



# REFLECTING ON HISTORY TO GUIDE OUR FUTURE



**20 YEARS OF SIGNIFICANT FIRE HISTORY**

**CLIMATE CHANGE**

**2040: FUTURE SCENARIOS**



2002



0  
community fatalities

0  
firefighter fatalities

180,000  
hectares of land burnt

9,754  
hectares burnt before  
reproductive maturity

0  
homes destroyed

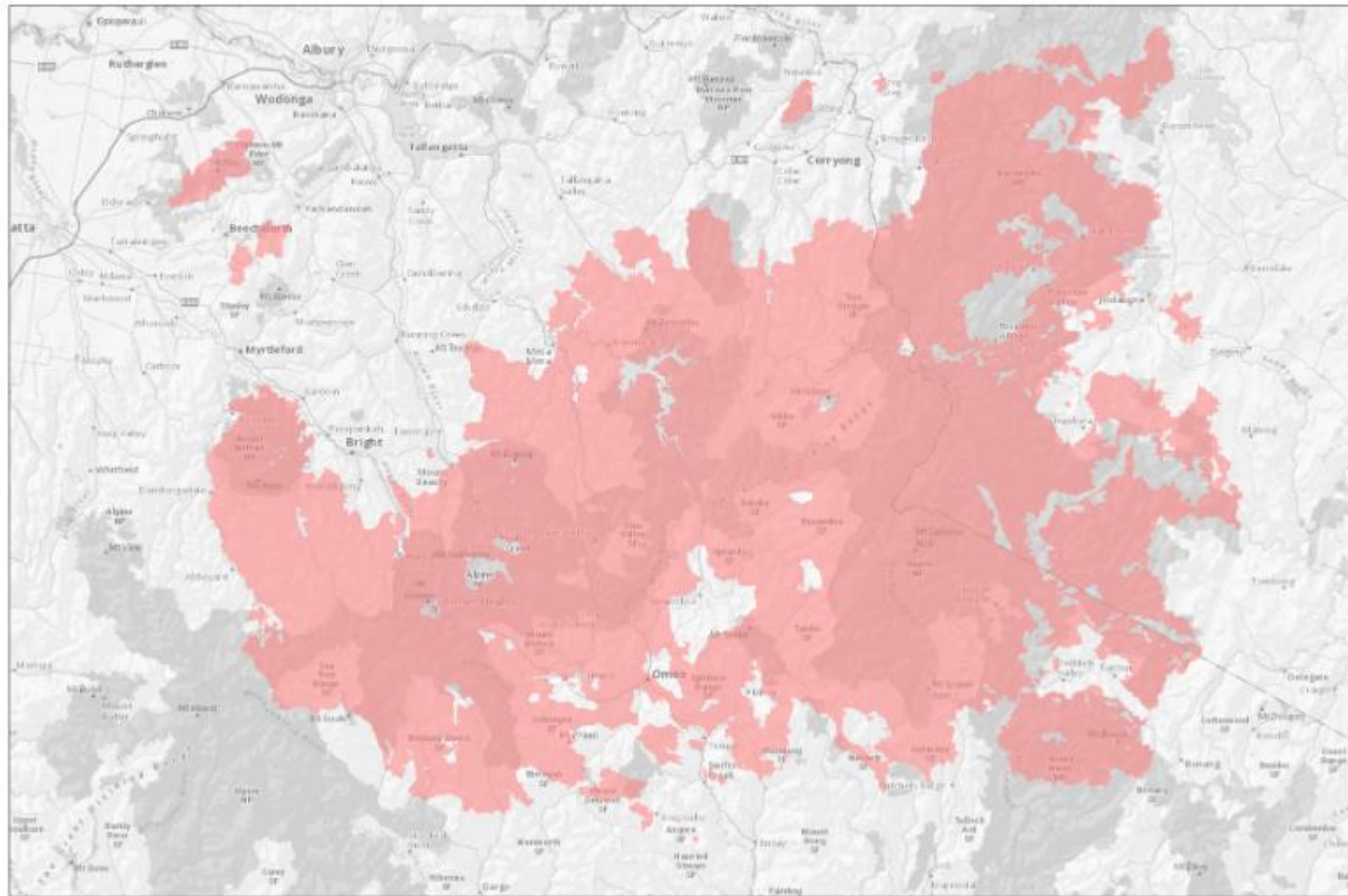
1  
structure destroyed



 = 10,000 hectares     = 100,000 hectares (little smaller than Geelong)

# BIG DESERT FIRE

2002/03



0  
community fatalities

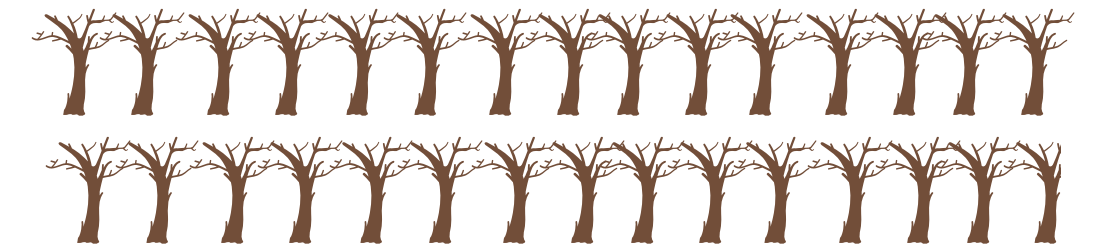
1  
firefighter fatalities

1,300,000  
hectares of land burnt

296,998  
hectares burnt before  
reproductive maturity

41  
homes destroyed

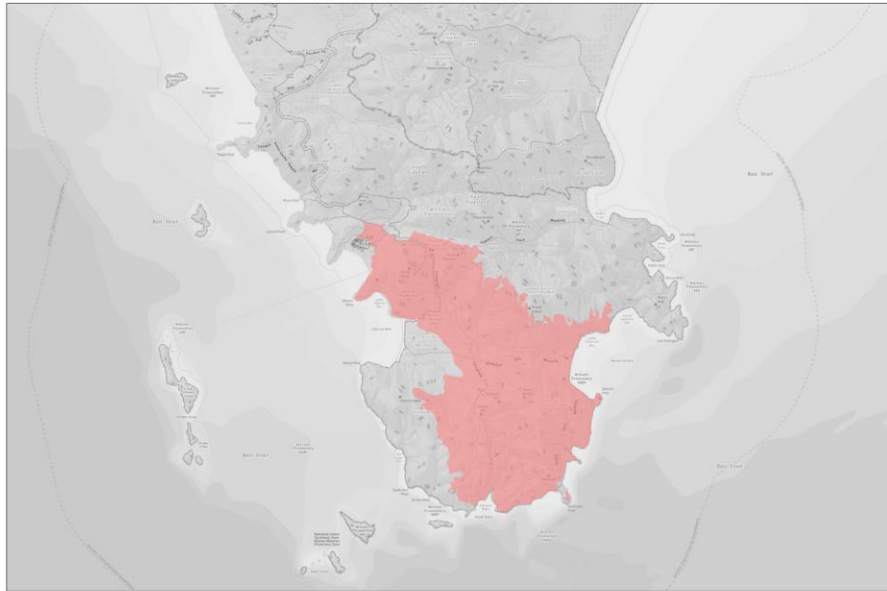
254  
structures destroyed



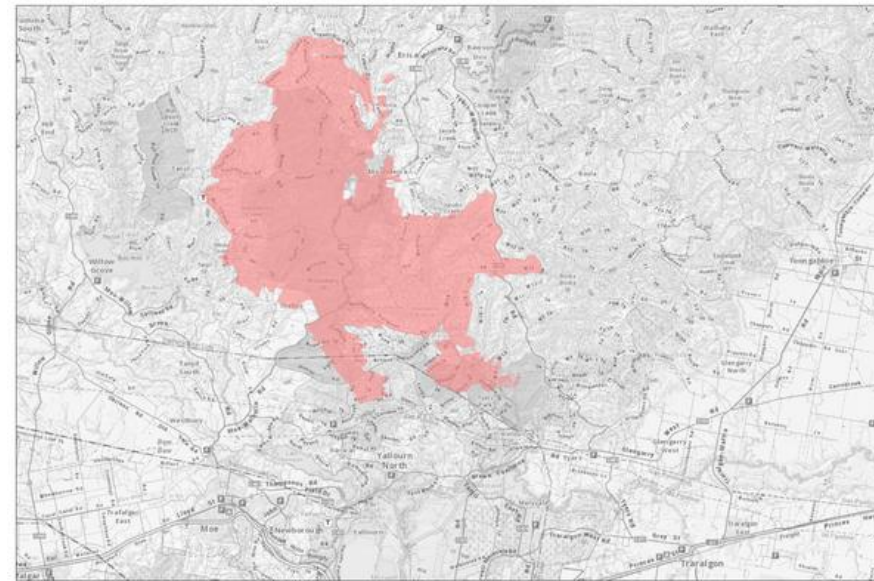
 = 10,000 hectares     = 100,000 hectares (little smaller than Geelong)

# 2005/06

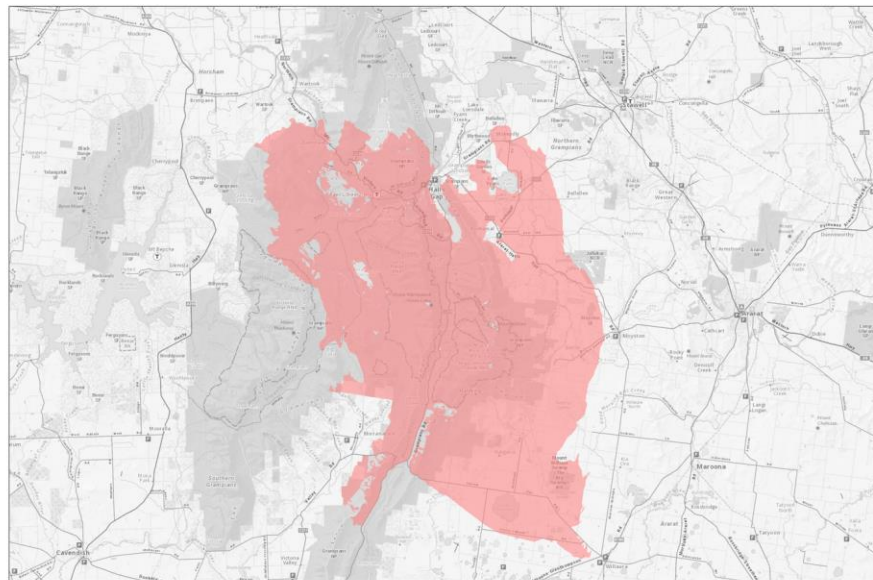
Wilson's Promontory - 1st April to 12th April 2005 - 6,520 Hectares



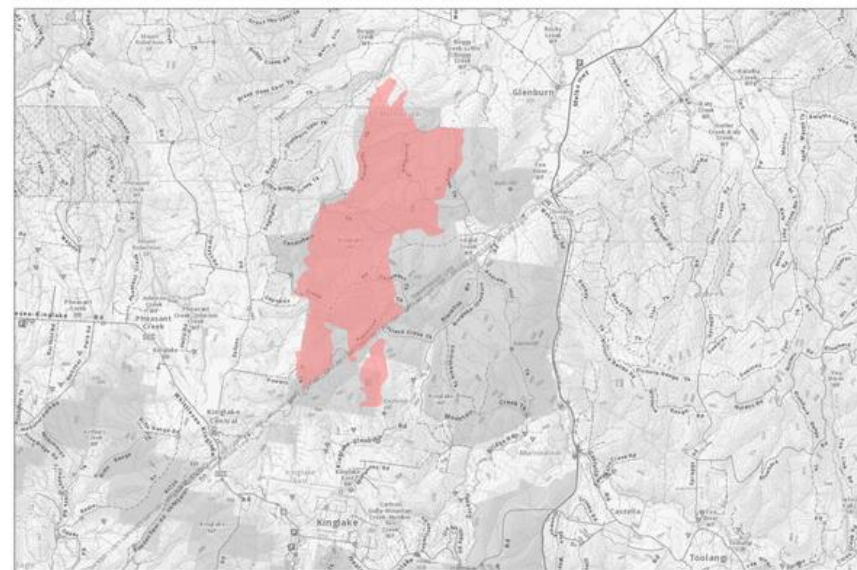
Erica - Moondarra - 19th January to 12th February 2006 - 15,200 Hectares



Grampians - Mount Lubra - 19th January to 20th February 2006 - 130,000 Hectares



Kinglake - Burgan Track - 19th January to 20th February 2006 - 1,650 Hectares



4  
community fatalities



0  
firefighter fatalities

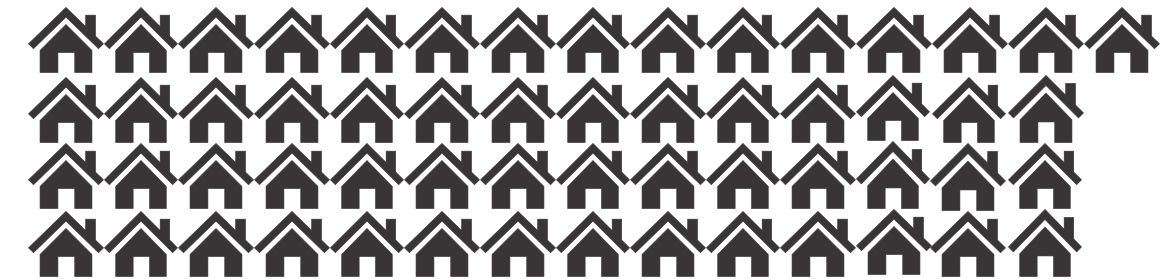
224,000  
hectares of land burnt



25,068  
hectares burnt before  
reproductive maturity



57  
homes destroyed



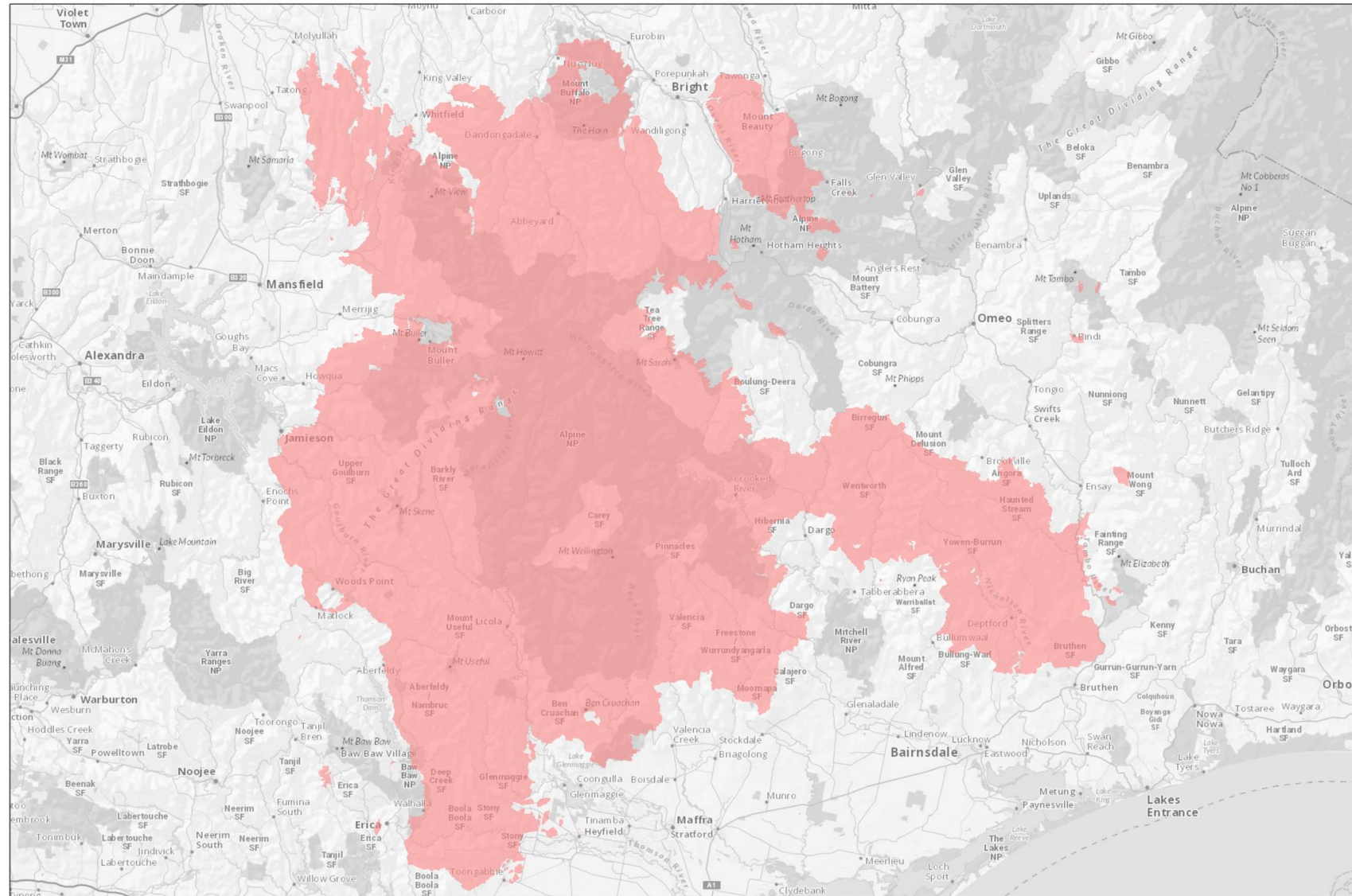
359  
structures destroyed

 = 10,000 hectares     = 100,000 hectares  
(little smaller than Geelong)

## WILSONS PROM, MOONDARRA, GRAMPIANS, KINGLAKE

FOREST FIRE  
MANAGEMENT VICTORIA

2006/07



1  
community fatalities



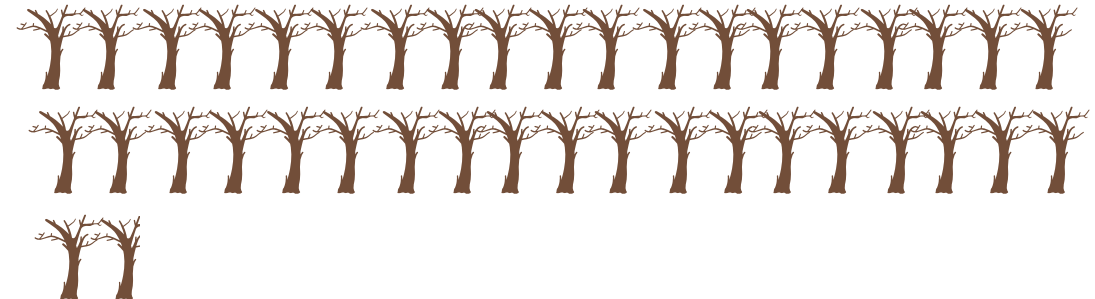
1  
firefighter fatalities



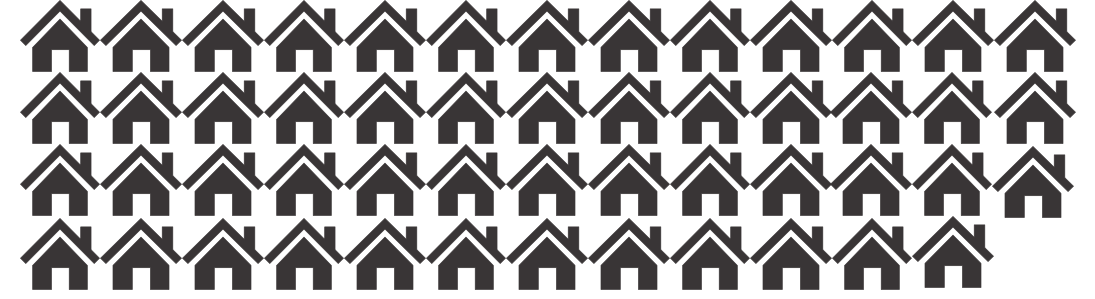
1,200,000  
hectares of land burnt



398,713  
hectares burnt before  
reproductive maturity



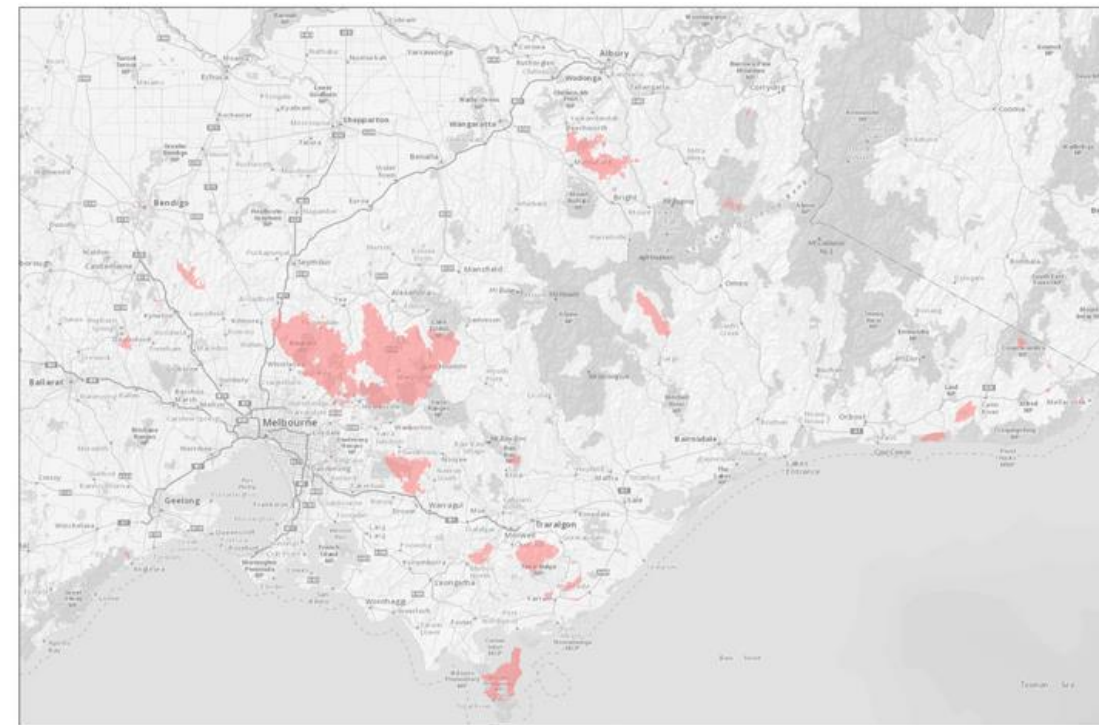
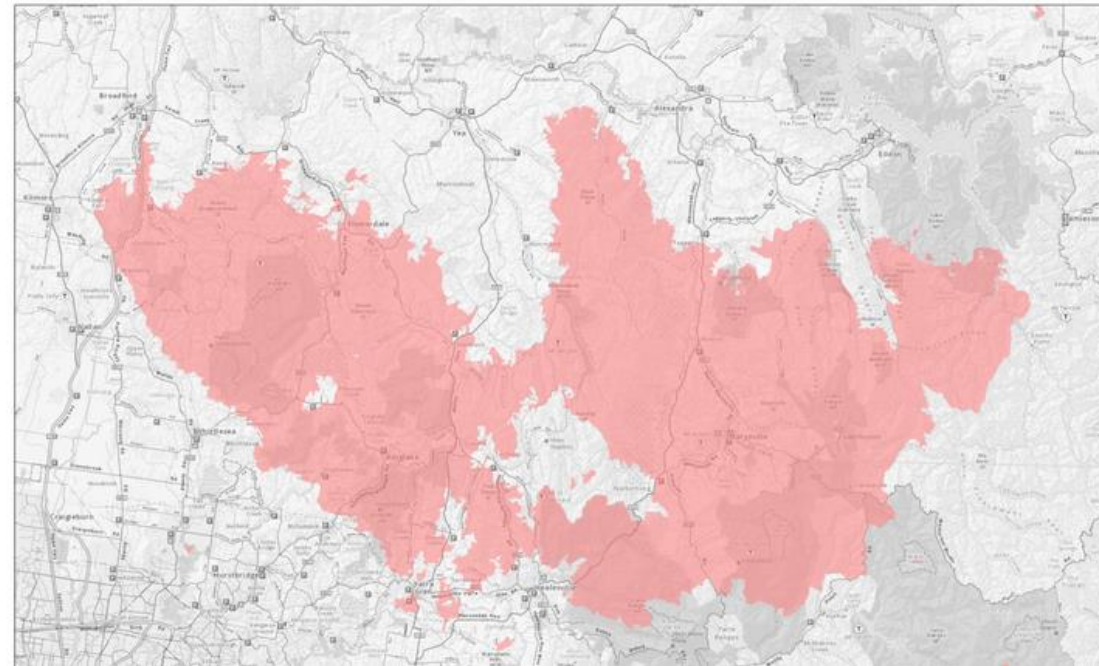
51  
homes destroyed



 = 10,000 hectares     = 100,000 hectares  
(little smaller than Geelong)

# GREAT DIVIDE FIRES

2009



172  
community fatalities

2  
firefighter fatalities

430,000  
hectares of land burnt

123,436  
hectares burnt before  
reproductive maturity

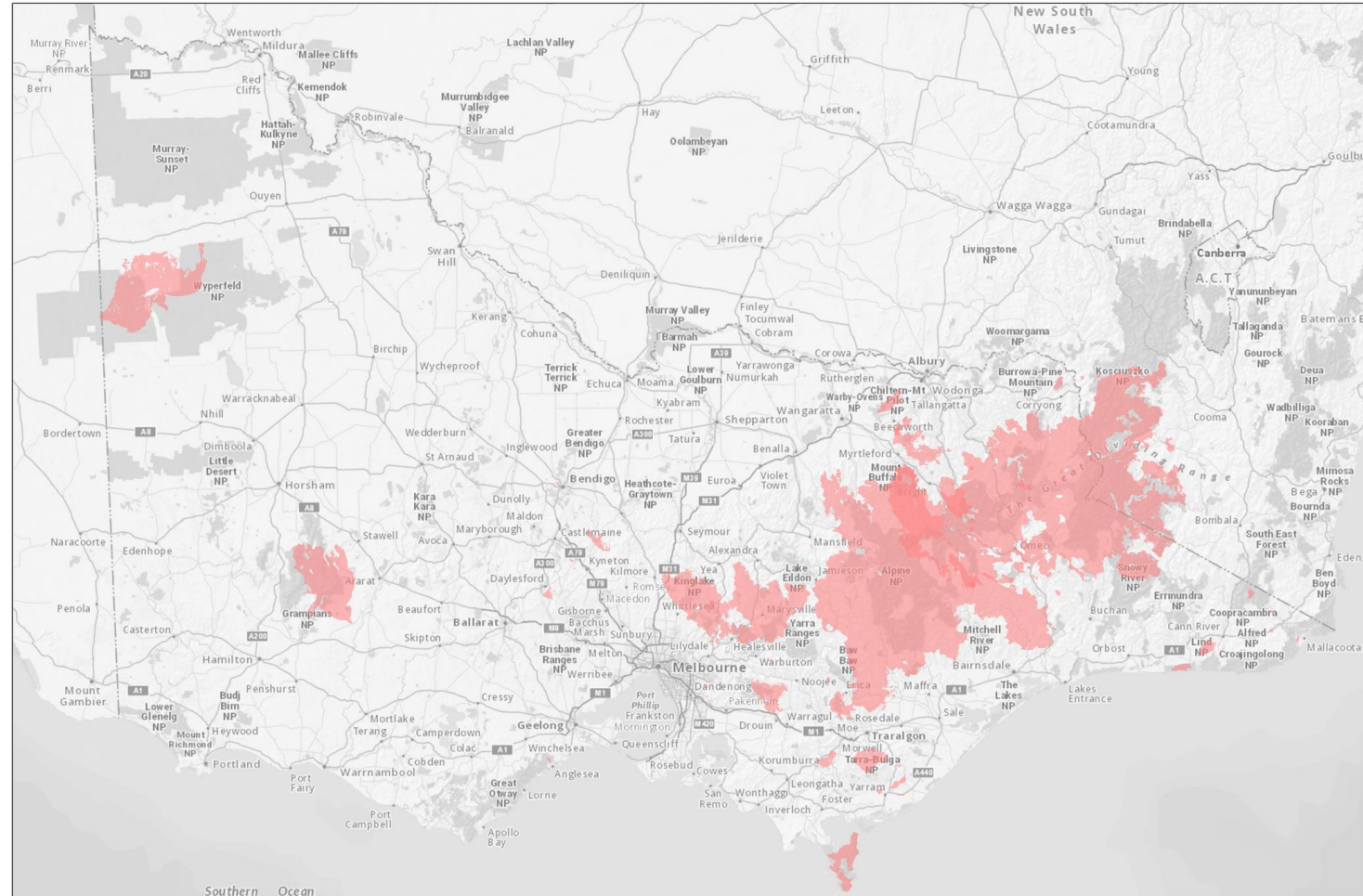
2,298  
homes destroyed



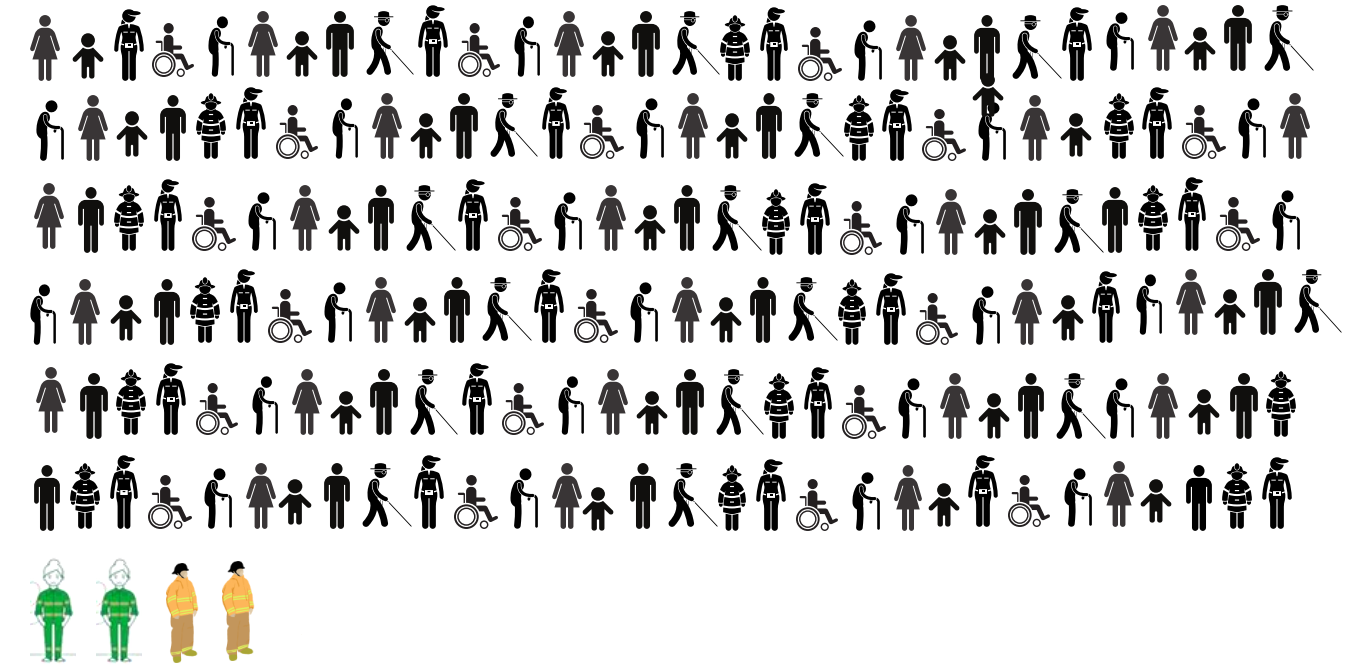
= 10 houses    = 10,000 hectares    = 100,000 hectares (little smaller than Geelong)

# BLACK SATURDAY FIRES

2002 - 2011



177  
community fatalities



4  
firefighter fatalities

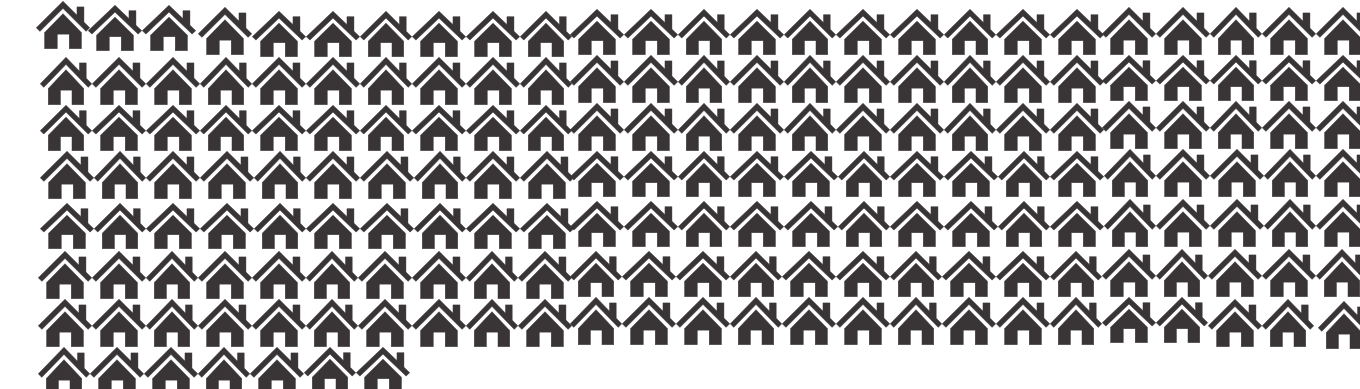
3,334,000  
hectares of land burnt



1,655,256  
hectares burnt before  
reproductive maturity



2447  
homes destroyed

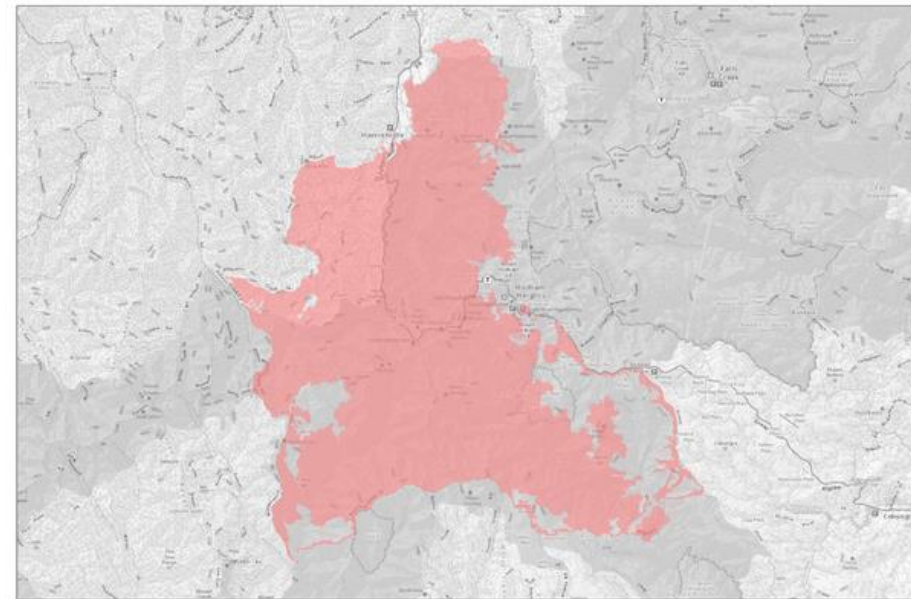
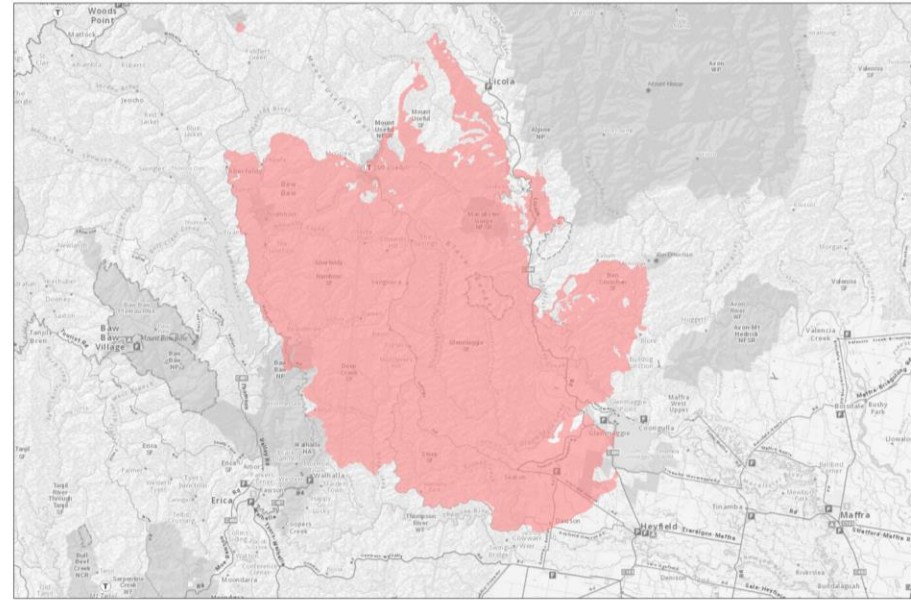


4113+  
structures destroyed

= 10 houses    
 = 10,000 hectares    
 = 100,000 hectares (little smaller than Geelong)

10 YEAR FIRE SUMMARY

2013



1  
community fatalities



3  
firefighter fatalities



123,000  
hectares of land burnt



102,780  
hectares burnt before  
reproductive maturity



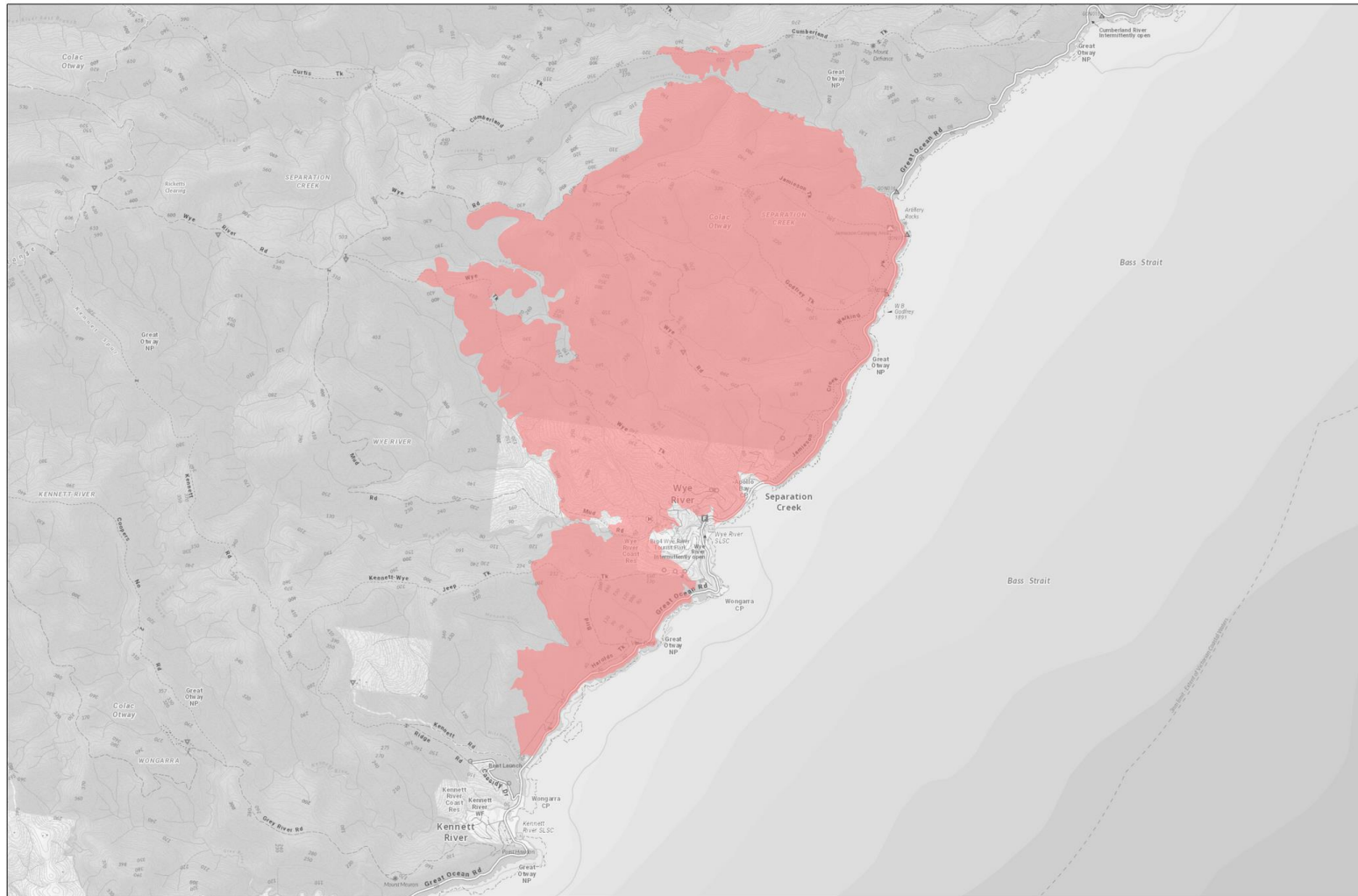
46  
homes destroyed



 = 10,000 hectares     = 100,000 hectares (little smaller than Geelong)

# ABERFELDY & HARRIETVILLE FIRES

2015/16

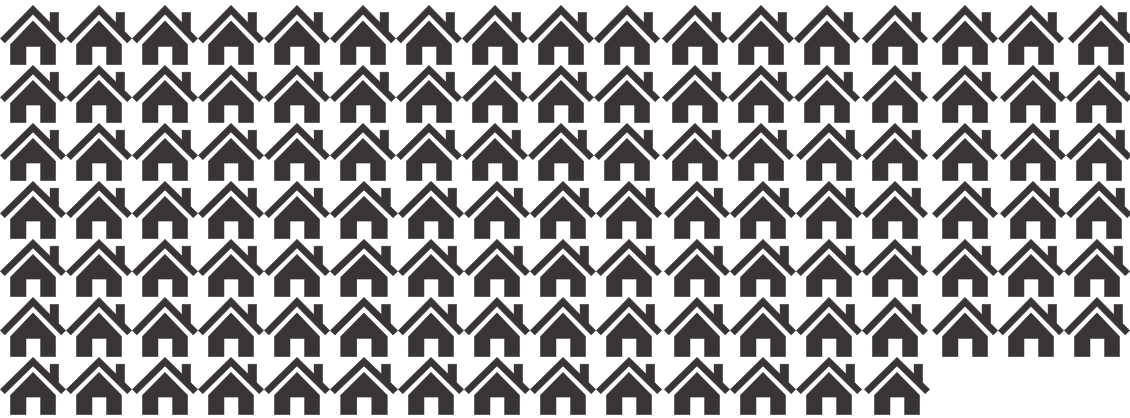



0  
community fatalities

0  
firefighter fatalities

2,500  
hectares of land burnt

116  
homes destroyed

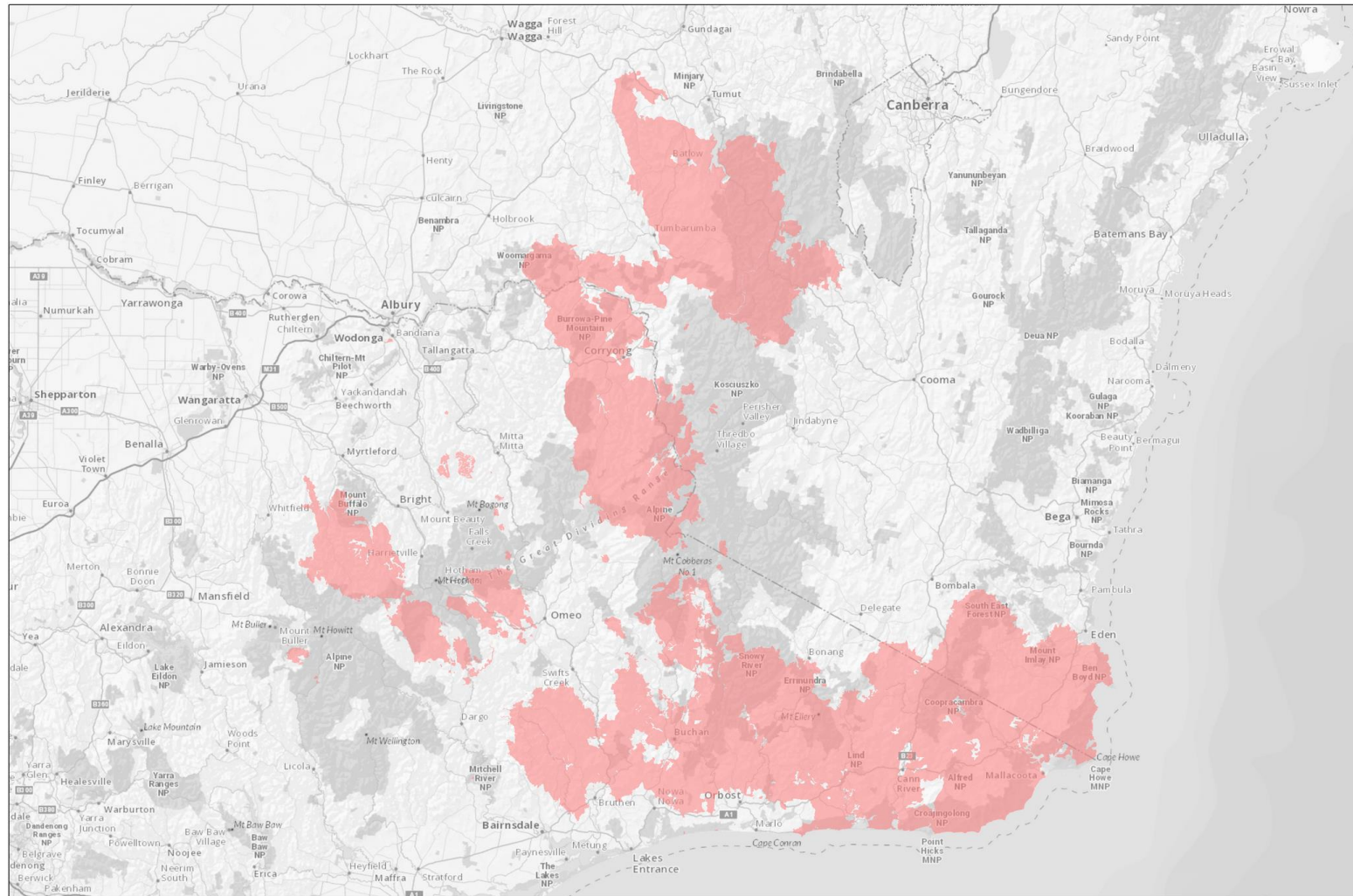


 = 10,000 hectares

 = 100,000 hectares  
(little smaller than Geelong)

WYE RIVER

2019/20



2  
community fatalities



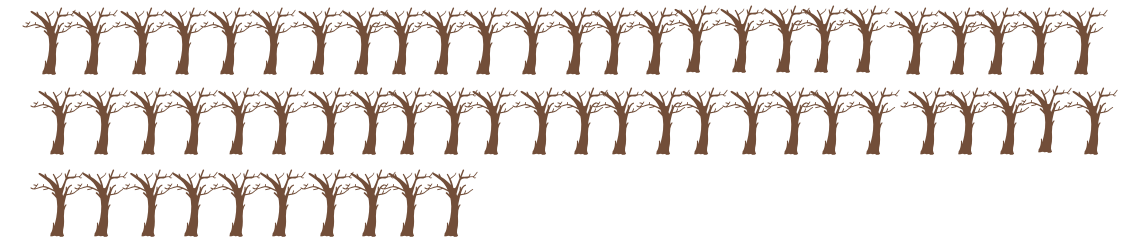
3  
firefighter fatalities



1,500,000  
hectares of land burnt



757,898  
hectares burnt before  
reproductive maturity



313  
homes destroyed



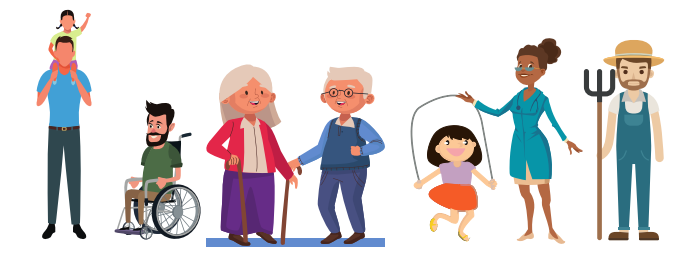
458  
structures destroyed

\*Data does not include NSW.

BLACK SUMMER FIRES

2002 - 2021

180  
community fatalities

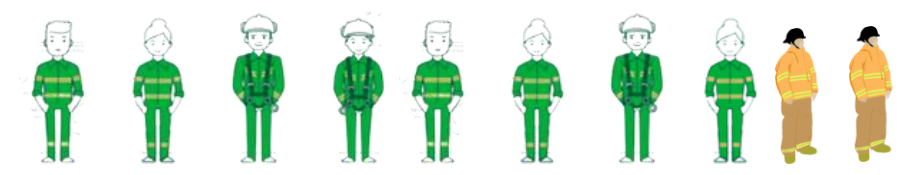


\*Data does not include NSW.

2002 - 2021

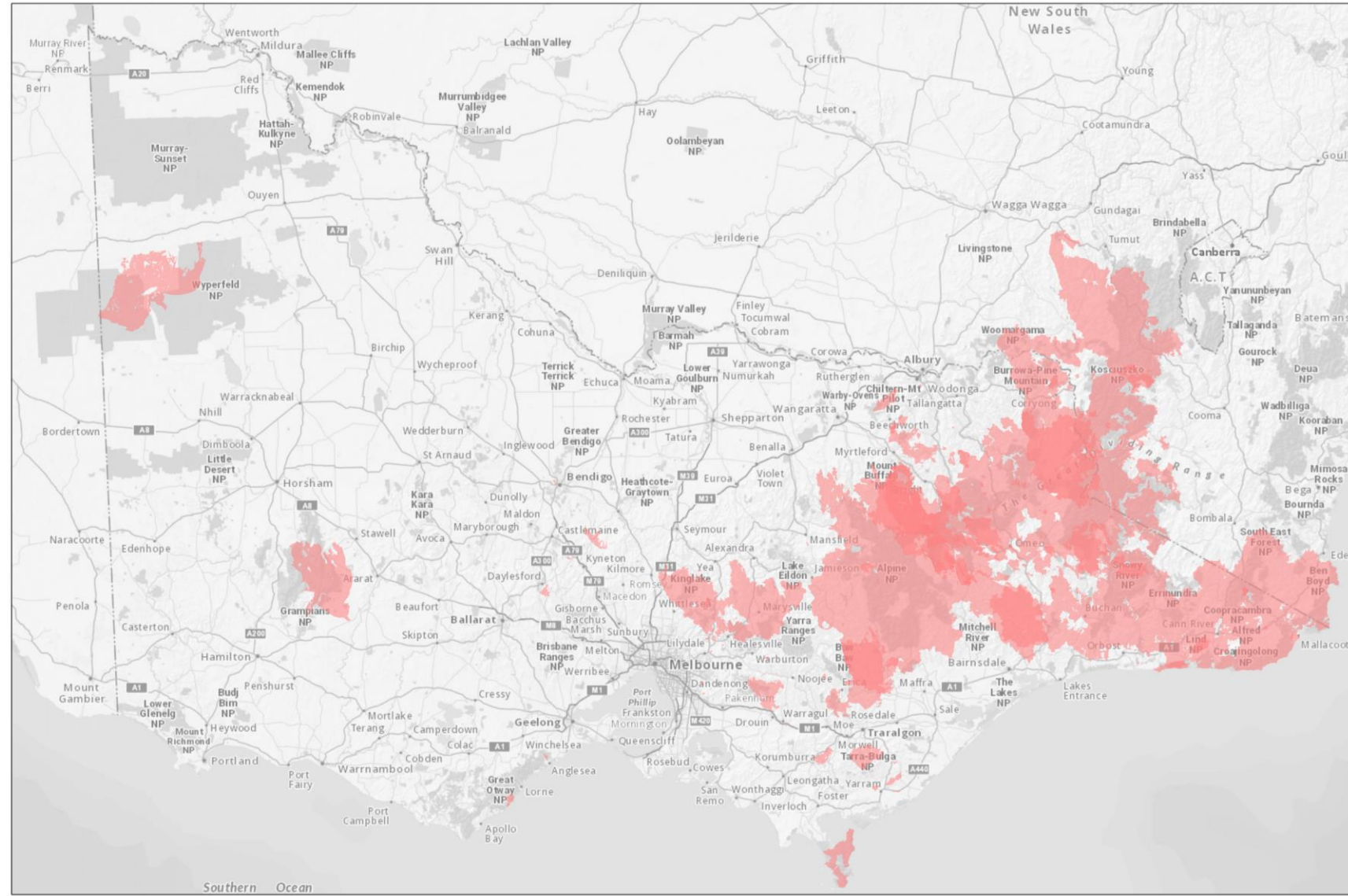
180  
community fatalities

10  
firefighter fatalities



\*Data does not include NSW.

# 2002 - 2021

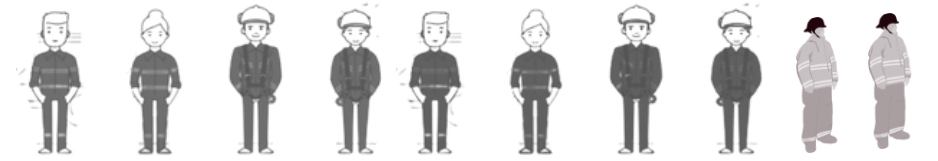


Total land burnt

**180**  
community fatalities

**10**  
firefighter fatalities

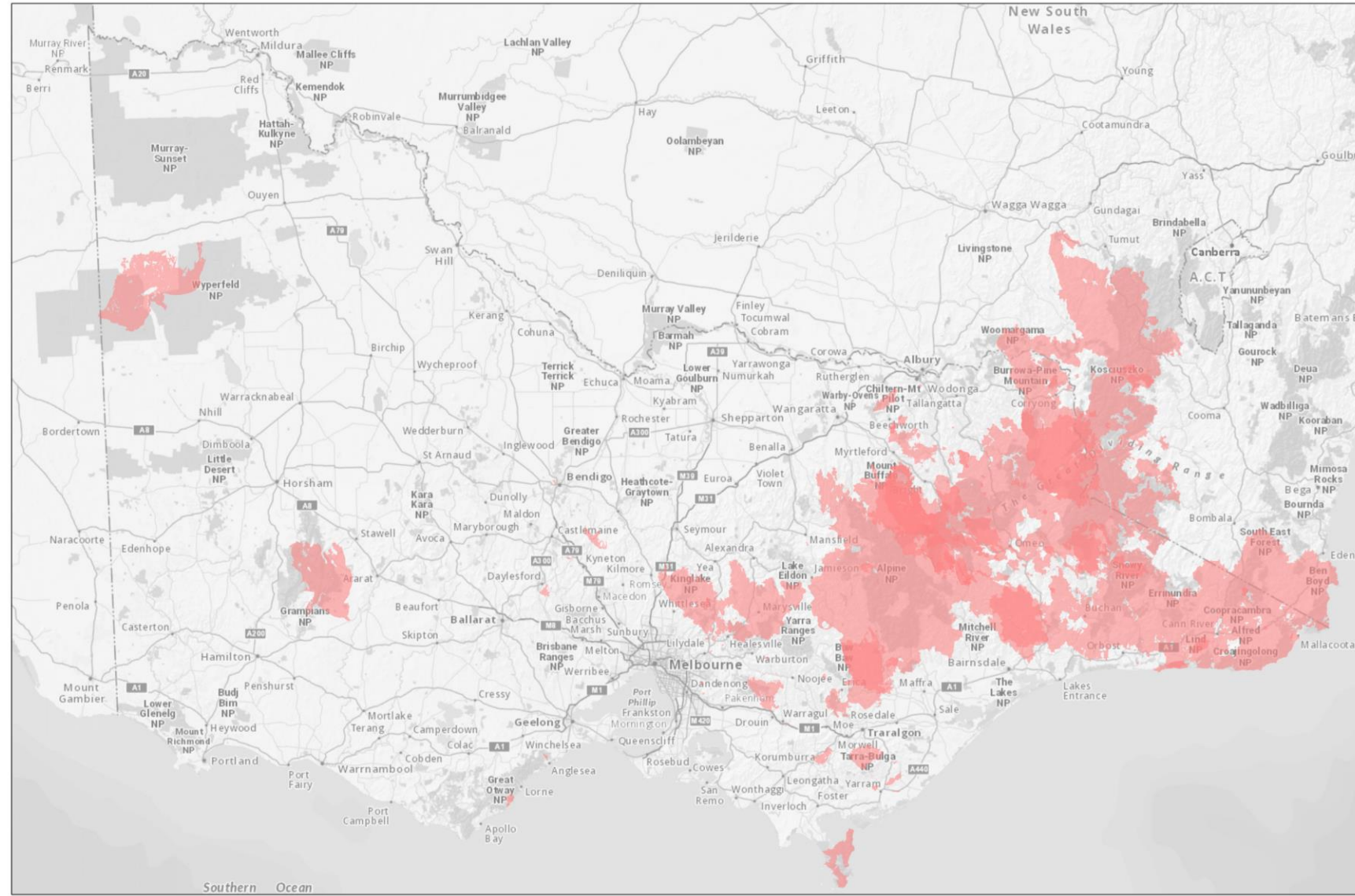
**4,959,500**  
hectares of land burnt



\*Data does not include NSW.

# 20 YEAR FIRE SUMMARY

2002 - 2021



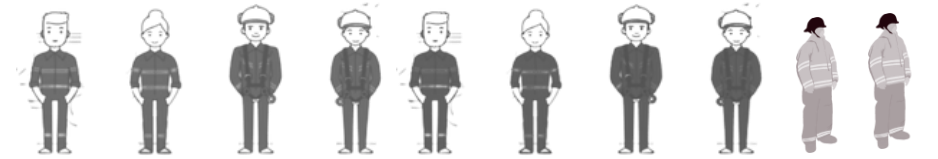
Total land burnt

180  
community fatalities

10  
firefighter fatalities

4,959,500  
hectares of land burnt

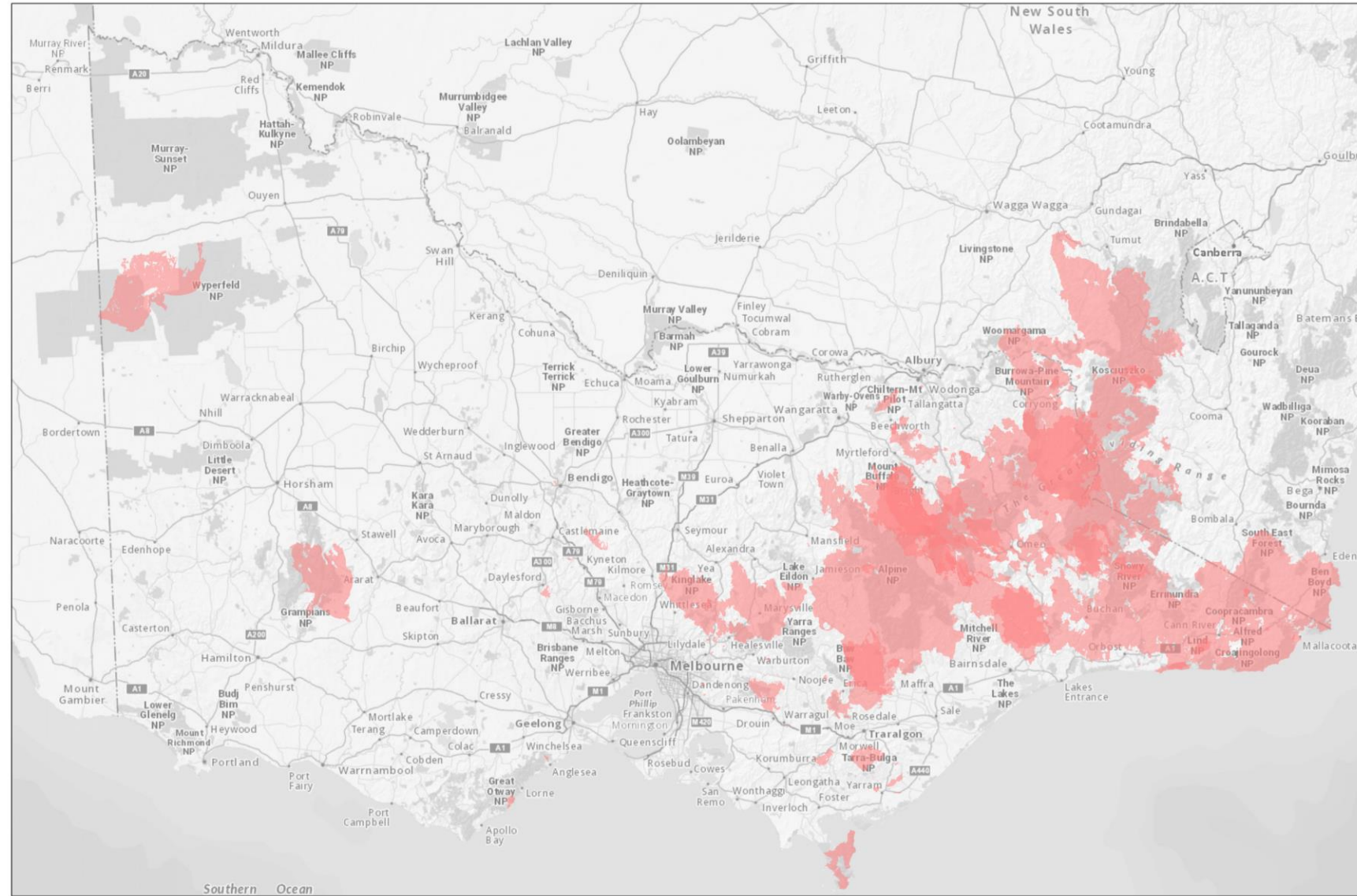
2,554,834  
hectares burnt before  
reproductive maturity



\*Data does not include NSW.

# 20 YEAR FIRE SUMMARY

# 2002 - 2021

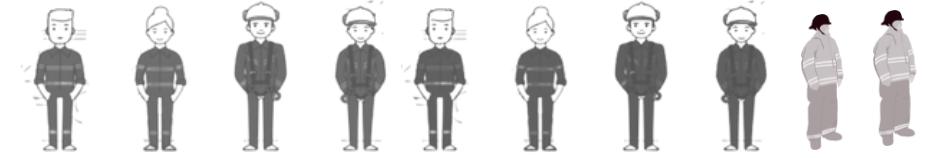


Total land burnt

**180**  
community fatalities



**10**  
firefighter fatalities



**4,959,500**  
hectares of land burnt



**2,554,834**  
hectares burnt before reproductive maturity

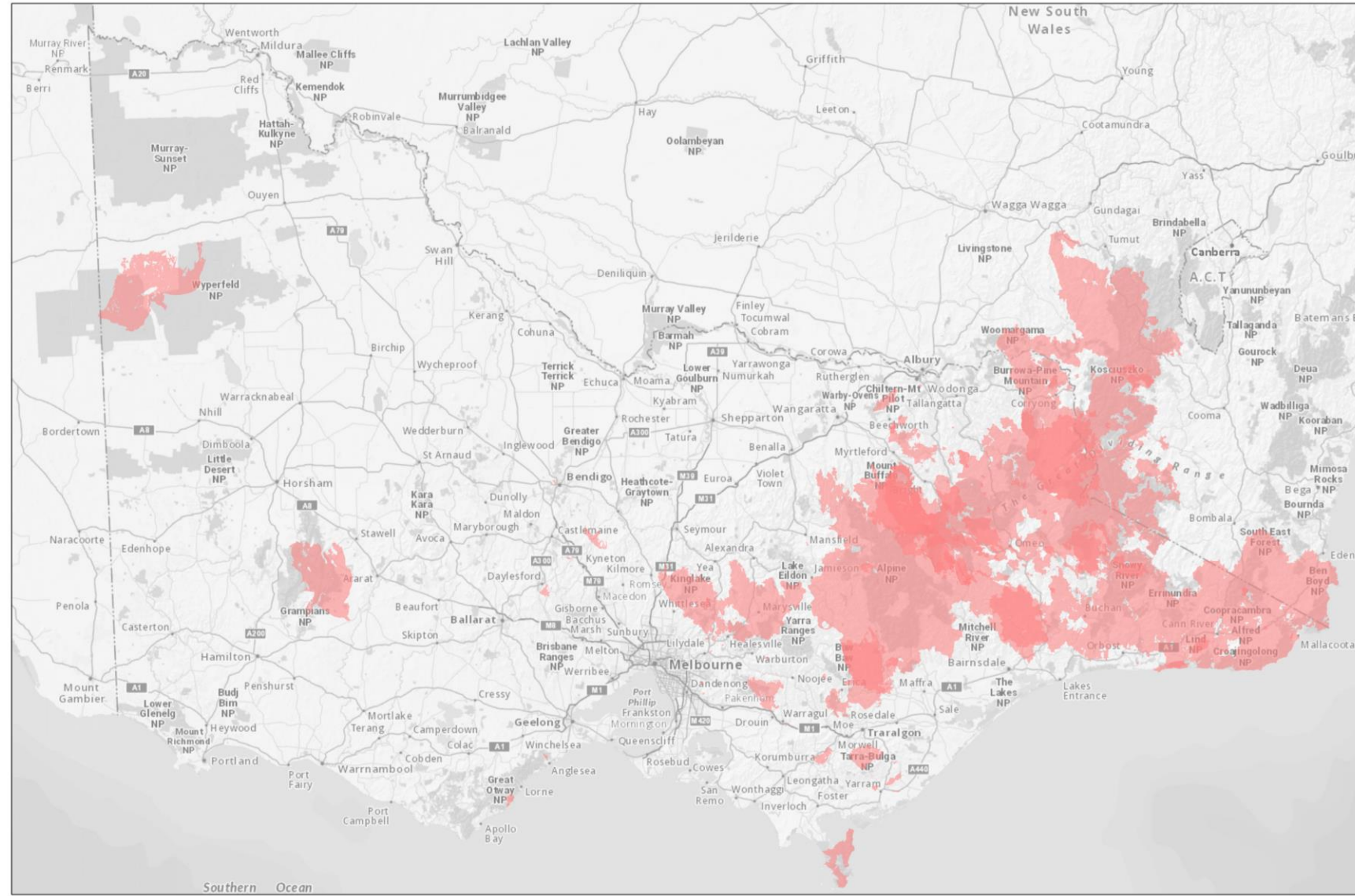


**2922**  
homes destroyed



\*Data does not include NSW.

# 2002 - 2021

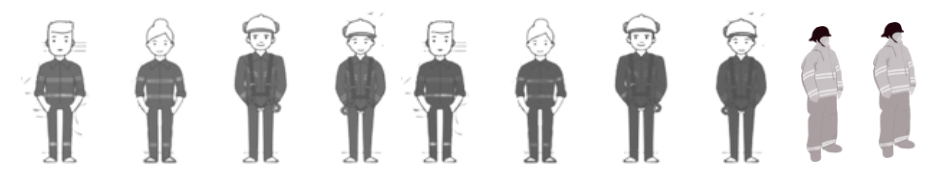


Total land burnt

**180**  
community fatalities



**10**  
firefighter fatalities



**4,959,500**  
hectares of land burnt



**2,554,834**  
hectares burnt before reproductive maturity



**2922**  
homes destroyed



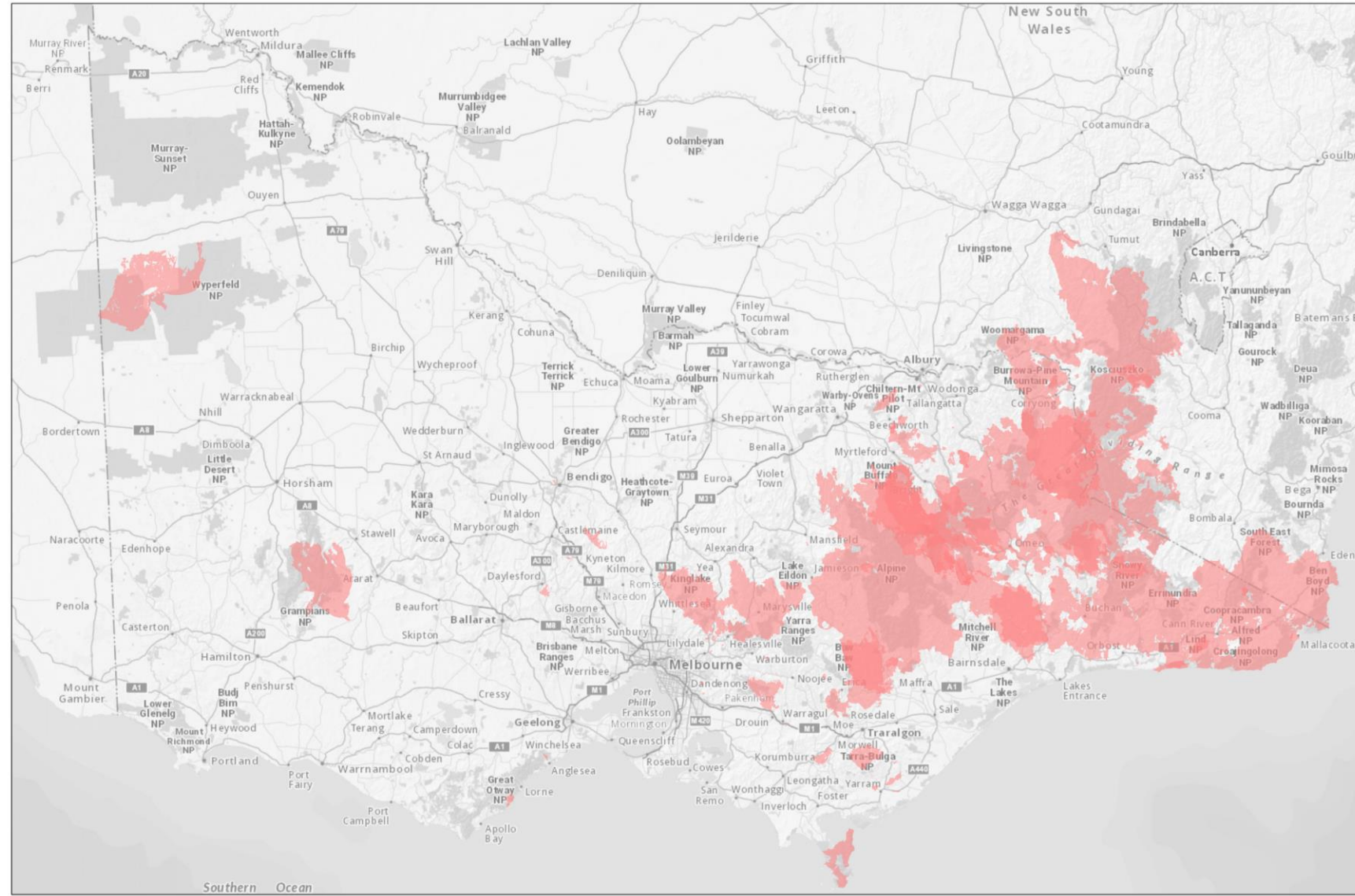
**4,571**  
structures destroyed



\*Data does not include NSW.

# 20 YEAR FIRE SUMMARY

# 2002 - 2021

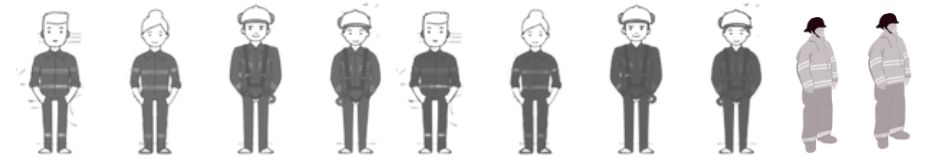


Total land burnt

**180**  
community fatalities



**10**  
firefighter fatalities



**4,959,500**  
hectares of land burnt



**2,554,834**  
hectares burnt before reproductive maturity



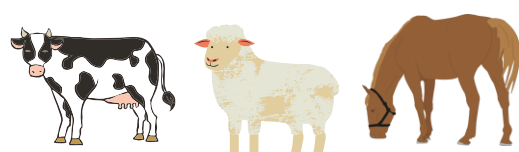
**2922**  
homes destroyed



**4,571**  
structures destroyed



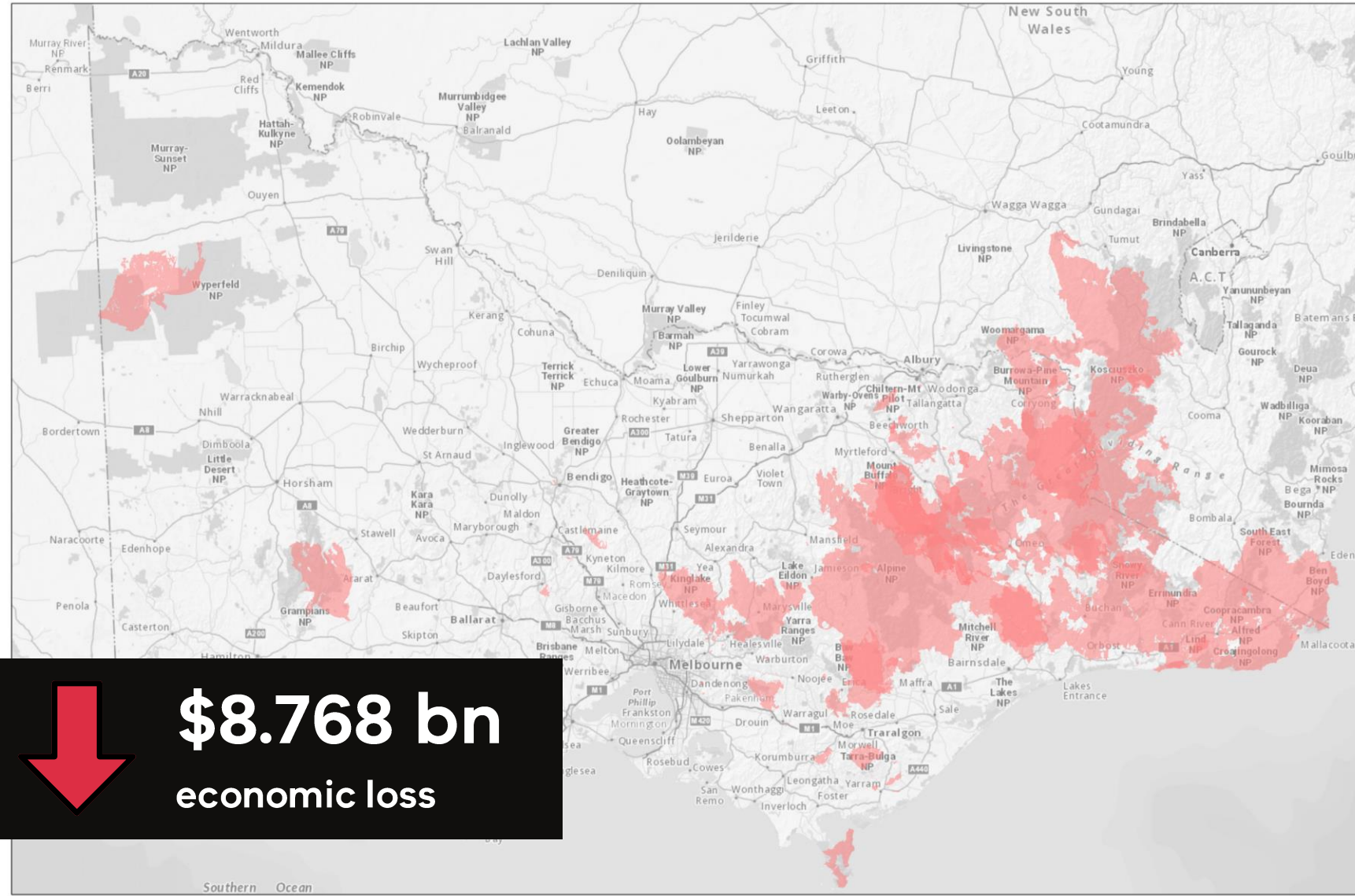
**93,173**  
livestock killed




\*Data does not include NSW.

# 20 YEAR FIRE SUMMARY

2002 - 2021



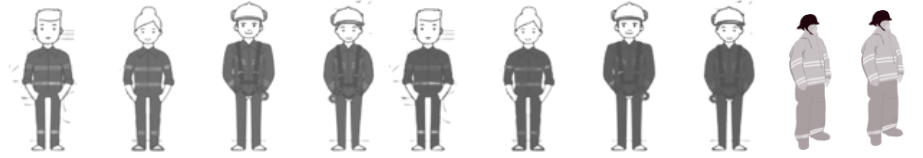
 **\$8.768 bn**  
economic loss

 Total land burnt

**180**  
community fatalities



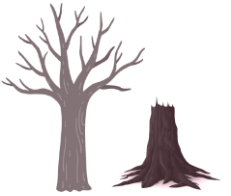
**10**  
firefighter fatalities



**4,959,500**  
hectares of land burnt



**2,554,834**  
hectares burnt before reproductive maturity



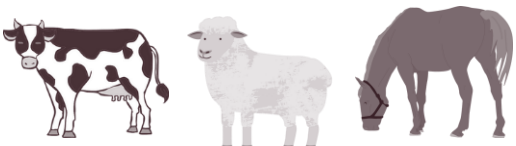
**2922**  
homes destroyed



**4,571**  
structures destroyed



**93,173**  
livestock killed



\*Data does not include NSW.

**20 YEAR FIRE SUMMARY**

**2002 - 2021**

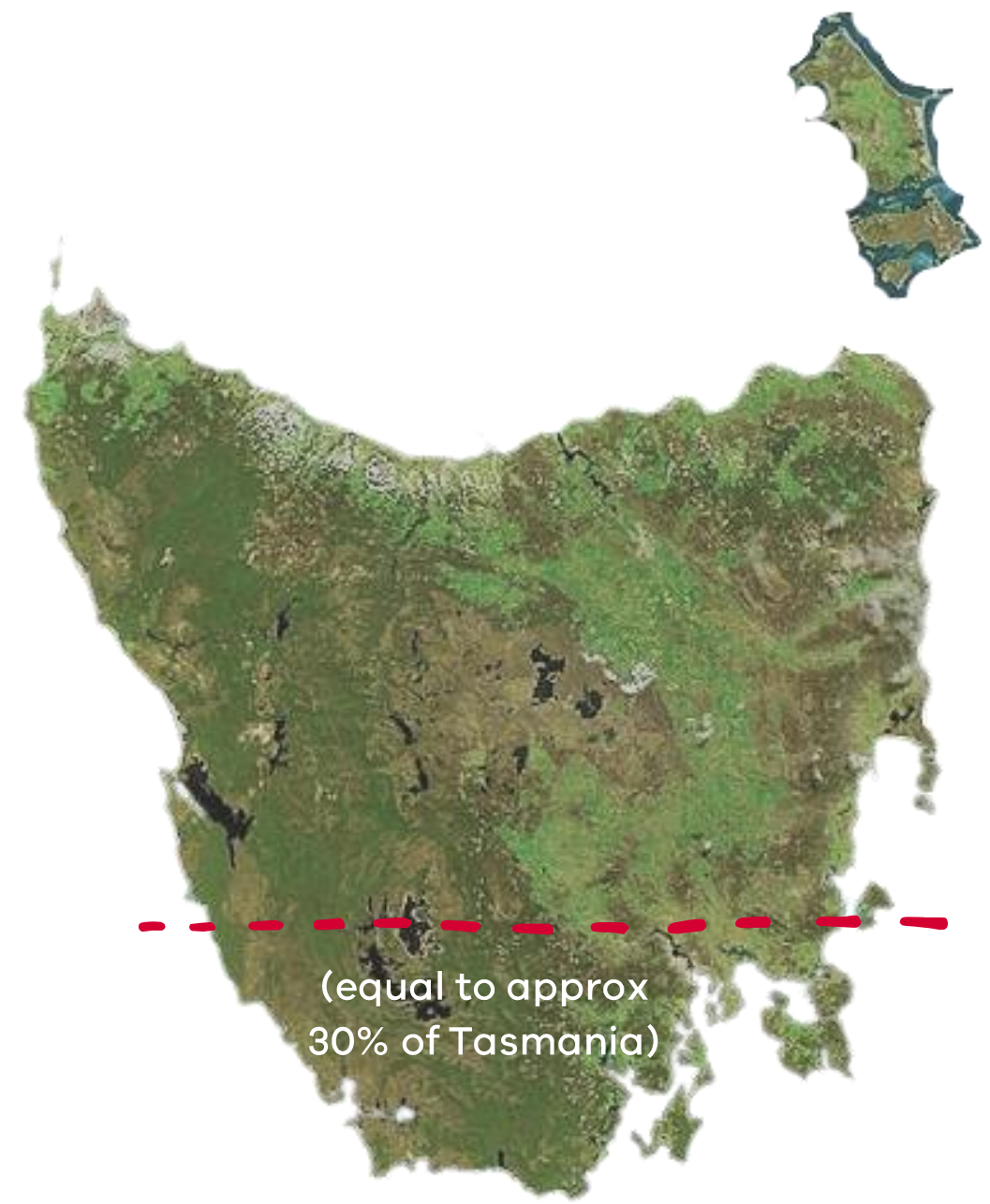
**2002**

**2,344,677 (33%)**

hectares of forest not at  
reproductive maturity and at  
risk if burnt

**2002 - 2021**

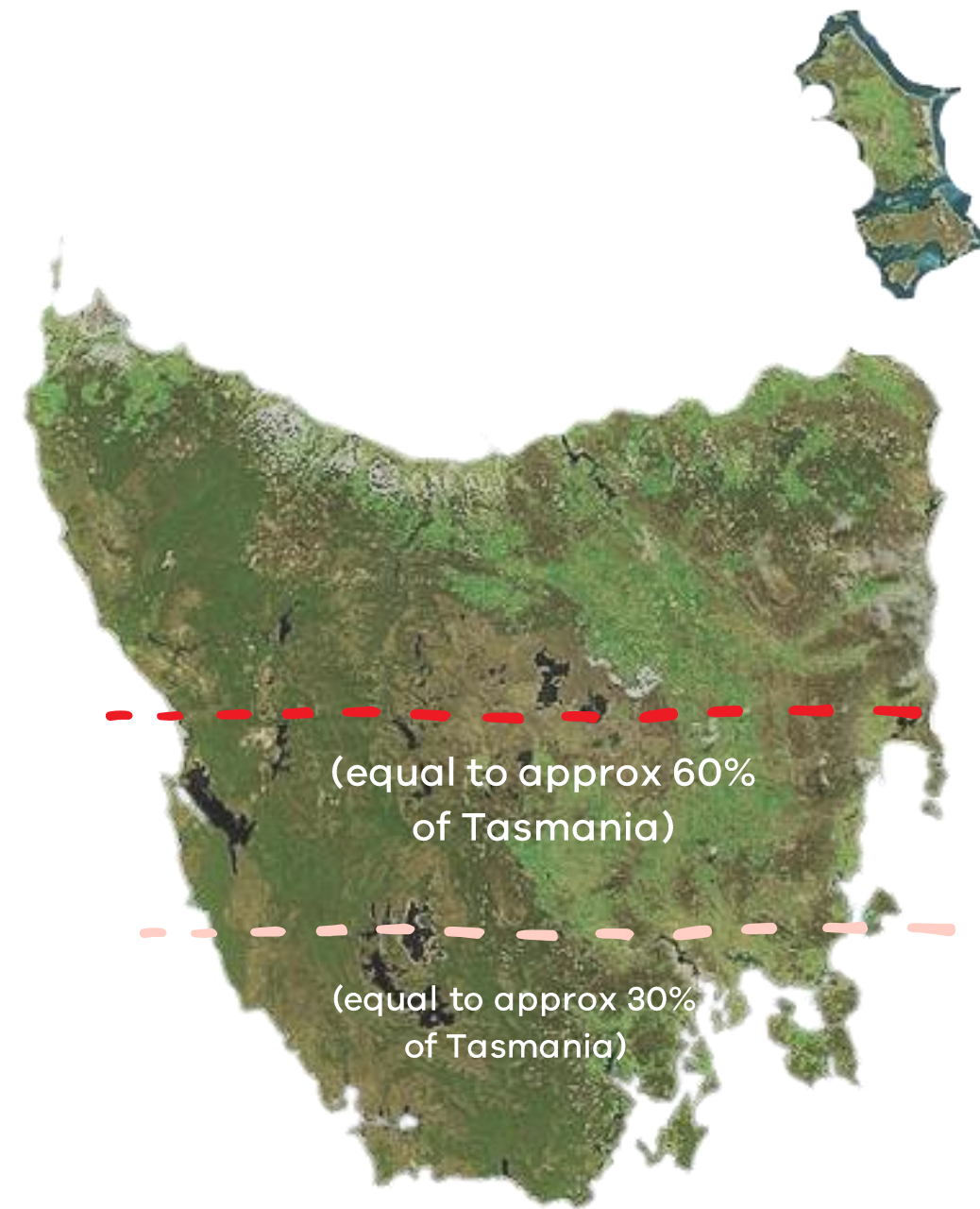
**2002**  
**2,344,677 (33%)**  
hectares of forest not at  
reproductive maturity and at  
risk if burnt



# 2002 - 2021

**2021**  
**4,157,670 (55%)**  
hectares of forest not at  
reproductive maturity and at  
risk if burnt

**2002**  
**2,344,677 (33%)**  
hectares of forest not at  
reproductive maturity and at  
risk if burnt



Tasmania landmass 6,840,100 ha  
Victorian public land 7,899,500 ha

# 2020 FLORA & FAUNA IMPACT

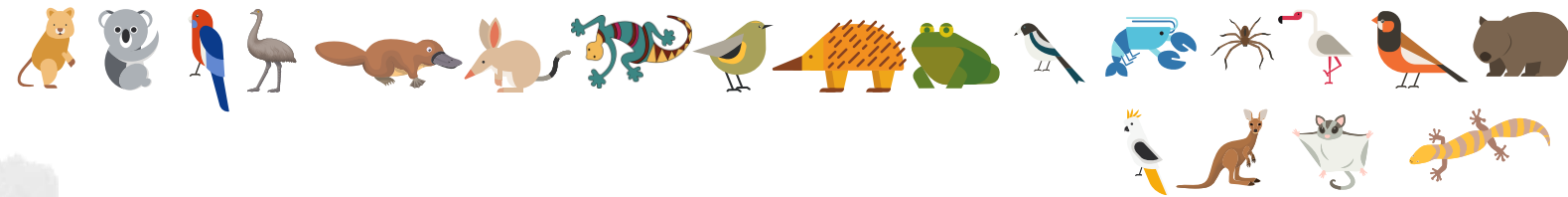


**187**  
total fauna species  
impacted



## BLACK SUMMER

# FLORA & FAUNA IMPACT



**20**  
fauna species  
50% habitat burnt



**187**  
total fauna species  
impacted



**2020 BLACK SUMMER**

# FLORA & FAUNA IMPACT



**20**  
fauna species  
50% habitat burnt



**187**  
total fauna species  
impacted

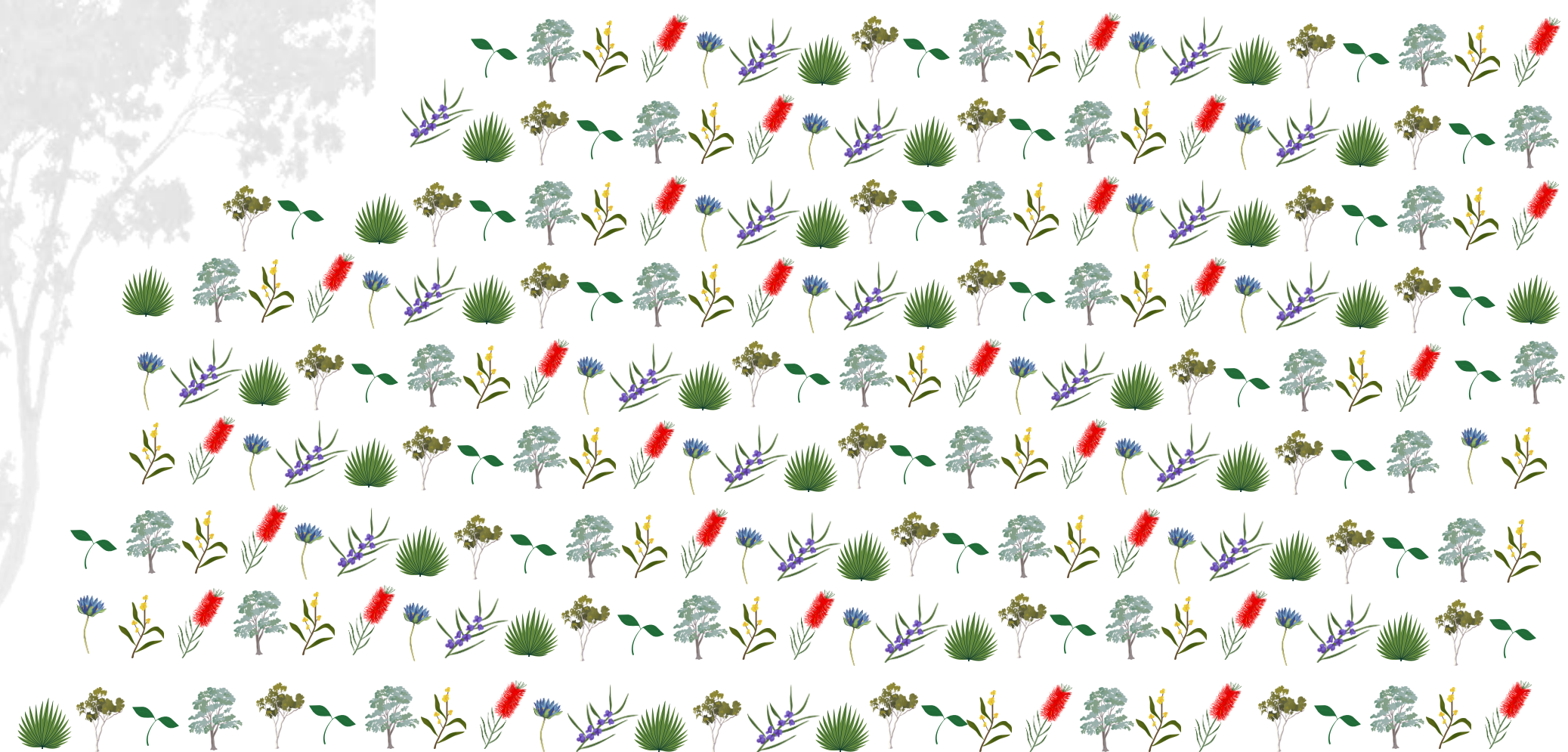
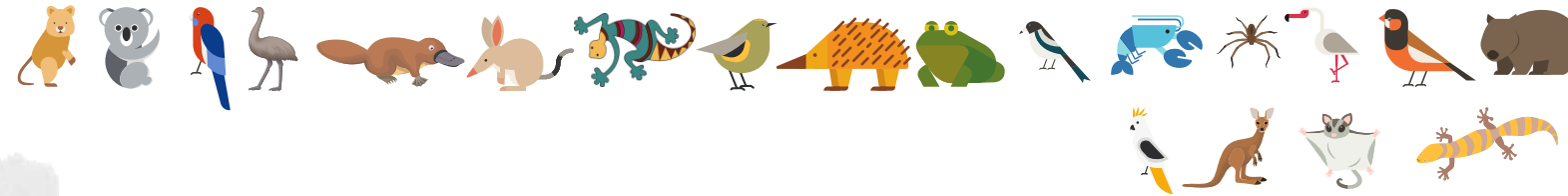


**1,392**  
total flora species  
impacted



**2020 BLACK SUMMER**

# FLORA & FAUNA IMPACT



**20**  
fauna species  
50% habitat burnt



**187**  
total fauna species  
impacted



**224**  
flora species  
50% habitat burnt

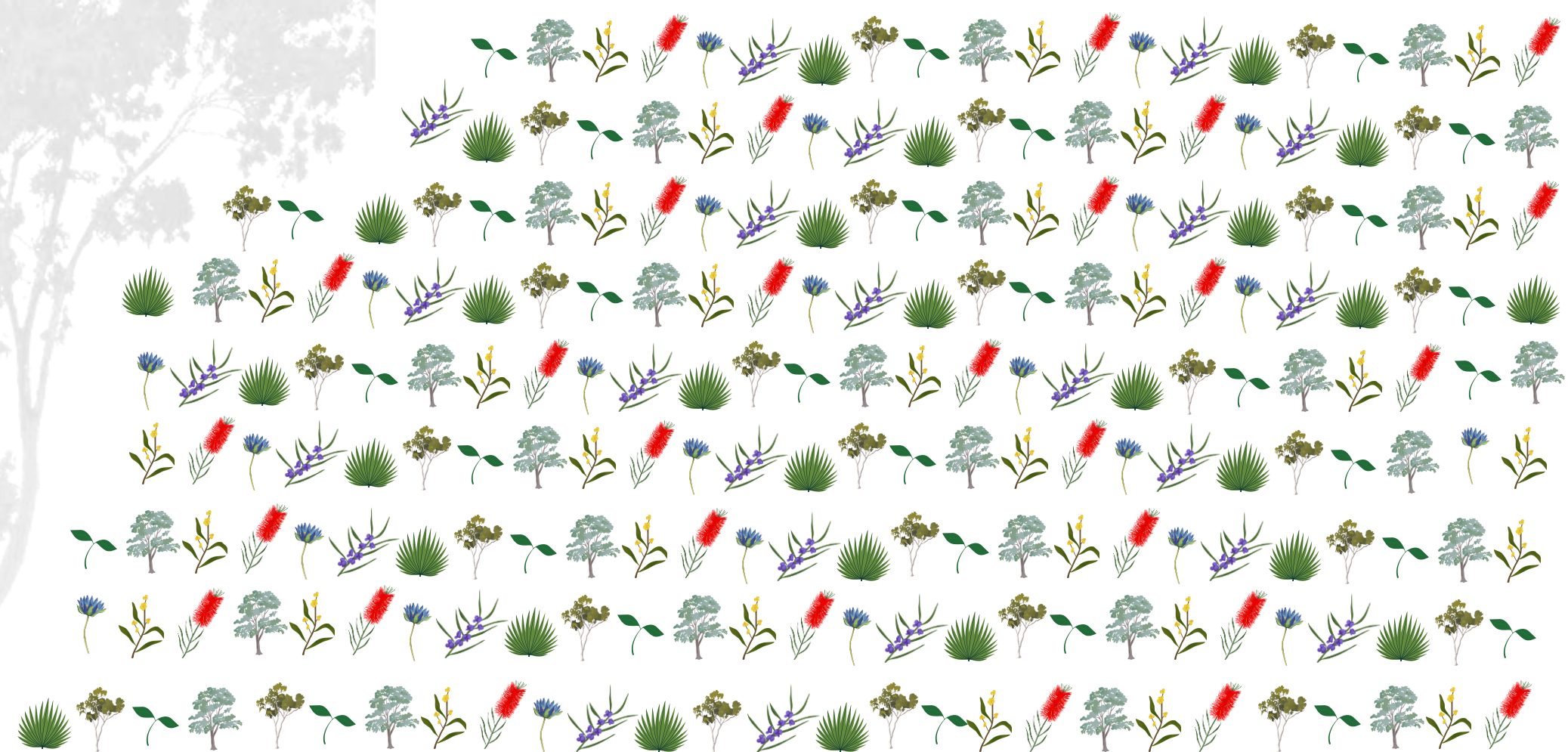
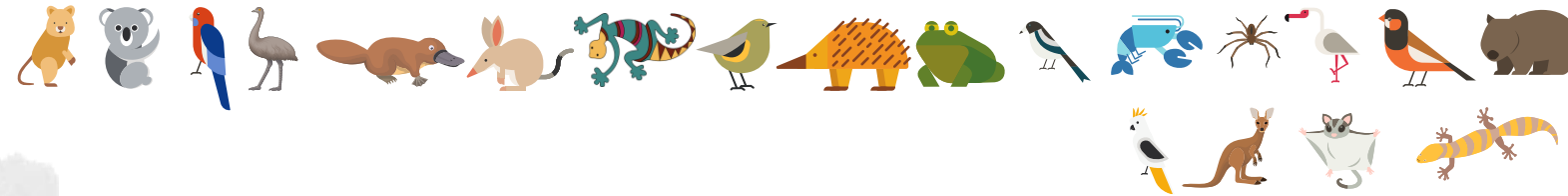


**1,392**  
total flora species  
impacted



**2020 BLACK SUMMER**

# FLORA & FAUNA IMPACT



**20**  
fauna species  
50% habitat burnt



**187**  
total fauna species  
impacted



**224**  
flora species  
50% habitat burnt



**1,392**  
total flora species  
impacted

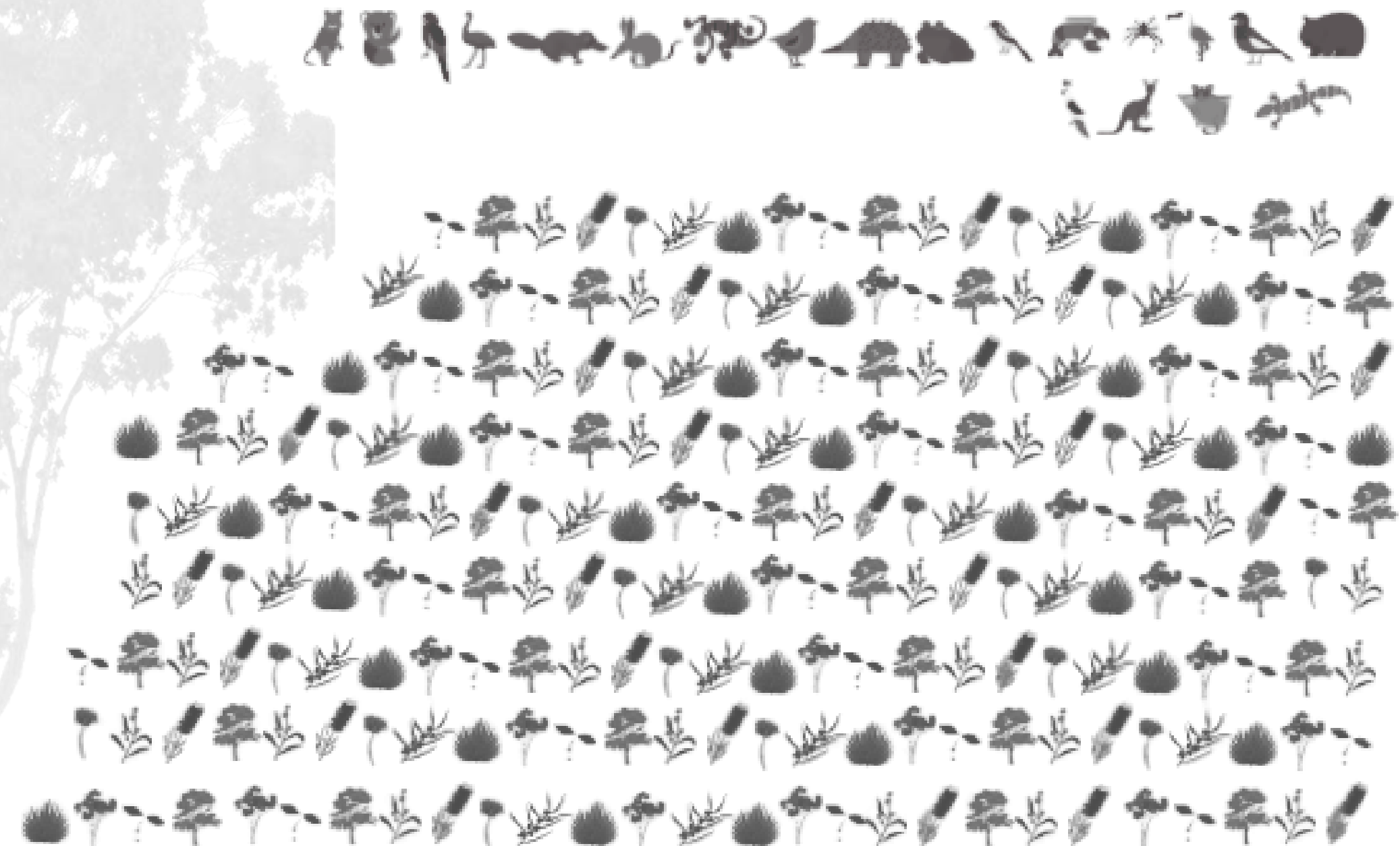


**757,898**  
hectares burnt before  
reproductive maturity



**2020 BLACK SUMMER**

# FLORA & FAUNA IMPACT



**20**  
fauna species  
50% habitat burnt

**187**  
total fauna species  
impacted

**224**  
flora species  
50% habitat burnt

**1,392**  
total flora species  
impacted

**757,898**  
hectares burnt before  
reproductive maturity

**\$77.2 million**  
recovery costs

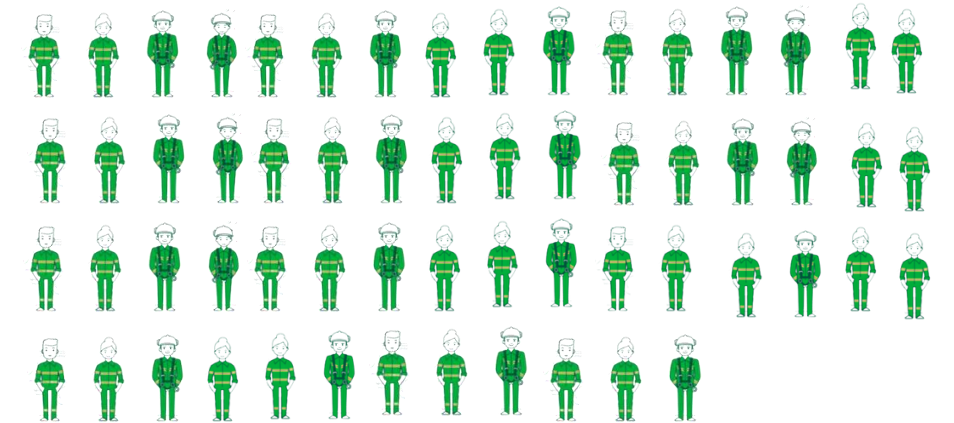
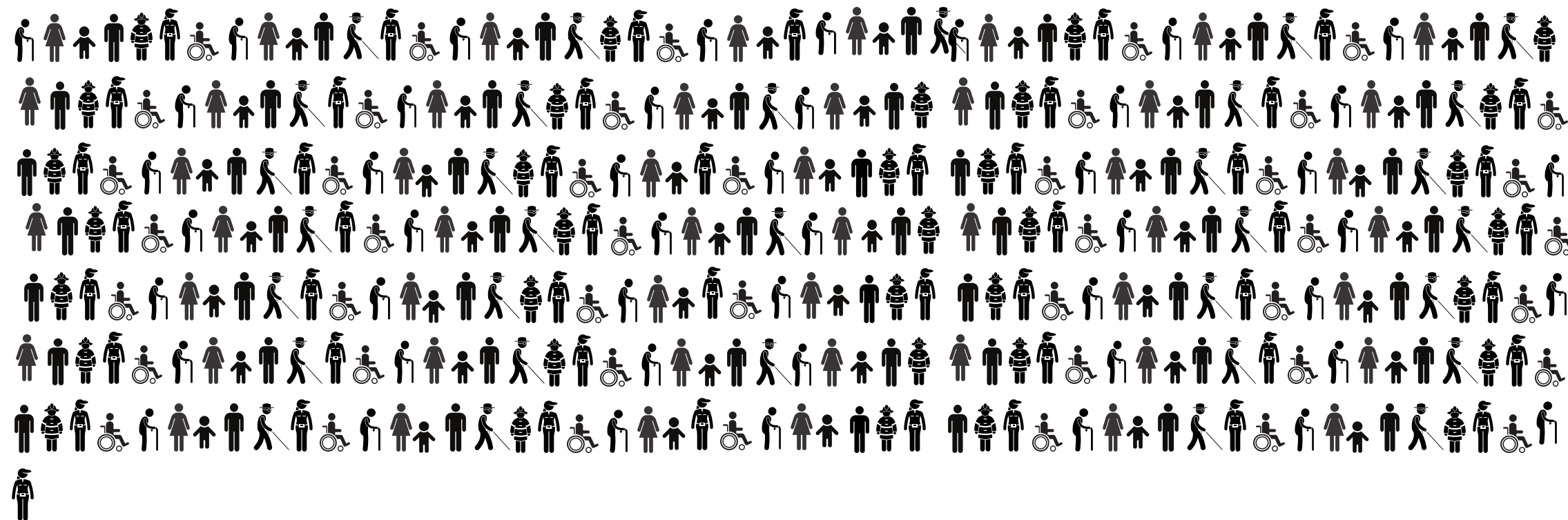
**2020 BLACK SUMMER**

# 1901 - 2020 TOTAL FIRE RELATED FATALITIES

ALL OTHER  
AUS. STATES

(259)

(60)

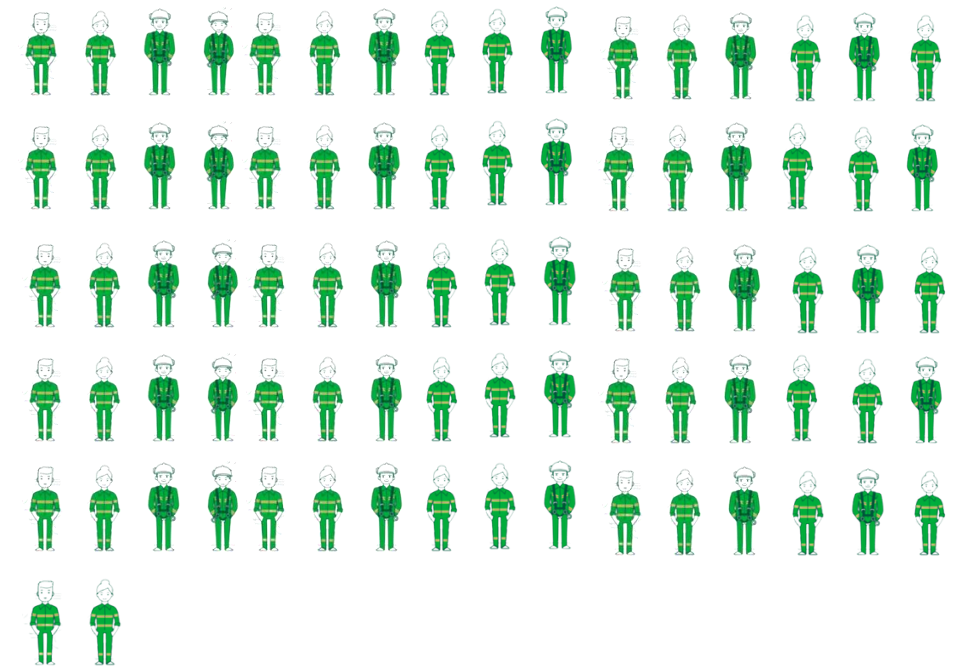
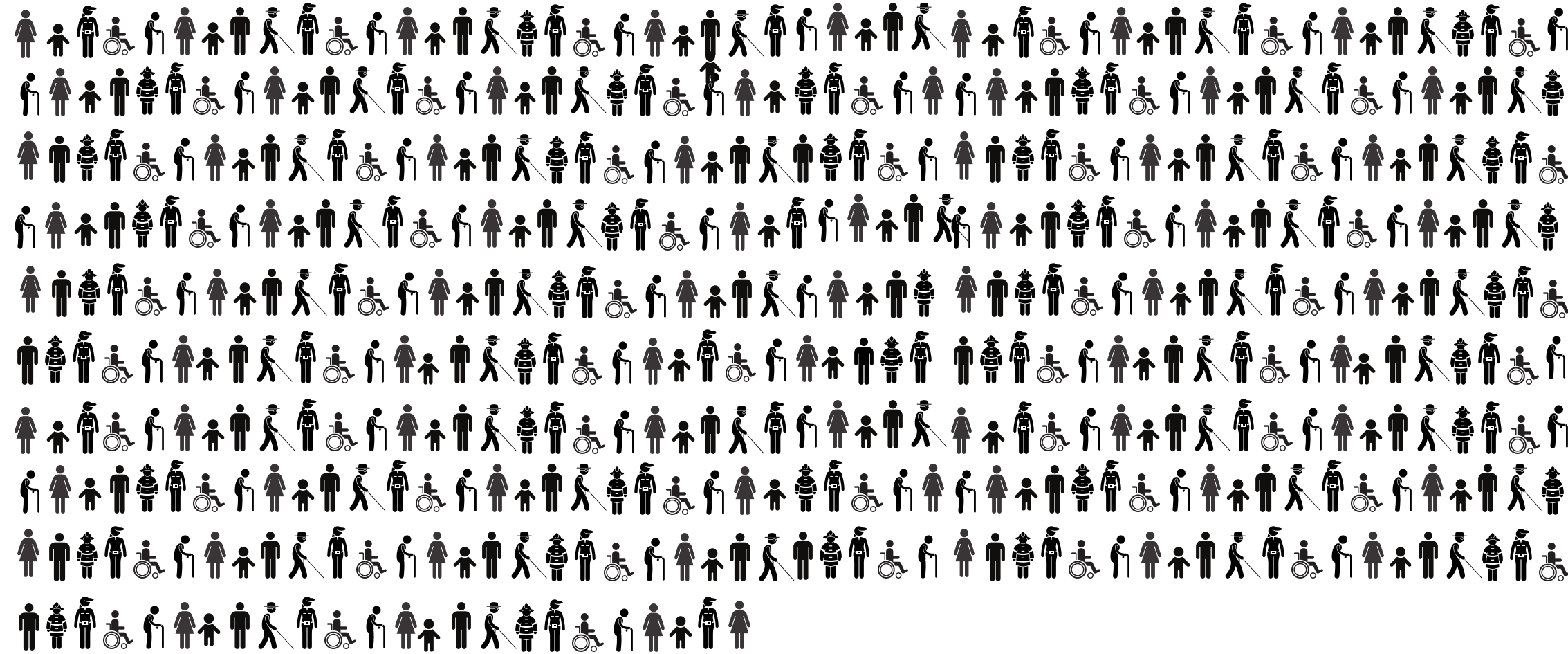


# 1901 - 2020 TOTAL FIRE RELATED FATALITIES

## VICTORIA

(474)

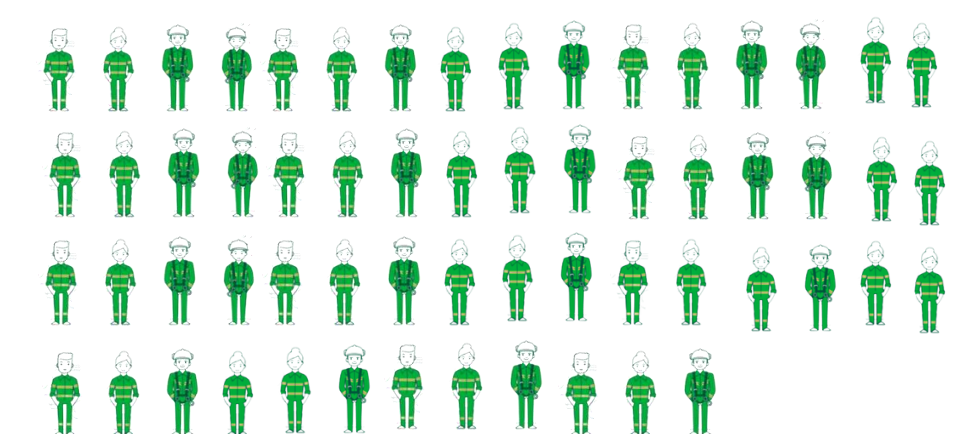
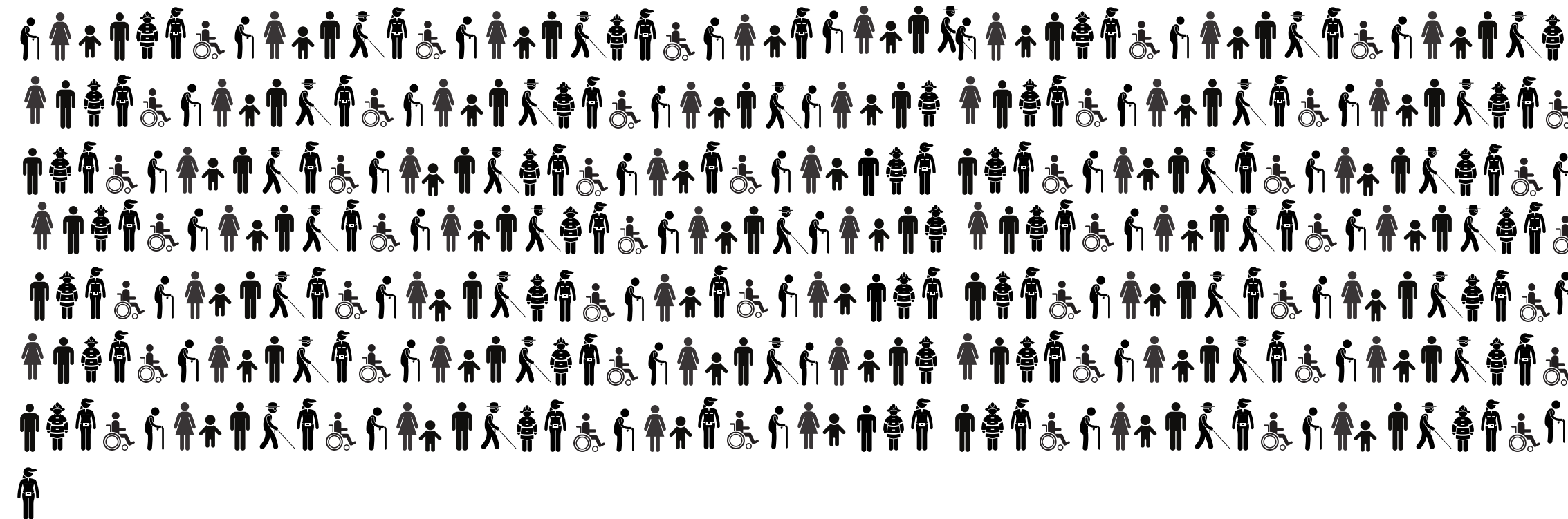
(82)



## ALL OTHER AUS. STATES

(259)

(60)



# 2000 - 2020 KEY REVIEWS AND INQUIRIES

- 2020 2020 AUSTRALIAN BLACK SUMMER ROYAL COMMISSION
- 2020 IGEM INQUIRY INTO THE 2019-2020 VICTORIAN FIRE SEASON
- 2015 INDEPENDENT INVESTIGATION OF THE LANCEFIELD-COBAW FIRE
- 2014 NATIONAL INQUIRY ON BUSHFIRE MITIGATION AND MANAGEMENT 2014
- 2013 HARRIETVILLE INQUEST AND RESPONSE
- 2009 2009 VICTORIAN BUSHFIRES ROYAL COMMISSION
- 2008 IMPACTS OF PUBLIC LAND MANAGEMENT PRACTICES ON BUSHFIRES IN VICTORIA
- 2007 OPERATIONAL REVIEWS OF MAJOR FIRES IN VICTORIA 2006/07
- 2006 FIRE SEASON DEBRIEF OUTCOMES REPORT 2005/06
- 2006 MINISTERIAL TASKFORCE ON BUSHFIRE RECOVERY 2005/06 FIRES
- 2005 EXAMINATION OF PRECRIBED BURNING PRACTICES
- 2003 MINISTERIAL TASKFORCE ON BUSHFIRE RECOVERY 2002-03 FIRES
- 2003 FIRE PREVENTION AND PREPAREDNESS (VICTORIAN AUDITOR GENERAL)
- 2003 INQUIRY INTO THE 2002-2003 VICTORIAN BUSHFIRES

\*Class Actions - police and worksafe investigations

# CLIMATE CHANGE AND FUTURE FIRE

**Climate change  
impacts**



**Bushfire  
impacts**



**Fire  
management  
impacts**

# CLIMATE CHANGE AND FUTURE FIRE

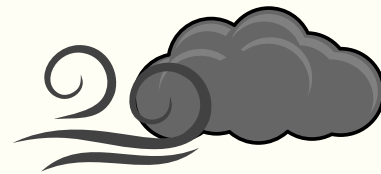
Climate change impacts



Bushfire impacts



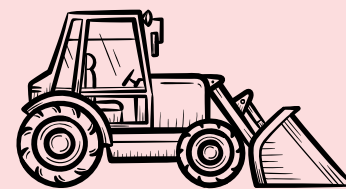
Fire management impacts



More severe weather



More lightning ignitions



Increased demand for state resources

# CLIMATE CHANGE AND FUTURE FIRE

## Climate change impacts



More severe weather



More days over 35

## Bushfire impacts



More lightning ignitions



Longer fire seasons

## Fire management impacts



Increased demand for state resources



Increased fire fighter injuries & fatalities

# CLIMATE CHANGE AND FUTURE FIRE

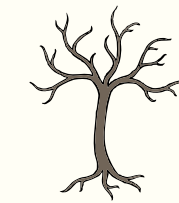
## Climate change impacts



More severe weather



More days over 35



Less winter/spring rainfall

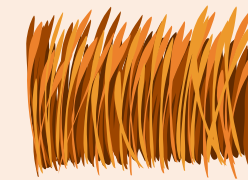
## Bushfire impacts



More lightning ignitions



Longer fire seasons



Increased flammability of fuels

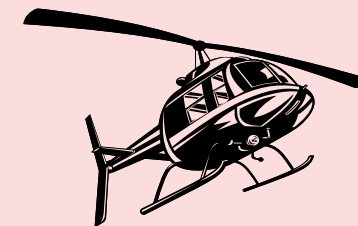
## Fire management impacts



Increased demand for state resources



Increased fire fighter injuries & fatalities



Reduced access to international & national resources

# CLIMATE CHANGE AND FUTURE FIRE

## Climate change impacts



More severe weather



More days over 35



Less winter/spring rainfall



More time spent in drought

## Bushfire impacts



More lightning ignitions



Longer fire seasons



Increased flammability of fuels



Shorter time between high intensity fires

## Fire management impacts



Increased demand for state resources



Increased fire fighter injuries & fatalities



Reduced access to international & national resources



Reduced suitable days for planned burning

# CLIMATE CHANGE AND FUTURE FIRE

## Climate change impacts



## Bushfire impacts



## Fire management impacts



More severe weather

4 of the worst fifty spike days recorded since 1972 occurred in 2019/20



More days over 35



Less winter/spring rainfall



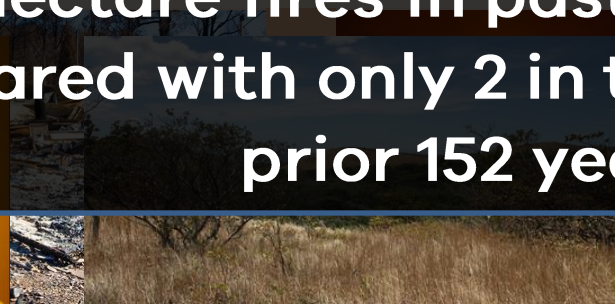
More time spent in drought



More lightning ignitions



Longer fire seasons



Increased flammability of fuels



Shorter time between high intensity fires



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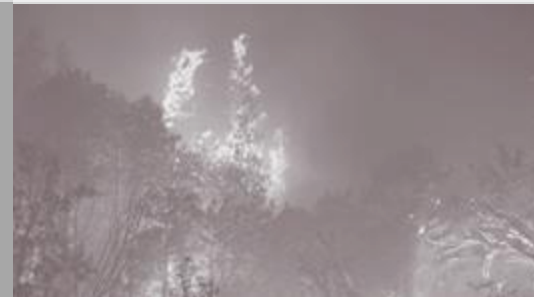
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Longer fire seasons



Increased high-intensity fires



Shorter time between high intensity fires

## Fire management impacts



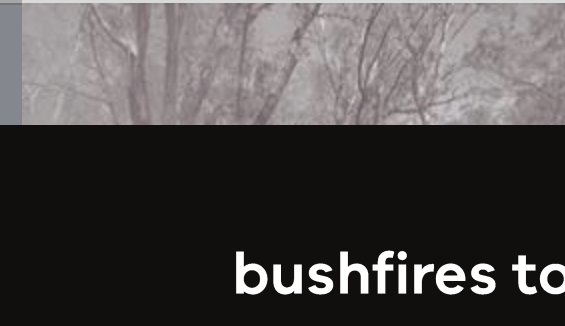
Increased demand for state resources



Increased fire fighter injuries & fatalities



Reduced access to international & national resources



for planned burning



**Average cost of bushfires to double by 2050 annually in NSW, ACT and Victoria (Climate Council)**

# CLIMATE CHANGE AND FUTURE FIRE



Increased risk to rivers and catchments



Increased risk to endangered fauna species & communities



Increased risk of burning older forests (i.e habitat features)



Increased risk of forests not reaching reproductive maturity



Increased climate impacts as bushfires release carbon into the atmosphere

## BIODIVERSITY IMPACTS

# CLIMATE CHANGE AND FUTURE FIRE



Increased risk of water supply and contamination



Increased risk of air pollution and health side-effects



Increased risk to communities and businesses



Increased flow on emergency events, e.g. food & transport disruption



Reduced opportunities for future generations

## COMMUNITY IMPACTS

# FUTURE FIRE MANAGEMENT

VICTORIA 2020 - 2040

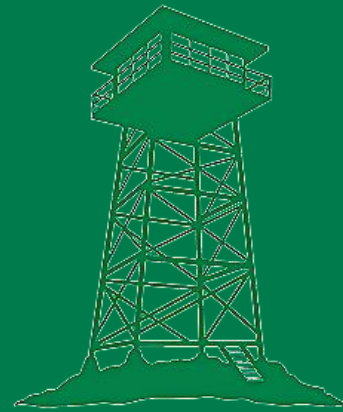
WHAT WILL BE OUR STORY



# 2000 - 2020: EXISTING APPROACH



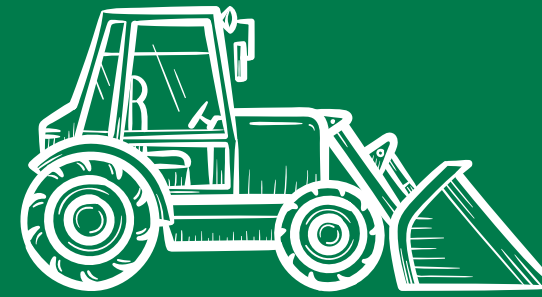
Traditional planned burning



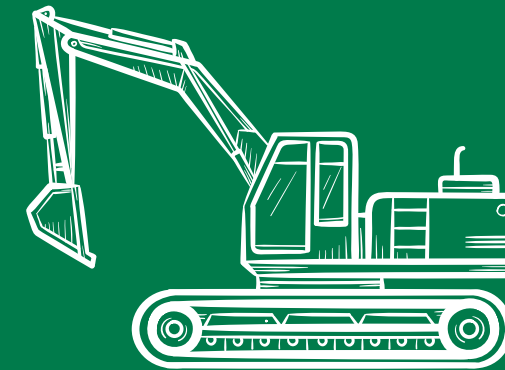
Rapid ignition detection (fire towers)



Standard first attack



Reactive construction of strategic fuel breaks

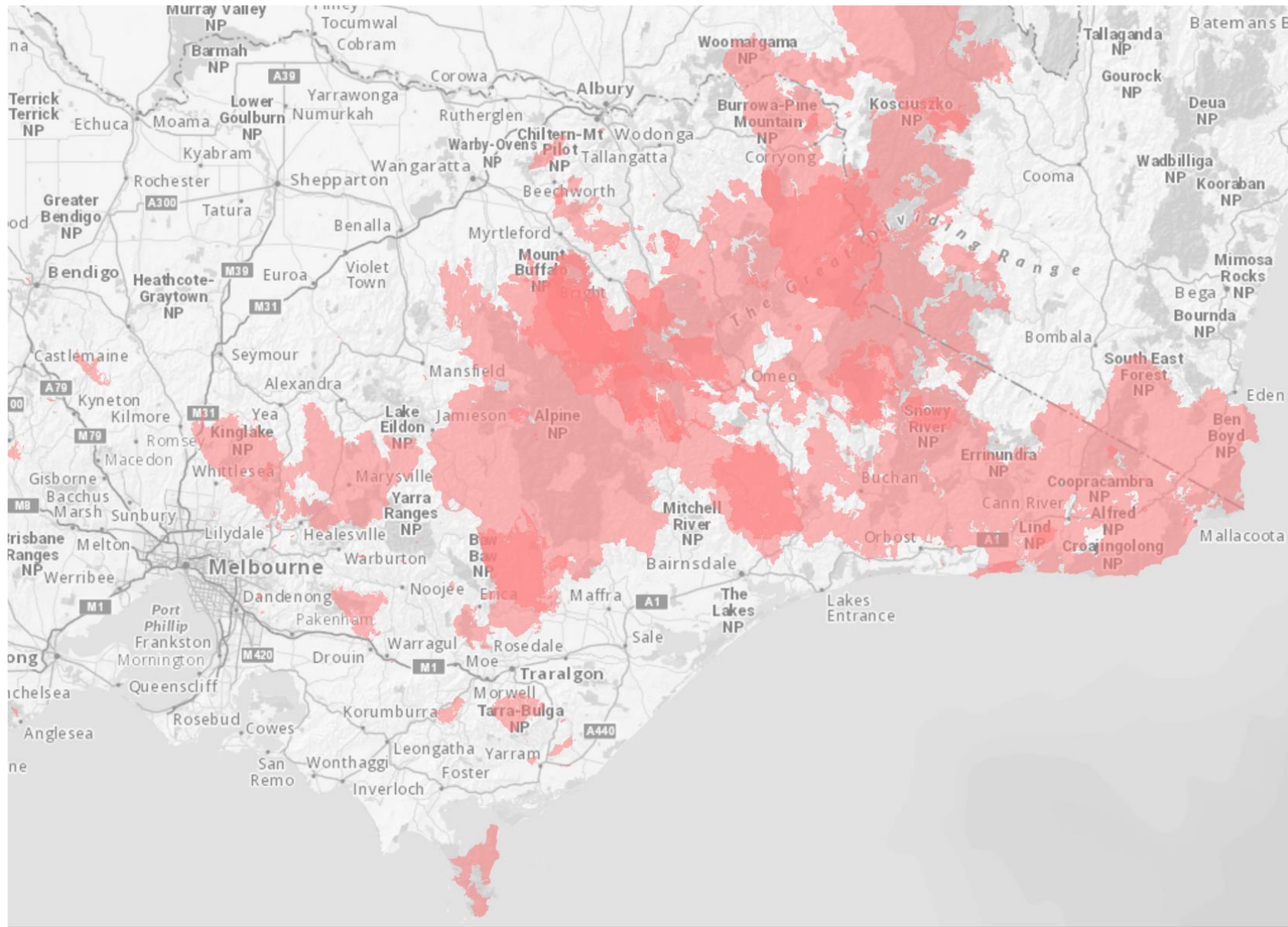


Reactive hazardous tree removal

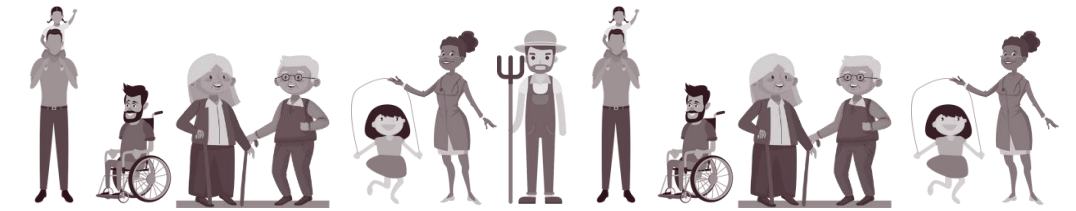


Ongoing investment in Bushfire Recovery

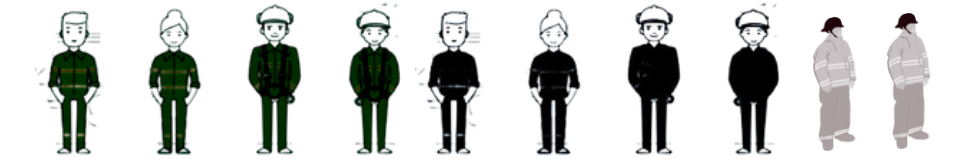
# 2040: EXISTING APPROACH



?  
community fatalities



?  
firefighter fatalities



?  
hectares of land burnt



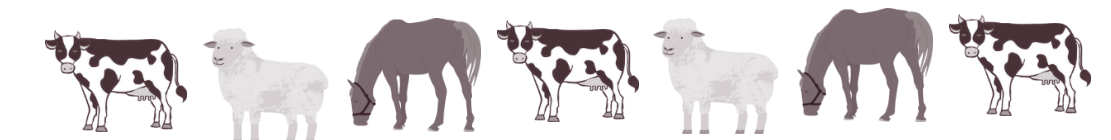
?  
homes destroyed



?  
structures destroyed



?  
livestock killed



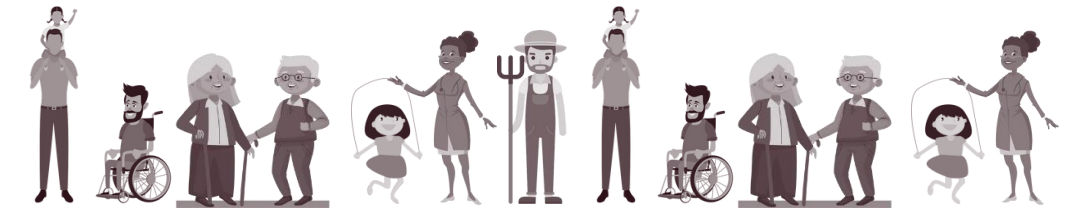
# 2040: EXISTING APPROACH



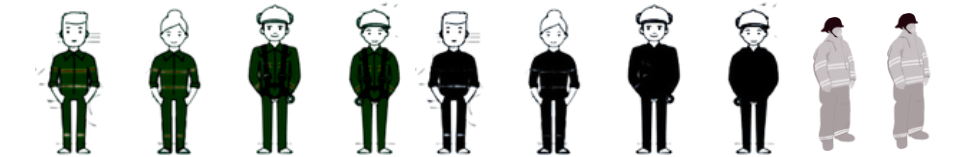
**2020 - 2040 KEY REVIEWS AND INQUIRIES**

- 2040 AUSTRALIAN ROYAL COMMISSION
- IGEM INQUIRY INTO THE VICTORIAN FIRE SEASON
- INDEPENDENT INVESTIGATION
- NATIONAL INQUIRY ON BUSHFIRE MITIGATION
- INQUEST AND RESPONSE
- 2030 VICTORIAN BUSHFIRES ROYAL COMMISSION
- IMPACTS OF PUBLIC LAND MANAGEMENT
- OPERATIONAL REVIEWS OF MAJOR FIRES

?  
community fatalities



?  
firefighter fatalities



?  
hectares of land burnt



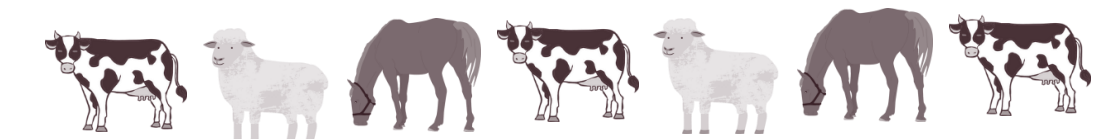
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?  
livestock killed



# 2022: Future Fire Management



Empower  
local communities



Support  
ecosystem resilience



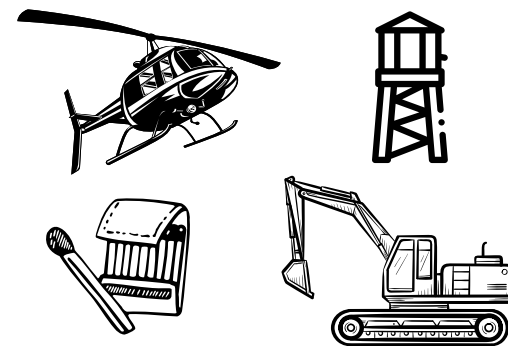
Partner with  
Traditional Owners



Work  
with each other



Apply  
evidence-based  
approaches



Enhance  
capability & capacity

# 2022: Future Fire Management



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Enhance  
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# Empower local communities



**Community based bushfire management plans**



**Living with fire strategy**

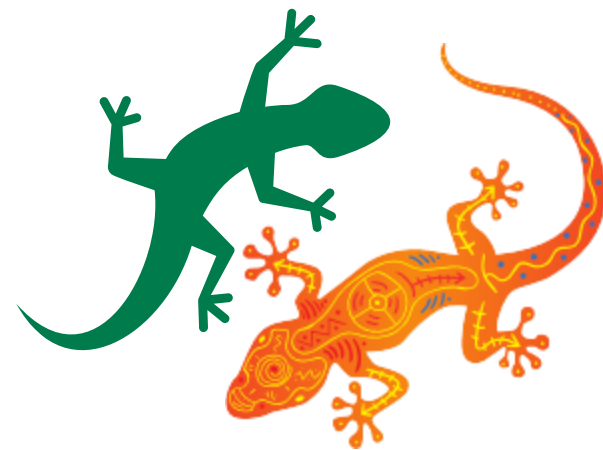
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Empower  
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Support  
ecosystem resilience



Partner with  
Traditional Owners



Work  
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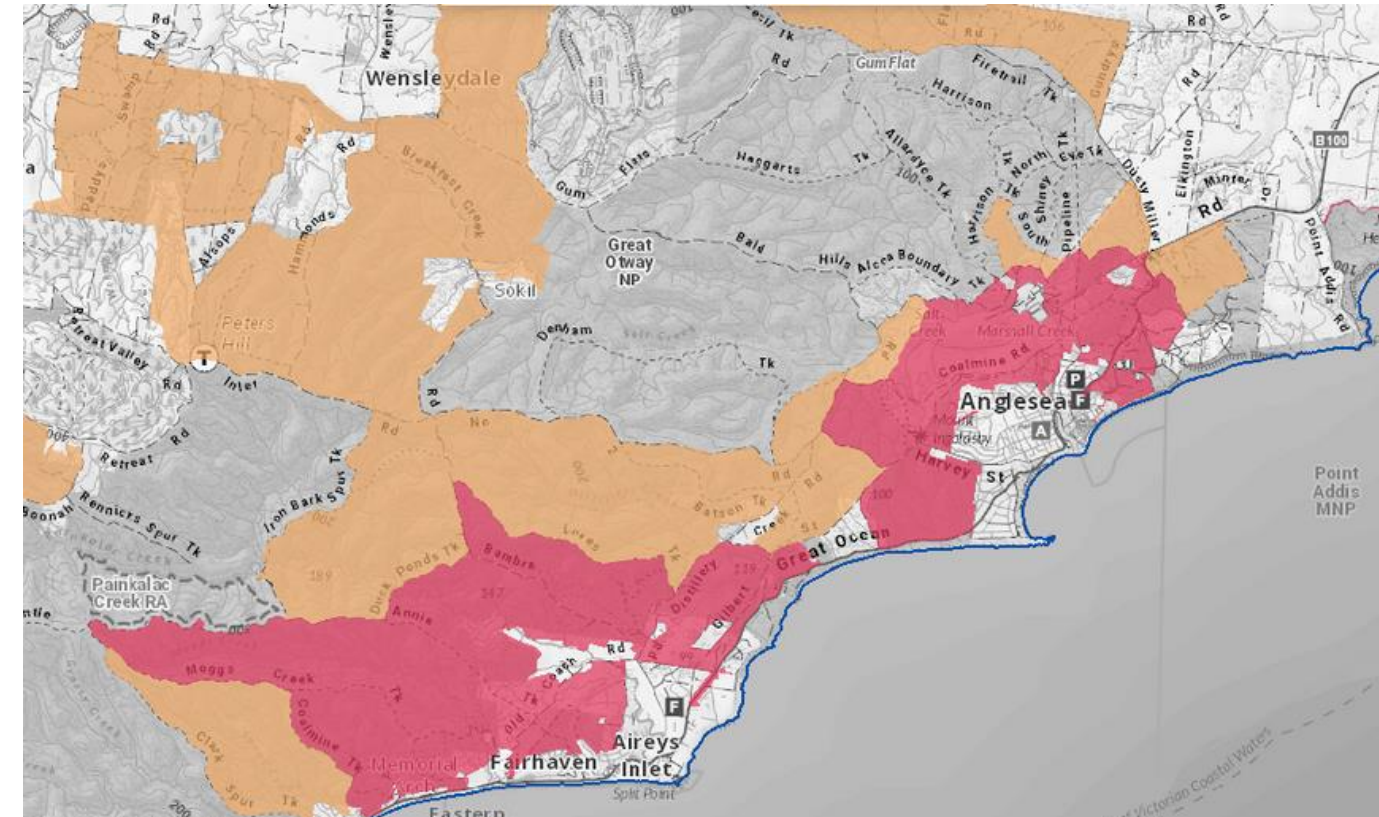
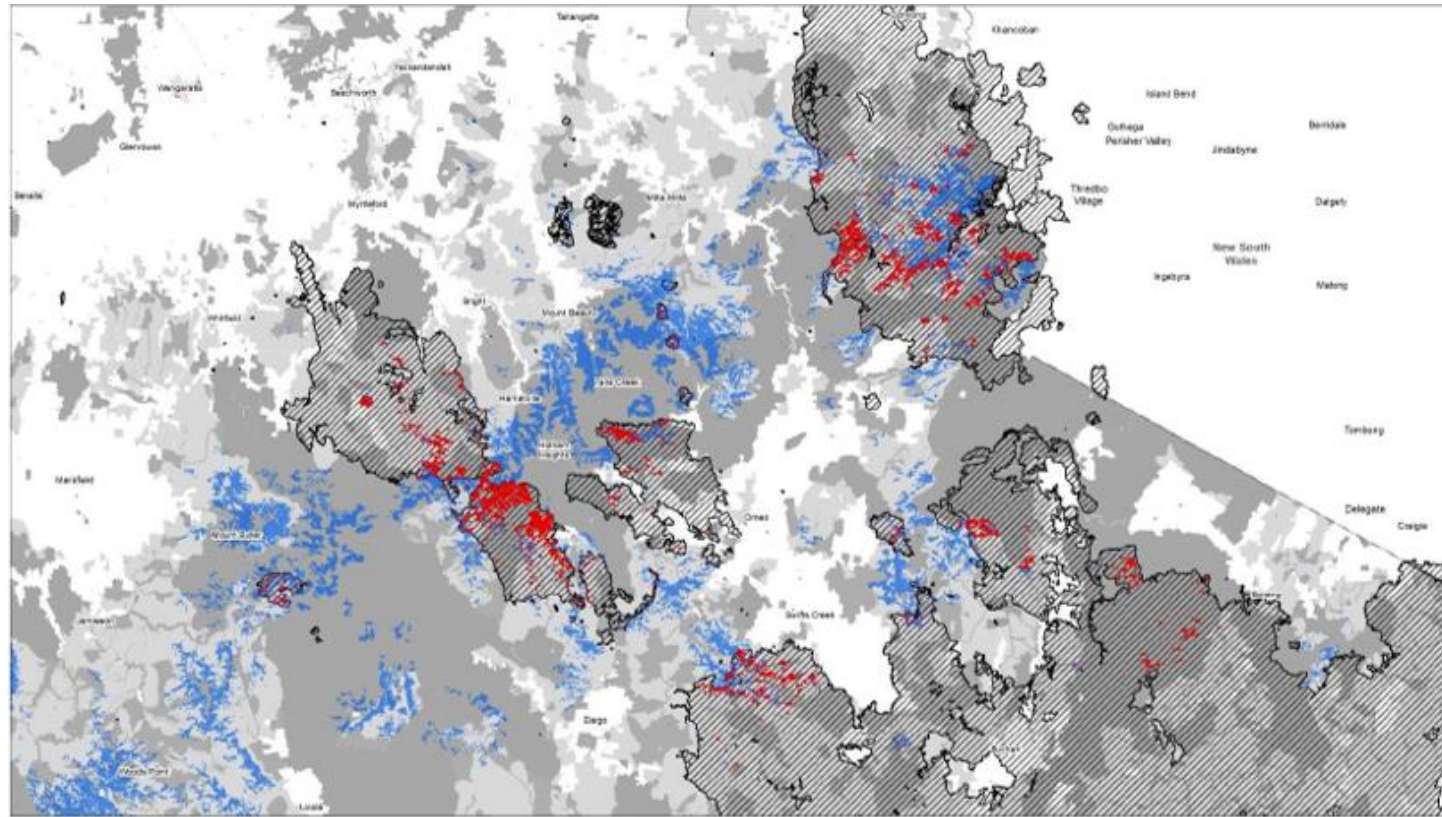


Apply  
evidence-based  
approaches



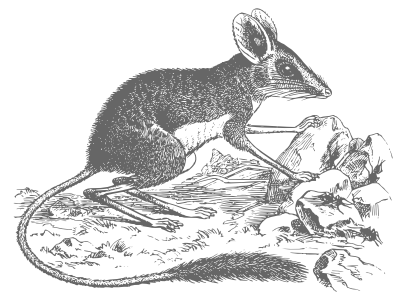
Enhance  
capability & capacity

# Support ecosystem resilience

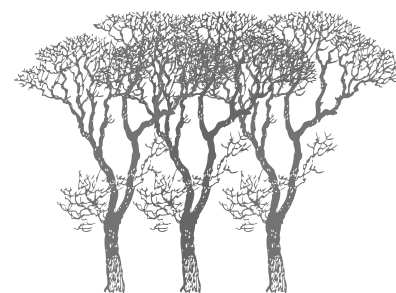


## Reintroduction of fire into fire affected areas

## Fire Management Zoning Review



Improve habitat structure  
& species diversity



Introduce a Mosaic of Forest Age  
Class Distribution

# 2022: Future Fire Management



Empower  
local communities



Support  
ecosystem resilience



Partner with  
Traditional Owners



Work  
with each other



Apply  
evidence-based  
approaches



Enhance  
capability & capacity

# Partner with Traditional Owners



**Traditional Owner led implementation of the Cultural Fire Strategy on Country**



**State-wide Caring for Country Partnership Forum and the Regional Partnership forums**

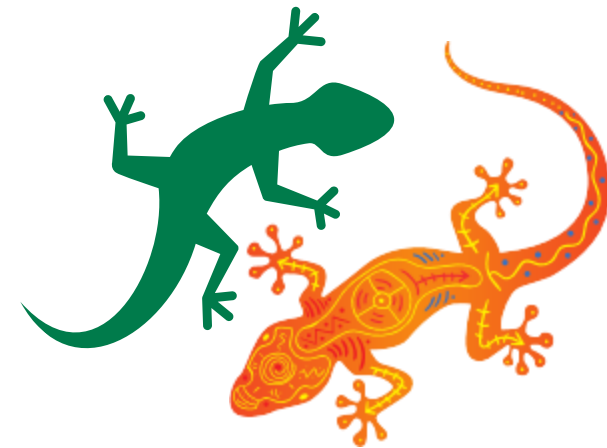
# 2022: Future Fire Management



Empower  
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Support  
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Partner with  
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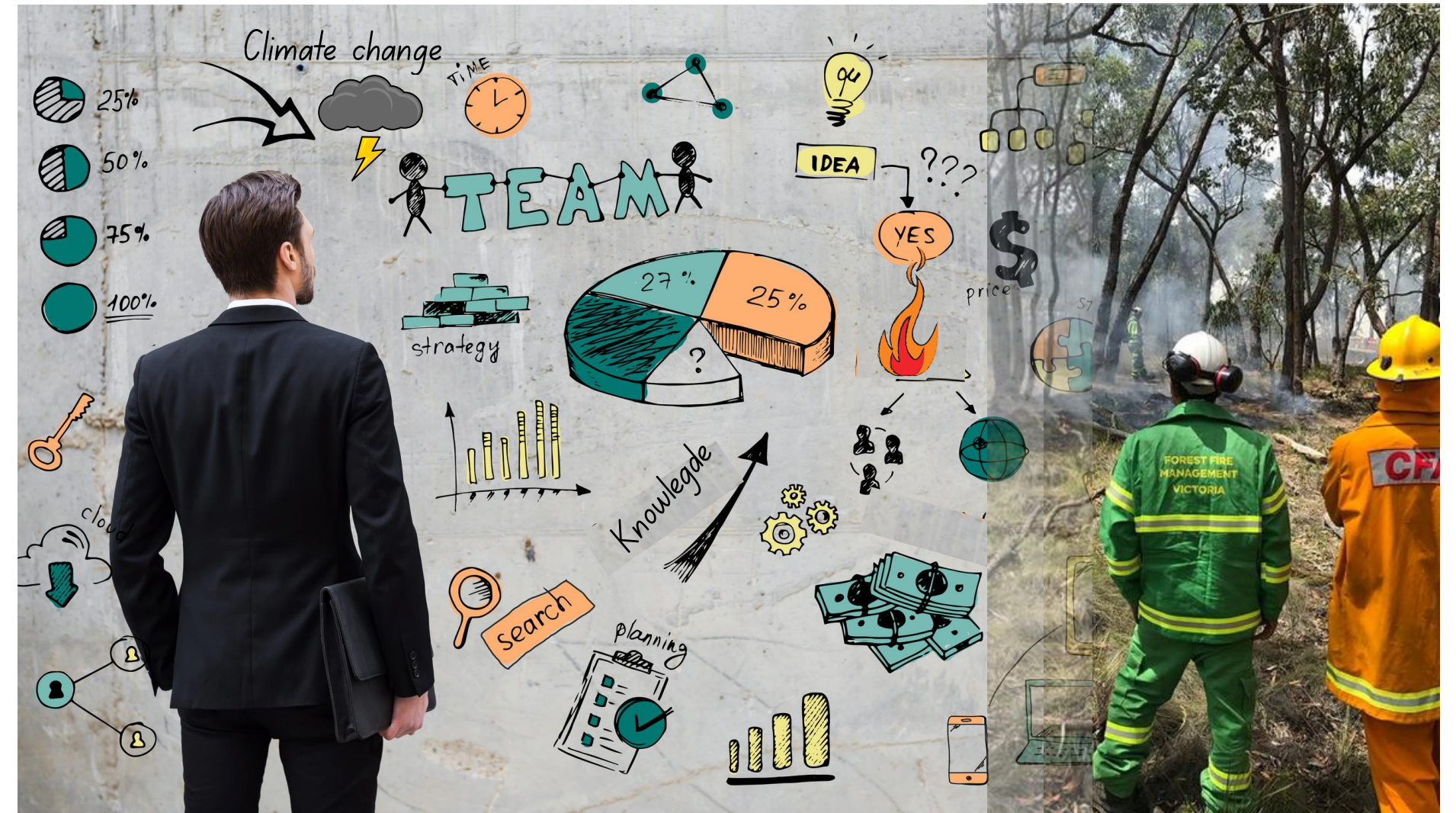


Enhance  
capability & capacity

# Work with each other



Support industry and community to take on enhanced roles in bushfire management.



Roles and responsibilities for bushfire management are well defined and understood.

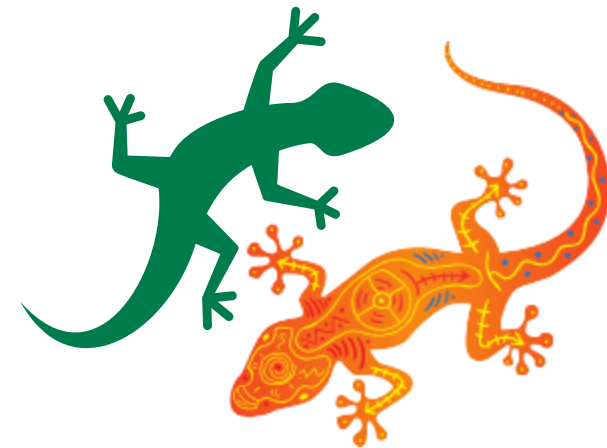
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Support  
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Partner with  
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Apply  
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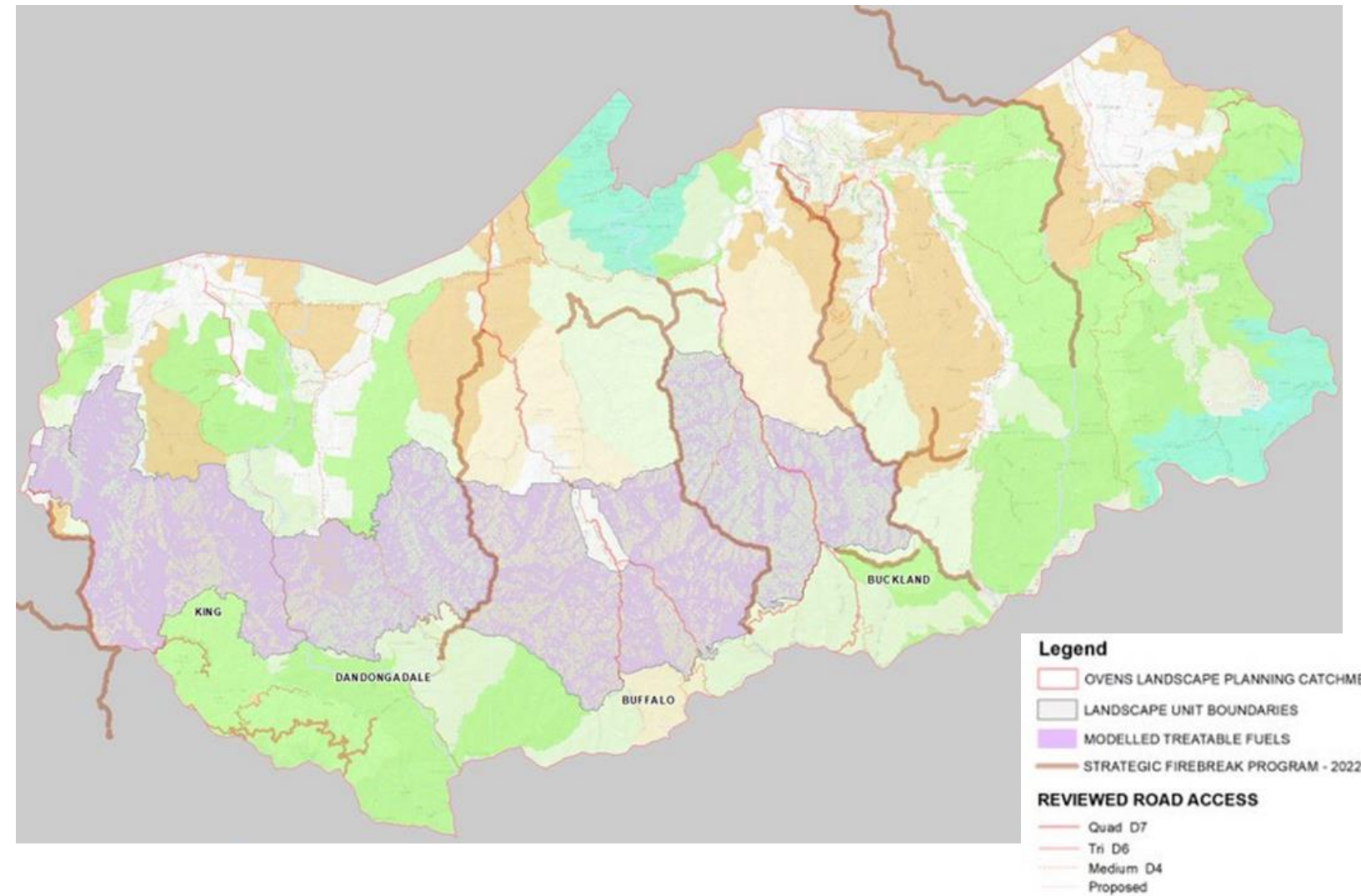


Enhance  
capability & capacity

# Apply evidence-based approaches



Night aviation program



Landscape mosaic burning

# 2022: Future Fire Management



Empower  
local communities



Support  
ecosystem resilience



Partner with  
Traditional Owners



Work  
with each other

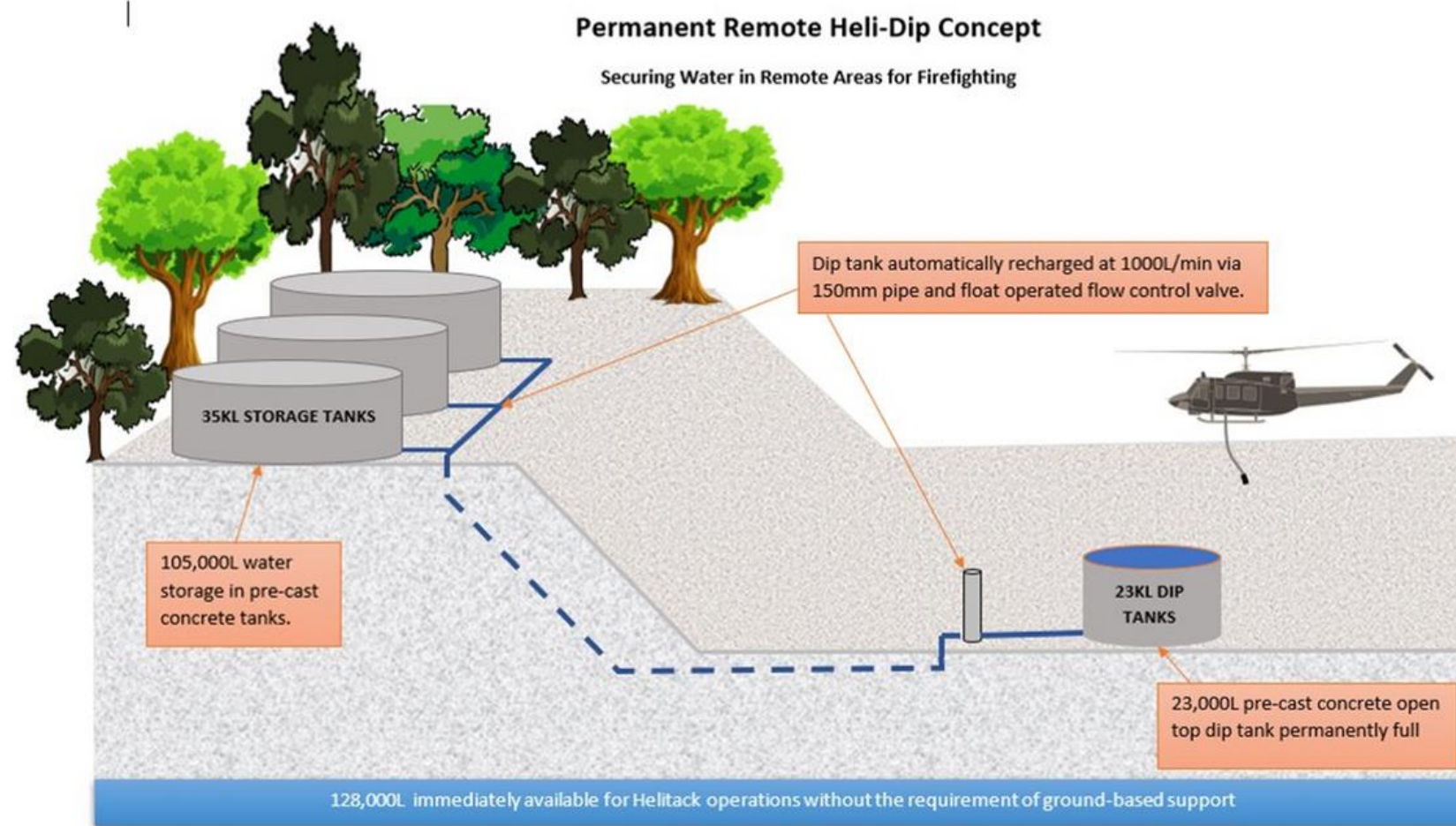


Apply  
evidence-based  
approaches

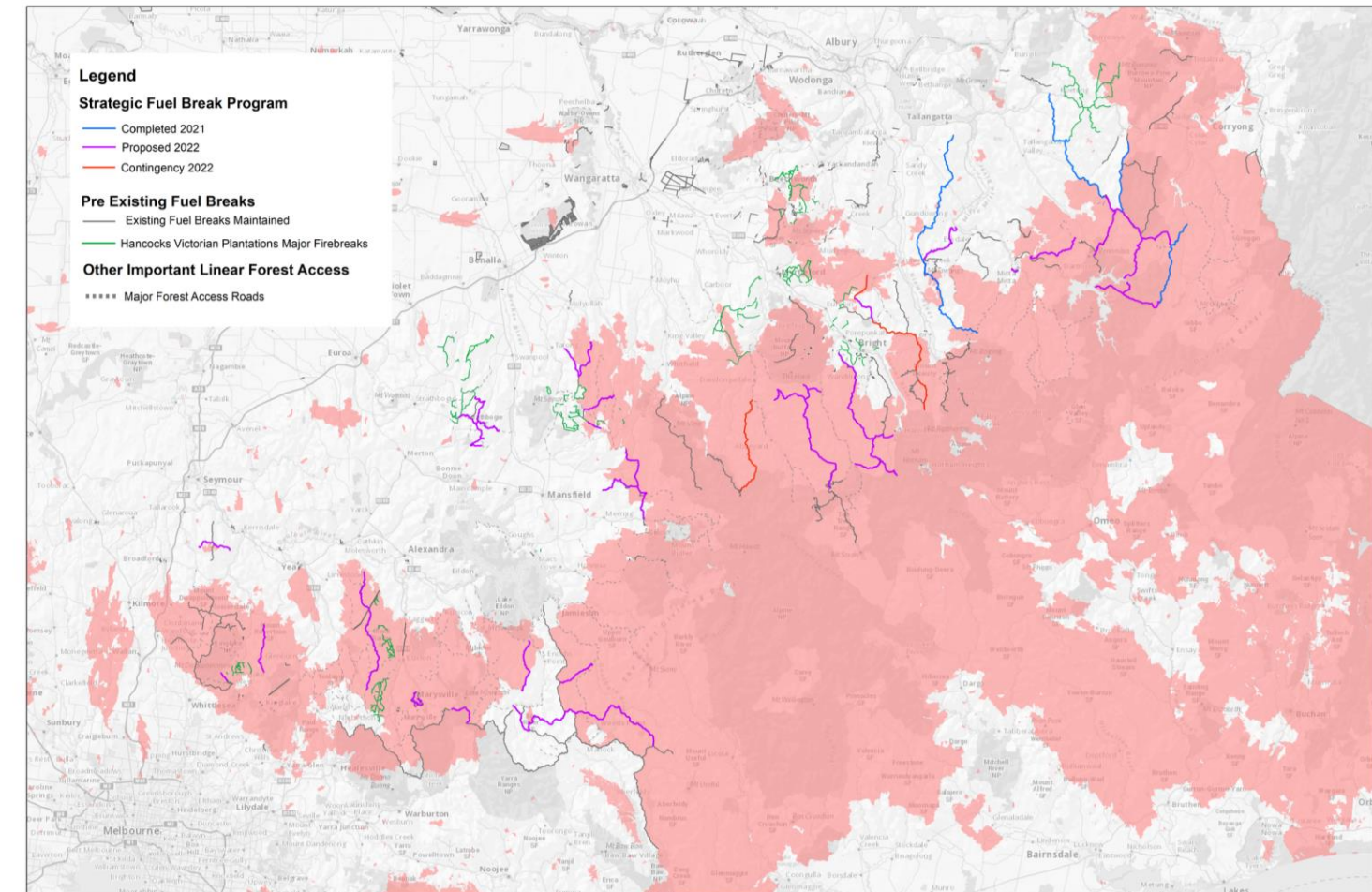


Enhance  
capability & capacity

# Enhance capability & capacity



Securing Remote Water Supplies



Strategic Fuel Breaks



# How do we want to manage future bushfires?



# 2022 - 2040



We empowered  
local communities



We supported  
ecosystem resilience



We partnered with  
Traditional Owners



We worked  
with each other



We applied  
evidence-based  
approaches



We enhanced  
capability & capacity

# 2022 - 2040



Photos: Tom Fairman

Three 1M+ hectare fires in past 18 years

Only 2 in the prior 152 years

4 of the worst fifty spike days recorded since 1972 occurred in 2019/20

What are the chances of us avoiding more?

# Questions?



THANK YOU FOR LISTENING

**END OF PRESENTATION**