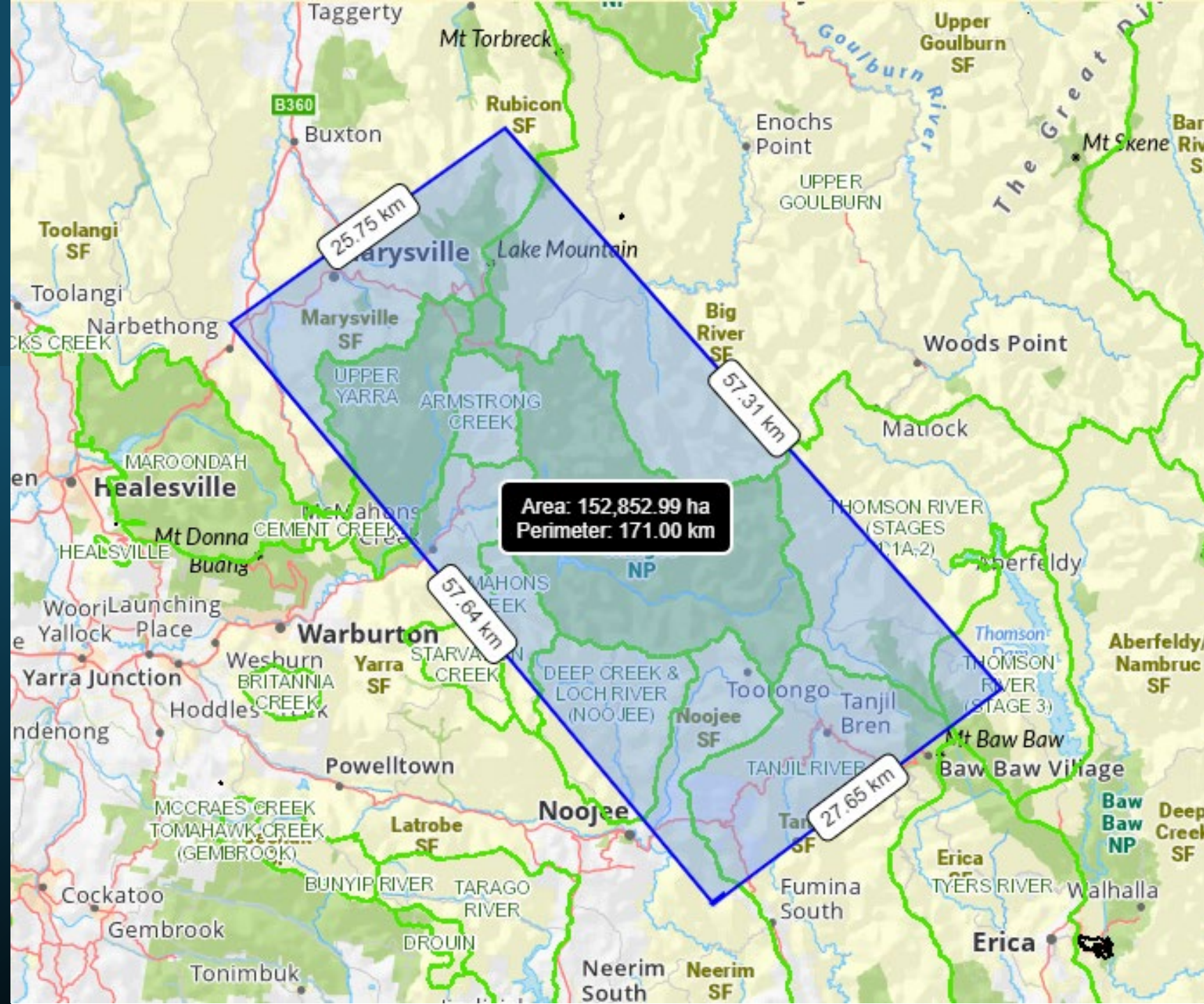
Melbourne Water – Scenario

- **Upper Yarra and Thomson catchment burnt by high severity bushfire**
- **Subsequent rainfall**

BLACK SATURDAY



What if?





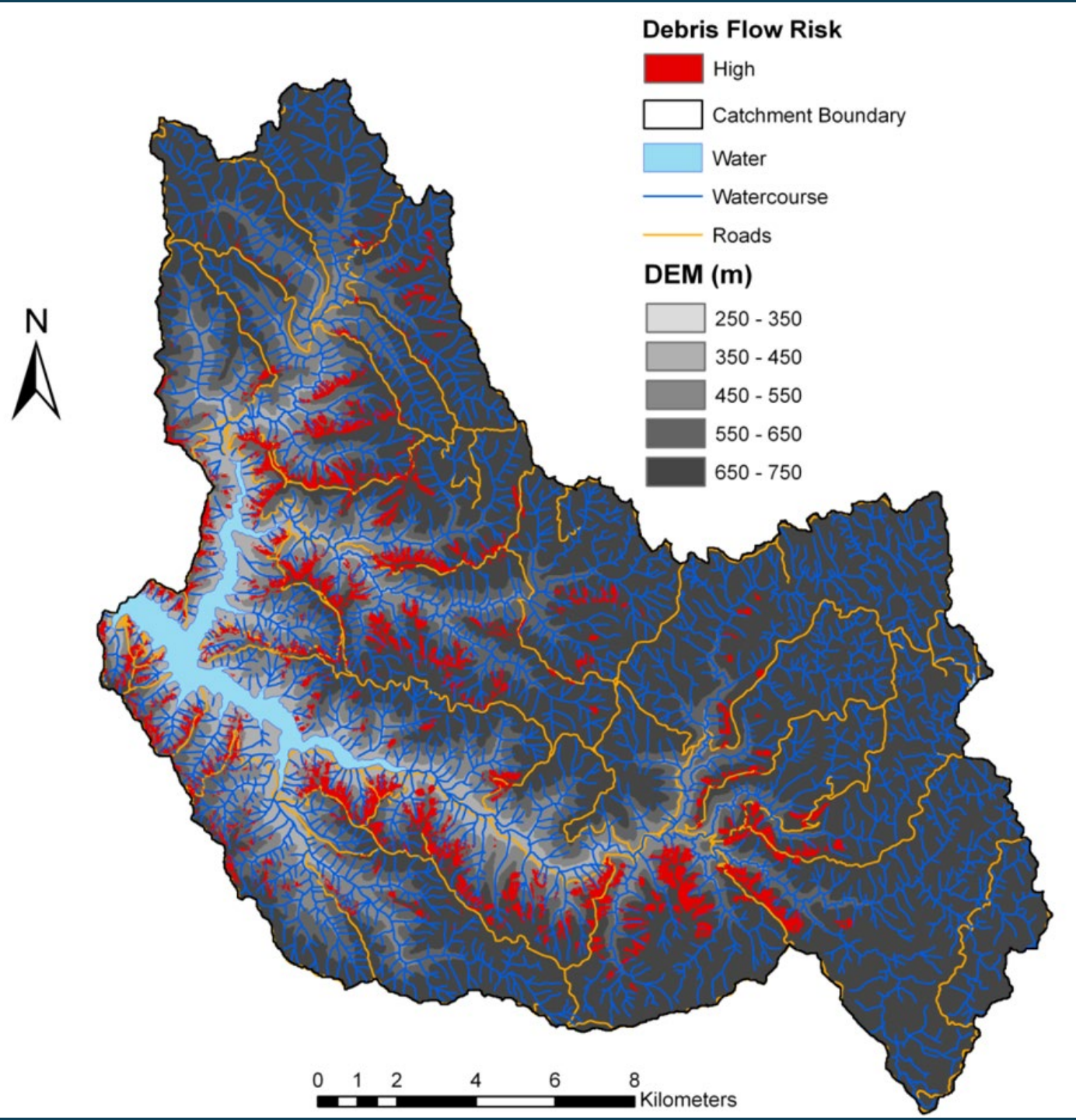
Bushfire Consequences

	Area	Unburnt	Low	Medium	High	Extreme
	(ha)	%	%	%	%	%
Walwa bushfire 2019/20	177085	0	25	13	46	16
Actual planned burns 2022/23	6049	42	51	3	1	1

Bushfire Consequences

- **Water quality - Debris flow - 0-2 years**
- **Water yield – regrowth forest - > 100 years**

Sediment & Debris Flow



Sediment & Debris Flow



Sediment & Debris Flow



Sediment & Debris Flow



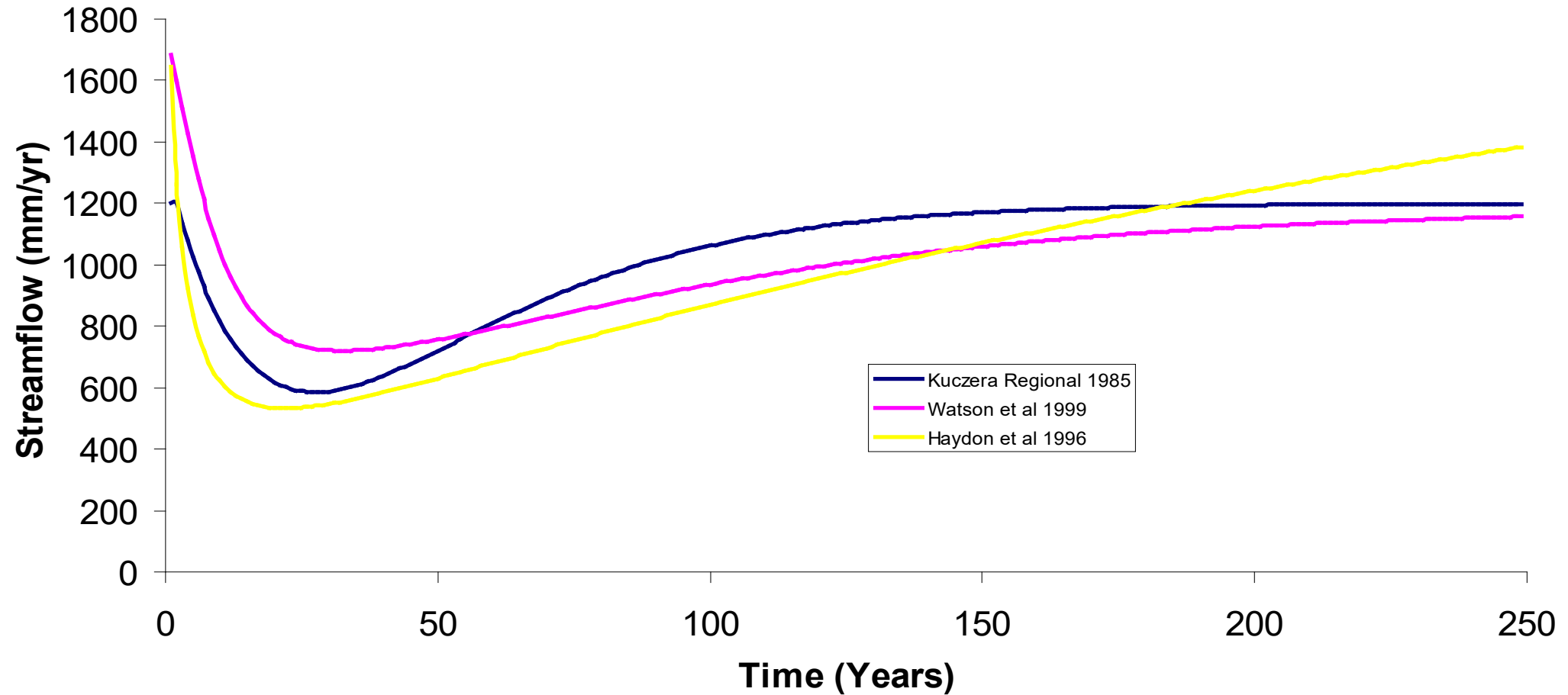
Sediment and Debris Flow



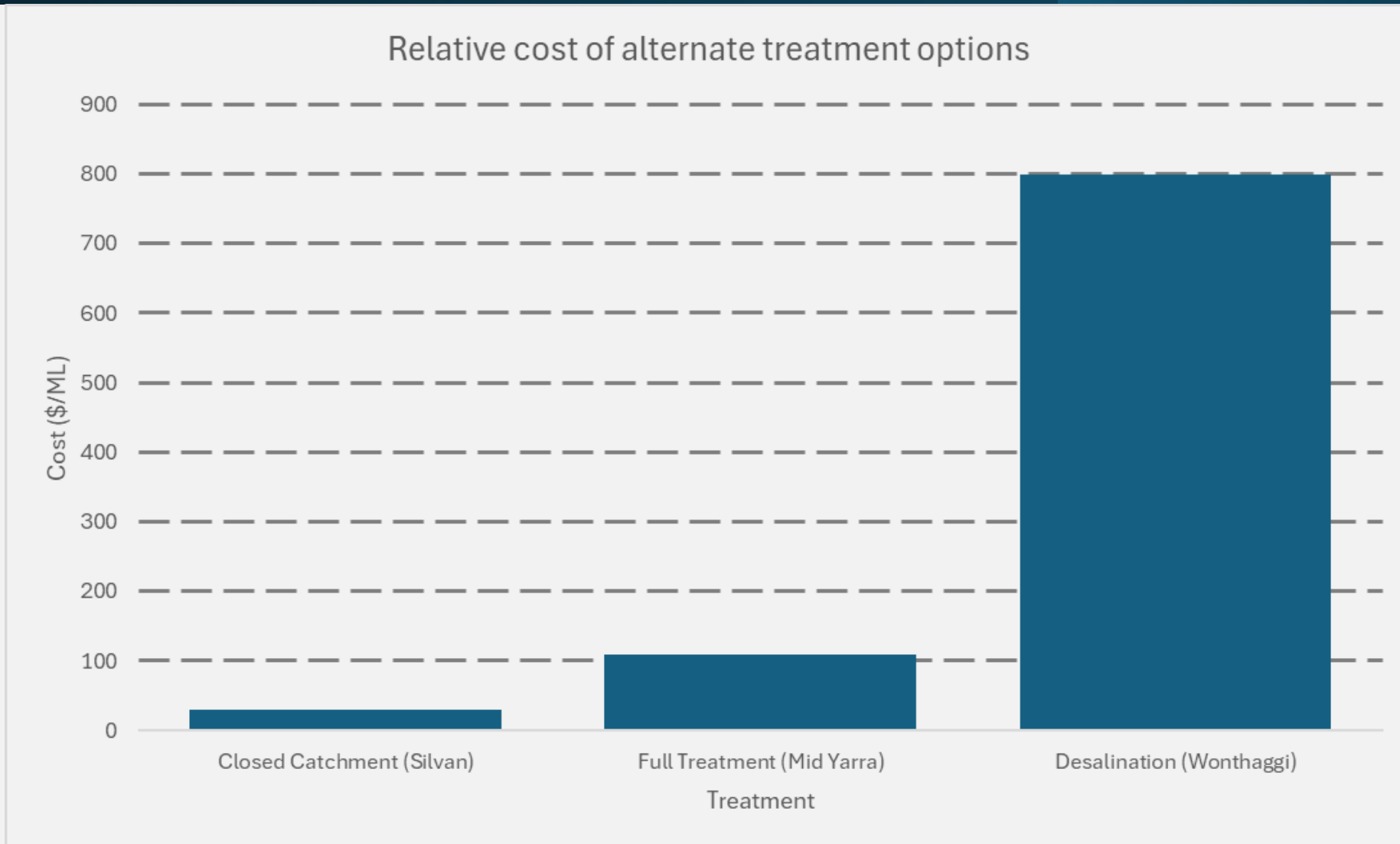
Water Quality – Cost

- **Water treatment plant at Silvan \$3.5 billion to build**
- **10 – 15 year build**
- **Large footprint**
- **\$50 million/year to operate**

Water Quantity



Water Quantity – Cost



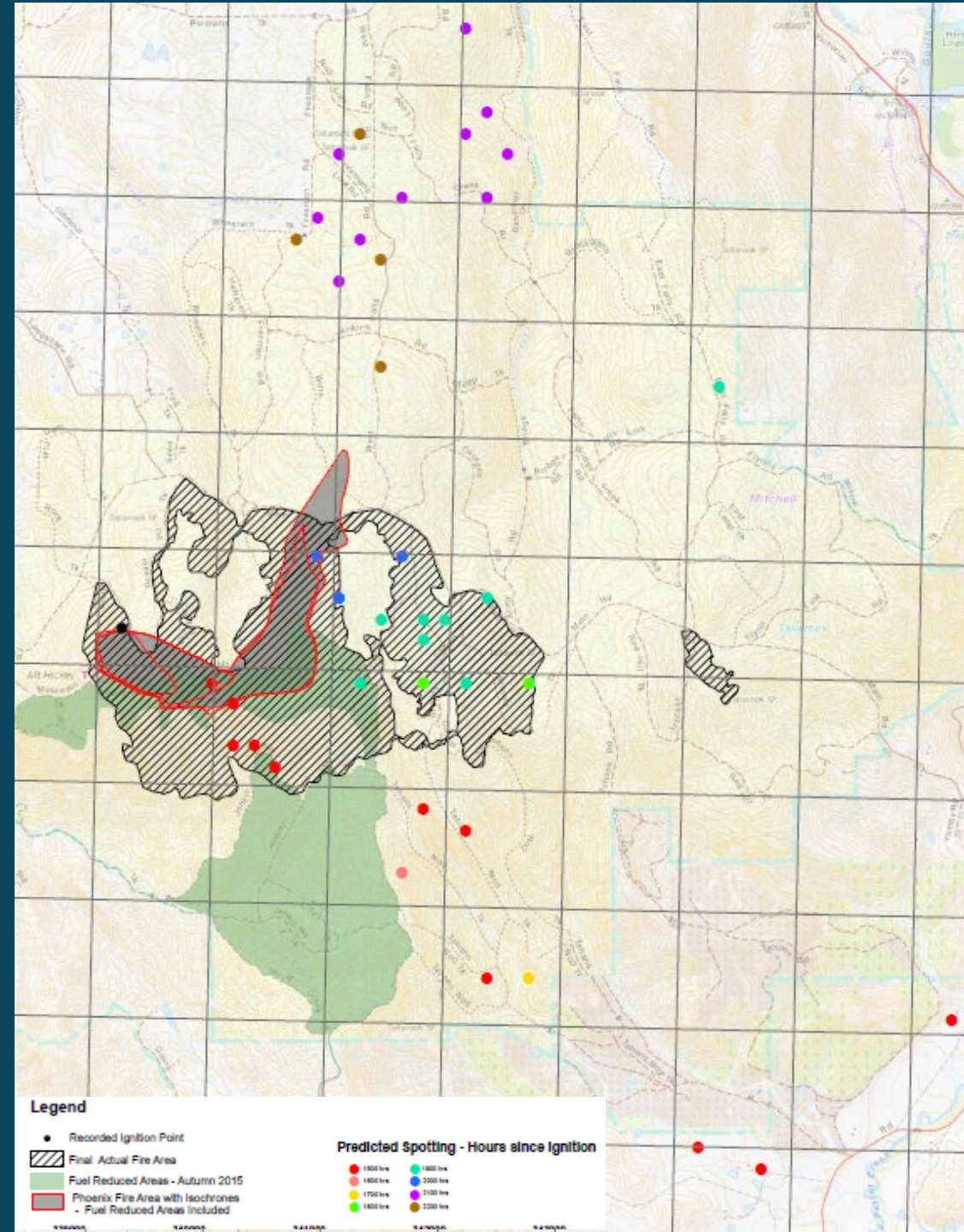
Bushfire Consequences

- **Restrictions for extended periods**
- **Pay for contingency solutions (eg full treatment)**
- **Frequent fire stand change scenario - different species can change water quality and quantity**

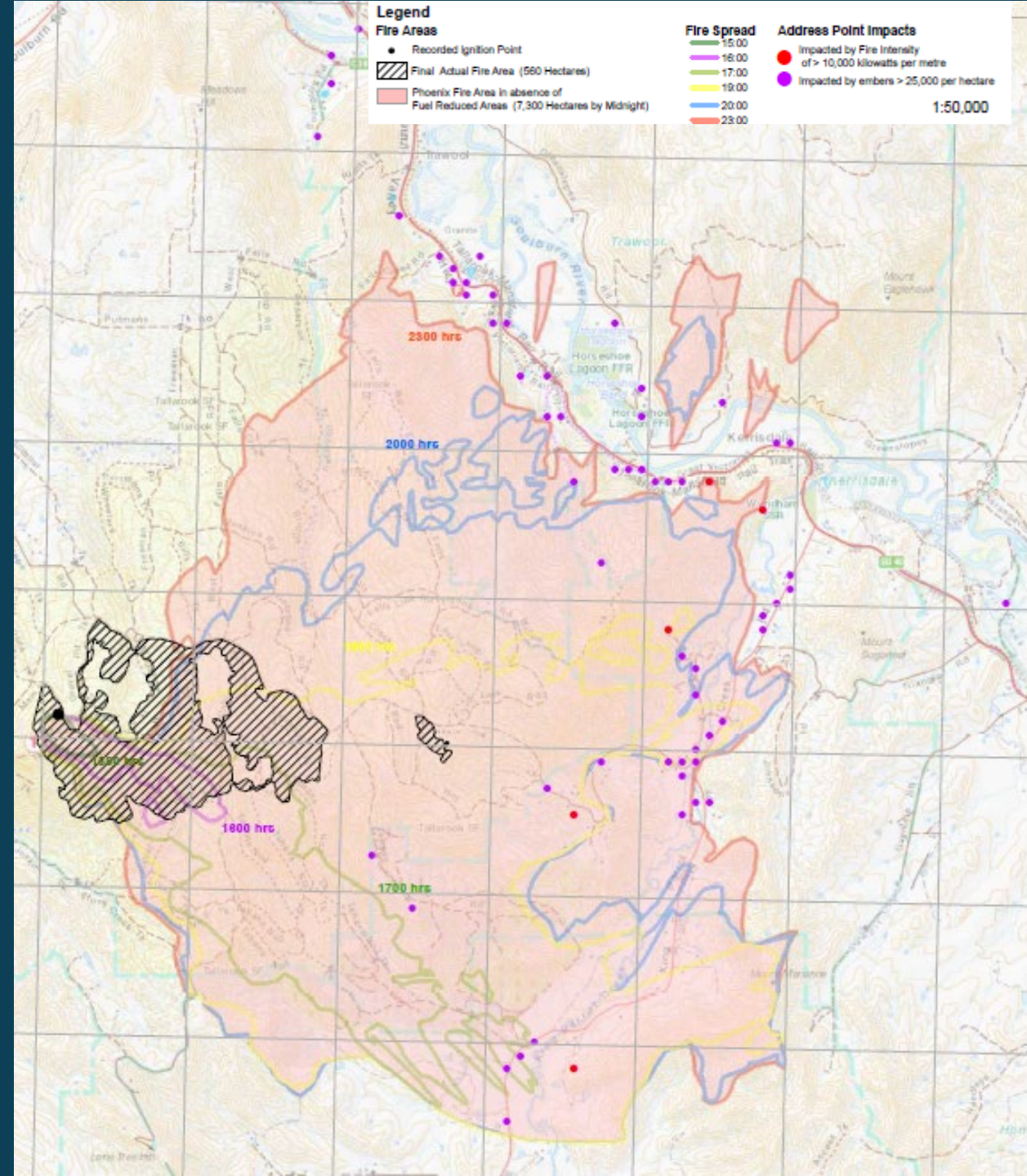
Tallarook – Mt Hickey Case Study

- Tallarook State forest located north of Melbourne between Seymour and Broadford
- Around 5,100 ha of mixed species eucalypt forest
- 6 October 2015 – unseasonally hot, dry and windy (Lancefield)
- Fire started at 14.00 hrs
 - Temp: 35° C
 - RH: 8 %
 - Wind: NW 55 (av) – 81 (gust) km/hr
 - DI: 88
 - FFDI: 114 (catastrophic) at 14.00 hrs

Case Study



Case Study



Tallarook – Mt Hickey Case Study

- **The final fire size was 557 hectares and the fire was contained solely within the Tallarook State forest. No properties were affected by the fire.**
- **No planned burn results in an area of approximately 7,500 hectares. Around 65 properties impacted.**
- **Planned burn results in 92.5% reduction in size under catastrophic conditions.**

Beechworth – Mudgegonga Case Study

- **Library Road is located around 3 km south of Beechworth**
- **Mixed species eucalypt forest**
- **7 February 2009 (Black Saturday)**
- **Fire started at 18.00 hrs**
 - **Temp: 45.5° C at 15.00 (Wangaratta)**
 - **RH: 6 % at 15.00 (Wangaratta)**
 - **Wind: NNW 35 (av) – 57 (gust) km/hr at 14.00 (Wangaratta)**
 - **FFDI: 126 (catastrophic) at 13.30 hrs (Wangaratta)**

Beechworth – Mudgegonga Case Study

Phase 1 (18.00 to 21.30)

- Flame height 10 m and spotting 500 m
- 8 km total (2 km/hr)
- In fuel reduced areas (2003 bushfire , 2005 and 2008 planned burns)

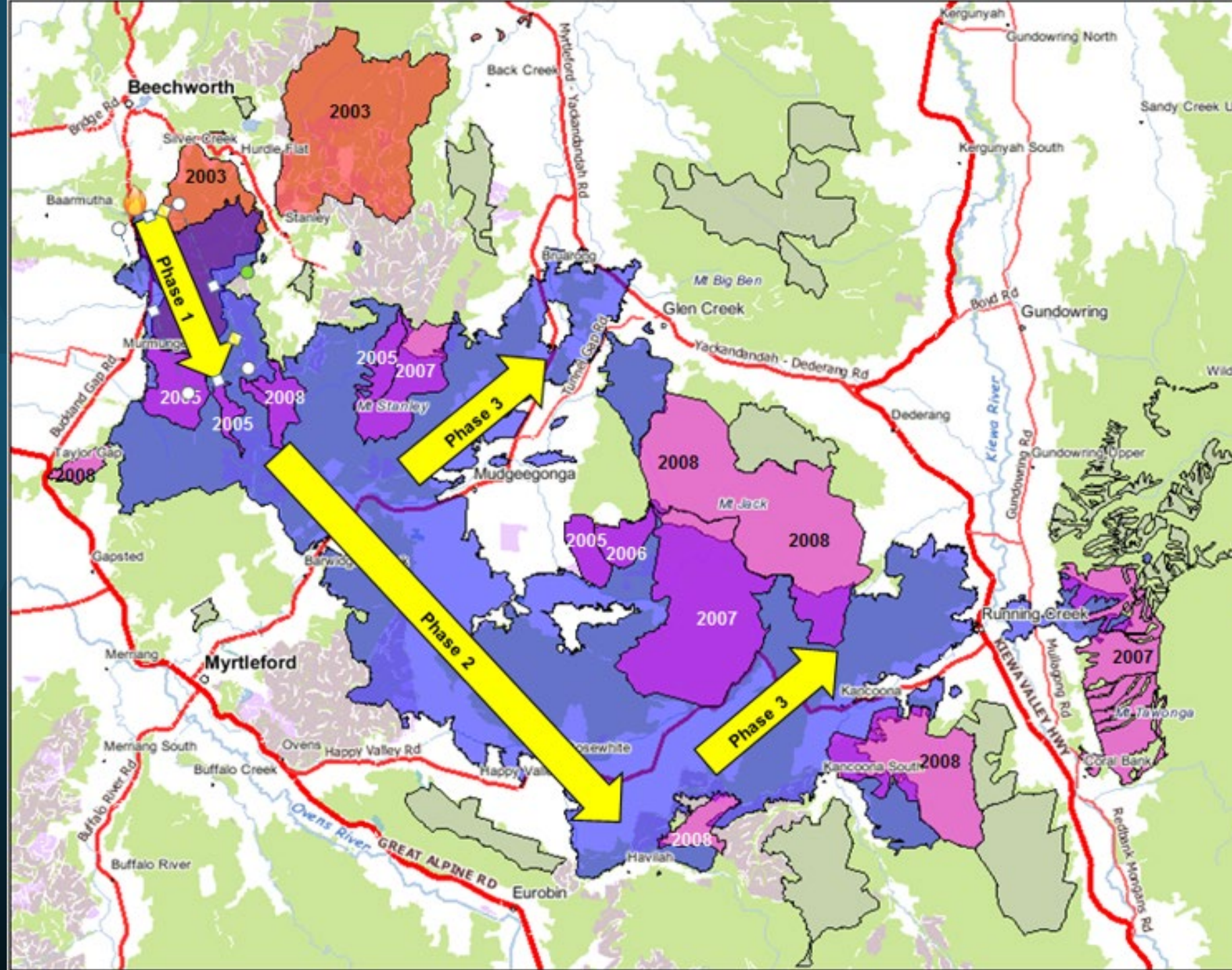
Phase 2 (21.30 to 03.00)

- Crown fire and spotting 9 km
- 24 km total (5 km/hr)
- In non-fuel reduced areas

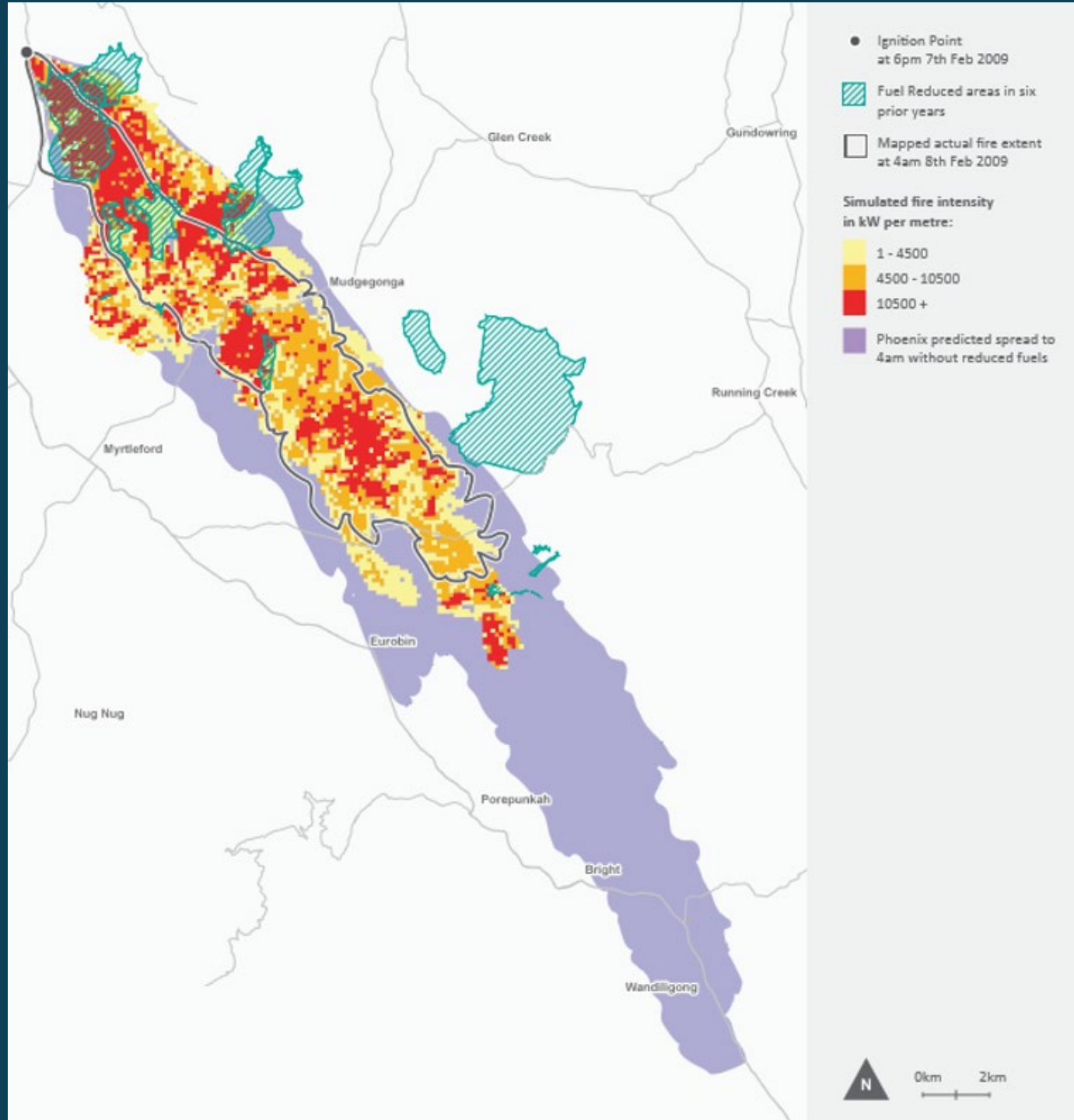
Phase 3 (03.00 onwards)

- South-west wind change

Case Study



Case Study



Beechworth – Mudgegonga Case Study

- **In the absence of planned burns fire run would have been at least 12 km longer (32 km v 44 km) – 28% reduction**
- **Phoenix modelling suggests 56 km – 43% reduction**

Beechworth – Mudgegonga Case Study

- **Marysville, Narbethong, Buxton – 40 killed, >500 houses.
Population (2006) 1,190**
- **Beechworth-Mudgegonga - 2 killed, 38 houses**
- **Bright, Porepunkah and Wandiligong population (2011) – 3,415**
- **Pro -rata impacts – 115 killed, 1435 houses**

Conclusion

- **Planned burning works under even the most extreme conditions**
- **You don't have the option of a 'no bushfire' regime.**
- **A well planned and consistently delivered planned burning program must be a key element of a future risk management framework to help ensure a sustainable supply of affordable water for Melbourne.**