Healthy Country: re-writing the book on Australia

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Taungurung Land & Waters Council — First people of the rivers and mountains

Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation

Larrakia Nation — Living Stronger, Living Longer

Bandjalang Aboriginal Corporation — Prescribed Body Corporate RNTBC

The University of Melbourne — Indigenous Knowledge Institute

ASRAC — Arafura Swamp Rangers Aboriginal Corporation

Mimal Land Management

Yirralka Rangers — Laynhapuy IPA

Gunaikurnai Land & Waters

Eastern Maar Aboriginal Corporation

PF-FIRE — Past Fire Frequency and Intensity REconstruction

Australian Government — Australian Research Council

Australian Government — ANSTO

Australian Research Council — Centre of Excellence for Australian Biodiversity and Heritage

The Australian National University

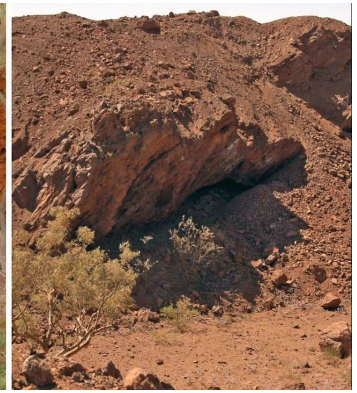
The University of Nottingham

Perspective

P

Past Fire Frequency and
Intensity REconstruction

What’s the real difference?



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Terra nullius

This was no-ones Country

Methods of acquiring territory:

For European powers, there were four internationally recognised ways of acquiring new territories in the seventeenth and eighteenth centuries. They were through inheritance; by conquest; by purchase; and through settlement.

Inheritance

James II inherited Scotland from his father when he became kind in 1685.

Conquest

A conquered country was one that was overtaken by another.
The English conquered India through force. However, in international law, or custom, the consequence of conquest was that local law applied unless overruled by English law. Therefore, England had to take local Indian law into account when governing India as a colony of the British Empire.

Purchase

England purchased a number of territories in North America, such as Louisiana from France and New Mexico from Mexico. England lost these colonies as a result of the American War of Independence.

Occupation or Settlement

A settled country was one that was uninhabited and this available for occupation by another.
By 1670, English **jurists** were talking of English colonists acquiring unoccupied territory. The Laws of England stated that English Law applied immediately on the occupation of deserted and uncultivated land by English subjects. Unoccupied land was declared to be *terra nullius* and English colonists going to a new unoccupied territory took with them '...only so much of the English law as is applicable to their own situation and condition of any infant colony'.

This is what managed country looks like

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Not this…

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Port Phillip Bay – 1836 John Norlock (HMS Rattlesnake)

"The country here is enchantingly beautiful – extensive rich plains all round with gently sloping hills in the distance, all thinly wooded and having the appearance of an immense park. The grasses, flowers and herbs that cover the plains are of every variety that can be imagined, and present a lovely picture of ***what is evidently intended by Nature*** *to be* ***one of the richest pastoral communities in the world****."*

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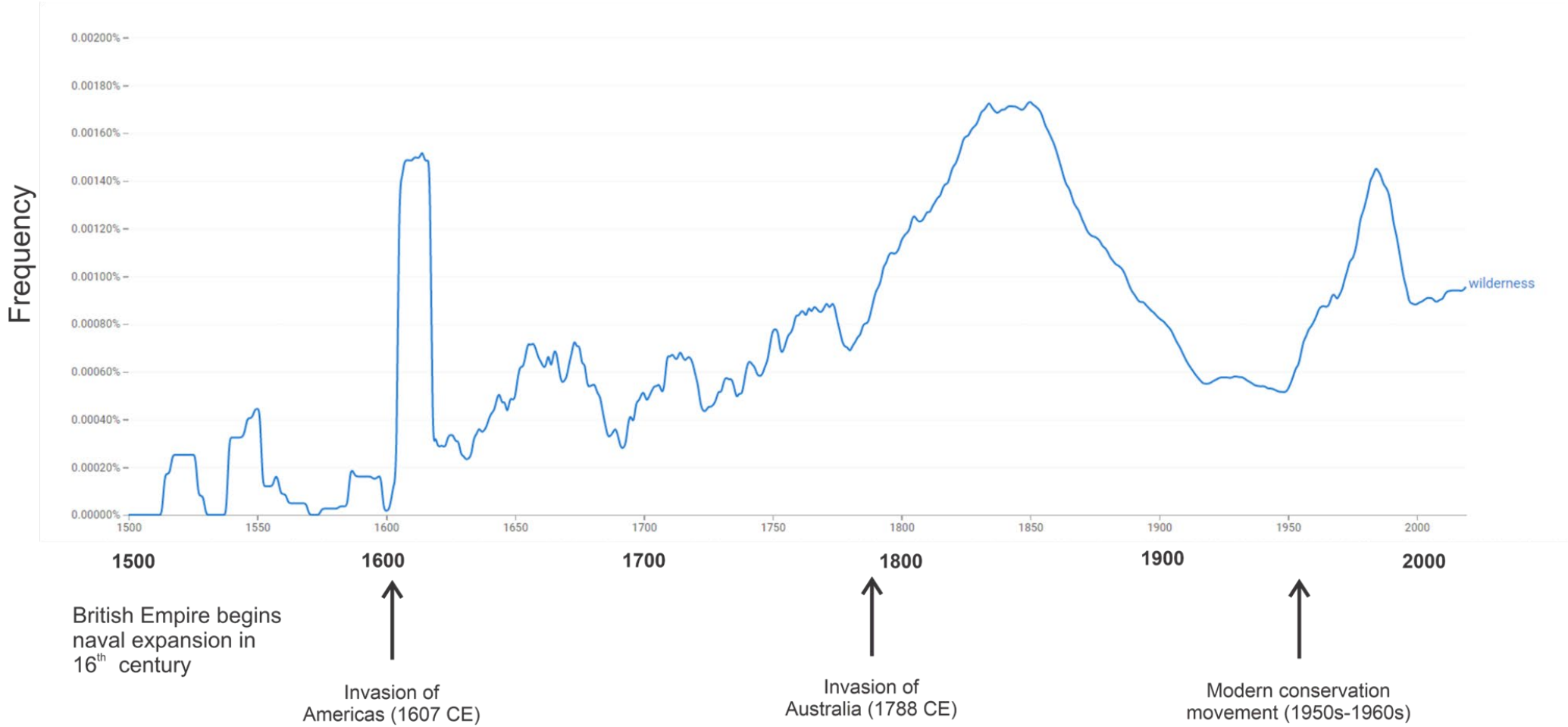
Wilderness usage through time



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Social Darwinism

"Darwin wrote asking for Tasmanian skulls when only four of the island's Aborigines were left alive, provided his request would not 'upset' their feelings."


Kindred of Stone Age Men Discovered on Antarctic Island

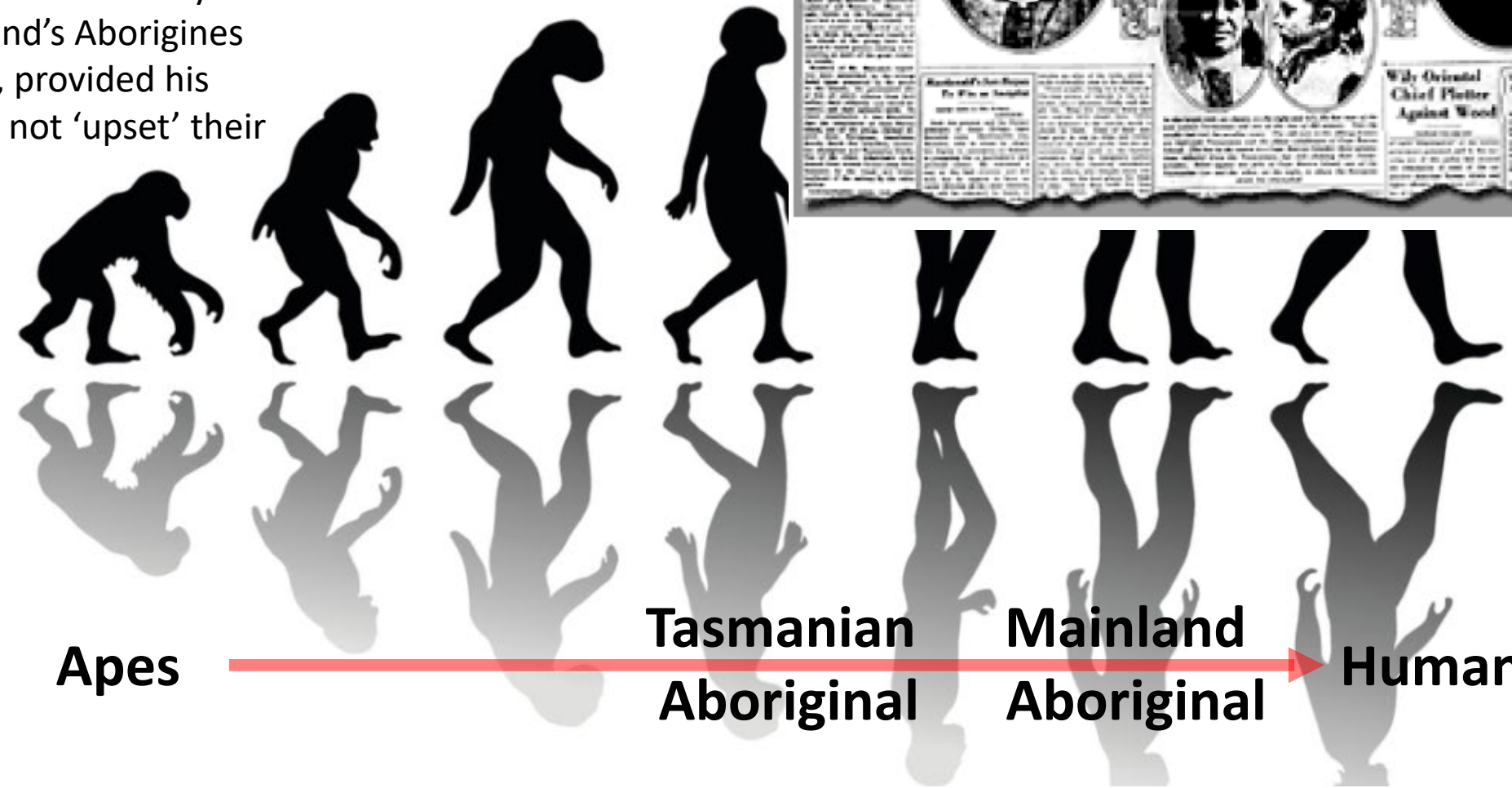
Missing Links With Mankind in Early Dawn of History

Two Survivors Of Tasmanian Tribes Found

Opium Trade Gains Laid to Laxity in U. S.

Wily Oriental Chief Plotter Against Wood

NEW YORK TRIBUNE SUNDAY, FEBRUARY 10, 1924



Definitions

Wildland:

- Land in a natural or uncultivated state (also in *plural* in same sense). Also: a region or tract of such land. (Oxford English Dictionary [OED])

Wilderness:

- Wild or uncultivated land

Wilderness or wildlands (usually in the plural), are natural environments on Earth that have not been significantly modified by human activity

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A. P. Elkin

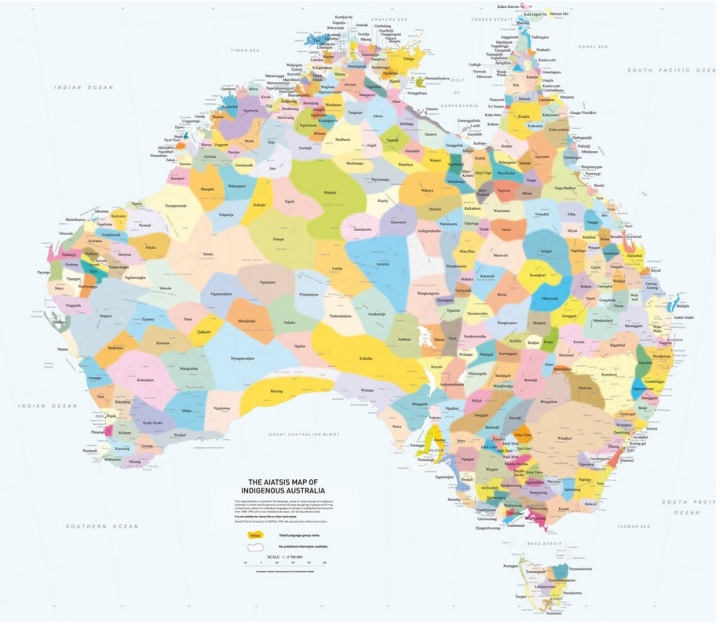
- Professor Anthropology 1932-1956
- Effectively dominated Australian anthropology, advised governments, trained administrators
- President of the Association for the Protection of Native Races from 1933 to 1962
- Vice-president of the Aborigines Protection Board of New South Wales

- "*a parasite on nature; that is, he did not assist nature to produce his sustenance either by tilling the soil and sowing seed, nor by domesticating and breeding animals. He was subservient to nature, and could do no more than become skilled in observing her ways, and in gathering and catching her gifts of vegetable products, marsupials, reptiles, fish, birds and insects*" (Elkin 1933).

- "*The consequence of this invasion was that the Aborigines were forced to adapt themselves to the newcomer. Whereas previously they had been parasites on nature, from 1788 onwards, if they were to survive at all, they had to become parasites on the white man*" (Elkin 1951).

D. Horton

- employed as an archaeologist, biologist publisher at Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) 1974-1998
- Created the Map of Aboriginal Australia from Tindale's work
- Published "Pure State of Nature" in 2000



- *"Aborigines did, to some extent, attempt to manage the environment by the use of fire, but they fitted into the natural Australian fire regime, and their use of fire has had little, if any, effect on vegetation; we shouldn't use 'control burning' to manage the environment, though we may wish to use it selectively to protect property. But wherever it is used, it is not good for the environment*" (Horton 2000).

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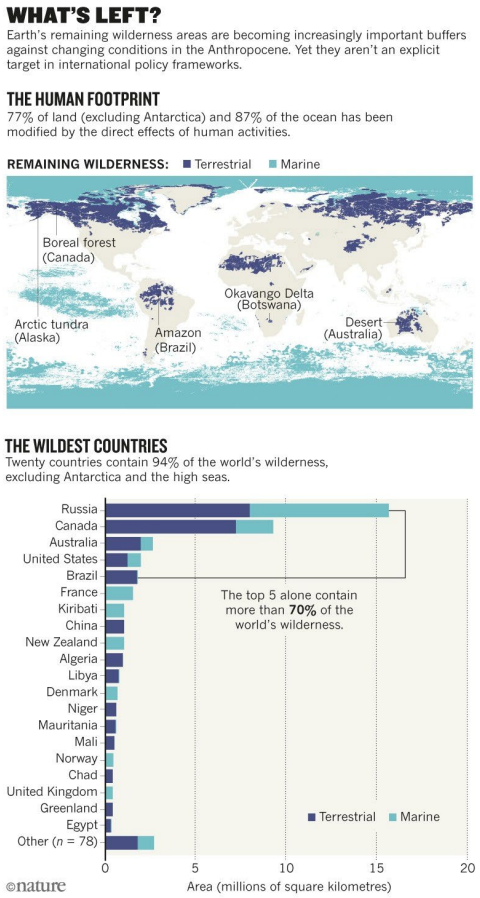
The last of the wild



Watson 1998: Nature

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Fire as an evil and the arrogance of scientists

COMMENT PIECE

doi: 10.1111/emr.12564

Cultural burning, cultural misappropriation, over-simplification of land management complexity, and ecological illiteracy

By David Lindenmayer and Elle Bowd

David Lindenmayer *is a Professor, and Elle Dowd is a Postdoctoral Research Associate, at the Fenner School of Environment and Society, The Australian National University (Canberra, ACT 2601, Australia; Email: david.lindenmayer@anu.edu.au).* ***Elle Bowd*** *is Professor, Fenner School of Environment and Society, The Australian National University (Canberra, ACT 2601, Australia; Email: elle.bowd@anu.edu.au.*

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Lindenmayer and Bowd 2022

The myth of scientific objectivity

- *"This is the traditional understanding of the nature of science which gives us the idea that scientific knowledge is free from any kind of human attitude and strictly based on observations, experiments, logical analyses of its concepts and so on which give us the bare facts of the real world. According to this view, human attitude is associated with human sciences; but as far as natural science is concerned there is no scope for any subjective elements. Scientific knowledge is purely objective, and it is an objective description of the real structure of the world*" (Mannan 2016).

- "*Scientists are men and social beings; therefore, no scientist is beyond his psychology, ideology and sociology which have significant impact on his thought. All these factors produce influences over scientific decisions,, how different theories are to be compared, when the research as decisions about when a phenomenon is recognized as a problem, what the methods are for solving the problem, what the methods are for justification, how different theories are to be compared, when the research comes to end, etc"* (Mannan 2016)

- *Teams tested the same hypotheses with the same data. Some found negative results, some positive, some nada. No effect of expertise or confirmation bias. "Idiosyncratic researcher variability is a threat to the reliability of scientific findings*." (Breznau et al 2022: PNAS)

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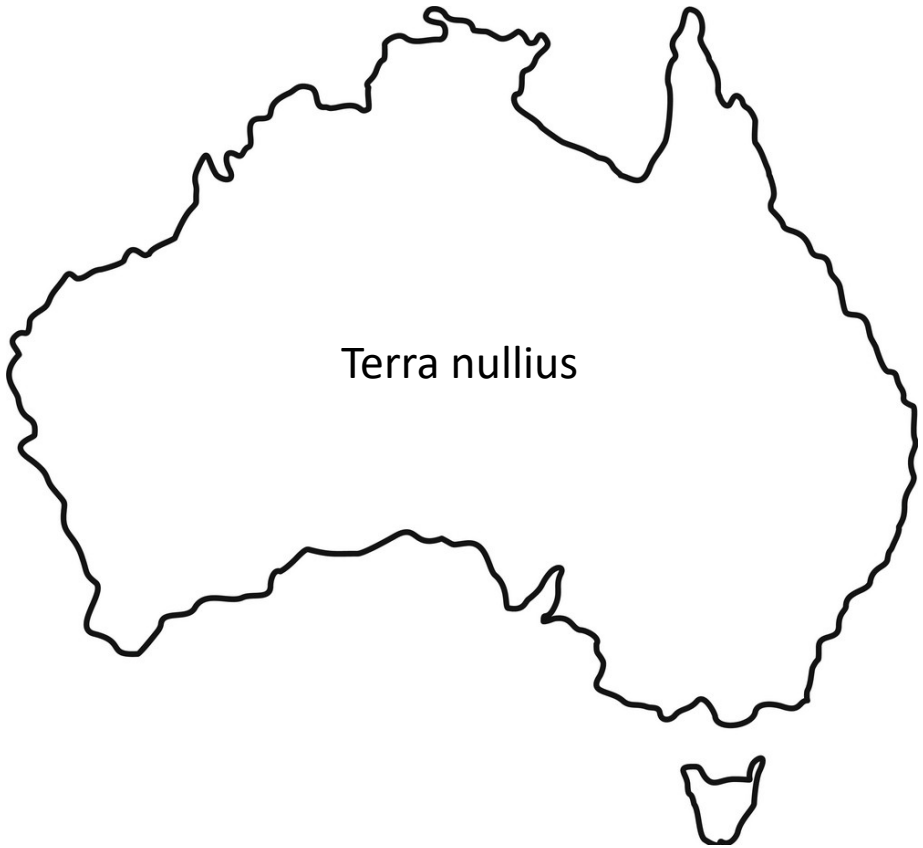
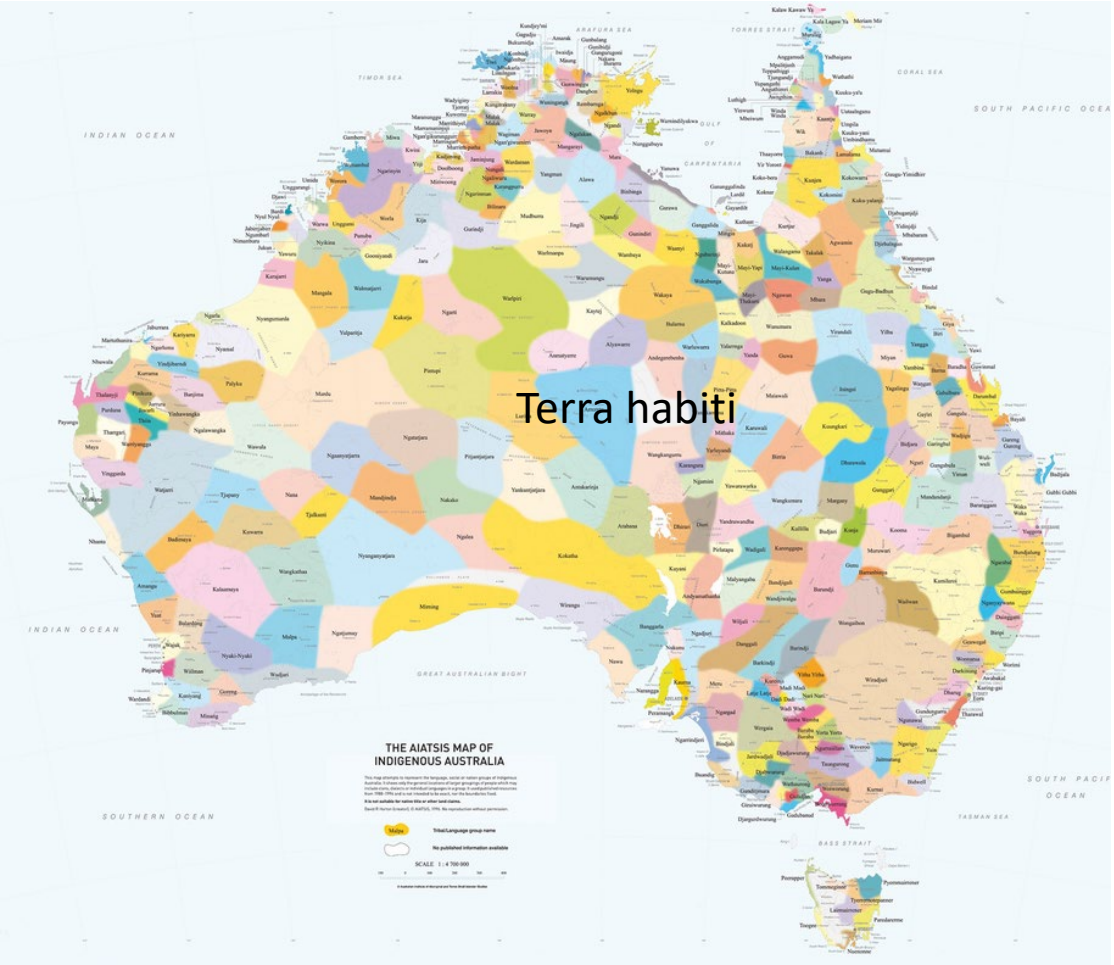
A hall of mirrors

- *The self sets itself within a hall of mirrors; it mistakes its reflection for the world, sees its own reflections endlessly, talks endlessly to itself, and, not surprisingly, finds continual verification of itself and its world view. This is monologue masquerading as conversation, masturbation posing as productive interaction; it is a narcissism so profound that it purports to provide a universal knowledge when in fact its violent erasures are universalizing its own singular and powerful isolation. It promotes a nihilism that stifles the knowledge of connection, disables dialogue, and maims the possibilities whereby 'self' might be captured by 'other'"* (Rose-Bird 2004)

Perspective



Reality



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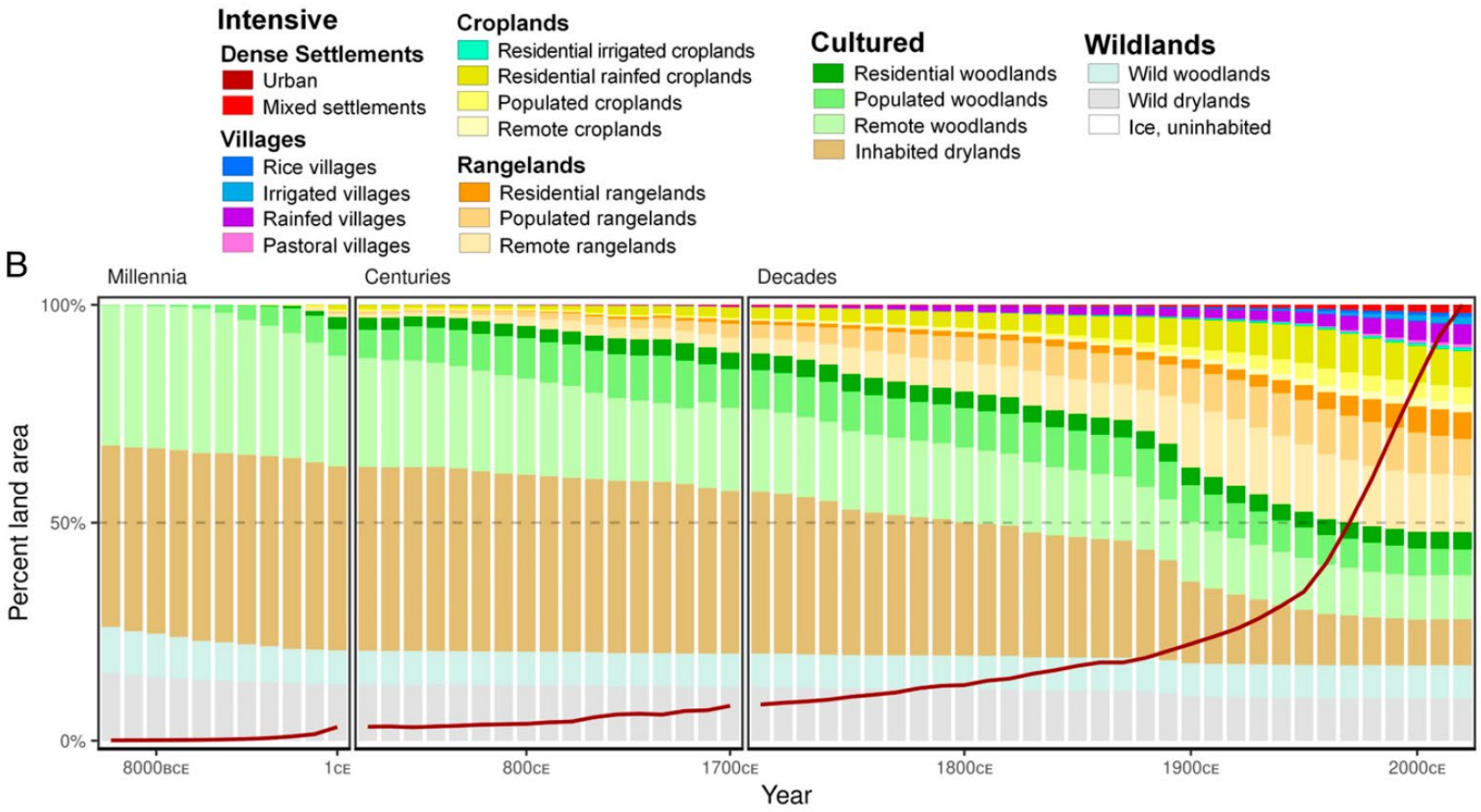
Wildlands?



SUSTAINABILITY SCIENCE

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Ellis et al. 2021; PNAS

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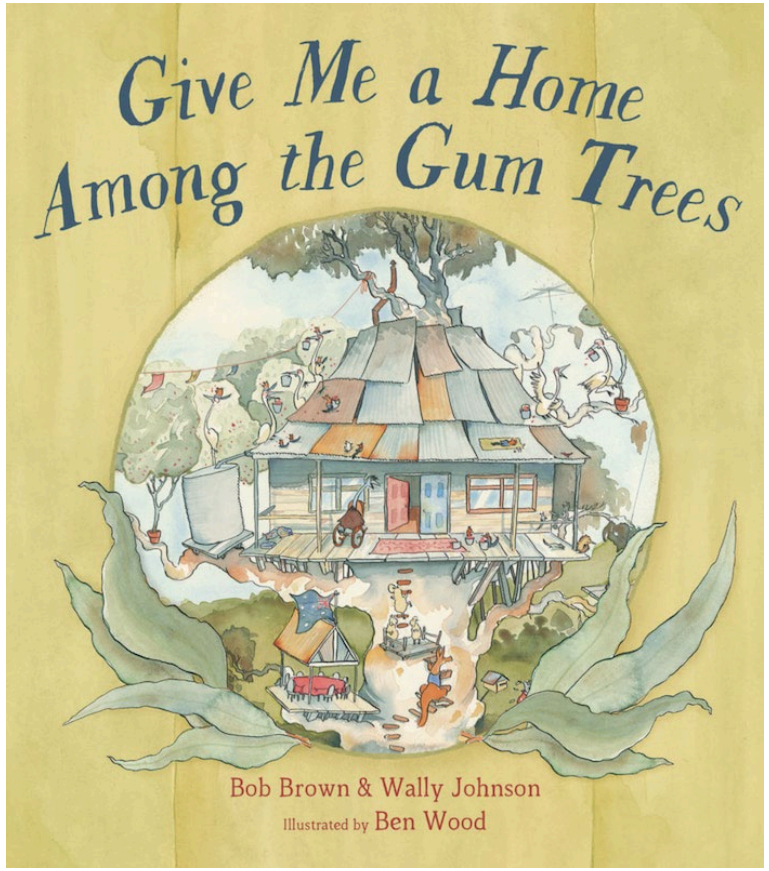
A perilous national identity



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Fires and climate

Politics Federal Bushfires

This was published 10 months ago

CSIRO study proves climate change driving Australia's 800% boom in bushfires

Mike Foley
November 26, 2021 – 9.00pm

Save Share A A A 174 View all comments

Climate change is the dominant factor causing the increased size of bushfires in Australia's forests, according to a landmark study that found the average annual area burned had grown by 800 per cent in the past 32 years.

The peer-reviewed research by the national science agency, CSIRO — published in the prestigious science journal, *Nature* — reveals evidence showing changes in weather due to global warming were the driving force behind the boom in Australia's bushfires.

The CSIRO findings bolster that conclusion and call into question calls for native forest logging to be used as a bushfire management tool.

"This is happening regardless of anything that we might or might not do to try to stop the fires," Dr Canadell said.

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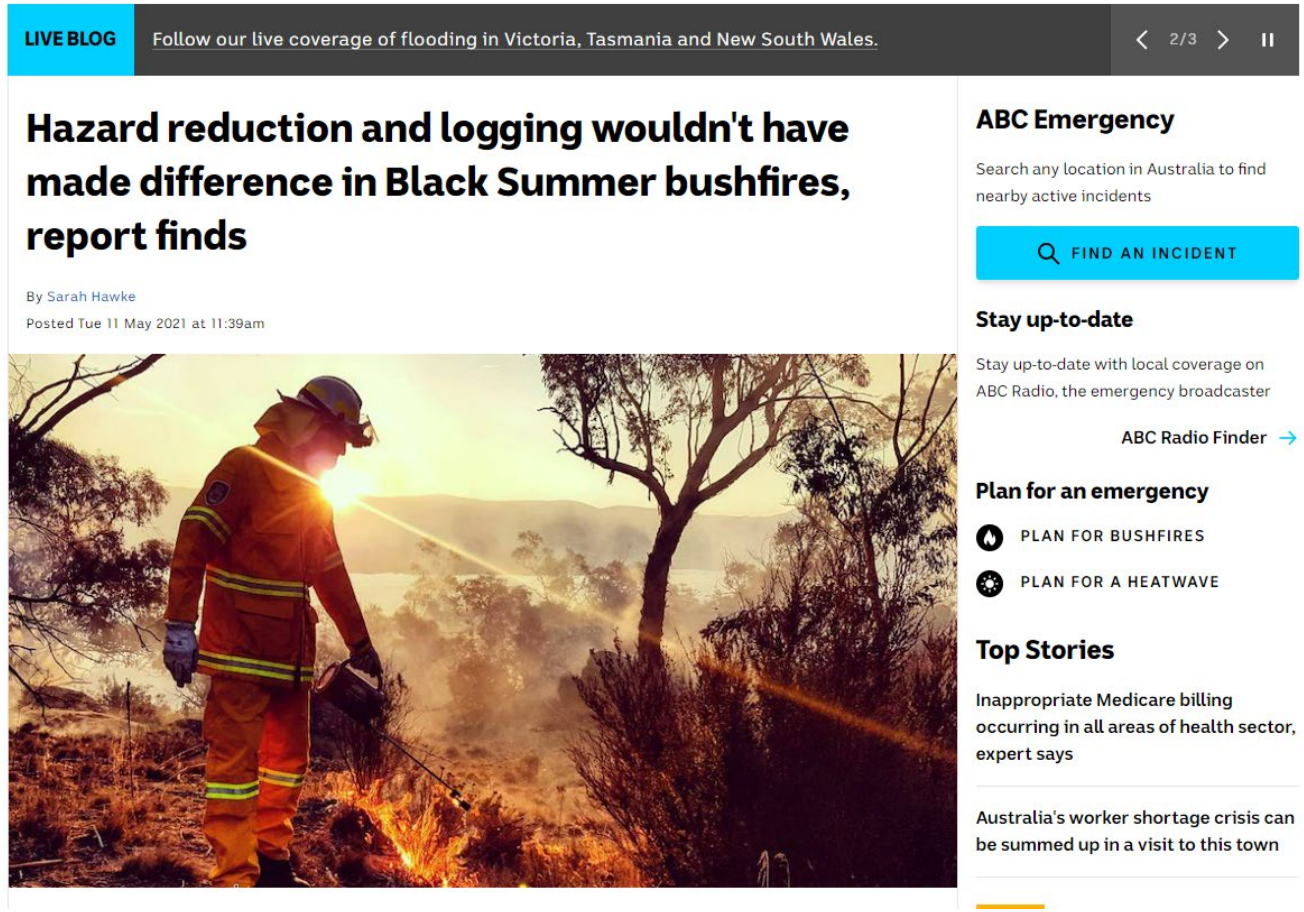
Fires and climate



LIVE BLOG Follow our live coverage of flooding in Victoria, Tasmania and New South Wales. 2/3

Hazard reduction and logging wouldn't have made difference in Black Summer bushfires, report finds

By Sarah Hawke

Posted Tue 11 May 2021 at 11:39am

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Australia's worker shortage crisis can be summed up in a visit to this town

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The villain: climate change

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More trees! More trees!

Home / Earth / Environment

OCTOBER 14, 2022

Stopping native forest logging key to getting to net zero in Australia

by Australian National University

Eucalyptus forest, Australia. Credit: Unsplash/CC0 Public Domain

Leading researchers are calling for a cease to native forest logging if Australia wants to meet its net zero targets in coming decades.

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What do we actually know?

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Humans and fire

Table 1
Prehistoric sites containing evidence or possible evidence of human use of fire.

Chesowanja Kenya	1.42 ± 0.07 Ma K–Ar age of overlying basalt	Discoloured clay aggregates intermingled with Oldowan lithics and fauna. Magnetic susceptibility studies	Gowlett et al., 1981. Nature 294:125–129.
Koobi Fora and Middle Awash, Kenya	~1.5 Ma	Burnt discoloured sediment patches based on thermo-luminescence	Bellomo, R., 1994. J. Hum. Evol. 27:173–195. Clark, J.D., Harris, J.W.K., 1985. Afr. Arch. Rev. 3, 3–27.
Wonderwerk Cave, Kuruman Hills. Western Transvaal, South Africa.	1.0 Ma	Fourier transform infrared microspectroscopy (mFTIR) analyses of intact sediments indicating burned bone and ash plant remains	Berna et al., 2012. www.pnas.org/cgi/doi/10.1073/pnas.1117620109
Swartkrans, Gauteng, South Africa	1.0–1.5 Ma	Burnt bones, charcoal	Brain, C.K., 1993. Nature 336, 464–466.
Gesher Benot Ya'akov, Jordan Valley	0.7–0.8 Ma	Pot-lid fractures (planoconvex stone flakes–burnt microdebitage) Thermoluminescence. charred wood, seeds, and grains.	Goren-Inbar, N., et al., 2004. Science, 304, 725–727.
Zhoukoudian cave, China	0.6 Ma	Burned bones associated with burned flint, Wood ash residues	Weiner, et al., 1998. Science 281, 251–253.
Qesem Cave, Israel	0.38–0.2 Ma	Burnt bone, heated soil, 10–36% of identified bone specimens show signs of burning, reaching 500 °C	Karkanas, P., et al. 2007. J. Hum. Evol. 53, 197–212.

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Humans: the fire organism

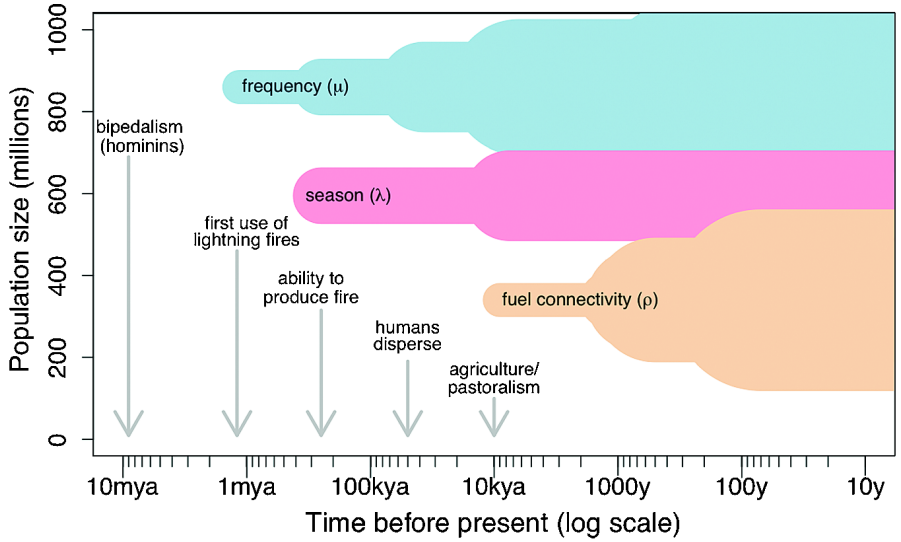
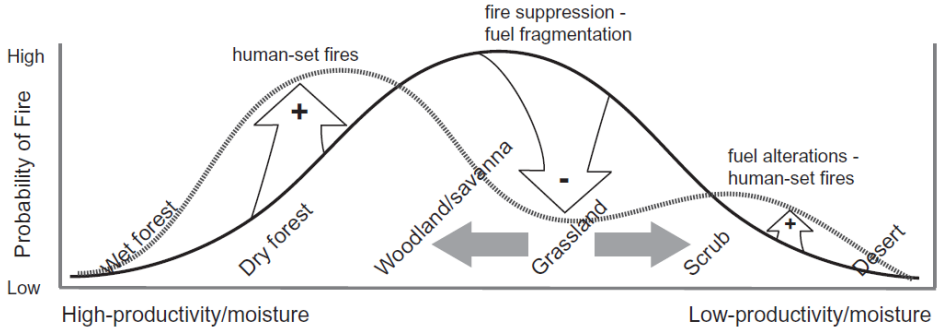


Figure 5.1 Fire and human activity. Stages of human evolution defined by their ability to manipulate μ (frequency of ignition events), λ (timing of ignition events), and ρ (the connectivity of the fuel bed). The thickness of the coloured lines gives a rough representation of the magnitude of the effect. (From Archibald *et al.*, 2012).

Fire on Earth: An Introduction, First Edition. Andrew C. Scott, David M.J.S. Bowman, William J. Bond, Stephen J. Pyne and Martin E. Alexander.



McWethy et al (2013): *Global Ecology and Biogeography*

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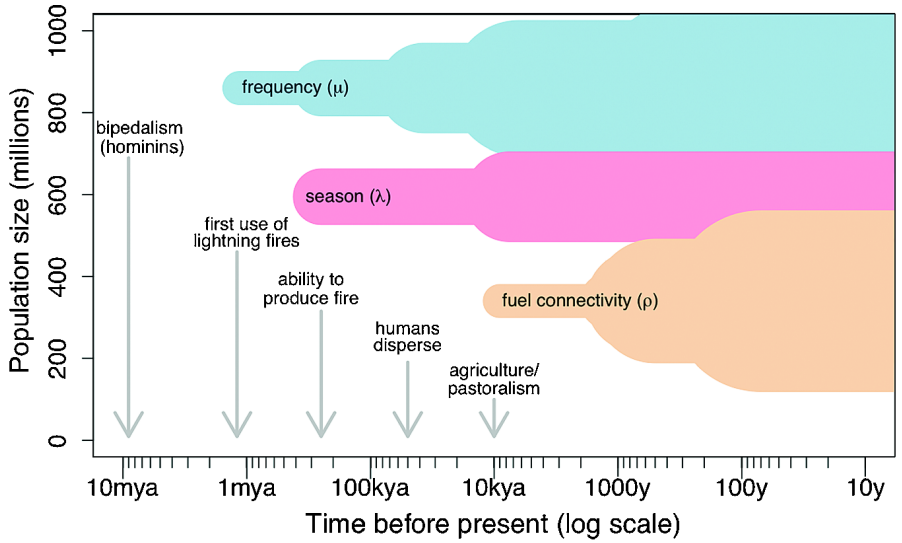
Humans: the fire organism



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Why Fire Makes Us Human

Cooking may be more than just a part of your daily routine, it may be what made your brain as powerful as it is

Darwin himself considered language and fire the two most significant achievements of humanity. (Illustration by Frank Stockton)

By **Jerry Adler**
SMITHSONIAN MAGAZINE | SUBSCRIBE
JUNE 2013

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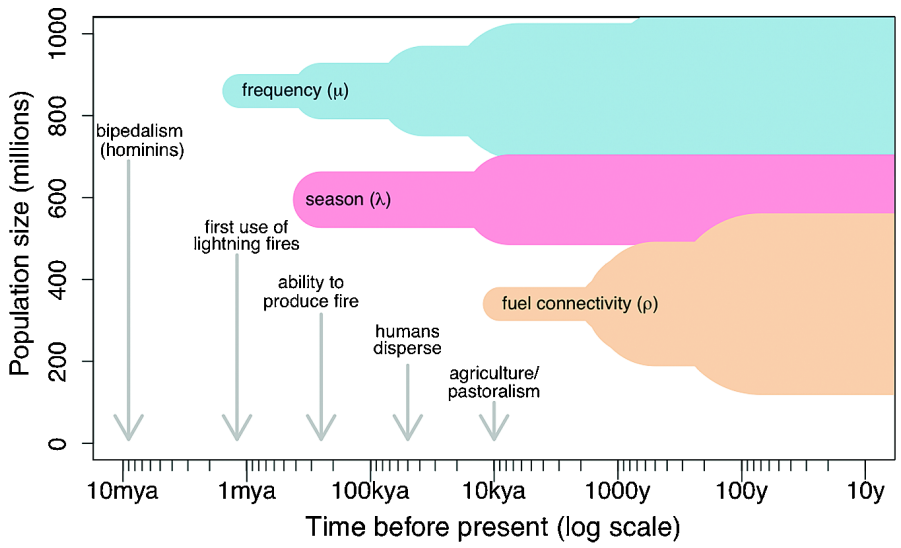
Humans: the fire organism



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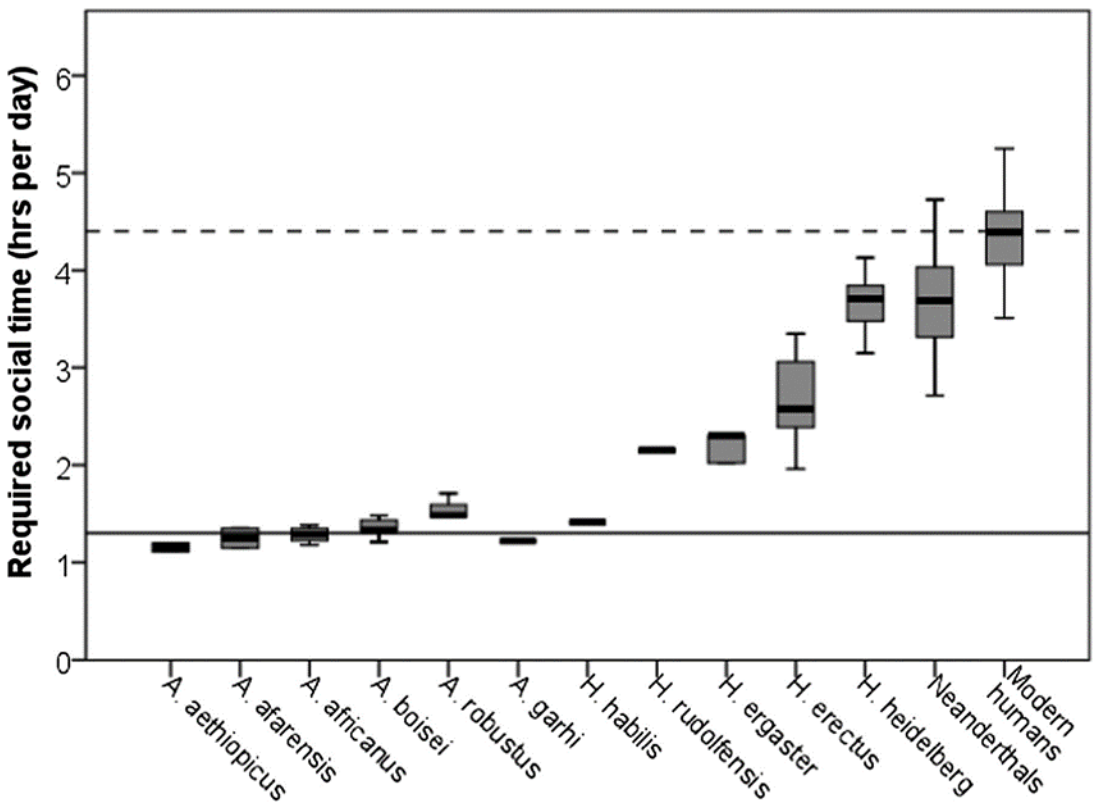

Dunbar (2014) *PNAS*

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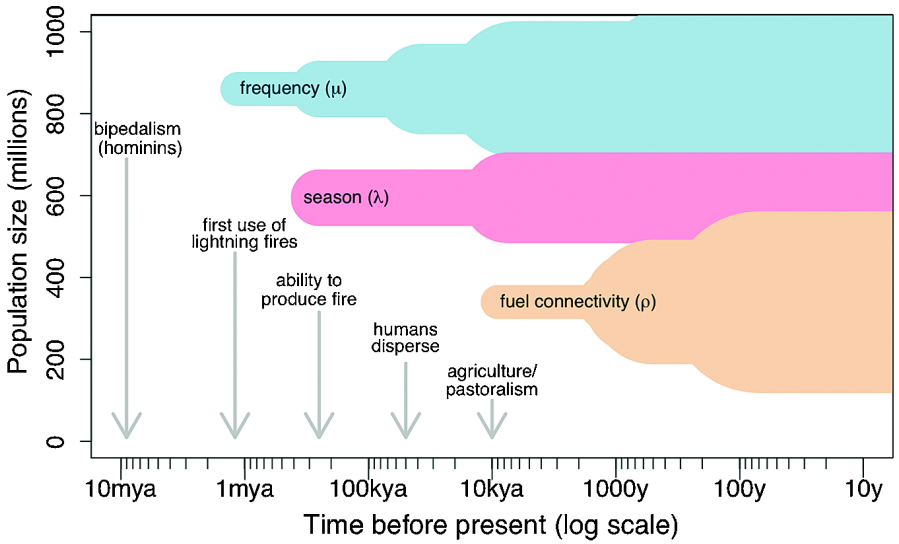
Humans: the fire organism



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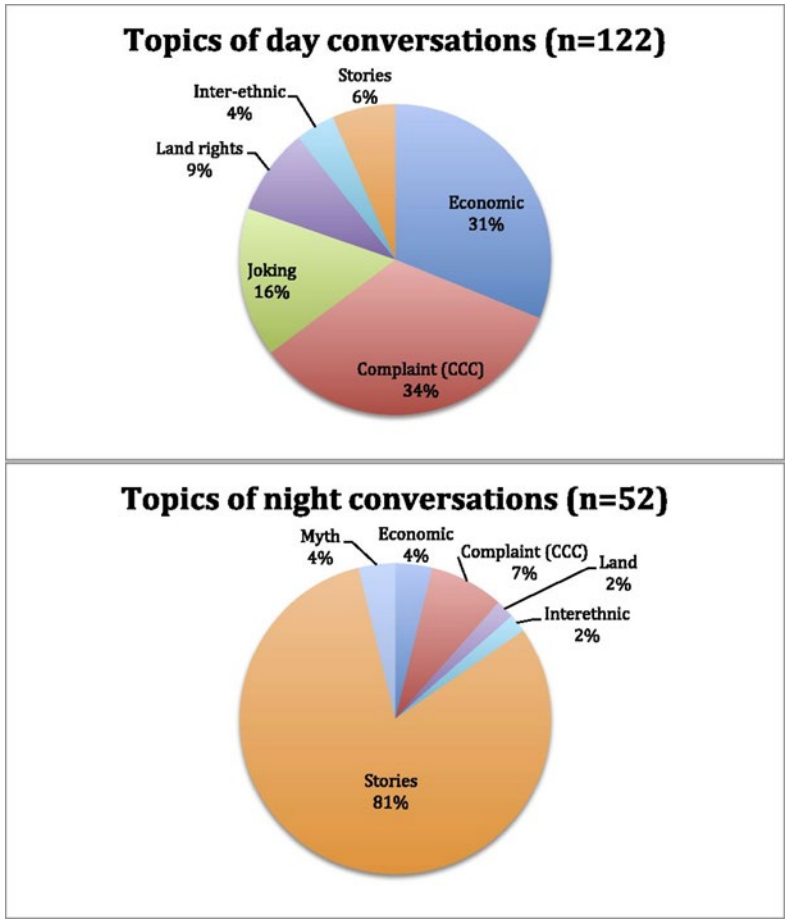

Dunbar (2014) *PNAS*

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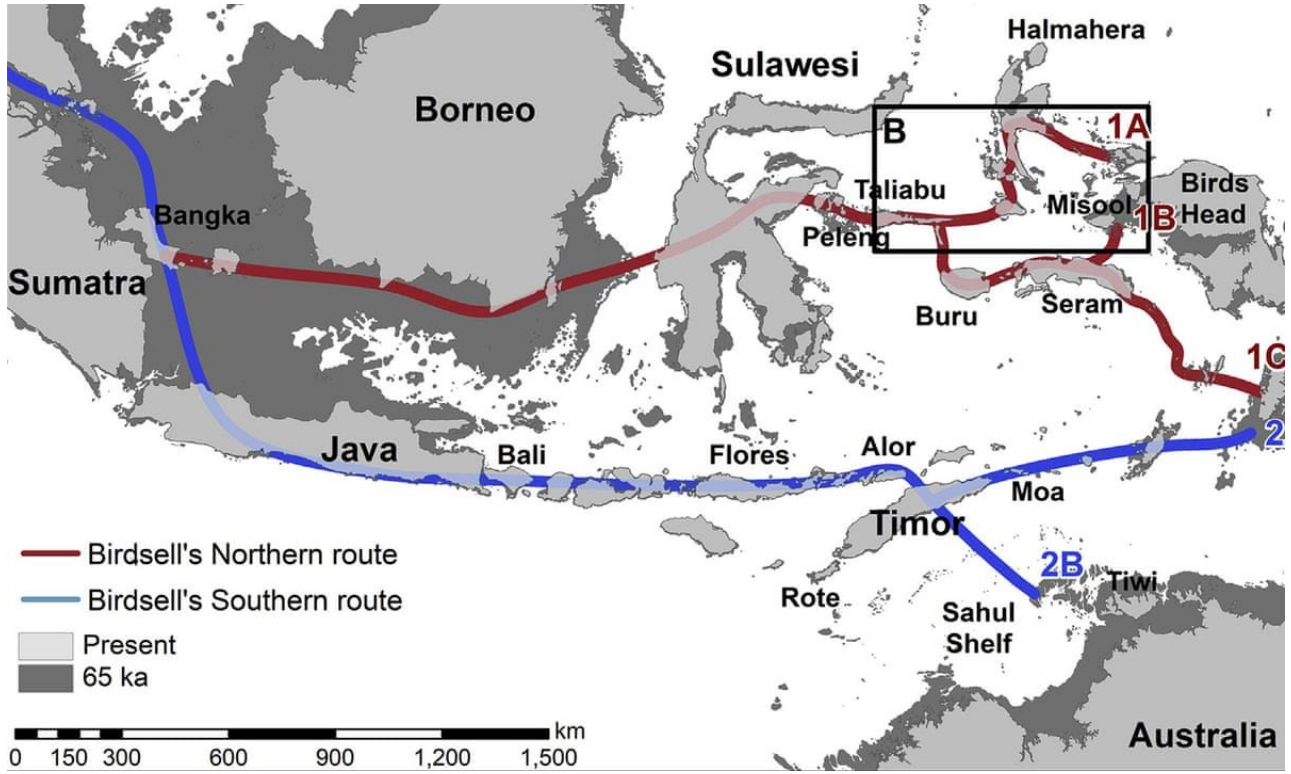
Fire-humans and physiology

- Increased body mass, especially in females, promoted by reduced mortality due to fire use.
- Reduced molar area, a result of food being softened by heat.
- Reduced gut volume, indicated by a narrowing of the rib-cage and pelvis.
- Loss of arboreal adaptations in the shoulders, arms, legs, hands and feet as arboreal foods grew less important than cooked terrestrial foods, and because *Homo erectus* could sleep on the ground following the control of fire.
- Reduced body hair, with extra warmth achieved at night by resting near a campfire.

Human arrival in to Australia



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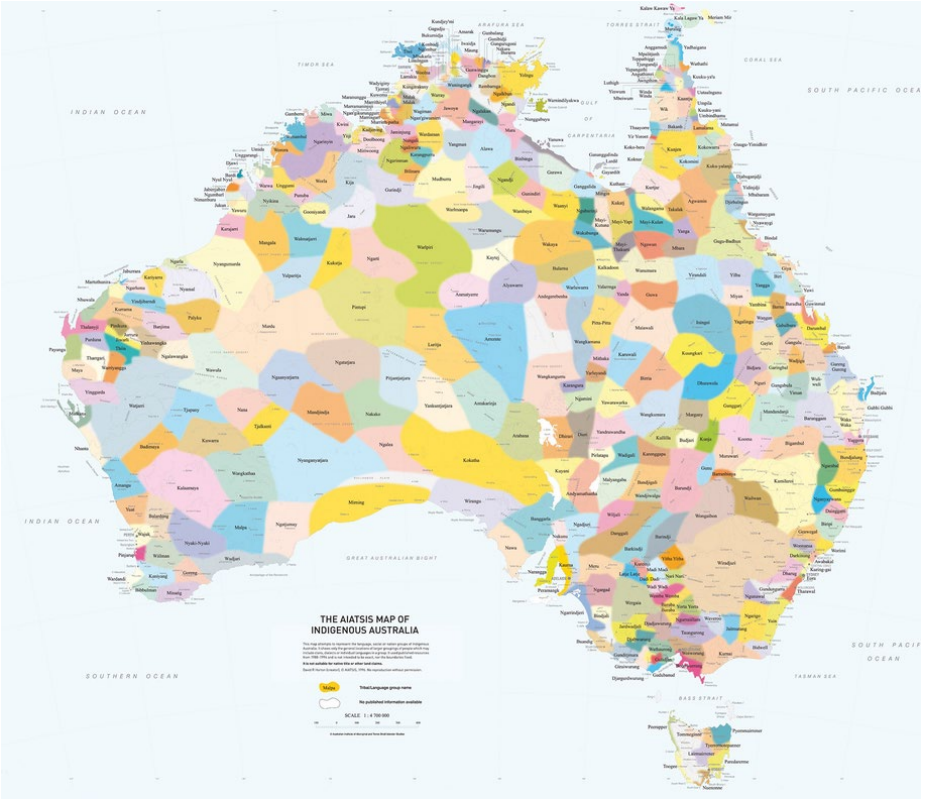
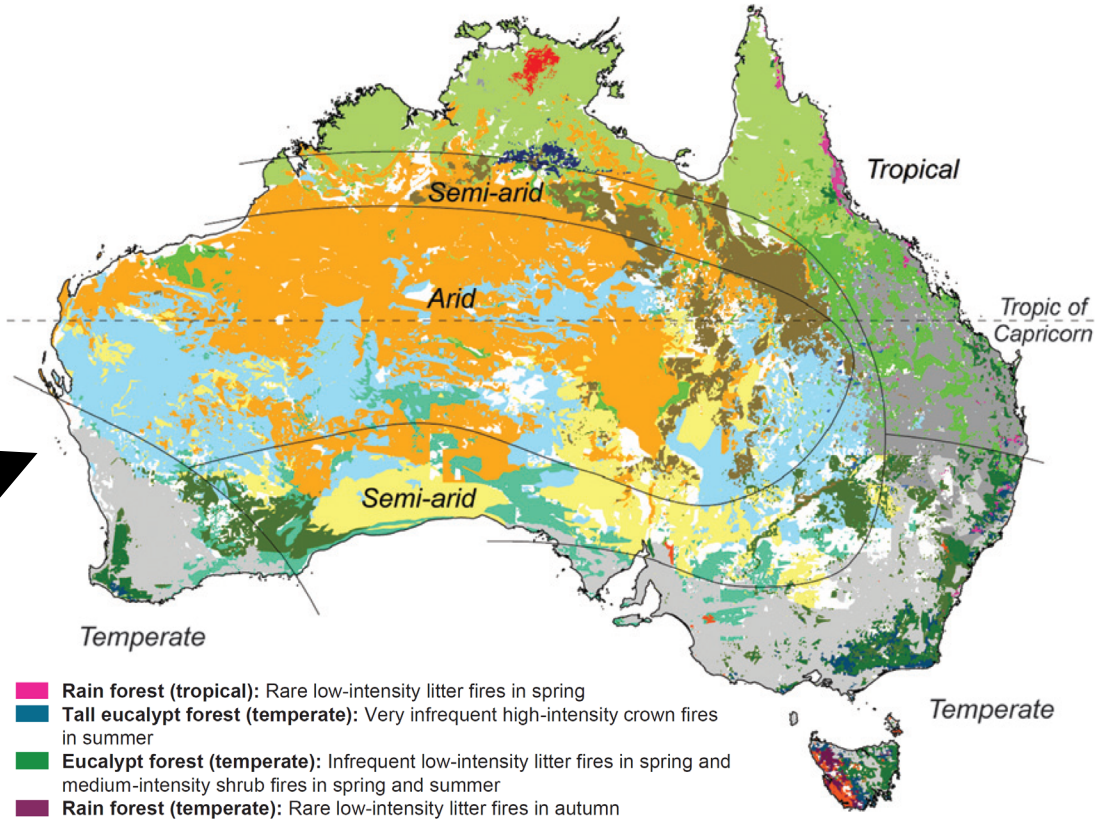
Australian fire regimes





- **Rain forest (tropical):** Rare low-intensity litter fires in spring
- **Tall eucalypt forest (temperate):** Very infrequent high-intensity crown fires in summer
- **Eucalypt forest (temperate):** Infrequent low-intensity litter fires in spring and medium-intensity shrub fires in spring and summer
- **Rain forest (temperate):** Rare low-intensity litter fires in autumn
- **Heath (temperate):** Infrequent medium-intensity shrub fires in spring and summer
- **Pasture (tropical and subtropical):** Infrequent low-intensity grass fires in spring and summer
- **Pasture, cropland (temperate):** Infrequent low-intensity grass fires in autumn
- **Eucalypt woodland (temperate):** Infrequent low-intensity litter fires in spring and medium-intensity grass fires in summer
- **Eucalypt forest and woodland (tropical):** Infrequent low-intensity grass fires in winter and medium-intensity shrub fires in spring
- ***Acacia* woodland (brigalow) (tropical semi-arid):** Rare medium-intensity crown fires in spring and summer
- **Tussock grassland (temperate semi-arid):** Very infrequent low-intensity fires in autumn or medium-intensity grass fires in spring and summer
- **Heath (tropical):** Infrequent medium-intensity shrub fires in winter and spring
- **Eucalypt savanna woodland (monsoon tropical):** Very frequent low-intensity grass fires in winter and spring
- **Mallee (temperate):** Infrequent medium-intensity shrub fires in spring and summer
- ***Acacia* woodland (lancewood) (tropical semi-arid):** Very infrequent medium-intensity shrub fires in spring
- ***Acacia* shrubland (mulga) (semi-arid/arid):** Rare low-intensity grass or medium-intensity shrub fires in spring and summer
- **Eucalypt woodland (tropical semi-arid):** Frequent to infrequent low-intensity grass fires in spring and summer
- **Chenopod shrubland (semi-arid/arid):** Rare low-intensity litter fires in spring and summer
- **Hummock grassland (semi-arid/arid):** Infrequent medium-intensity grass fires in spring
- **Tussock grassland (tropical semi-arid/arid):** Very infrequent low-intensity grass fires in spring and summer
- **No data**

Figure 1 The distribution of major fire regime niches throughout Australia. See Table 1 for a more detailed description of typical and extreme fire intensities and intervals for each niche. The niches are ordered according to decreasing annual net primary productivity.

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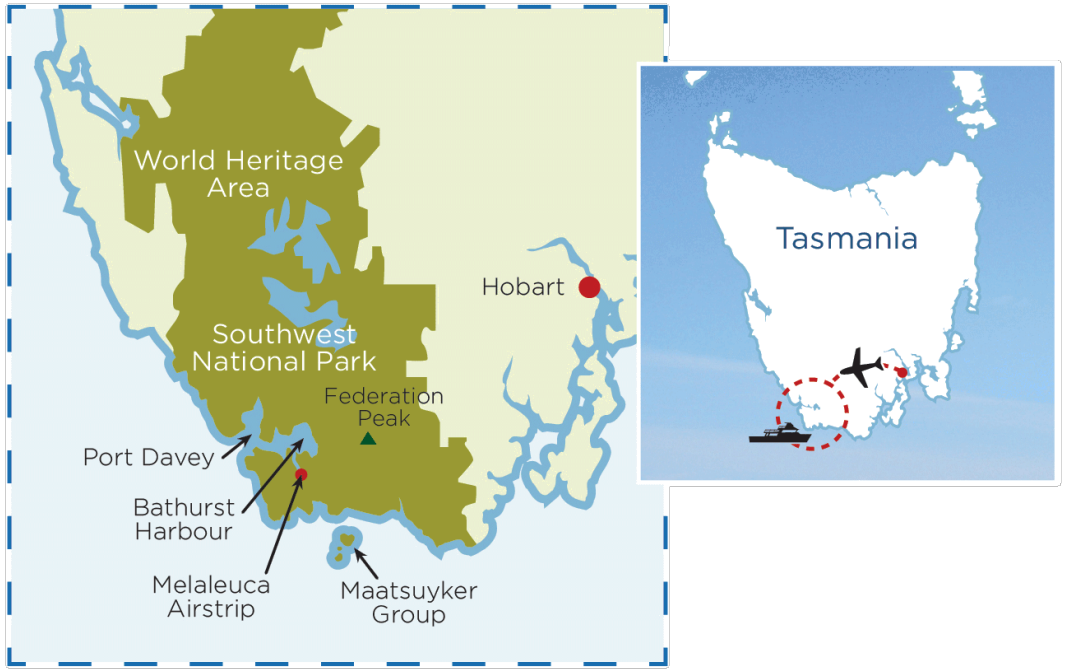
Murphy et al 2013: *Journal of Biogeography*

Tasmanian “Wilderness” World Heritage Area



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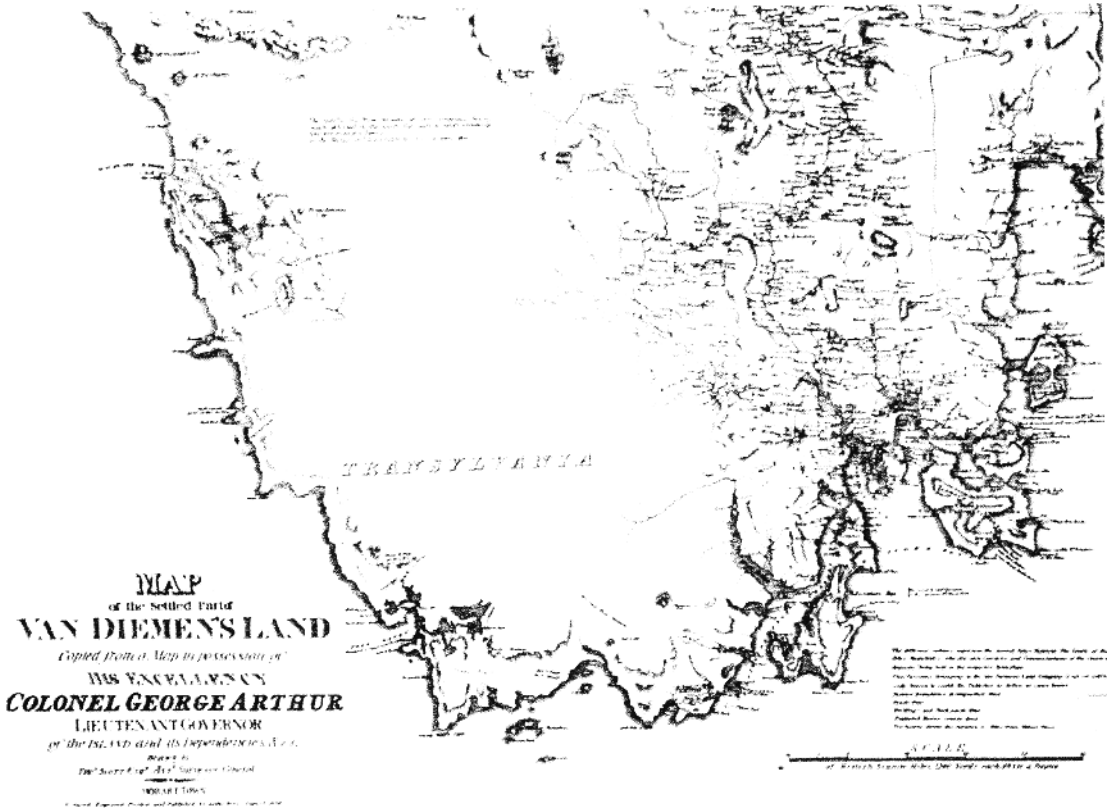

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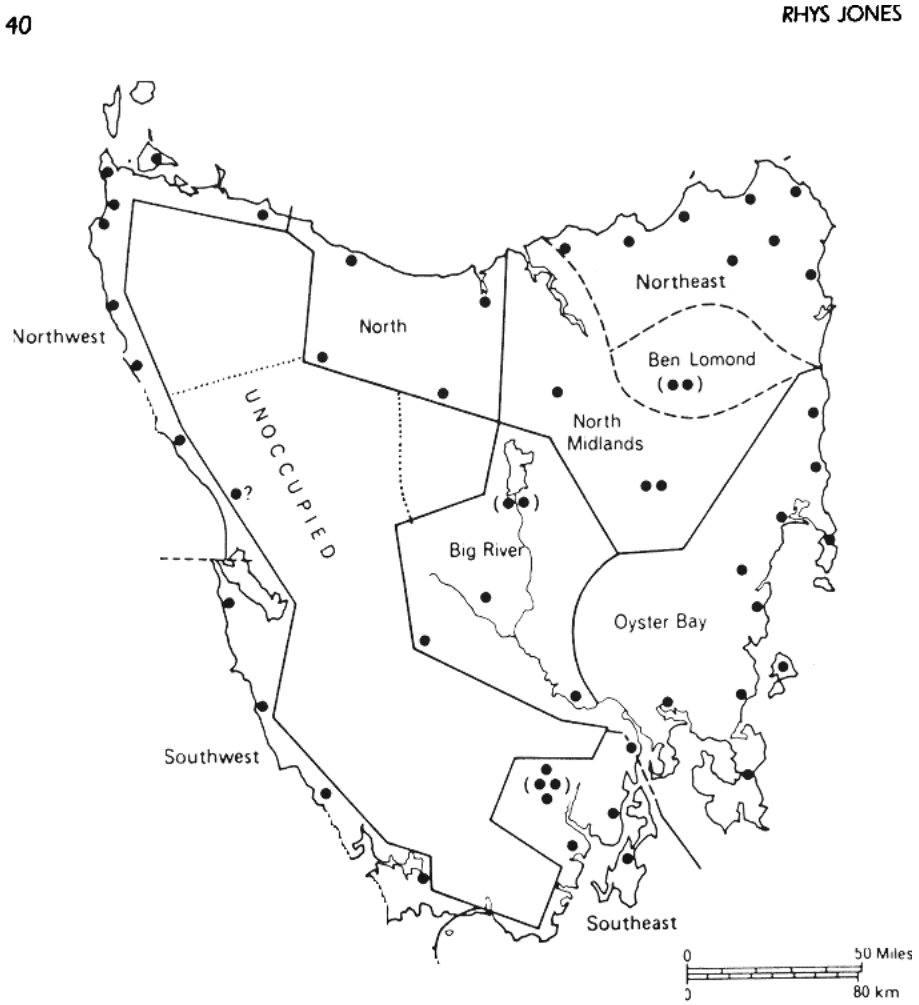
Luckman and Davies (1979) *The Southwest Book* 23-27

Tasmanian “Wilderness” World Heritage Area



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Jones (1984) *Hunters and History*

Tasmania – Palawa arrival

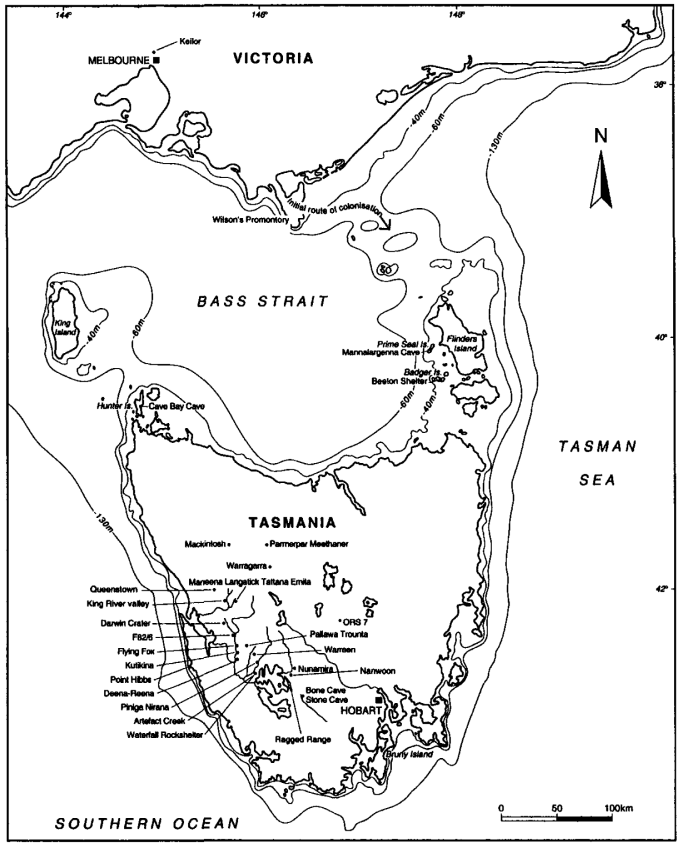

Fig. 1. Distribution of late Pleistocene Tasmanian sites with off-shore bathometry indicated.

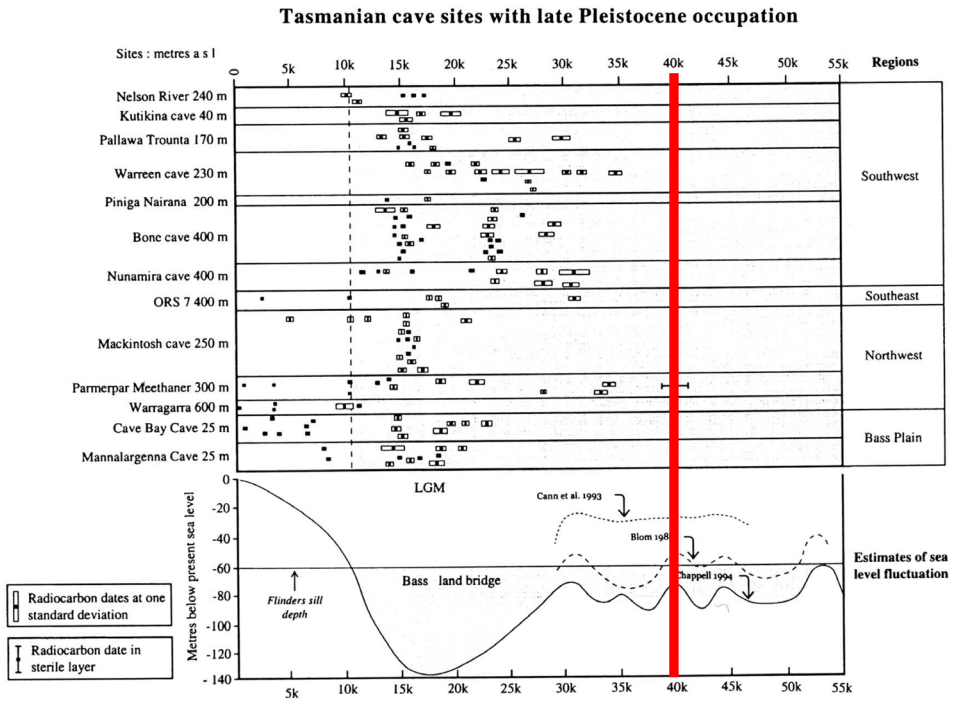

Fig. 2. Distribution of radiocarbon dates from cave sites relative to changing sea levels through time.

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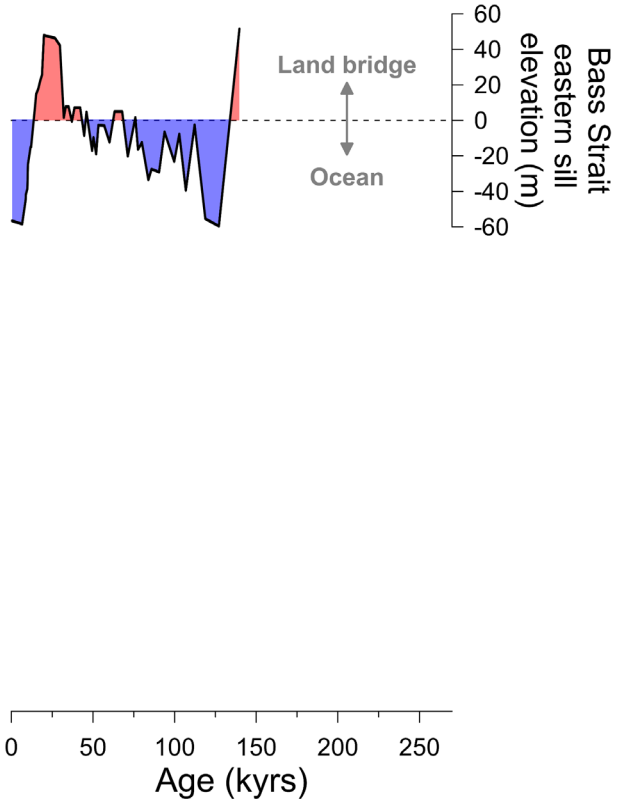
Cosgrove 1999; Journal of World Prehistory

Deep Time Aboriginal influence in Tasmania



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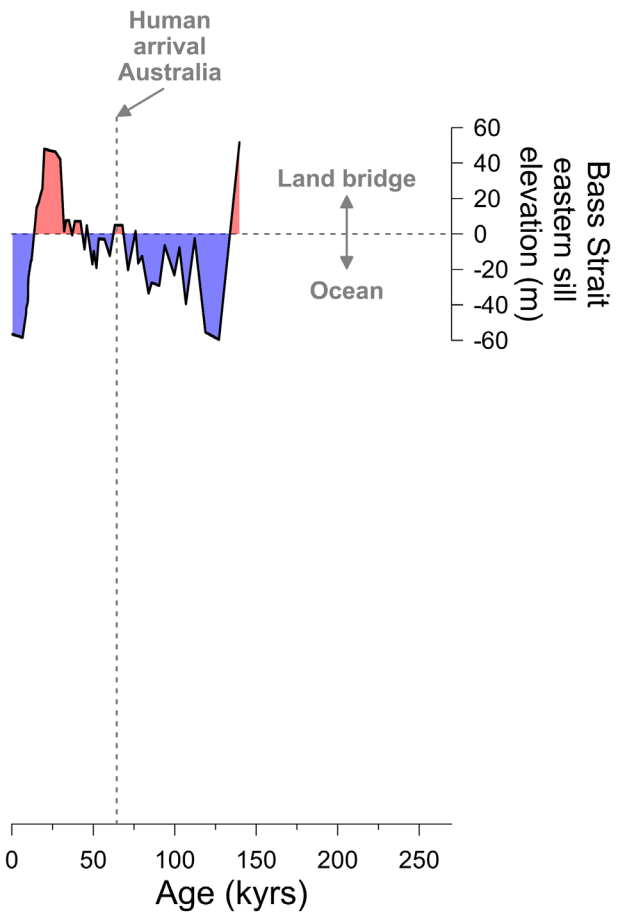
Fletcher et al. (in prep)

Deep Time Aboriginal influence in Tasmania



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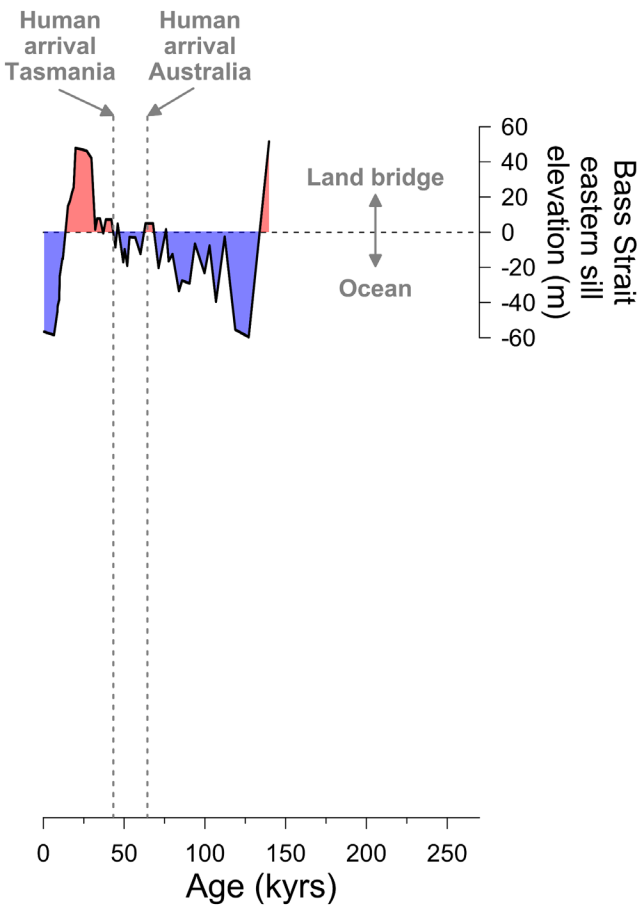
Deep Time Aboriginal influence in Tasmania



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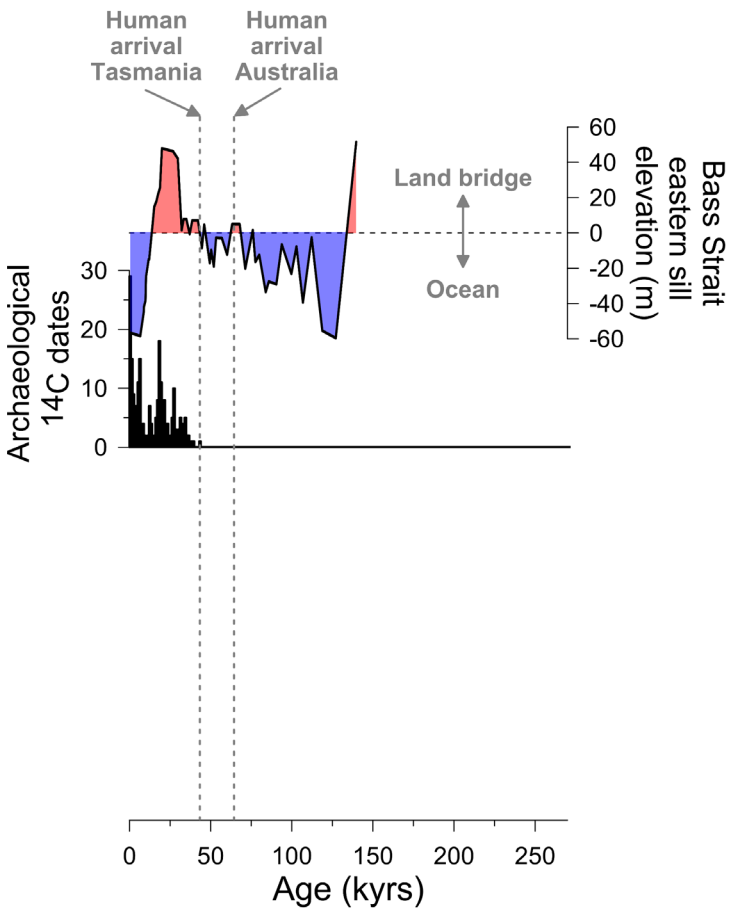
Deep Time Aboriginal influence in Tasmania



Fletcher et al. (in prep)

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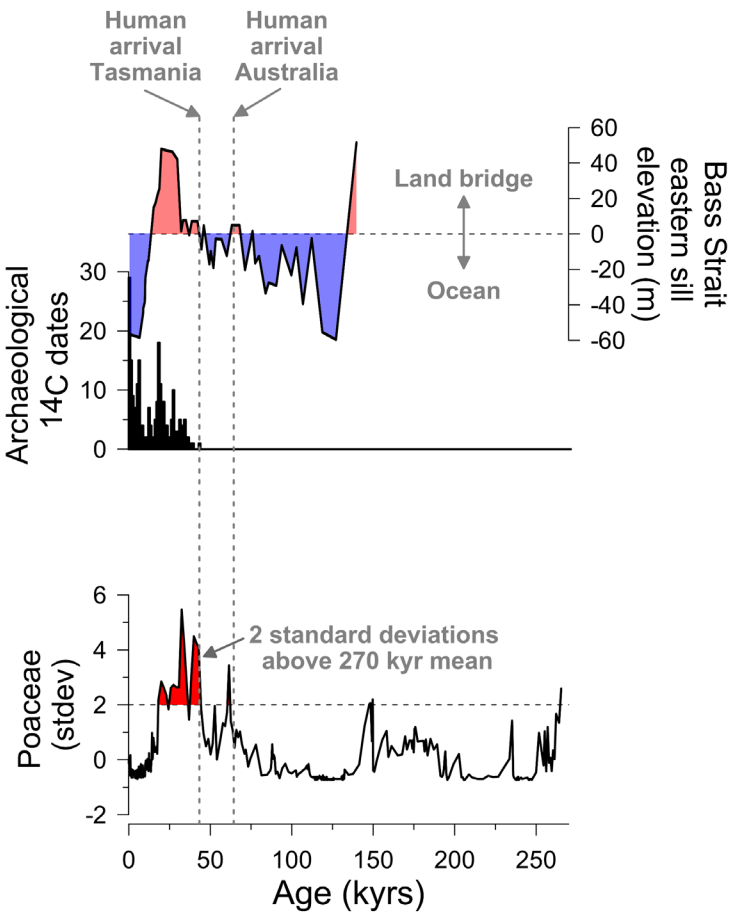
Deep Time Aboriginal influence in Tasmania



Fletcher et al. (in prep)

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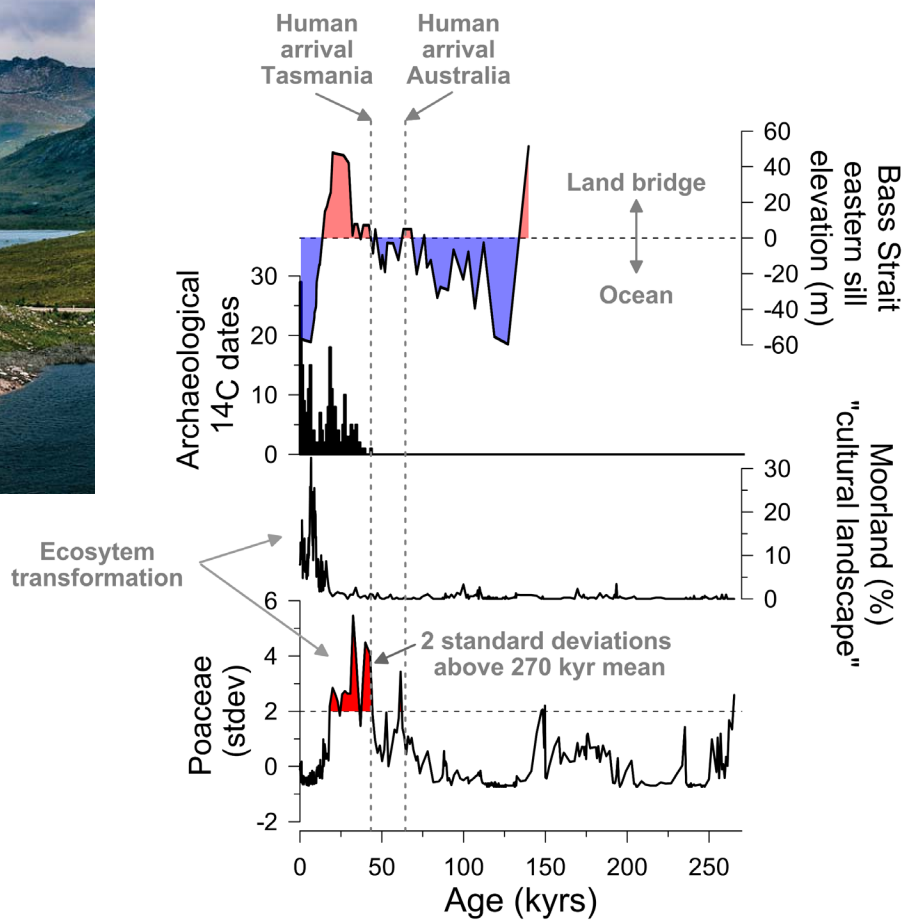
Deep Time Aboriginal influence in Tasmania



Fletcher et al. (in prep)

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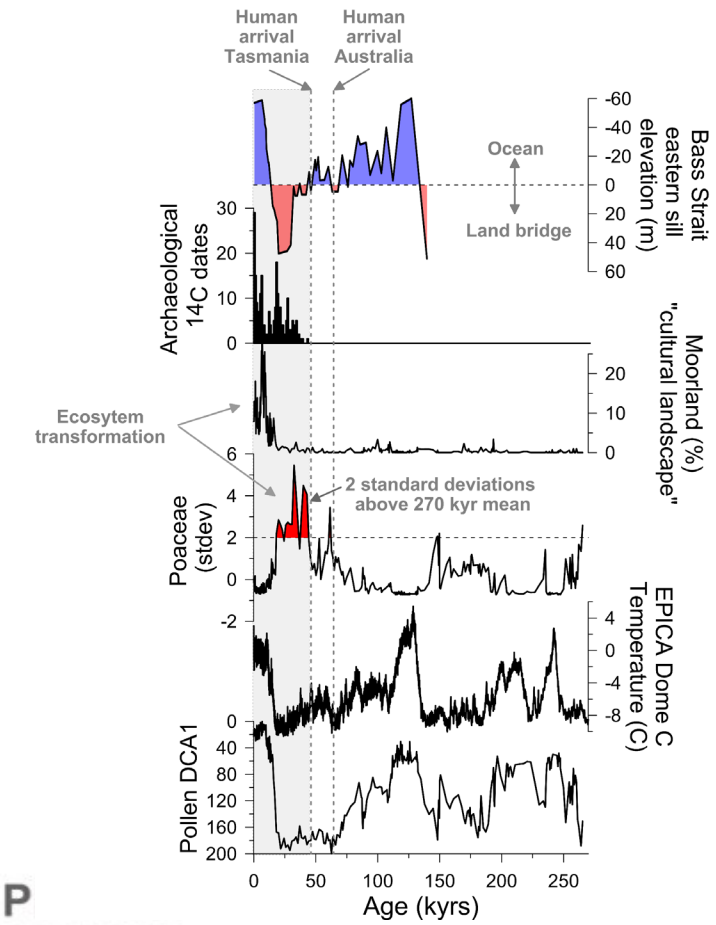
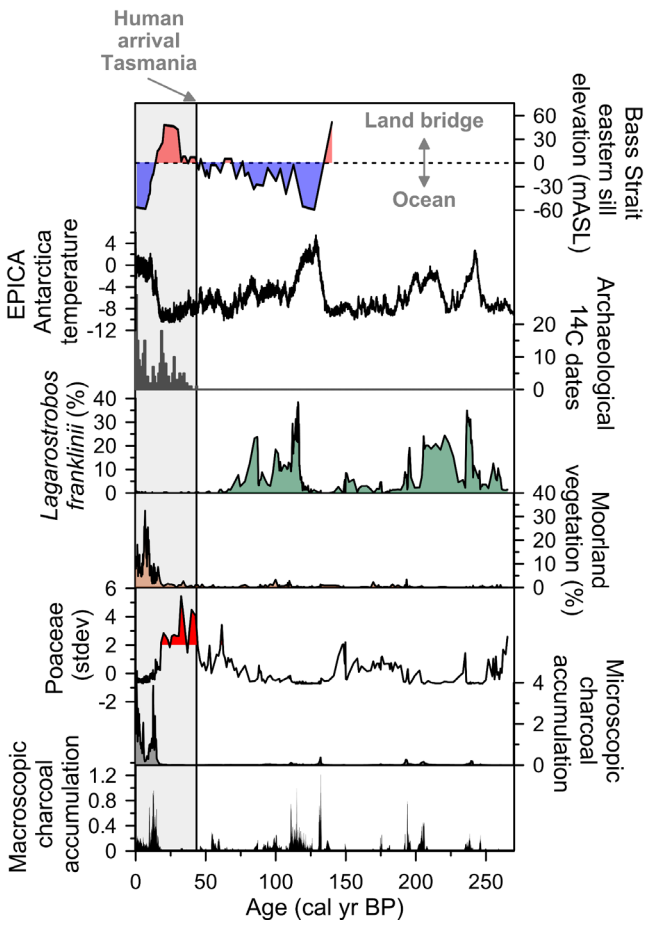
Initial Human impact in Tasmania?





P

Past Fire Frequency and Intensity REconstruction

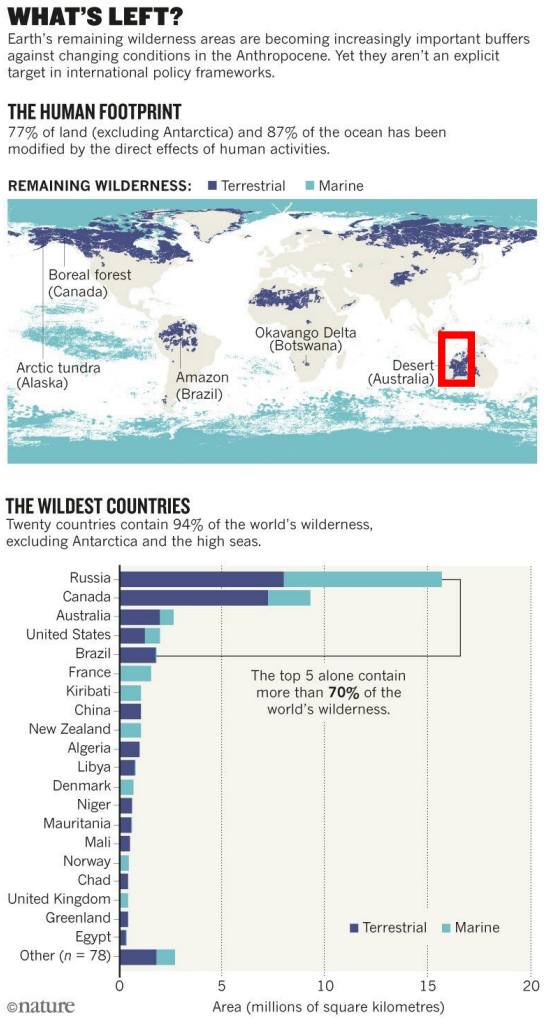
Modern scientific constructions of “Wilderness”

- Eight indicators of human pressures: built environments, crop lands, pasture lands, population density, night-time lights, railways, major roadways and navigable waterways.

- ***We identified wilderness land or ocean areas as those that were free of human pressures, with a contiguous area of more than 10,000 km² on land.***

- ***Wilderness regions are home to some of the most politically and economically marginalized indigenous communities on Earth.***

The Martu “Wilderness”



Watson et al. (2018) *Nature*

Painting by Martu women of estates within Martu Country: Kumpaya Girgirba, Yikartu Bumba, Karnu Taylor, Ngamaru Bidu, Yuwali Nixon, Reena Rogers, Thelma Judson, and Nyalangka Taylor. Photo by Gabrielle Sullivan. Used with permission from Martumili Artists

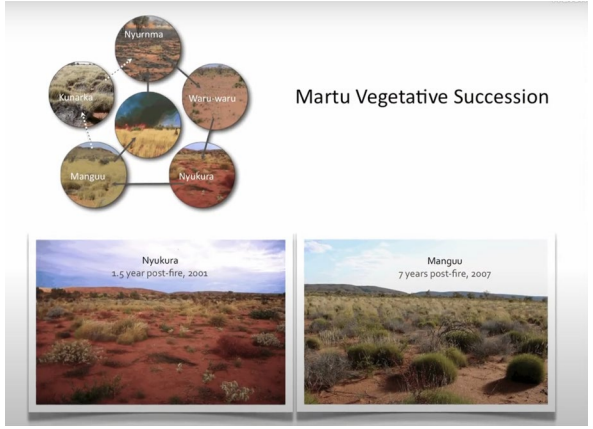


Photo credit: Kanyirninpa Jukurrpa

Fire management

Martu Country

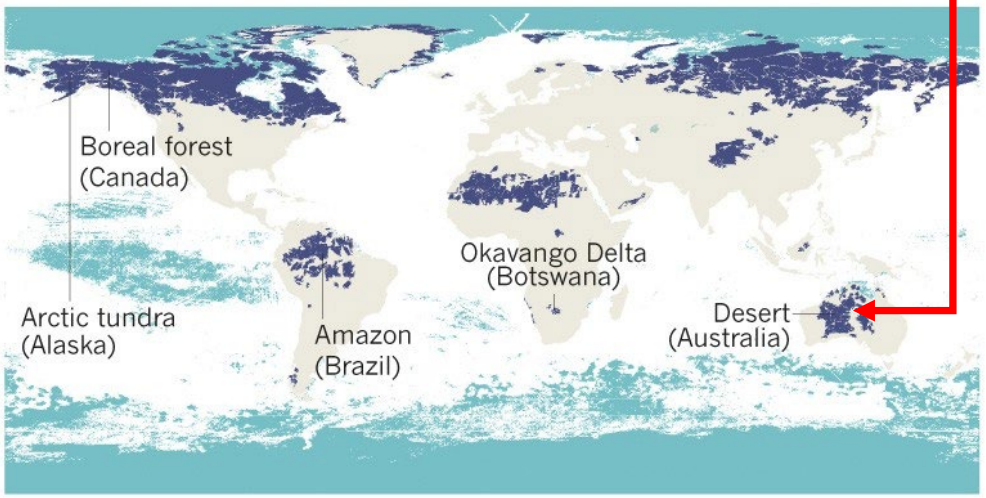
WHAT'S LEFT?

Earth's remaining wilderness areas are becoming increasingly important buffers against changing conditions in the Anthropocene. Yet they aren't an explicit target in international policy frameworks.

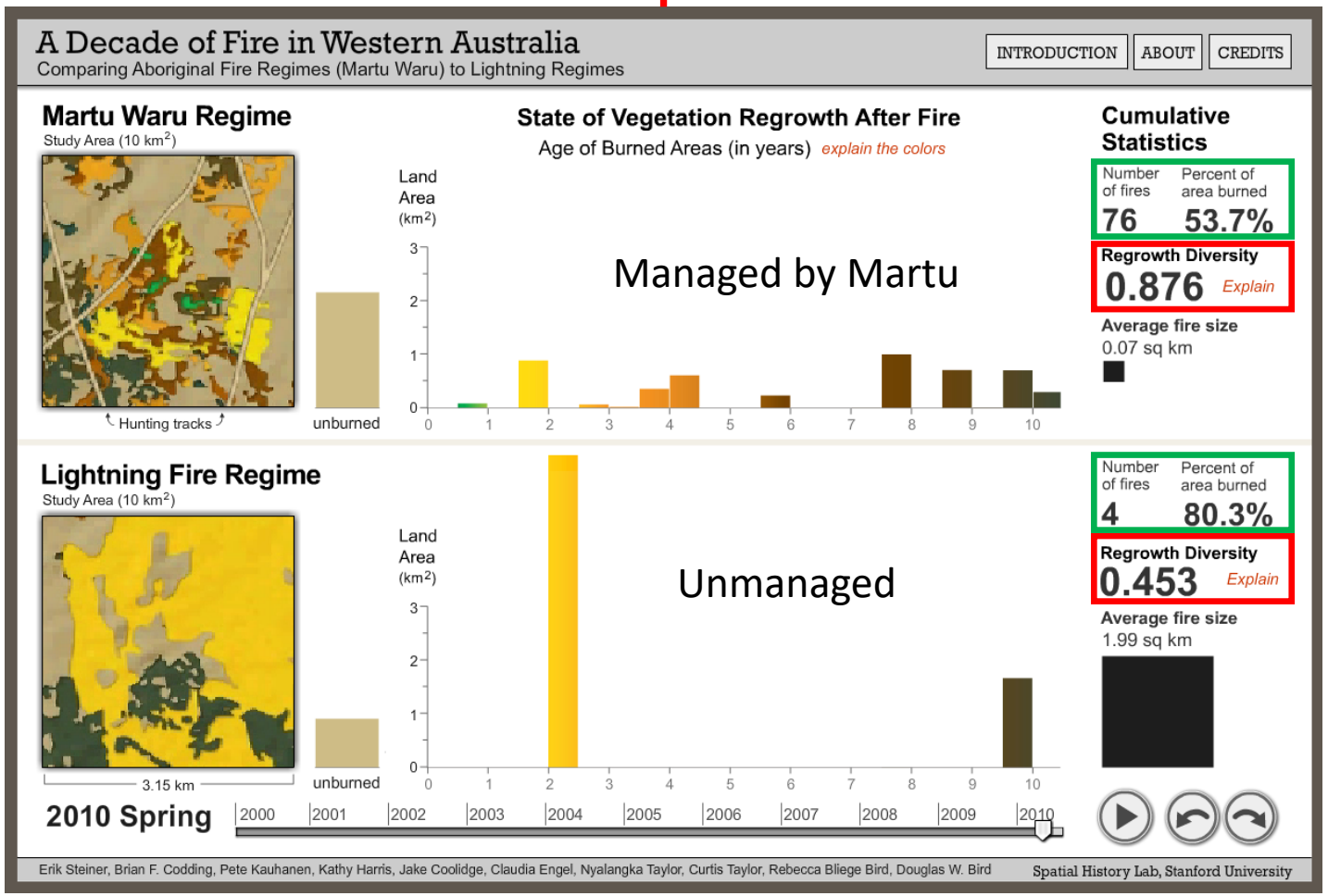
THE HUMAN FOOTPRINT

77% of land (excluding Antarctica) and 87% of the ocean has been modified by the direct effects of human activities.

REMAINING WILDERNESS: ■ Terrestrial ■ Marine



(Watson et al 2018: Nature)



https://web.stanford.edu/group/spatialhistory/cgi-bin/site/viz.php?id=395

Past Fire Frequency and Intensity REconstruction

What happens when you remove cultural burning?

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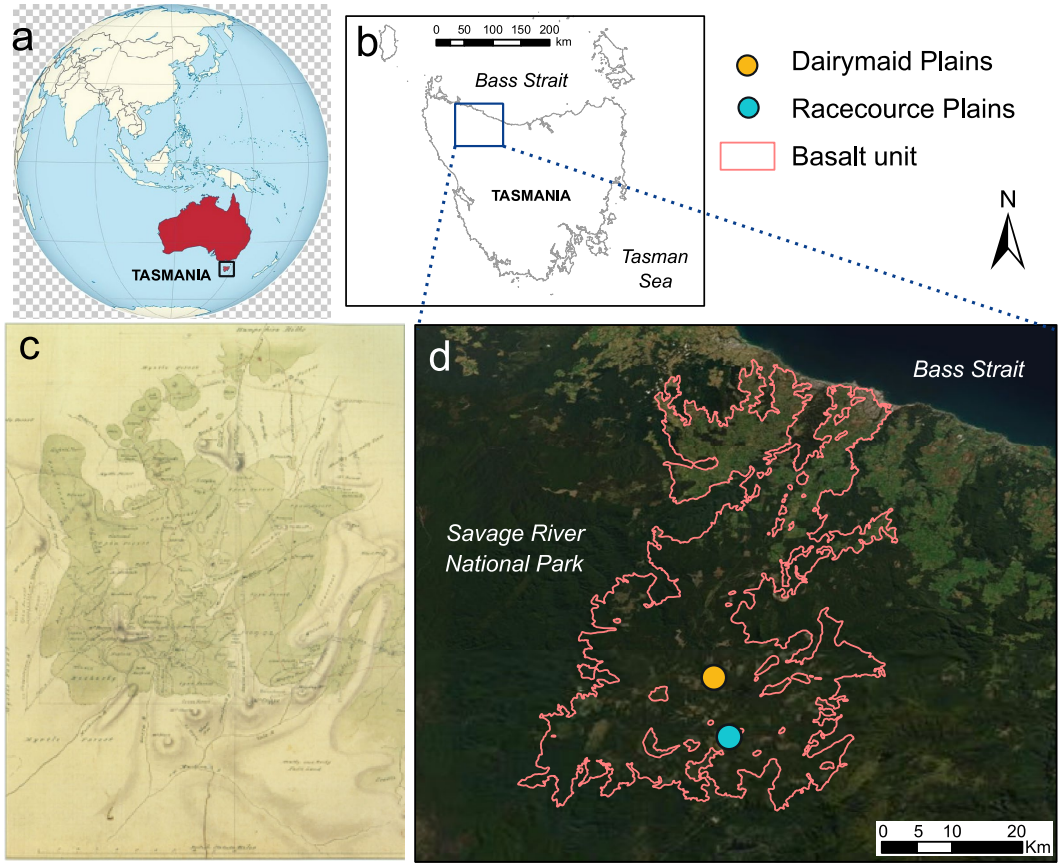
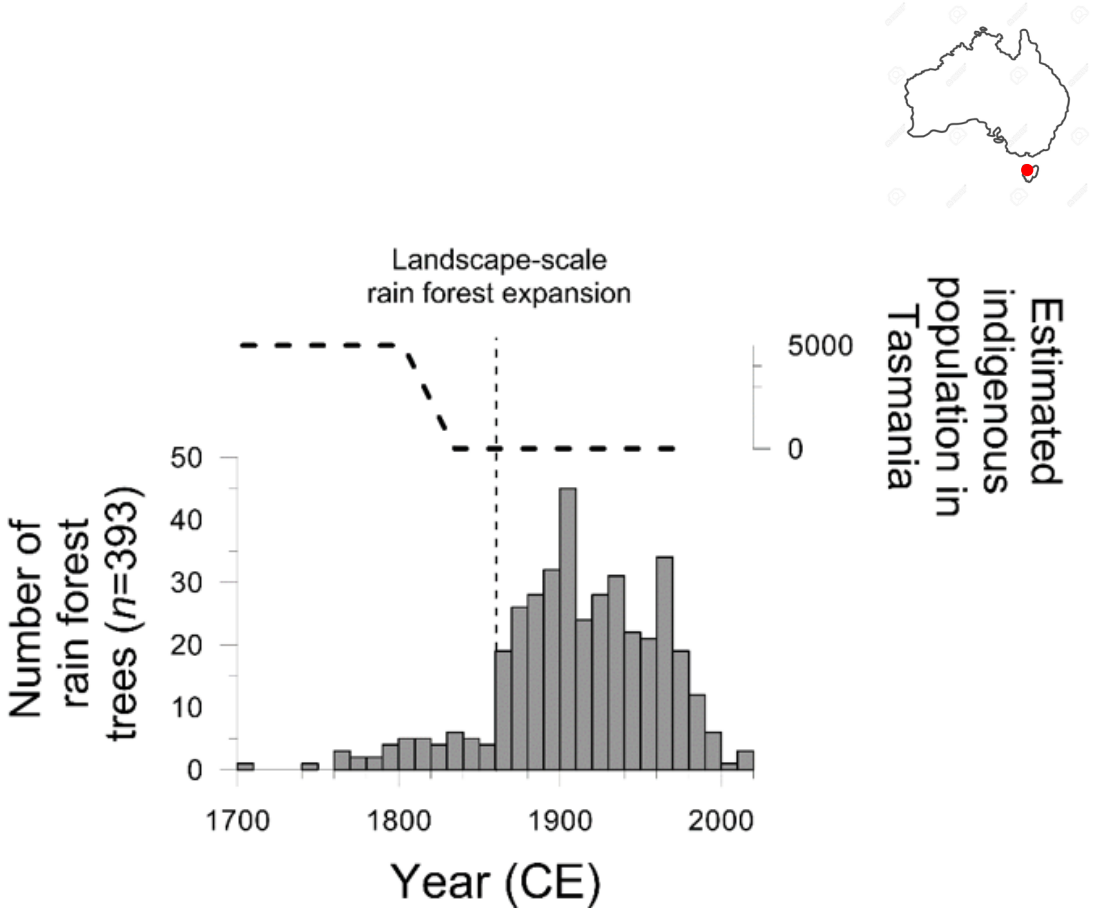
Past Fire Frequency and Intensity REconstruction

What happens when you remove cultural burning?



Fletcher et al. (2020) *Ambio*



Fletcher et al (unpublished)

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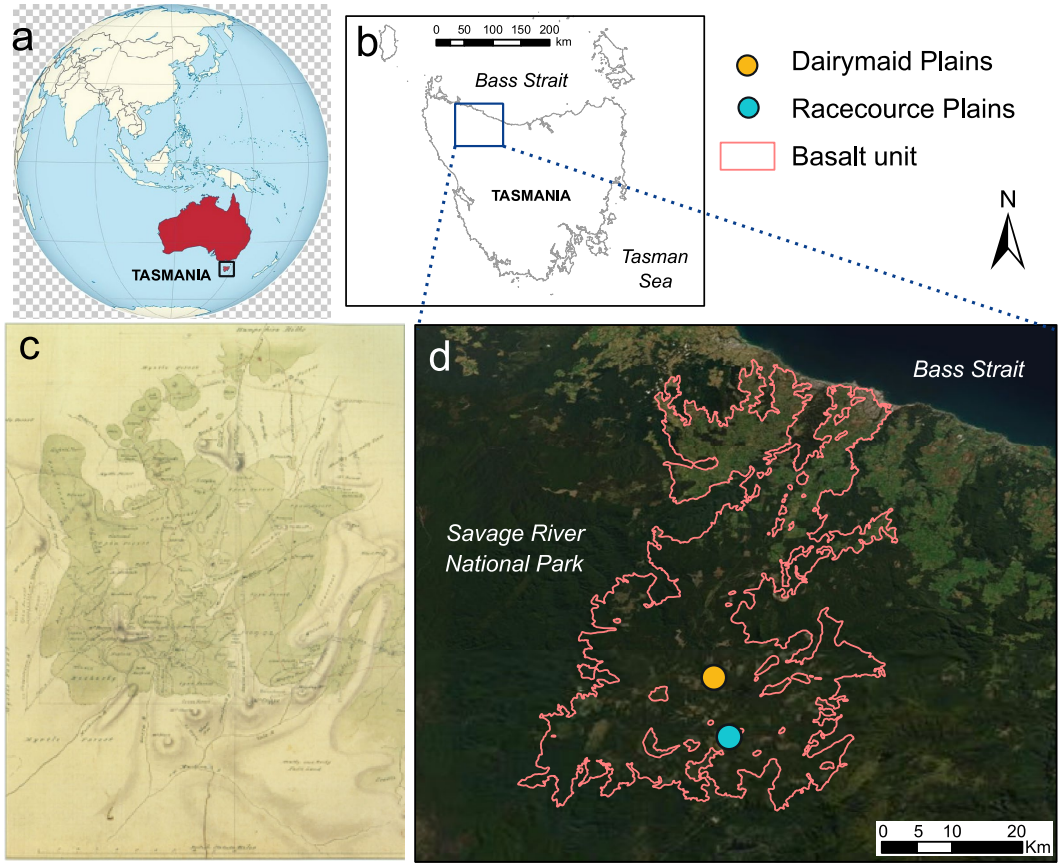
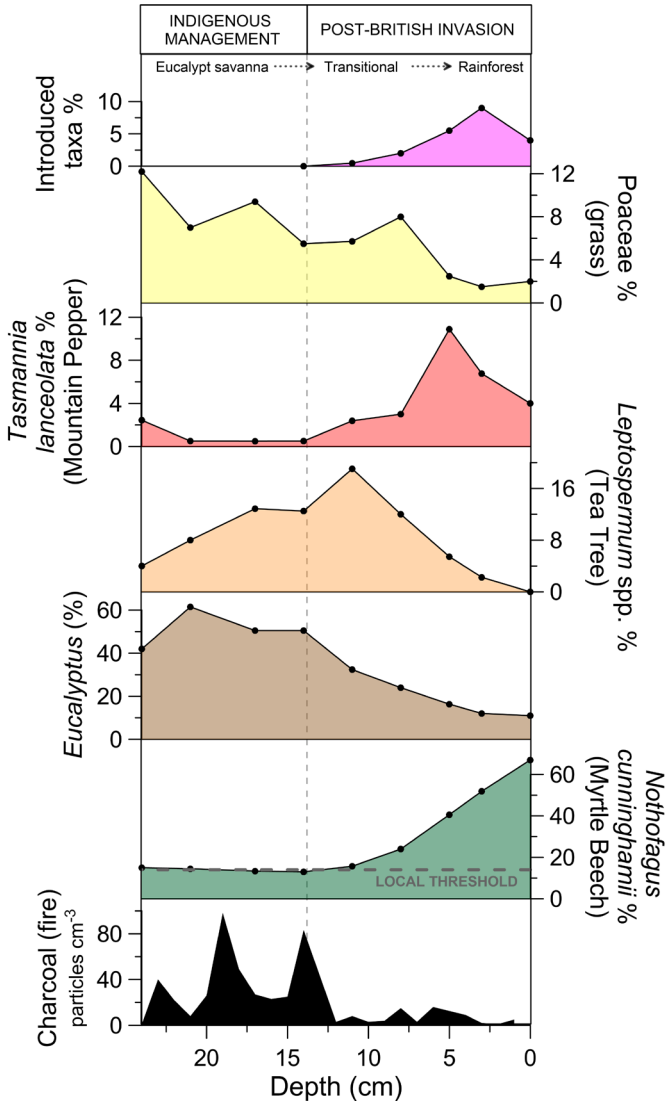
The Surrey Hills: a former grassland-savanna





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Fletcher et al. (2020) *Ambio*

Northern Tasmanian conflagrations

CATASTROPHIC CONFLAGRATIONS: FOREST FIRES IN TASMANIA FROM THE 1850S TO THE 1890S

Kathryn Evans

Northern Tasmanians witnessed European Australia's first major bushfire catastrophe in the summer of 1850–51. The devastating Black Thursday fires engulfed Victoria on 6 February and the dark smoke and ash from those fires travelled across Bass Strait, shrouding the town of Launceston in a murky mist that obscured the sun.[1] James Fenton, residing at Devon on the north-west coast, recalled the spectacle in his *Bush life in Tasmania fifty years ago*, written in 1891.

> Early in the afternoon clouds came rolling over the heavens, obscuring the light of the sun in a most ominous and mysterious manner. There was a lurid glare in the sky, mixed with dense columns of blackest cloud-banks in the distance, which stole gradually upwards from the horizon until the sun became entirely obscured.[2]

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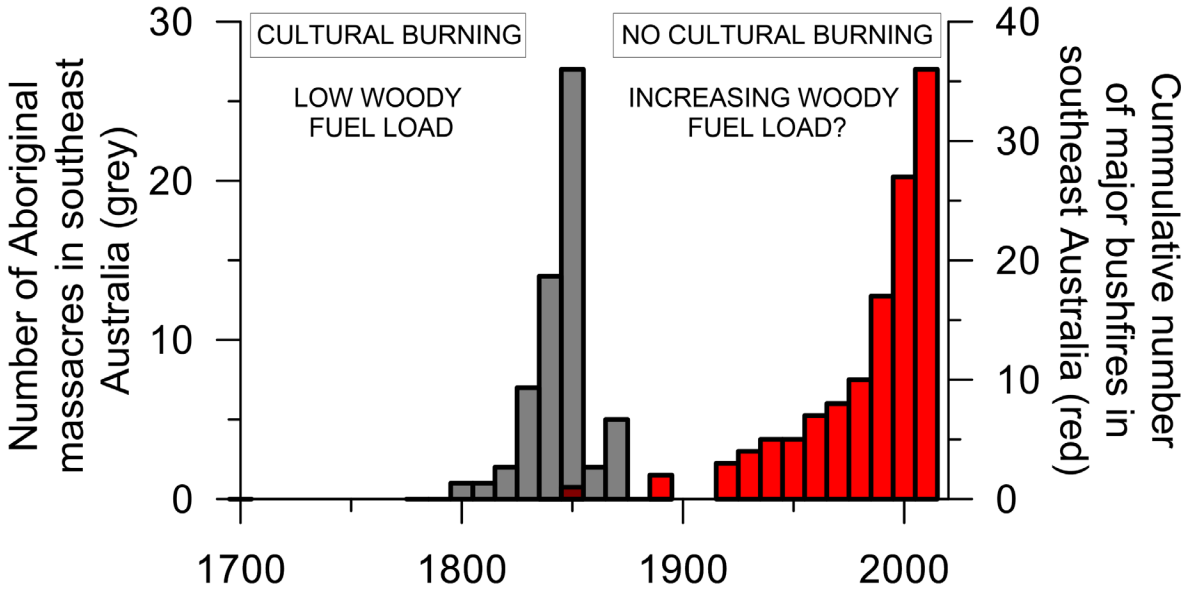
British Invasion



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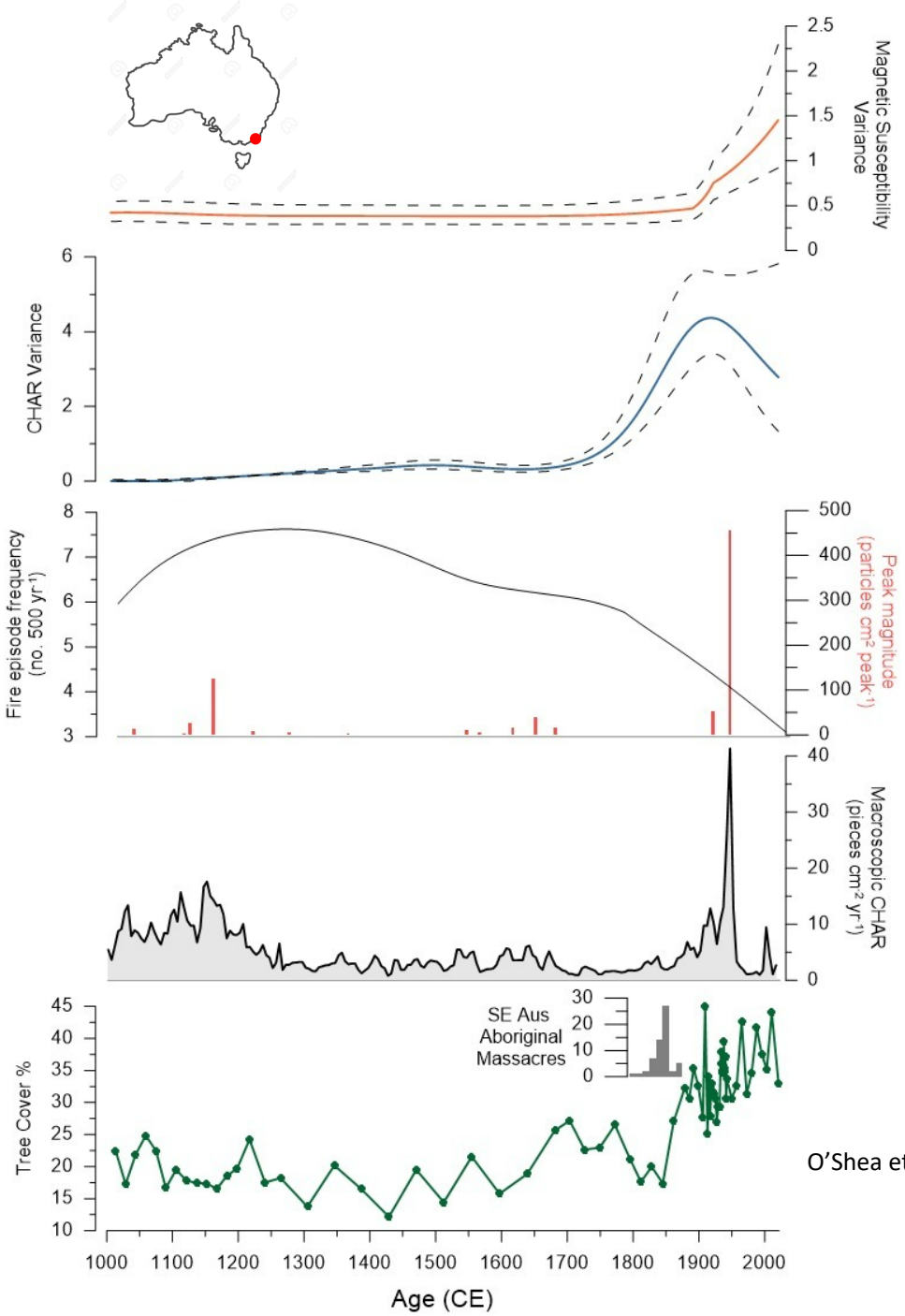
Fletcher et al. (2021) Fire

Croajingalong National Park, Gippsland, Victoria



O'Shea et al. (in prep)

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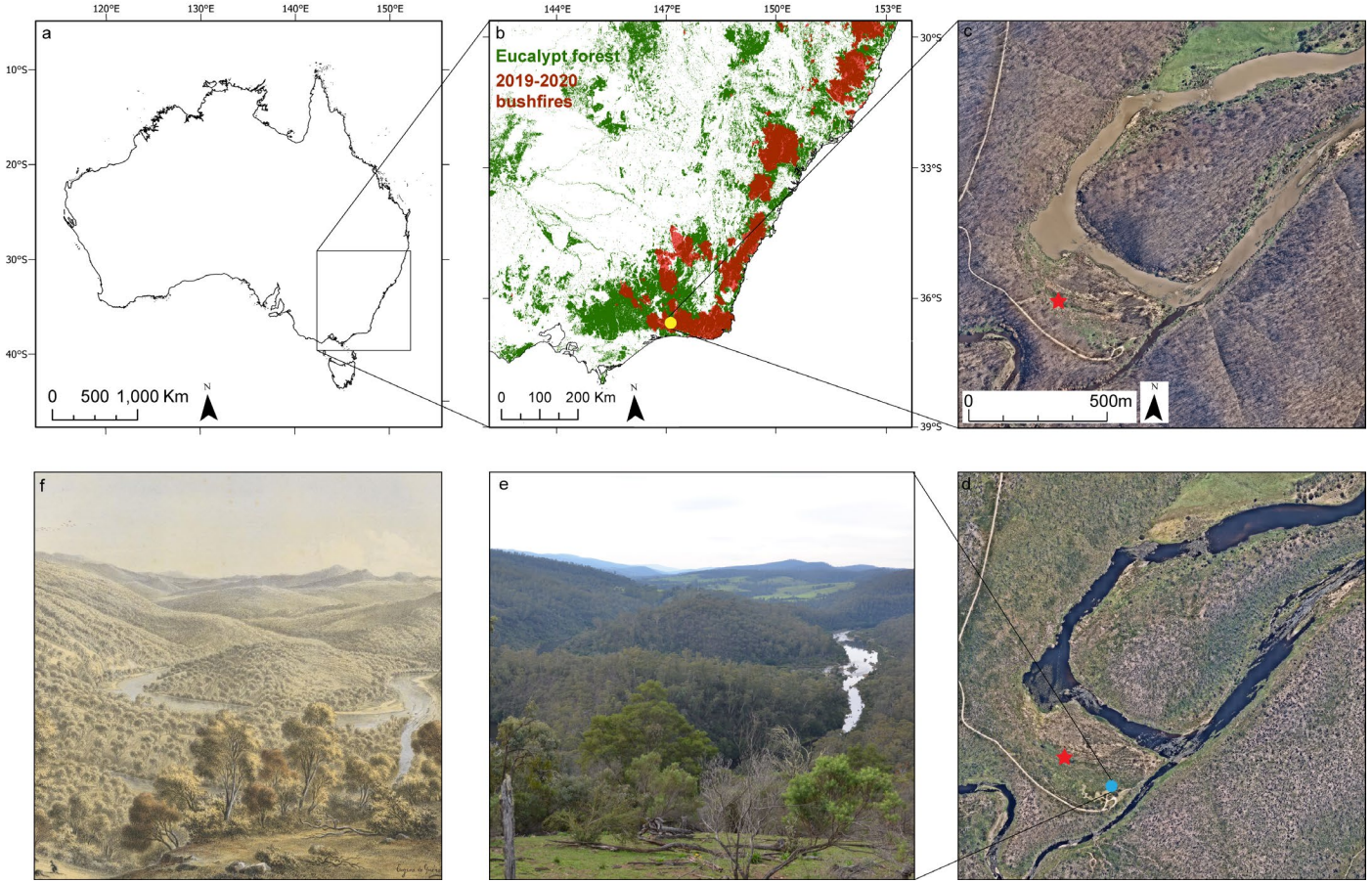
Buchan, SE Australia



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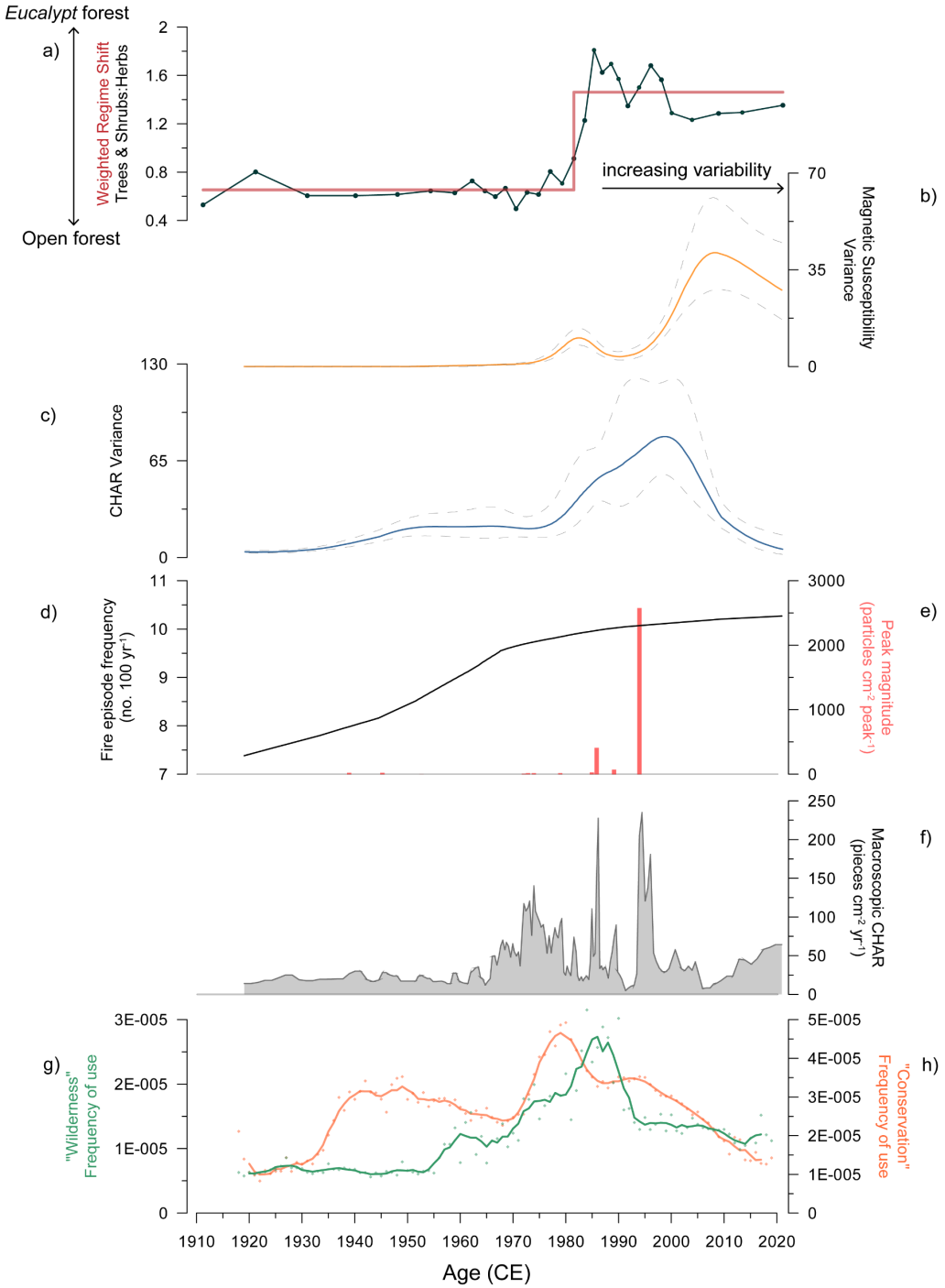

(Laming et al. 2022)

PF-FIRE

Past Fire Frequency and Intensity REconstruction

2007 Inquiry into the impact of public land management practices on bushfires in Victoria,

- *"In earliest times the indigenous people used the firestick as a management tool – burning the dry grass, keeping the grassy areas fresh and green and ensuring a plentiful supply of wildlife. These fires were not dangerous – just slow burning and maintaining a balance in the bush. After the limitations on these people, the settlers followed their ways and the country retained its grassland quality. Forestry Officers took over this responsibility of maintaining a balanced public land service. These men had a good under-standing of the bush and did a very good management job. Then the regulations began to be more and more restrictive. Public land management and the responsibility of the Minister, have been evaded, over a long time."*
- *"In our area it was 35 years ago when the use of the burnt areas for cattle grazing was stopped… That happened in about 1970, and in fact it was when the Land Conservation Council first started that it stopped cattle grazing and took the runs off us in our area. That is when the demise of all this started happening. The older ones who are still around will still tell you that one day they will burn us out, because there is no management in the bush anymore as far as fire suppression goes, and, really, it is coming true"*

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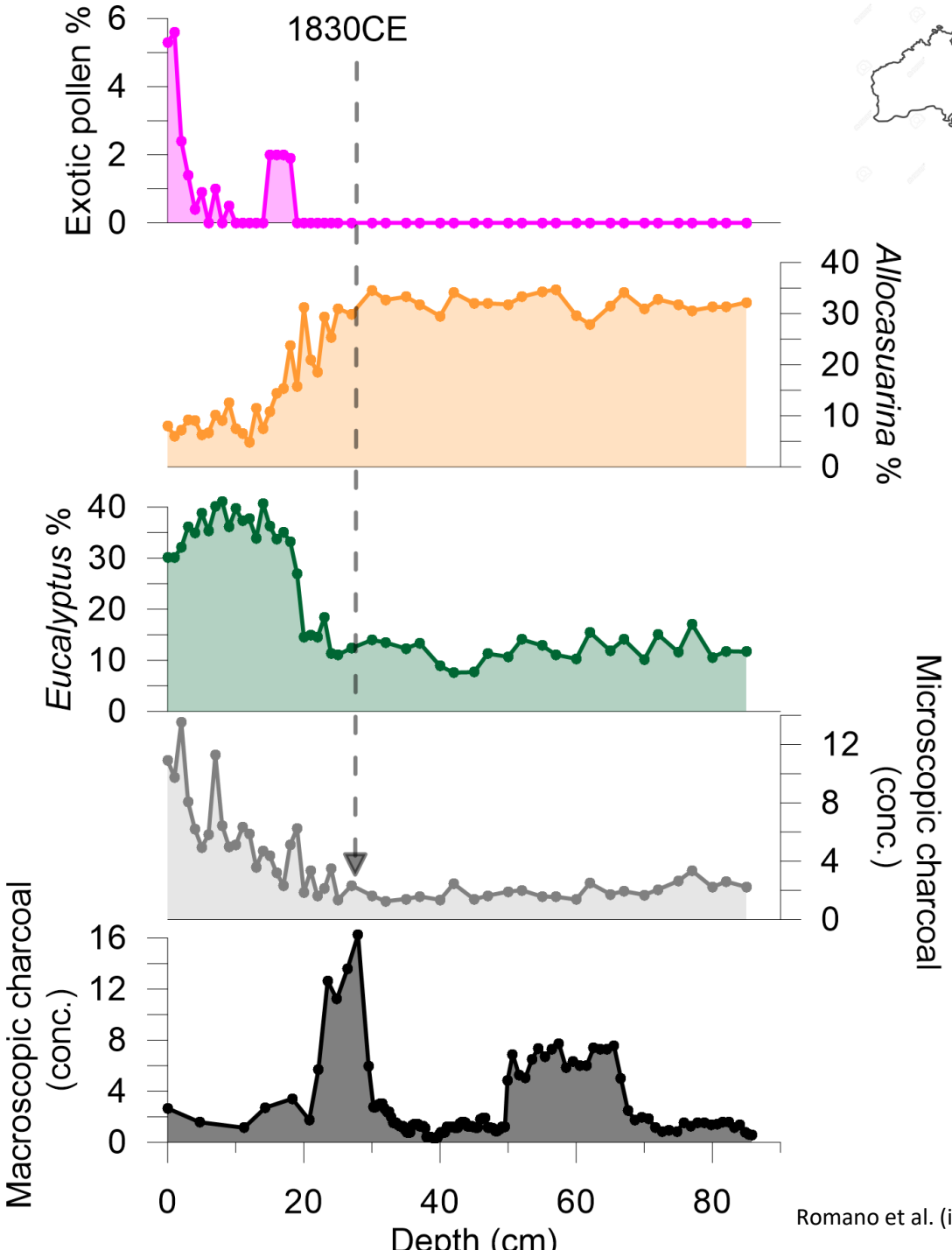
Spermwhale Head National Park, Gippsland, Victoria



Romano et al. (in prep)

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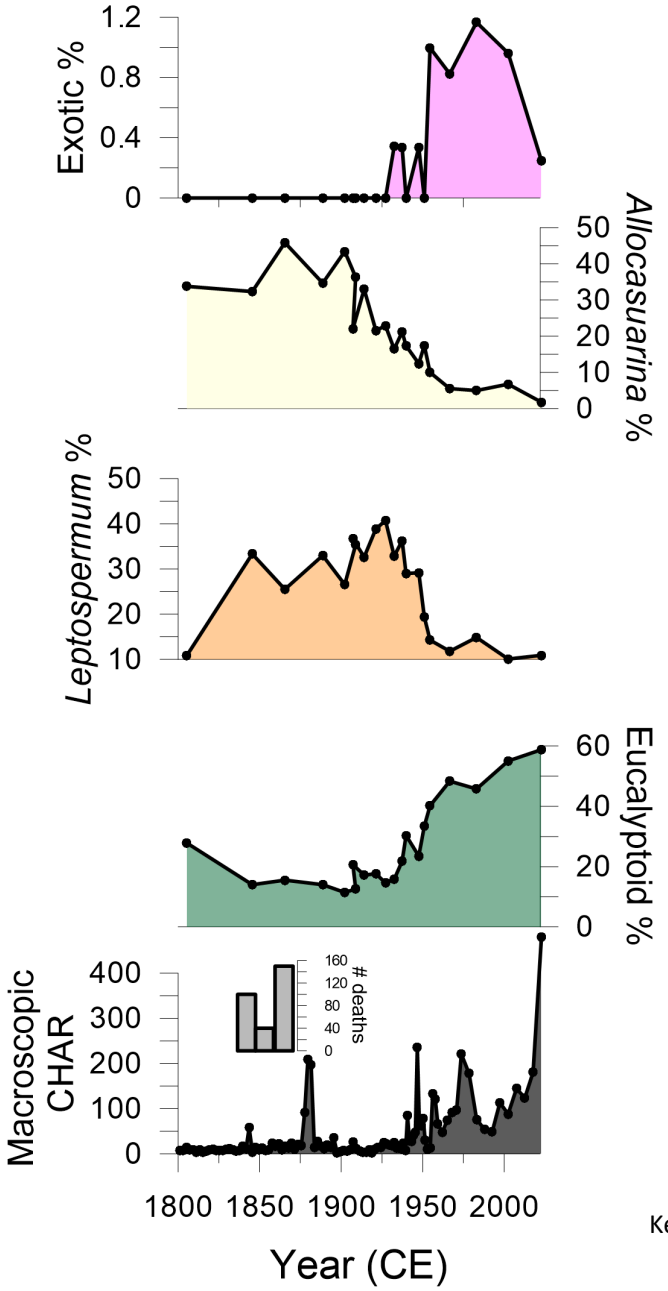
Bundjalung National Park, northern NSW



Kennedy et al. (in prep)

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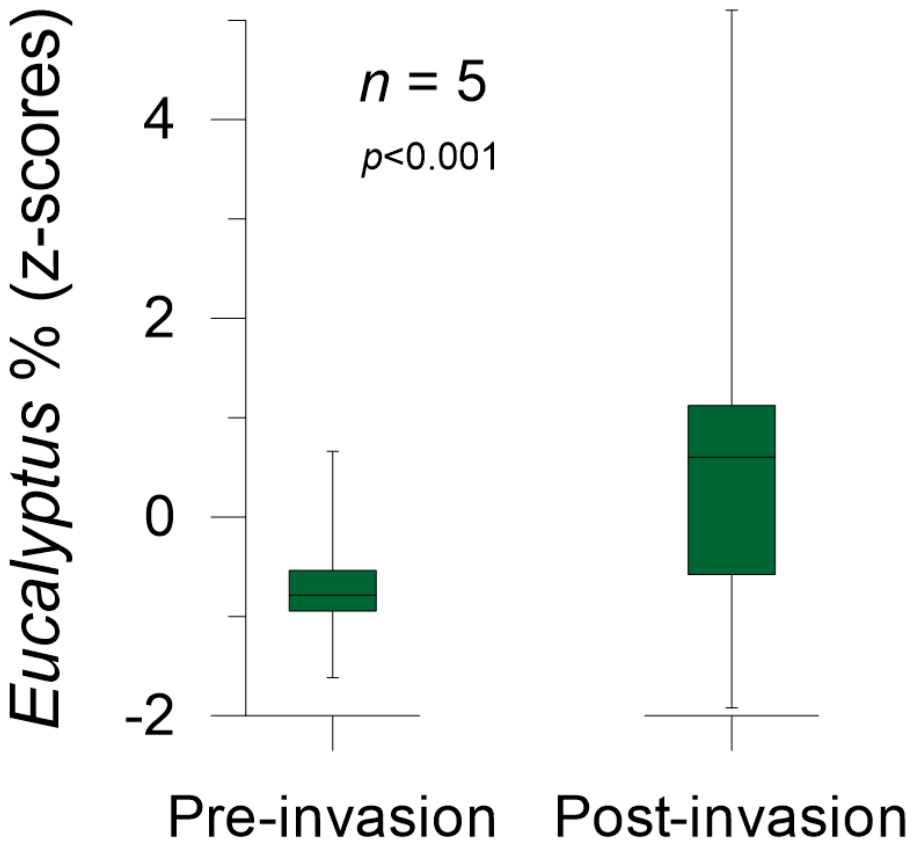
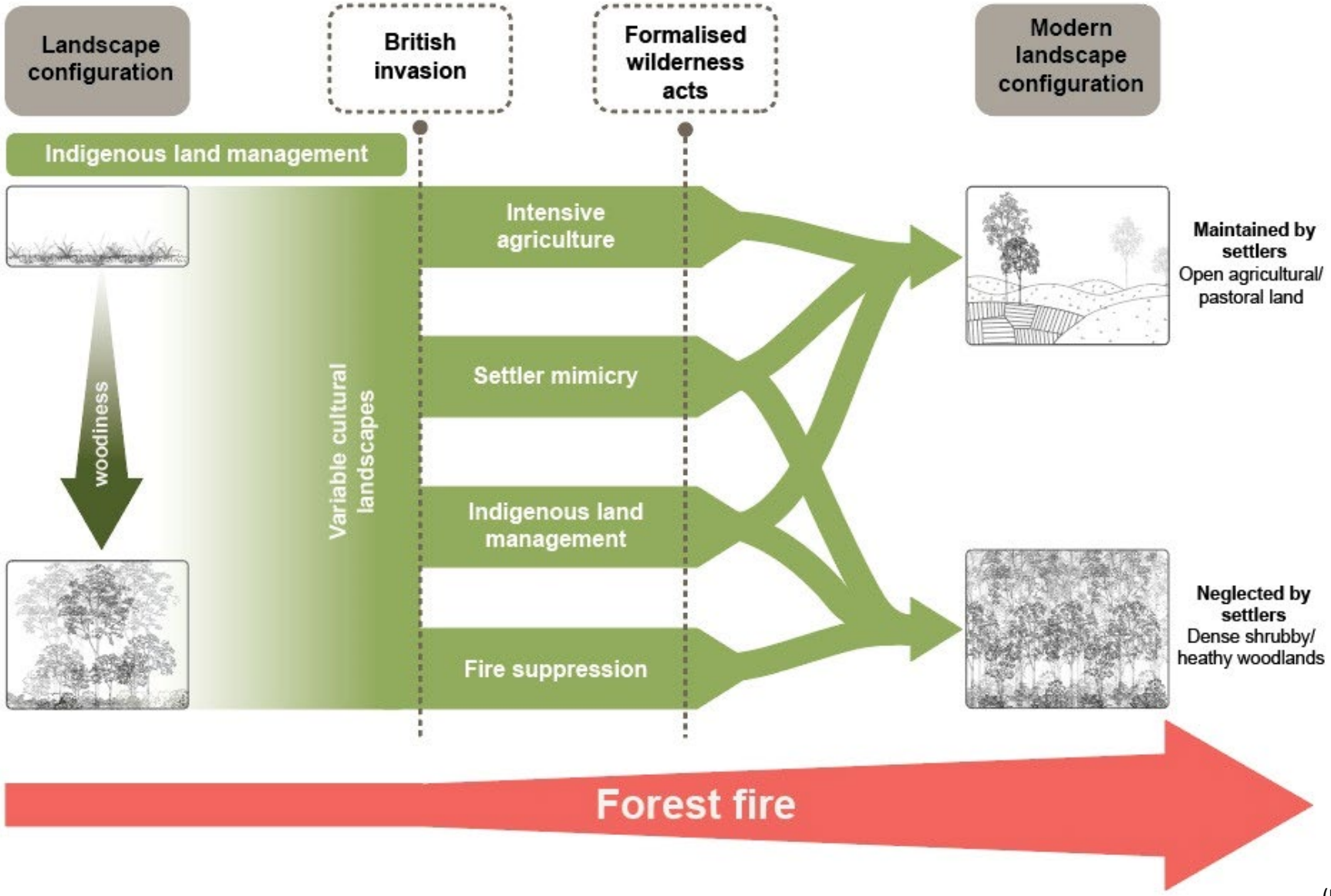
Eucalyptus increase



(Laming et al. 2022)

PF-FIRE
Past Fire Frequency and Intensity REconstruction



(Laming et al. 2022)

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Past Fire Frequency and Intensity REconstruction

Busting the climate myth

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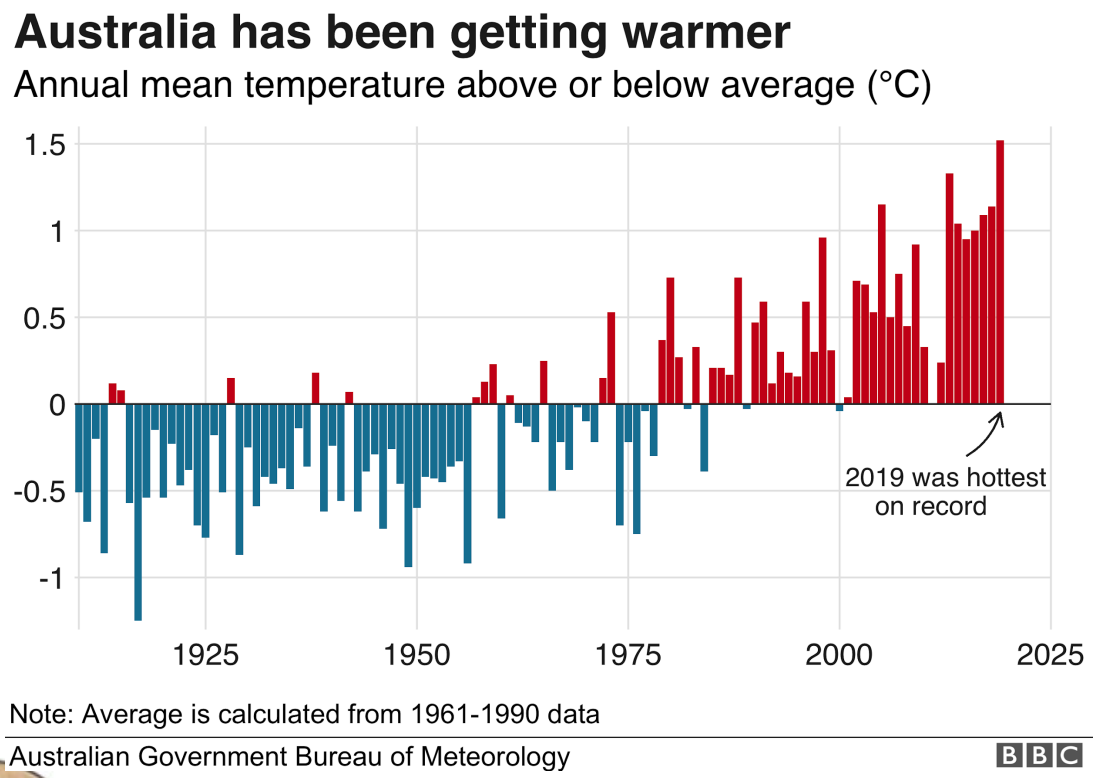
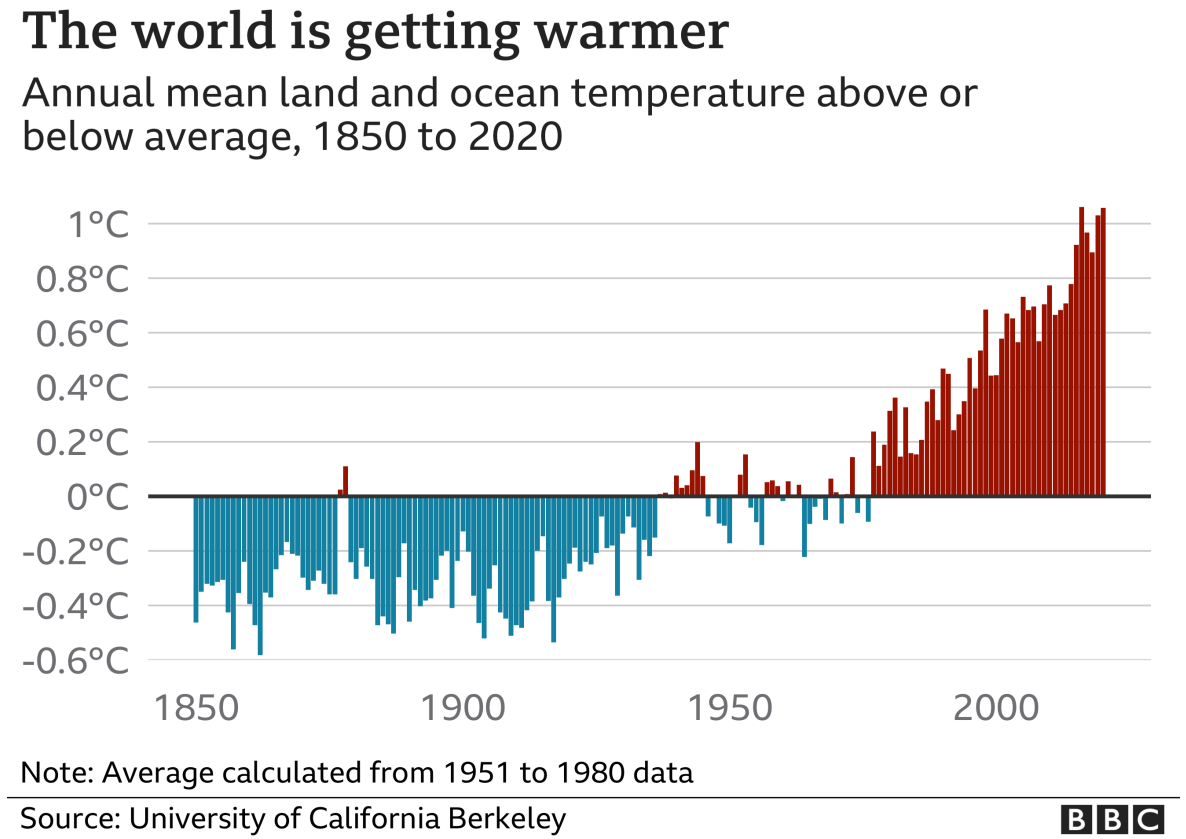
Past Fire Frequency and
Intensity REconstruction

Anthropogenic climate change?





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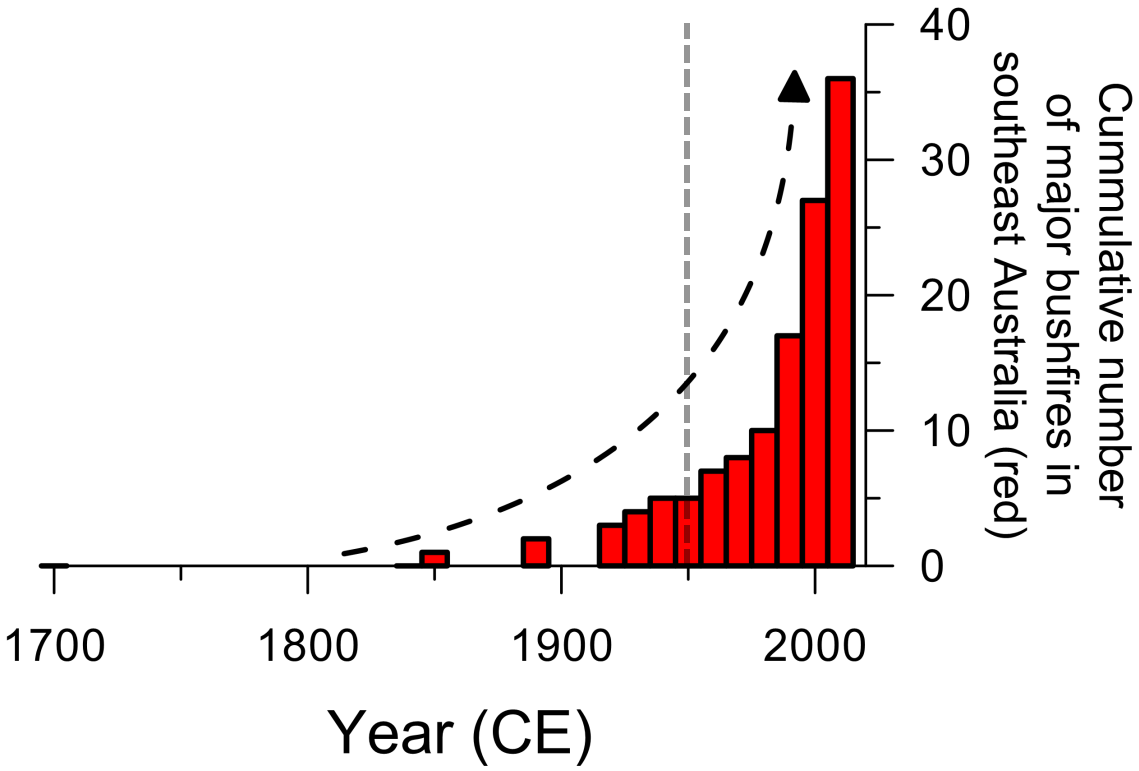
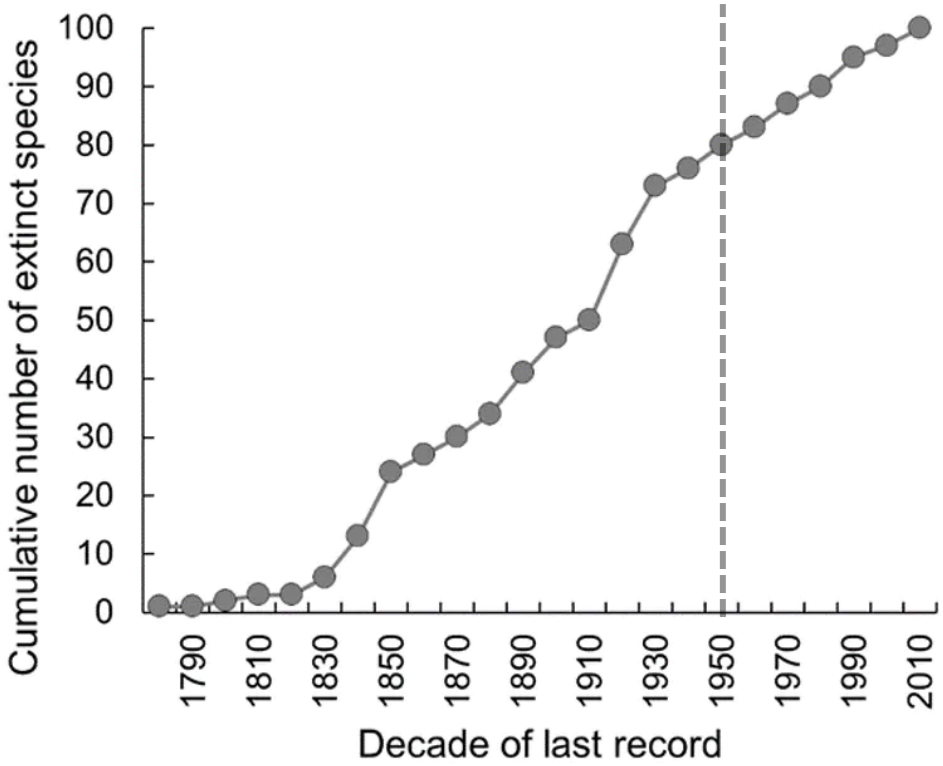
Continental unravelling



Fletcher et al. (2021) Fire



Woinarski et al (2019) Biological Conservation

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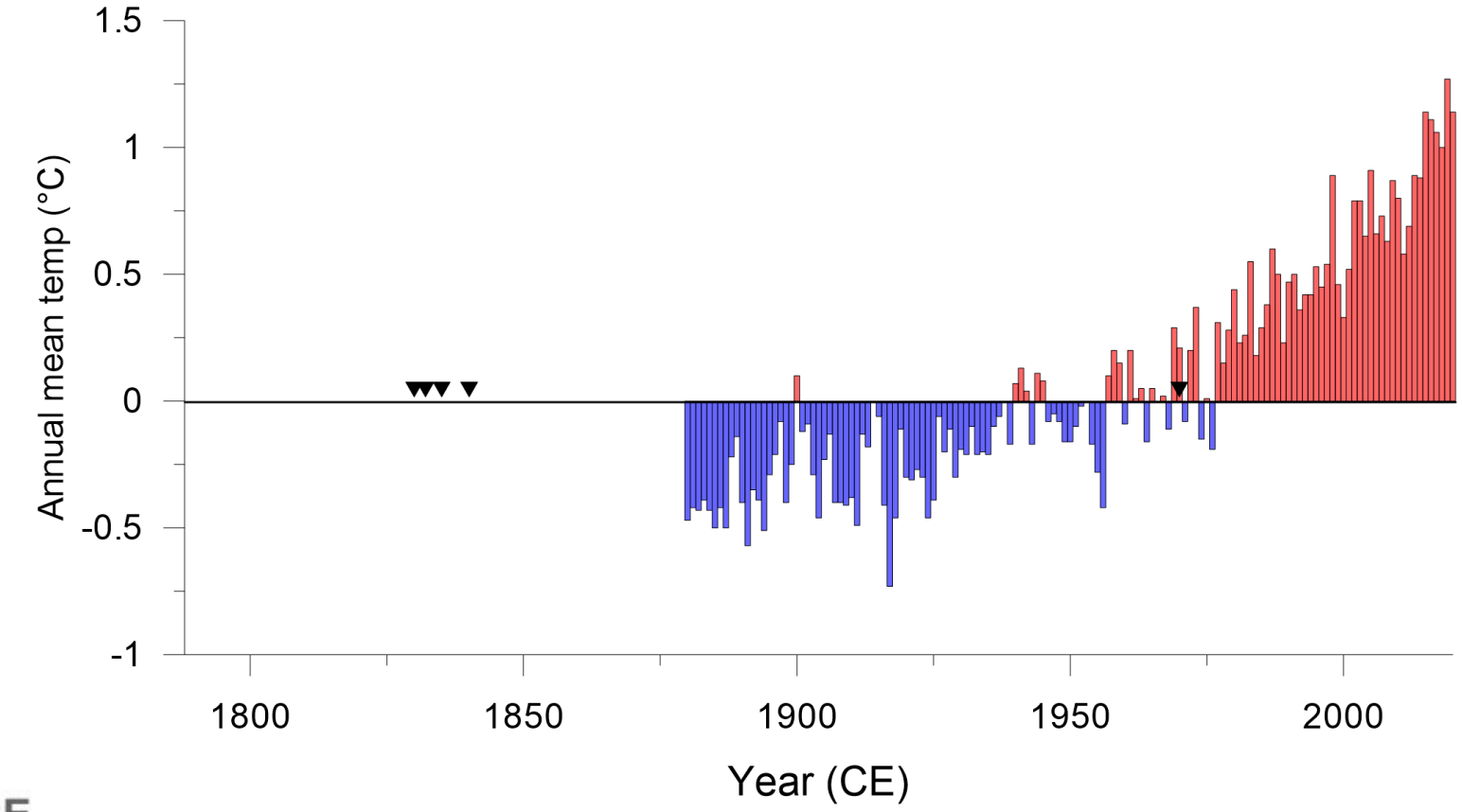
Eucalypt expansion and catastrophic fires began before climate change



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What does it all mean

1. Aboriginal people had a profound influence over the configuration of Australian vegetation landscapes
2. The biggest phase of environmental change in the past 12,000 years in Australia occurred in response to the British Invasion.
3. Diverse Country was bifurcated:
   1. Open agricultural land
   2. Neglected forests
4. Neglect has produced an unsafe situation in which life, property and Country are now under significant threat.
5. Climate change is a compounding factor, not the main driver of our current catastrophic fire crisis.

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A cultural problem

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Past Fire Frequency and
Intensity REconstruction

Cultural fire

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Fire fighting

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Fire fighting

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FIRE RESCUE
JBER
MSA

Fire fighting

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Intensity REconstruction

Fire fighting structure and language

- Fire front
- Containment line
- Attack crew
- Initial attack

Prescribed burning: The controlled application of fire under specified environmental conditions to a predetermined area and at the time, intensity, and rate of spread required to attain planned resource management objectives.

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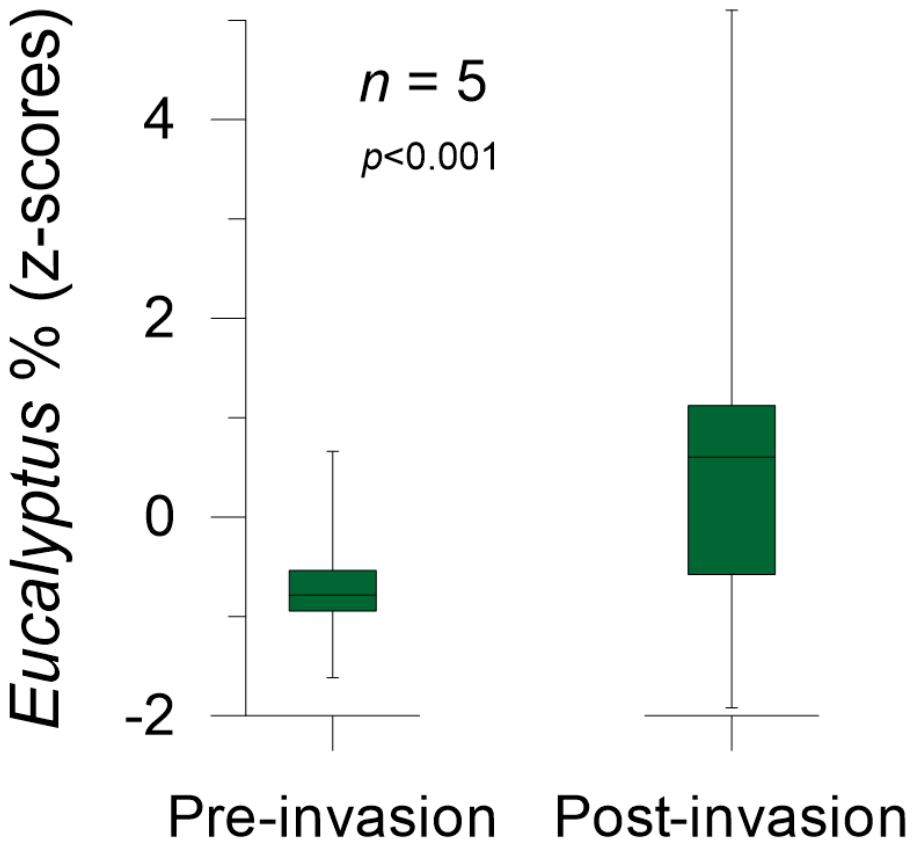
Eucalyptus increase



(Laming et al. 2022)

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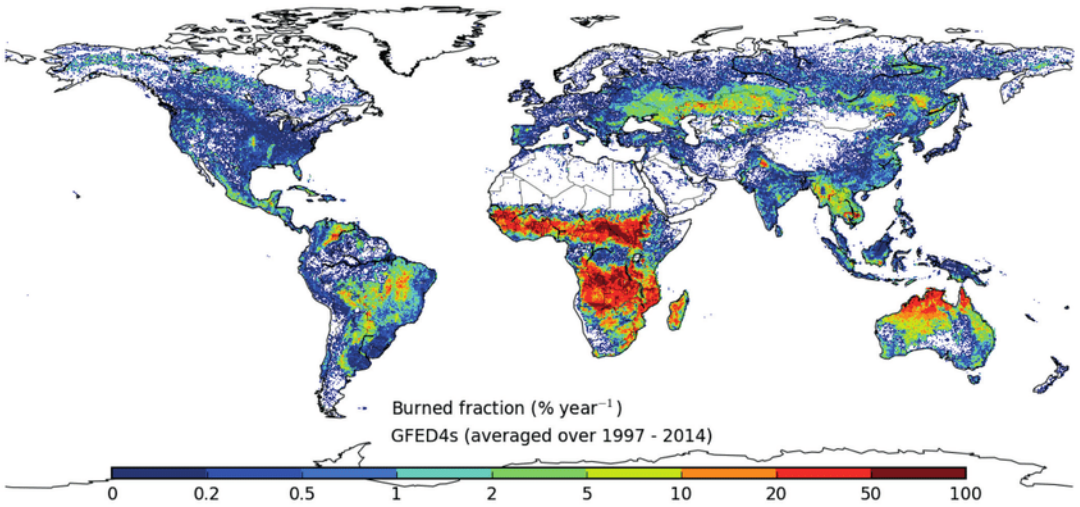
Northwest Europe



Global distribution of annual area burned, averaged over 1997-2014. White areas show no fire activity. Source: Global Fire Emission Database version 4, Giglio et al. 2013

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Nature-Culture divide

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Footprints and levers

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Great fire of London - 1666

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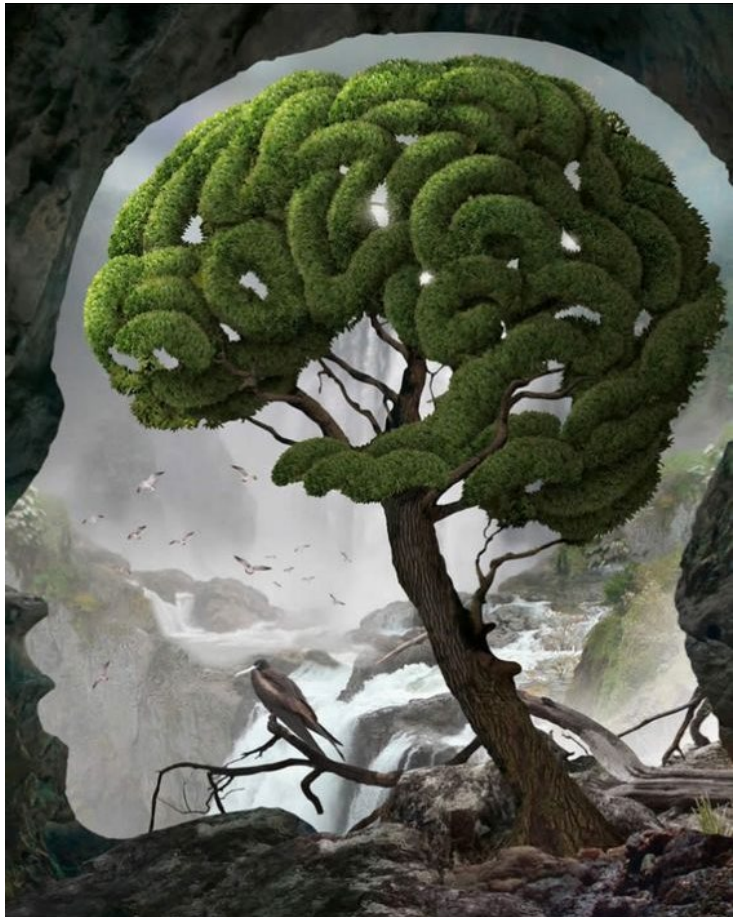
A challenge of the mind



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Country and wellbeing

Ecology and Society **22**(2): 11
https://www.ecologyandsociety.org/vol22/iss2/art11/

Table 3. Social cobenefits recorded in the Australian indigenous cultural and natural resource management literature.

Social cobenefit	Source
Family and community structures and functions	Gilligan (2006), Greiner et al. (2007), Hunt (2010), Urbis (2012), Green and Martin (2016), Social Ventures Australia (2016)
Social cohesion	Gilligan (2006), Hunt (2010), Urbis (2012), Robinson et al. (2016)
Mitigation of substance abuse	Gilligan (2006), Sithole et al. (2008), Hunt (2010), Green and Martin (2016)
Mitigation of crime and violence levels	Greiner et al. (2007), Sithole et al. (2008), Urbis (2012), Social Ventures Australia (2016)
Childhood educational attendance and engagement	Gilligan (2006), Hunt (2010), Urbis (2012), Social Ventures Australia (2016), Robinson et al. (2016)
Vocational training opportunities	Greiner et al. (2007), Urbis (2012), Robinson et al. (2016)
Access to social services	Gilligan (2006), Hunt (2010), Social Ventures Australia (2016)
External engagement, networking, and recognition	Sithole et al. (2008), Pew Charitable Trusts (2015), Social Ventures Australia (2016)
Targeting and coordination of research	Sithole et al. (2008), Urbis (2012)
Delivery of government social objectives	Gilligan (2006), Hunt (2010), Social Ventures Australia (2016)

What’s the real difference?

THE GREENS

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Life at the ends of a spectrum: our relationship with Country/Nature

Dysfunctional

Narcissists

Exploit

Care

Dysfunctional

Misanthropes

Neglect

Healthy Country
Healthy People

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Many people believe that they are attracted by God, or by Nature, when they are only repelled by man.

– William Ralph Inge