

## **Fire in the forests? Exploring the human-ecological history of Australia's first frontier**

**Grace Elizabeth Karskens**

### ABSTRACT

In his landmark book *The Biggest Estate on Earth*, historian Bill Gammage argues that before the arrival of white settlers, the whole Australian continent was a manicured cultural landscape, shaped and maintained by precise, deliberate and repeated fires. In Aboriginal hands, fire made the entire country 'beautiful and comfortable', and so Australia was one vast 'estate', a giant 'park', a series of 'farms without fences'. These words imply that Aboriginal rights to land are closely tied to universal fire regimes. Gammage's book has been well-received and celebrated. But it has also polarised debates on fire regimes, especially the extent to which fire really did shape every corner of the continent, and the related assertion that contemporary ecologies are the result of the cessation of fire since 1788.

This paper integrates ethnographic history and archaeology with geography, soil science and ecology in order to set Gammage's model against a particular ecological zone – the dense River-flat Forests that once lined Dyarubbin, the Hawkesbury-Nepean River in New South Wales, Australia. Dyarubbin was occupied by Aboriginal people for perhaps 50,000 years, and from 1794 it became the site of the first major settler farming frontier. Paying attention to the local and the particular, this paper asks: was *this* fiercely contested country a tidy mosaic of open forests, water and grasslands created by cultural fire? Was Aboriginal burning here extensive or limited? What aspects of human and ecological history might be obscured by the universalising model in which cultural fire dominates above all other factors? Did the Aboriginal landscape in turn shape the settler one, and what were the consequences for land and people?

On November 17 1822, the young Methodist minister Ralph Mansfield was up early, preaching God's word among the settlers and convicts on the Nepean at Castlereagh and Emu Plains. But his journey back to Richmond was more like a ride through the gates of hell. A furnace wind blasted horse and rider, the sun beat down, its 'burning rays without a single cloud to mitigate their violence'. Across the river, the sclerophyll forests of the Blue Mountains were ablaze. The

sky was full of billowing smoke ‘rolling from the mountains, which from the natives having set fire to the grass and underwood, were in flames to a vast extent’. Poor Mansfield wrote later that it was ‘the most laborious and exhausting day I ever spent’.<sup>1</sup>

There are two things to note here: first, the fire lit by ‘the natives’ was burning in the forests in the Blue Mountains, and not on the flats and terraces along the Nepean River below. And second, Mansfield *assumed* the fire was Aboriginal burning. Settlers were evidently accustomed to Aboriginal people burning the bush, and they appear to have been unfazed by it – even, as in this case, two decades after white settlement.<sup>2</sup>

In some places, settlers in colonial Australia noted not only Aboriginal burning, but links between Aboriginal people, fire, vegetation and animals. Settlers themselves had to learn fast, because, as a landmass held in the thrall of the El Niño Southern Oscillation (ENSO), Australia is a continent of fire. Its dominant ecologies emerged in tandem with fire: thus, fire is not exceptional but integral to much of Australia’s scleromorphic vegetation.<sup>3</sup>

But knowledge of Aboriginal burning later slipped from public memory and was not rediscovered until the 1960s, when archaeologists and anthropologists began to write about ‘firestick farming’ and Aboriginal people’s use of fire as a tool to manage the landscape. This

---

<sup>1</sup> Ralph Mansfield, Journal, entry for 17 Nov. 1822, in John Thomas Bigge, *Report of the Commissioner of Inquiry on the Colony of New South Wales*, Appendices, Bonwick Transcripts, Box 52, 1308, Mitchell Library, State Library of New South Wales [hereafter ML].

<sup>2</sup> This evidence has been used to argue, incorrectly, that Aboriginal people were still burning on the long-farmed river bank at Castlereagh in 1822, see James L. Kohen, *The Darug and their neighbours: The traditional Aboriginal owners of the Sydney region* (Sydney: Darug Link and Blacktown and District Historical Society, 1993), p. 27. See also *Sydney Gazette* [hereafter SG], 31 Mar. 1805.

<sup>3</sup> John Hunter, *An Historical Journal of Events at Sydney and at Sea 1787-179...with further accounts by Governor Arthur Phillip and Lieutenant P. G. King*, edited by John Bach (Sydney: Angus and Robertson, 1968 [f.p. 1793]), pp. 43, 55; James Atkinson, *An Account of the State of Agriculture and Grazing in New South Wales* (Sydney: Sydney University Press, 1975 [f.p. 1826]), p. 21; Thomas Mitchell, *Journal of an Expedition into Tropical Australia in Search of a Route from Sydney to the Gulf of Carpentaria* (London: Longman, Brown, Green and Longmans, 1848), pp. 412, 413; Mary Gilmore, *Old Days, Old Ways: A Book of Recollections* (Sydney: Angus and Robertson, 1963 [f.p. 1934]), p. 153; Stephen Pyne, *Burning Bush: A Fire History of Australia* (Washington: University of Washington Press, 1998 [f.p. 1991]). See also Tom Griffiths, *Forests of Ash: An Environmental History* (Melbourne: Cambridge University Press, 2001), pp. 5-6; Tim Flannery, *The Future Eaters: An ecological history of the Australasian lands and people* (Sydney: Reed New Holland, 1998), pp. 81, 282, 283.

was radical thinking at a time when popular ideas about Aboriginal people still revolved around tropes of a ‘timeless’, unchanging ‘stone age’ people who made no impact on the land at all, who were, in fact, themselves part of nature. So that word ‘farming’ was deliberate. It asserted an equivalence between Aboriginal and settler land-use, in European terms. It thus challenged the founding colonial doctrine of *terra nullius*, the belief, dating back to the reports of James Cook and Joseph Banks from the *Endeavour*’s visit to the east coast of Australia in 1770, that Aboriginal people did not ‘use’ the land and therefore did not own it. The other startling implication of ‘firestick farming’ was that Australian landscapes were not ‘natural’ at all, but cultural: they were created and managed by Aboriginal people.<sup>4</sup>

Bill Gammage’s landmark book *The Biggest Estate on Earth* reasserts the earlier arguments in a dramatic meta-narrative of cultural fire which refashioned the entire Australian continent. It is a national story, and a kind of parable. Presenting what he calls a ‘tsunami’ of evidence, mainly from the diaries of nineteenth century explorers, as well as numerous paintings by early colonial artists, Gammage portrays the pre-invasion Australian landscape as a series of mosaics of water, open forests and grasslands. In this vision, every centimetre of this 7.7 million square kilometre continent was a manicured cultural landscape, shaped and maintained by precise, deliberate and repeated fires. ‘There was no wilderness, no *terra nullius*’ he writes elsewhere, ‘in that sense no nature, because all was as people made it or allowed it to be’.<sup>5</sup> He goes further still, binding ecology and theology together in a cosmology reaching back into deep time. Aboriginal fire regimes, he asserts, were a fixed religious/spiritual and legal code, practised across the entire

---

<sup>4</sup> Rhys Jones, ‘Firestick farming’, *Australian Natural History*, 16 (1969): 224-48; Norman Tindale, *The Aboriginal Tribes of Australia* (Canberra: ANU Press, 1974); Sylvia Hallam, *Fire and Hearth: A Study of Aboriginal Usage and European Usurpation in south-western Australia* (Canberra: Australian Institute of Aboriginal Studies, 1979); Flannery, *The Future Eaters*; Pyne, *Burning Bush*; David Horton argues against fire-stick farming in *The Pure State of Nature* (Sydney: Allen & Unwin, 2000).

<sup>5</sup> Bill Gammage, *The Biggest Estate on Earth: How Aborigines Made Australia* (Sydney: Allen & Unwin, 2011); Bill Gammage, ‘Plain facts: Tasmania under Aboriginal management’, *Landscape Research* 33 (2008): 252.

continent for over 60,000 years, a law Aboriginal people were utterly compelled to follow. They ‘risked their souls’ to uphold this Law.<sup>6</sup>

Gammage’s spiritual, unifying narrative has won wide admiration, praise and prizes. He exhorts white Australians to acknowledge their ecological sins and strive for redemption by learning the lessons of Aboriginal management. These appeals have struck chords in a society facing the onset of climate change and the ravages of other environmental disasters, and also, as historian Graeme Davison writes, ‘re-reading their landscape...for evidence of its deep history’.<sup>7</sup> The book is also a clarion call for reconciliation between Aboriginal and non-Aboriginal Australians – one which must begin with recognition and ultimate emulation of Aboriginal people’s spiritual links with the land and their deep understanding of its management.

But the critical response has been vigorous too. Gammage’s book, particularly his robust critique of scientists and their work, has polarised debate on the extent and impacts of Aboriginal fire, and driven a wedge between scholars in the humanities and those in the sciences. A palaeoecological study by Scott Mooney et al combined 223 studies of charcoal deposits from across Australia, dating from the last 70,000 years, but found no discernible link between the arrival of humans and the amount of burning on the Australian continent.<sup>8</sup> Ecologist Ron Hateley’s *The Victorian Bush* predated Gammage’s book by a year, but effectively laid the groundwork for its critique by pointing out the huge variety in landscapes and vegetation communities in Victoria, and just how much of the explorers’ and settlers’ evidence had been generalised across time and space in fire-stick farming literature. When contextualised, the

---

<sup>6</sup> Gammage, *Biggest Estate*, 126, 133.

<sup>7</sup> Graeme Davison, *City Dreamers: The Urban Imagination in Australia* (Sydney: NewSouth Publishing, 2016), 258.

<sup>8</sup> This study concluded that, at this continental scale at least, ‘the dominant control of fire activity is climate or climate-modulated change in vegetation cover’, see Scott Mooney et al, ‘Late Quaternary fire regimes of Australia’, *Quaternary Science Reviews* 30 (2011): 27, 41; pers. com. Scott Mooney, email 27 September 2016..

evidence suggests quite different, much more varied scenarios.<sup>9</sup> Ecologist Ian Lunt takes Gammage to task for extending his ‘grand narrative’ across space too – the immense diversity of Australian geographies and ecologies. The point about fire regimes is that they must be adjusted to particular ecologies and climates, so evidence from one place cannot be generalised to cover every other place.<sup>10</sup>

Some researchers assume the debate is simply split along disciplinary lines, with convinced humanities opposed to the sceptical sciences. But environmental historians and archaeologists are critical too. Tom Griffiths, and Fred Cahir and his team, argue similarly that fire regimes cannot be generalised, but respond to Australia’s enormous biodiversity and range of ecosystems, as well as change over time.<sup>11</sup> Archaeologist Peter Hiscock is critical of Gammage’s notion that fire regimes were eternal ‘Dreamtime Law’, because this echoes earlier tropes of ‘unchanging people’ in a ‘timeless land’, when it is abundantly clear that Australian people and landscapes have all changed dramatically over the past 60,000 years. Fire was always a significant story, says Hiscock, but it cannot have been a fixed and unchanging one.<sup>12</sup>

\*\*\*\*\*

Perhaps the most striking feature of *The Biggest Estate on Earth* is that word *estate*. To portray and communicate Aboriginal Australia, Gammage has used a range of European concepts of land and ideal landscapes, including *estate*, *Eden*, *garden*, and *farm*. In Aboriginal hands, he writes, fire made the country ‘beautiful and comfortable’, so that Australia was one vast estate, a

---

<sup>9</sup> Ron Hateley, *The Victorian Bush, its ‘original and natural’ condition*, (Melbourne: Polybractea Press, 2010), Chapter 8.

<sup>10</sup> Ian Lunt, ‘Location, Location, Location: The Future of Environmental History’, blog, 17 February 2013, <http://ianluntecology.com/2013/02/17/location-location-location-the-future-of-environmental-history/>.

<sup>11</sup> See Michael D. Doherty, ‘Ron Hateley, *The Victorian Bush*’, book review, *Ecological Management & Restoration*, 14(2014): 10-11; Griffiths, *Forests of Ash*; Christine Hansen and Tom Griffiths, *Living with Fire: People, Nature and History in Steels Creek* (Melbourne: CSIRO Publishing, 2012); Fred Cahir, Sarah McMaster, Ian Clark, Rani Kerin and Wendy Wright, ‘Winda Lingo Parugoneit or Why Set the Bush [On] Fire? Fire and Victorian Aboriginal People on the Colonial Frontier’, *Australian Historical Studies* 47(2016): 225-40.

<sup>12</sup> Peter Hiscock, ‘Creators or destroyers? The Burning Questions of Human Impact in Ancient Aboriginal Australia’, *Humanities Australia*, 5 (2014): 40-51.

giant park, a series of ‘farms without fences’. Ironically these are the same concepts the first white intruders brought with *them*, the lenses through which *they* saw or imagined this land. Gammage even presents Aboriginal people as the equivalent of Europe’s leisured gentry, because the land afforded bounteous nourishment with minimum effort, leaving plenty of time for leisure, sociability and culture.

By using these old, deeply rooted and still powerful images and ideals, Gammage has made the strange familiar, to non-Aboriginal Australians in particular. But these concepts are more than helpful metaphors. They are underpinned by the idea that rights to land, legitimate ownership and occupation rest ultimately on the successful transformation of land through labour – in this case by burning - to make it productive and beautiful. Ultimately, this is a dichotomous model: Aboriginal people either controlled their natural environments, or they lived, as Cook and Banks thought, in a ‘pure state of nature’, their existence utterly determined by environmental factors.<sup>13</sup>

Were there places which were not burned? If so, could such places suggest other ways to understand the relationships between people and environments, models which move beyond European concepts of land use, and alternatives to the maxim that to rightfully own land, people must modify and control it through fire?

There is now little debate among scholars on Aboriginal burning itself – both historical records and ongoing traditional practice of ‘cleaning up country’ make it clear that cultural fire was widespread. The debate now concerns the extent and impact of cultural fire, revolving around two major historical-ecological propositions: first, that all of Australia’s ecologies and landscapes were culturally created and predominantly shaped by fire before the British invasion. And second, that the cessation of Aboriginal fire regimes after 1788 resulted in major ecological alteration – more and denser trees and shrubs, and the advent of destructive wildfires

---

<sup>13</sup> See note 4; Horton, *The Pure State of Nature*, 10ff, chap 4.

as a result of the build-up of vegetable matter.<sup>14</sup> Thus the radical implication is that the contemporary landscapes ecologists study are not ‘natural’ at all, but the result of historical developments over the past century or two, which disrupted the fixed patterns of aeons earlier.

This second question – concerning ecological change in the two-hundred years after the invasion – was explored by ecologists Jennifer Silcock, T. P. Piddocke and Rod Fensham in a fascinating historical-ecological project focusing on a vast arc of semi-arid and arid zones of Queensland, north-western New South Wales and north-eastern South Australia. The team georeferenced some 4,500 explorers’ observations dating from 1844 to 1919 using ‘landscape features, distances, bearings and latitudes’ combined with topographic maps and satellite imagery, to pinpoint the places where these observations were made. The study confirmed the alarming decrease and disappearance of smaller marsupials and the silting up of some waterholes. But with regard to the larger ecological picture, ‘little change in the broad vegetation structure or waterholes’ had occurred since the explorers first saw this country. The authors are quick to point out, however, that these conclusions are *specific to the region*, and they draw a contrast with ‘regular dry season burning in the high rainfall areas across northern Australia’, as well as in the wetter and more fertile southeast of the continent. Methodologically, then, two things are clear here: the prime importance of *bio-regional* scale and focus; and, once more, the explanatory power of reconnecting historical observations with geographic locations.<sup>15</sup> Tom Griffiths writes similarly of Victoria’s Mountain Ash forests and its fire history:

In order to unearth the forest’s secrets, then, we need to research very specific, local histories. In such accounts, it will emerge that a forest is not just any forest, but a unique community of trees, and a fire is not just any fire, but one of particular frequency, a

---

<sup>14</sup> Eric Rolls, *A Million Wild Acres* (Melbourne: Penguin, 1984), pp. 247-52; Gammage, *Biggest Estate*, chap. 2.

<sup>15</sup> J. L. Silcock, T. P. Piddocke and R. J. Fensham, ‘Illuminating the dawn of pastoralism: Evaluating the record of European explorers to inform landscape change’, *Biological Conservation* 159 (2013): 321-31. The authors note that there were relatively few reports of Aboriginal burning in the explorers’ journals. See also Grace Karskens, *The Colony: A History of Early Sydney* (Sydney: Allen & Unwin, 2009), pp. 271-2.

particular intensity, a particular range. The forest will have a history, and the fire might even have a name.<sup>16</sup>

What, then, of the first question, the extent to which ‘1788 landscapes’, as Gammage calls them, were *cultural landscapes*, a continent-wide series of mosaics of grass, forest and water, made by Aboriginal fire? In this scenario, natural features and conditions, such as soil, rainfall, gradient, altitude, light and so on, are de-emphasised as the ‘facile reasons often given by the deniers’, as one reviewer put it.<sup>17</sup> But, again, did fire really shape every corner of Australia?

\*\*\*\*\*

To explore these questions, this paper will return to a ‘specific, local history’, an early colonial landscape significant to Aboriginal people and settlers alike – the River-flat Forests of Dyarubbin, the Hawkesbury-Nepean River in New South Wales. This river was the site of the first major and successful settler farming frontier from 1794. It was also the well-populated Country of Aboriginal people, whose presence here reaches back perhaps fifty thousand years. Dyarrubbin became fiercely contested ground. One of the longest frontier wars in Australian history was fought here, in three terrible pulses between 1794 and 1816.<sup>18</sup>

The tall, dense River-flat Forest which once stood on Dyarubbin was typical of Australia’s other east-coast rivers. These river lands were thus quite different from the open woodlands, mountain forests, rangelands and the arid interior which are the focus of so much fire history. Yet they were magnets for Aboriginal people, and well-populated. In Victoria in 1878 Robert Brough Smyth wrote ‘All that is known of the original condition of the natives of Victoria points to this: that the rivers were their homes’. Rivers tell a different settler story too – one that pre-dates the pastoral industry. If pastoralists ‘sought grass above all’, that is, the

---

<sup>16</sup> Griffiths, *Forests of Ash*, 9.

<sup>17</sup> Ken Taylor, ‘The Biggest Estate on Earth’, review, *Landscape Research* 38 (2013): 158.

<sup>18</sup> G. C. Nanson, R. W. Young and E. D. Stockton, ‘Chronology and palaeoenvironment of the Cranebrook Terrace (near Sydney) containing artefacts more than 40,000 years old’, *Archaeology in Oceania* 22 (1987): 72-78; Eugene Stockton and Gerald Nanson, ‘Cranebrook Terrace Revisited’, *Archaeology in Oceania*, 29 (2004): 59-60; Karskens, *The Colony*, chap. 5; Grace Karskens, *People of the River* (Sydney: Allen & Unwin, forthcoming).

grasslands created by Aboriginal burning, the early river settlers were not after pasture-lands for their own sake, but soil for farming – the rich alluvial soils of the river flats.<sup>19</sup>

River-flat Forests receive relatively limited scholarly attention from historians and ecologists – largely because they have almost all vanished. The reasons are historical. Rivers were not only places where Aboriginal people lived, they were the intense locus of early settler farming expansion, and once all the arable land had been appropriated on one river, settlers ‘leap frogged’ north or south to the next, and the slow and laborious process of clearing began again. Today, River-flat Forest is classed as endangered, and ecologists warn that what is left will go extinct unless protected.<sup>20</sup>

How do we reconstruct a long-lost forest and its fire history? This is not straightforward: there are no detailed historical/ecological descriptions and very few surviving analogous areas from which to work. The task is one of gleaning details and descriptions from scattered historical accounts, the journals of early botanists, as well as the reports of ecological consultants carrying out surveys for developers, and integrating these with data on environmental factors like geology, soil science, fluvial geomorphology. Most important in this process is *place*: in order to recover this landscape meaningfully, the historical and botanical descriptions must be pinned back to particular geographic places.

\*\*\*\*\*

PLACE FIG. 1 HERE

Caption: Fig. 1 Hawkesbury-Nepean River/Dyarubbin region and catchments (Paul Irish)

PLACE FIG. 2 HERE

Caption : Fig. 2 Hawkesbury-Nepean River/Dyarubbin, showing study area (Paul Irish)

---

<sup>19</sup> Gammage, *Biggest Estate*, 188; Brough Smyth cited in Hateley, *The Victorian Bush*, 108; Karskens, *The Colony*, 106-7.

<sup>20</sup> See New South Wales Scientific Committee, *River-flat eucalypt forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions – endangered ecological community listing – final determination* (Sydney: Department of Environment and Heritage, 2004), online at <http://www.environment.nsw.gov.au/determinations/RiverflatEucalyptForestEndSpListing.htm>

Dyarubbin flows west of Sydney, rising in the highlands around Goulburn in the south and reaching the ocean at Broken Bay to the north (Fig. 1). My case study area for this paper includes the early farming areas along the freshwater reaches from around Cattai Creek in the north to the start of the sandstone Nepean Gorge in the south. The Nepean and Hawkesbury are in fact the same river, joined at Yarramundi, where the Grose River joins them, flowing down from the Blue Mountains to the west. Nevertheless the Nepean is distinct from the Hawkesbury because of its many cobble rapids, the largest and most important of which straddle the river at Emu Plains, the Castlereagh Neck/Blacks Falls and Yarramundi (Fig. 2). From archaeological and historical evidence we know that these rapids were highly significant Aboriginal places, and continued to be well into the nineteenth century. People used them to cross the river and built stone and timber traps on them to catch fish. A number of huts reportedly stood on the west bank at Emu Ford in the early 1800s and it was still a well-populated area in the 1820s. The Nepean rapids were also tool-making powerhouses, major sources of hard, smooth cobbles (mudstone, basalt, hornfels), traded and used all over the Sydney region, especially for making *mogo*, the edge-ground, hafted hatchets adopted by Aboriginal men in the mid-Holocene. When white collectors began to pick up Aboriginal tools on the Nepean from the 1880s, they found hundreds of hatchet heads near these three great rapids.<sup>21</sup>

The River-flat Forests growing alongside the rivers and creeks need to be seen in their wider ecological contexts – they were only one of the ecological communities occupying the environs of the Hawkesbury-Nepean. Contemporary ecologists have identified at least 25 different surviving plant communities in the area between Windsor and Penrith alone. Here I want to

---

<sup>21</sup> SG 23 Sept. 1804; Frederick D. McCarthy, 'The Lapstone Creek excavation: two culture periods revealed in eastern New South Wales', *Records of the Australian Museum* 22 (1948): 28 and fig. 99; Tessa Corkhill, 'Sourcing stone from the Sydney region: A hatchet job', *Australian Archaeology* 60 (2005): 41-50; J. C. Cox, 'Notes and exhibits', *Proceedings of the Linnaean Society of NSW* 5(1880): 271-2; W. W. Thorpe and M. S. Stanley, 'Aboriginal Axes,' *The Australian Museum Magazine*, 3(1928): 211; George Bunyan to Frederick D. McCarthy, 28 June 1935, McCarthy Papers, Box H2316, ML.

focus on four of the major communities, each of which was used in different ways by both Aboriginal people and settlers (see Fig. 3).<sup>22</sup>

**PLACE FIG. 3 HERE**

Caption: Fig. 3 Vegetation Communities of the Hawkesbury-Nepean River/Dyarubbin c1788 (Paul Irish, with kind permission of Doug Benson. The vegetation communities shown here are simplified from mapping provided in Benson and Howell, *Taken for Granted*, 1990, and Tozer *et al.*, 'Native vegetation of southeast NSW', 2010. GIS data from Tozer *et al* 2010 kindly provided by the Office of Environment and Heritage)

1. The lush, dense **River-flat forest**, dominated by tall Cabbage Gums (*Eucalyptus amplifolia*), Forest Red Gum (*E. tereticornis*) and Broad Leafed Apples (*Angophora subvelutina*).<sup>23</sup> It grew on the recent alluvial deposits of the river flats and terraces. In the early colonial period this forest was called 'brush' or 'woods' depending on its density, though these terms were interchangeable (see Figs 3 and 4).<sup>24</sup>
2. An extensive area of drier forest of Ironbarks (*E. fibrosa* and *E. crebra*) and Hard Leafed Scribbly Gums (*E. sclerophylla*), with a continuous shrub layer below, known as **Castlereagh Forest**, which only grows on the river's much older and higher Tertiary-age terraces, where the infertile soils are thought to be between 2 and 20 million year old (see Figs 3 and 5).
3. **Cumberland Woodland** was found on shale soil country – the flat and undulating areas east of river on the Cumberland Plain, and the lower slopes below Grose Vale on the

---

<sup>22</sup> See New South Wales National Parks and Wildlife Service [hereafter NPWS], *Native Vegetation Maps of the Cumberland Plain and Interpretation Guidelines* (Sydney: Office of Environment and Heritage, 2002), online at <http://www.environment.nsw.gov.au/surveys/GetHoldOfMapsDataAndReports.htm>; Doug Benson and Jocelyn Howell, *Taken for Granted: The Bushland of Sydney and its Suburbs* (Sydney: Kangaroo Press, 1990), map, frontispiece, includes in addition the Freshwater Wetlands which were significant on the Hawkesbury-Nepean River. Pers. com. Doug Benson, email, 16 March 2017. See also M.G. Tozer, K. Turner, D.A. Keith, D. Tindall, C. Pennay, C. Simpson, B. MacKenzie, P. Beukers and S. Cox, 'Native vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands', *Cunninghamia* 11:3 (2010) 359–406.

<sup>23</sup> Ecologists and conservation bodies use several other terms for this type of forest, including Alluvial Woodland, Sydney Coastal River Flat Forest and Riparian Forest, and also subdivide it into different communities see *ibid*; in the Australian government's National Vegetation Information System, River-flat forest was subsumed in the 'Tall Open Forest' group, see Department of Sustainability, Environment, Water, Population and Communities, *National Vegetation Information System – Vegetation Profiles*, Canberra, *National Vegetation Information System – Vegetation Profiles* (Canberra: the Department, 2007), online at <http://www.environment.gov.au/erin/nvis/publications/vegfsheet.html>

<sup>24</sup> The meaning of the settler term 'brush' shifted over the nineteenth century, but in the period under discussion (1788-c1820) it was used to describe any dark, dense vegetation, such as River-flat Forest.

west. This classic landscape of widely spaced Grey Box (*E. moluccana*), Forest Red Gum (*E. tereticornis*) and Narrow Leafed Ironbark (*E. crebra*) with a grassy understorey was much admired and desired by early elite settlers. They called it ‘forest ground’. It reminded them of the fashionable gentlemen’s parks in England created by landscape architects such as Capability Brown (see Figs 3 and 6).<sup>25</sup>

4. On the rugged sandstone escarpment of the Blue Mountains and the Grose Gorge, and along the dramatic Nepean Gorge to the south, is the **Dry Sclerophyll Forest**. Common trees here include Broad-leafed Scribbly Gums (*E. haemastoma*), Red Bloodwoods (*E. gummifera*) and Stringybarks (*E. oblonga* and *E. sparsifolia*) (see Figs 3 and 7).<sup>26</sup>

**PLACE FIGS 4, 5, 6, 7 HERE**

Fig. 4 River-flat Forest, Mitchell Park, Cattai Creek, a tributary of the Hawkesbury River (Grace Karskens, 2011).

Fig. 5 Castlereagh Forest, The Northern Road, Londonderry (Grace Karskens, 2017)

Fig 6 Cumberland Plains Woodland (photo courtesy Scott Mooney)

Fig 7 Sandstone Sclerophyll Forest, Grose Gorge southwest of Grose Vale (Grace Karskens 2017)

This diversity of forest types makes it clear that if we are to grasp the histories and ecologies of this – or indeed any – area, we have to abandon the common and generic idea of ‘the bush’, so often depicted by nineteenth century colonial sojourners as ‘dreary’ and ‘monotonous’. People who lived and worked in these forests knew them in all their variety. So we must re-imagine the forests in the ways past people saw and experienced them: as varied, localised and complex.

Fire regimes *must* have reflected this complexity.

---

<sup>25</sup> Elizabeth Macarthur to Kingdon, 1 September 1795, in Sibella Macarthur Onslow (ed.), *Some early records of the Macarthurs of Camden* (Sydney: Rigby, 1973 [f.p. 1914]), p. 48.

<sup>26</sup> NPWS, *Native Vegetation Maps*; Doug Benson, ‘Survey of the Natural Vegetation of the Floodplain of the Hawkesbury River and its Major Tributaries’, chapter 3 in H. A. Scholer (ed.), *Geomorphology of New South Wales Coastal Rivers Report No. 139* (Sydney, Water Research Laboratory, University of New South Wales, 1974); Doug Benson and Jocelyn Howell, *Taken for Granted: The Bushland of Sydney and its Suburbs* (Sydney: Kangaroo Press, 1990), pp. 21-3, 77-8, 84-5.

Let's first look at the sclerophyll forests away from the river (2, 3 and 5), where the young alluvials meet the ancient tertiary-age terraces and the shale soils of the rolling Cumberland Plain, and where the bush becomes fire-prone and fire-loving. We don't in fact know the fire history of any of these areas, but the 'parklike' Cumberland Plain Woodland, dominated by widely spaced eucalypts and acacias, would have been easy to burn and maintain as open, grassy country for grazing animals and hunting. The denser Castlereagh Forests around present day Londonderry and Cranebrook are fire-prone too. Major bushfires, the first of the season, are burning there as I write (November 2016). Several early accounts describe fires in the sclerophyll forests of the Blue Mountains to the west – surveyor George Evans reported one in early January 1814 and Reverend Mansfield, as we have seen, in November 1822.<sup>27</sup> In the mid 1830s, Quaker missionary James Backhouse saw 'fire...raging with fury' in some parts of the 'forests of Gum and Stringy-bark' above Emu Plains, while on other places 'it had burnt the scrub off...and left it black'.<sup>28</sup> Further north, in the similar, rugged sandstone country in the Broken Back Ranges beyond Putty, convict explorer William Parr saw a series of fires in October and November 1817, the last of which were so severe and extensive they finally forced him to turn back.<sup>29</sup>

Even in these dry sclerophyll zones, there are of course other, obvious ways to explain the variations in the shape and structure of the forests besides fire regimes. Today, all these plant communities precisely reflect the soils in which they grow, echoing in turn the path and history of the river. Species, density and habitat shift and grade into one another as you move from

---

<sup>27</sup> Cited in Gammage, *Biggest Estate*, pp. 158-9. Some of these fires appear to have been natural, for example the big fire described by surveyor George Evans in January 1814, which destroyed everything from grass to the foliage at the tree-tops, see George Evans, 'Journey to Bathurst Plains', 1813-1814, in Frederick Watson (ed.), *Historical Records of Australia* [hereafter *HRA*] (Sydney: Library Committee of the Commonwealth Parliament, 1914-1925), VIII, pp. 165-77.

<sup>28</sup> James Backhouse, *A Narrative of a Visit to the Australian Colonies*, London, Hamilton, Adams, 1843, p. 305.

<sup>29</sup> Mark Dunn, 'A Valley in a Valley: Colonial Struggles over Land and Resources in the Hunter Valley, NSW 1820-1850', PhD thesis, University of New South Wales, 2015, pp. 109-13. Dunn argues that the large fires which burned all night were likely wildfires, ignited by lightning strike.

alluvial to shale soils, from dry to soggy ground, uphill and downhill.<sup>30</sup>

How extensive was Aboriginal burning in the River-flat Forests along Dyarubbin itself? Did the landscape here really look like Gammage's tidy mosaic of open forests and grasslands, of clearings, tree clumps and tree belts? The earliest descriptions of the River-flat Forest on the river banks from Cattai Creek to Emu Plains suggest just the opposite. The earliest white intruders fought their way through a rampant tangle of huge trees, vines, shrubs and soft-leaved ground-cover plants, including a great many plants with fleshy roots, bulbs and rhizomes. Explorers found it very hard going. Lieutenant Watkin Tench and his party struggled exasperatedly through 'reeds, thickets, and a thousand other objects' around Emu Island (now Emu Plains) on the Nepean in 1789, and Governor Arthur Phillip's 1791 party tripped and cursed their way through reeds, vines, shrubs and nettles which 'plagued and entangled' them on the Hawkesbury between Cattai Creek and South Creek. Local settlers' descriptions tell us that the trees were not widely spaced with a grassy understorey, as in a classic fired landscape. Emancipist Margaret Catchpole, who rented a small farm near Richmond, described the forests in 1804 as 'woods' – the word in this period implied trees that were close together and dense undergrowth. Poet Charles Tompson who attended school on the Nepean in the 1810s also described them as 'the tall wood', rather than 'forest ground'. The trees were up to 50 metres tall, reaching for the sky in the race for light.<sup>31</sup>

You could not walk through this forest easily. So it was threaded through with Aboriginal

---

<sup>30</sup> Compare NPWS, *Native Vegetation Maps* with NSW Department of Environment, Climate Change and Water, Penrith, Soil Landscape Series, Sydney, n.d. c2000, Sheet 9030. See also Glen Atkinson, 'A review of soil and geological maps of the Nepean River terraces, NSW', *Australian Geographer* 18 (1987): 124-36; Chris Cunningham, 'A Fire History of the Blue Mountains', in Jocelyn Powell (ed.), *The Improvers' Legacy: Environmental Studies of the Hawkesbury* (Sydney: Deerubbin Press, 1998), p. 39.

<sup>31</sup> Watkin Tench, *A Complete Account of the Settlement at Port Jackson*, published as *Sydney's First Four Years* (Sydney: Library of Australian History, 1979 [f.p. 1793]), pp. 154, 227; Richard Atkins, Journal of a voyage to Botany Bay and South America 1791-1810, MSS 737, ML, entry 14 Nov. 1792; George Caley, 'A tour on the 20, 21, 22, & 23 of October 1801' and 'A tour on the 17, 18, 19, 20, & 21 of Jan 1802', in George Caley, *Journals 1802-1807*, MAV FM4/2568, ML; Margaret Catchpole to W. Howes, 20 Dec. 1804, MS1508, ML; Charles Tompson, 'Retrospect; Or, A Review of my Scholastic Days' *Notes: from the Lyre of a Native Minstrel*, 1826, Australian Digital Collection, University of Sydney Library, <http://purl.library.usyd.edu.au/setis/id/v00007>.

pathways, certainly trodden down by human feet, but perhaps also lightly burned to keep them open. In the 1790s a clear, narrow path ran through this tall, dense forest alongside the river, and there were webs of paths leading to the campsites, duck traps, yam beds, bark shelters, hunting hides and stone tool workshops. There must have been a path between the rapids at the Castlereagh Neck/Blacks Falls and Emu Ford too, because an anonymous traveller was led along it by Aboriginal guides in 1804.<sup>32</sup>

Apart from two references to the same place, discussed below, there are no historical accounts of Aboriginal burning in these River Flat Forests. It was not a forest that welcomed fire. It didn't burn easily. Much of the understorey was *mesophyllous* – too dense and moist to burn. It is uncommon for fires to burn down into river corridors. In fact if wildfire did spread, for example, during periods of prolonged drought, the impacts would very likely have been catastrophic. The great River Oaks (*Casuarina cunninghamiana*) fringing the river are killed if their canopies are burnt. Many of the animals which lived in such forests, for example great gliders (*Petauroides volans*), have low fire tolerance. These forests were in fact refuges for animals fleeing fire in surrounding drier bushland.<sup>33</sup>

This absence of fire is echoed in occasional historical reports from other areas where tall, dark forests grew. In such places *not burning*, actively excluding fire, was important Aboriginal practice. Fire, after all, was destructive. The famous Australian writer Mary Gilmore recalled an Aboriginal elder telling her father that

---

<sup>32</sup> Arthur Phillip, Journal, in Hunter, *Historical Journal*, 342; Atkins, Journal, entry for 16 Nov. 1792; Tench, *Complete Account*, 154-5; William Bradley, Journal: A Voyage to New South Wales, December 1786 - May 1792, Safe 1/14, ML, transcript online at [http://image.sl.nsw.gov.au/Ebind/safe1\\_14/a138/a138000.html](http://image.sl.nsw.gov.au/Ebind/safe1_14/a138/a138000.html), p. 167; SG 23 Sept. 1805.

<sup>33</sup> Kate Hammill and Liz Tasker, *Vegetation, Fire and Climate in the Greater Blue Mountains World Heritage Area* (Sydney: Department of Environment, Climate Change and Water, 2010), 23, 33, 37, 42-3, 54; James L. Kohen, 'Aboriginal uses of fire in Southeastern Australia', *Proceedings of the Linnaean Society of New South Wales*, 116 (1996): 24; Hateley, *The Victorian Bush*, 135; Samantha Capon, Cassandra James and Michael Reid, (eds), *Vegetation of Australian Riverine Landscapes* (Melbourne: CSIRO Press, 2016), 297-306. Capon and her team accept the generalised argument that Aboriginal people used fire 'to keep flood-plains and their surrounding vegetation open to aid hunting and passage'. Yet they also cite descriptions of the Murray River near Albury as 'thickly wooded...overgrown with vines of various descriptions', see 53-55.

forest fires spoiled the fine timbers from which weapons were made and bark taken for canoes, that it took years for a forest to come back to itself after being burned; that fire destroyed birds, bees, seeds and animals.<sup>34</sup>

A traveller in Victoria in the 1840s also mused on the absence of fire in dense forests:

It is a strange circumstance, with their many dense forests of huge timber, that the Aborigines seldom, if ever, indulge in large fires, and if you ask them the reason, they tell you that the time is not far distant when wood will be extremely scarce and difficult to procure, and that, therefore, they are desirous of saving it.<sup>35</sup>

Aboriginal concerns over the future scarcity of timber may have been raised not only by settlers' clearing through cutting down trees and shrubs, but also because they did not 'ban fire', as Gammage suggests. Settlers were themselves enthusiastic and indiscriminate firebugs.<sup>36</sup>

Historians and archaeologists have of course long recognised that there were places where burning was avoided. But such places are usually assumed to be very limited and atypical, often referred to as *refugia*, the exception that proves the rule. In any case, such unburned places were still subsumed under the rubric of fire management regimes, as the deliberate decision to *withhold fire*, by 'burning around'.<sup>37</sup> Gammage himself acknowledges ecological diversity, for 'how much [fire] depended on terrain and climate'. Yet there is slippage. While rainforests were 'never burnt' and many places were 'burned around', nevertheless, 'sooner or later they burnt everywhere'. In this model, then, fire dominates every other human activity and natural process, it was 'the closest ally', the universal tool for sculpting all landscapes, the

---

<sup>34</sup> Gilmore, *Old Days, Old Ways*, p. 153; see also Pyne, *Burning Bush*, p. 54ff; Griffiths, *Forests of Ash*, pp. 6-9.

<sup>35</sup> J.C. Byrne, *Twelve Years' Wanderings in the British Colonies from 1835 to 1847* (London: Richard Bentley, 1848), p. 376, cited in Cahir et al, 'Winda Lingo', 236.

<sup>36</sup> Gammage, *Biggest Estate*, p. 122, cf. Gilmore, *Old days, old ways*, p. 153; Hansen and Griffiths, *Living with Fire*, 82-3; Karskens, *People of the River*, chap. 7.

<sup>37</sup> Gammage, *Biggest Estate*, pp. 2, 121, 162; Kohen, 'Aboriginal uses of fire', p. 22; Pyne, *Burning Bush*, pp. 3-9, 41.

element that shaped the entire continent.<sup>38</sup>

\*\*\*\*\*

The forests of Dyarubbin were not limited *refugia*, but an extensive corridor, typical of other rivers along the east coast of Australia. Yet here fire was clearly not the dominant, shaping element. What ecological factors and human activities have been eclipsed by the universal fire model in places like this? What, for example, was the role of fire in these forests, if not for large-scale landscape management? There *were* small fires everywhere in Dyarubbin's River-flat Forests, flickering between the trees: hunting and hearth fires, ceremonial, camp and cooking fires. The current fierce debate about Aboriginal fire regimes, their impacts on the Australian environment and their implications for future fire management may have made these smaller fires harder to see. Yet they were fundamental to Aboriginal life on the river, as elsewhere. As fire historian Stephen Pyne writes

Without campfires there would be no storytelling. Without torches and bonfires, there could be no ceremonial community after dark. Without the protective radiance of the hearth fire, Aborigines were defenceless against the evil spirits that marauded the night in search of souls to devour. Fire was ubiquitous in Aboriginal ritual and myth because it was ubiquitous in Aboriginal life.<sup>39</sup>

Fires in the big river trees smoked out possums and gliders, and left snug shelters in the tree-butts. Fire cracked stone for tools, hardened wood to be shaped into weapons and implements, flattened sheets of bark and melted sticky plant resin for fastening stone to wood. Camp fires cooked the families' foods – meat, yams, fish, mussels – made them delicious and fragrant. Fires lit the white-painted bodies of dancers at corroborees, made them gleam with unearthly light (Fig. 8). Fires lit on the river banks at night attracted fish for people to spear, dark shapes gliding

---

<sup>38</sup> Gammage, *Biggest Estate*, pp. 2, 162, 212, 226, 245, 282, 285, 289.

<sup>39</sup> Pyne, *Burning Bush*, p. 105.

under brilliant ripples. In cold weather, people slept around the glowing campfires at night, cradling small children in their arms.<sup>40</sup>

**PLACE FIG. 8 HERE**

Caption: Fig. 8 William Romaine Govett, A corroboree at Lake George c1835 (from William Govett 'Notes and sketches taken during a surveying Expedition in N. South Wales and Blue Mountains Road by William Govett on staff of Major Mitchell, Surveyor General of New South Wales, 1830-1835', p. 9, Mitchell Library, State Library of New South Wales).

Did Aboriginal people use fire to shape the forests of Dyarubbin at all? As we have seen, most accounts indicate they did not. But very occasionally, explorers, ramblers and surveyors did note grassy openings in the River-flat Forest, limited, green clears they called 'good situations', 'good spots', and 'grassy banks'. Sometimes they mentioned places where trees thinned out and the undergrowth disappeared, grassier patches of 'forest land'. Settlers in this period usually read the landscape in terms its suitability for farming: their eyes searched constantly for arable soil and open areas largely free of trees. If we glean these glimpses, scattered across place and time, and re-anchor them to geographic places, the faint outlines of the Hawkesbury-Nepean's Aboriginal landscape appear: a series of spots, limited in extent, which were open, or lightly timbered, when they should have continued tall, lush, dense forest (see Fig. 9).<sup>41</sup>

Clear patches were often observed at the junctions of creeks and rivers. Governor Arthur Phillip noted freshly burnt country at the junction of South/Wianamatta and Eastern Creeks during an exploratory expedition in 1791. Aboriginal people were still firing this area in 1805, well after settlers arrived – though this was the only place close to the river for which we have recorded evidence of burning. When Judge Advocate Richard Atkins was out rambling on the Nepean in

---

<sup>40</sup> Val Attenbrow, *Sydney's Aboriginal Past* (Sydney: UNSW Press, 2002), pp. 42, 90, 92-3, 113; William Romaine Govett, 'Notes and sketches taken during a surveying Expedition in N. South Wales and Blue Mountains Road by William Govett on staff of Major Mitchell, Surveyor General of New South Wales, 1830-1835', A330, ML, pp. 17, 32; Hyacinthe de Bougainville, *The Governor's Noble Guest: Hyacinthe de Bougainville's Account of Port Jackson, 1825*, edited by Marc Serge Rivière (Melbourne: Melbourne University Press, 1999), p. 102; Tench, *Complete Account*, p. 233.

<sup>41</sup> See NSW Department of Environment, Climate Change and Water, Penrith, Soil Landscape Series, Sheet 9030.

1792, he followed the swamps and lagoons of Rickaby's Creek up to its junction with the Hawkesbury near present day Windsor. As we have seen, the river bank was for the main part densely vegetated, but, at the junction of creek and river, Atkins observed that the land 'would take but little trouble in clearing as the timber is not very thick, nor are the trees'.<sup>42</sup>

A similar landscape was reported further east around the junction of South Creek and the Hawkesbury, later known as the Green Hills: David Collins remarked in 1794 that the land here was 'convenient for fresh water, not much burdened with timber'. As Gammage points out, this was the reason early settlers made a beeline for such areas in the first place: you wouldn't have to clear it. Earlier explorers had noted a similar open forest at the foot of Richmond Hill on the opposite bank. They described it with delight as a 'pleasant looking country, covered with grass', 'spread over with lofty trees, without any underwood', a classic fire-maintained landscape.<sup>43</sup>

Further south, the Nepean's big cobble rapids were important Aboriginal places, as we have seen. Here too, parts of the river bank appear to have been kept open. In 1802, a year before the first settlers arrived in this area, botanical collector Peter Good slogged his way through the 'immense forest' – but also an area of 'long grass' around the rapids at Yarramundi, near the falls. Over a decade earlier Lieutenant Watkin Tench, on one of his Nepean jaunts, found a 'level open Country for some Miles & the Grass short, so as not to be troublesome in walking'.<sup>44</sup> This last is the most extensive area of clear ground mentioned – it may have been around the rapids of the Castlereagh Neck, where there was a fish trap. It was long known locally as Blacks Falls.

---

<sup>42</sup> Phillip in Hunter, *Historical Journal*, p. 342; SG 31 March 1805; Atkins, Journal, entry for 14-15 November 1792. Atkins' expedition route calculated from distances and directions given in his account.

<sup>43</sup> David Collins, *An Account of the English Colony in New South Wales*, 2 volumes (Sydney: A.H and A.W. Reed, 1975 [f.p.1798]), I, p. 285; Gammage, *Biggest Estate*, p. 188; Hunter, *Historical Journal*, pp. 104-5.

<sup>44</sup> Peter Good, *The Journal of Peter Good: Gardener on Matthew Flinders Voyage to Terra Australis 1801-1803* (London: Bulletin of The British Museum (Natural History) Historical Series, vol.9, 1981), entry for 1 June 1802; Bradley, Journal, entry 30 June 1789.

The country around the next major ford at Emu Plains, west of the river, had been reserved for government purposes and was still not alienated in 1814. In January that year Surveyor Evans, completing the first inland survey described the area on the west side of the river at Emu Ford as ‘Forest land’: so it too was likely to have been open and grassy, with widely-spaced trees. On the opposite side, at Penrith, one old resident remembered that there was an Aboriginal bora ground ‘hard on the river’ near the Emu Ferry in the 1830s. If this was a pre-settler site, it too would have been cleared out of the forest, somewhere near the cobble ford.<sup>45</sup>

Together these descriptions suggest not a manicured, easy landscape or a mosaic of evenly balanced clears and forest belts, but, with the possible exception of the area Tench described, vast forests with small clear patches. These patches were in turn closely related to the topography and landscape features: the rapids, the places where the creeks flowed into the river.

**PLACE FIG. 9 HERE**

Fig. 9 Clear patches and areas of open forest on the Hawkesbury River/Dyarubbin mentioned in historical accounts 1789-1830s (Paul Irish).

How does this reconstruction compare to other river landscapes? Gammage is one of the few scholars who has collated early descriptions of river banks. Interestingly, they reveal not a uniform pattern, but a great variety of ecologies and appearances – from the Macquarie River in the New South Wales central west, where the ‘track of clear land occupied a Mile on each side of the river’, to the Bellinger, on the NSW north coast, where ‘extreme, dense forest or brush comprised [of] big, close trees over undergrowth and debris, often locked up with vines’.<sup>46</sup>

Clearly the use of fire in river forests varied from river to river, and between different places

---

<sup>45</sup> Evans wrote ‘I marked a Tree on the N.E. point of the Forest land nearly opposite the House on Captn. Woodriff’s Farm on the Bank of the River Nepean’. ‘Woodriff’s farm’ was the Rodley Estate, on east side of the river at Emu Ford, see Evans, ‘Journey to Bathurst Plains’, entry 8 Jan. 1813, *HRA*, VIII, 177; reminiscences of Mrs Barlow, *Nepean Times*, 23 May 1914.

<sup>46</sup> Gammage, *Biggest Estate on Earth*, pp. 189-93.

along rivers, and probably also over time and with different groups of people.

Again, Dyarubbin allows us to move beyond the universalising model of large-scale cultural fire, to ask: how did these forests work, if not shaped by fire? Their roots were anchored in alluvial soils, Dyarubbin's recent deposits, laid down over the past 10,000 years. These soils were renewed with fertile silts every time a flood or fresh washed through. The big floods could reach the tops of the highest trees. People must have been wary of them, especially in rainy seasons, watching for the tell-tale discolouration of the water, heeding messages of rainfall in the highlands, camping on higher ground and making sure they had access to the higher terraces. But some floods were both unexpected and devastating. Governor King discovered from Dyarubbin's Aboriginal people that a flood which swept through in the 1780s was so huge it forced people to climb to the top of the highest forest trees. But they were still swept away.<sup>47</sup>

Like all ecological communities, River-flat Forests were/are not simply collections of species: they are ecosystems, like complex organisms in themselves, the whole dependent on biodiversity. Even a small area has perhaps 100 species. These forests were also *dynamic boundary zones* linking different ecological communities, providing flow-corridors between them – in this case, sclerophyll uplands on one side, and river on the other. The forest vegetation captures nutrients flowing down with groundwater from higher land, and releases them into the river, which in turn supports aquatic plants and animals, the foods of Aboriginal people. Where the alluvial soils overlay beds of river gravel, fresh water, pure and sweet, seeped continually down through the gravels and into the river too, charging, emptying, recharging. The forests protect river banks from erosion, especially when great floods roar through. They shade and cool the water, discouraging algal blooms. The tall trees were home to small marsupials – possums and bats - while fallen logs and detritus in the river provide habitat and food for aquatic

---

<sup>47</sup> See Grace Karskens, 'Floods and flood-mindedness in in Early Colonial Australia', *Environmental History* 21 (2016): 315-42; Governor King to Earl Camden, April 7 1806, in F. M. Bladen, *Historical Records of New South Wales* (Sydney: Government Printer, 1893), vol. 6, 6.

creatures. The flows of the river created the great deposits of cobbles at bends and gorges, those sources of hard, smooth stone for hatchets and grinding stones<sup>48</sup>

These conditions meant that food, wood, stone and water were abundantly available on Dyarubbin without large scale fire management. The signs, structures and tools of foraging, hunting and trapping were everywhere. Dyarubbin's men and women were famed as tree-climbers, using stone axes to cut toeholds as they climbed the huge trunks to hunt possums tucked away in hollows. So trees bore these ascending toe-hold notches, along with shield- and canoe-scars. Huts and hunting hides were made of a single piece of bark folded in half. To capture birds and animals, they built elaborate tapering tunnel traps nearly 40 metres long from 'weeds, rushes and brambles'. Eels were trapped underwater, in hollow logs. People travelled the river north and south in swift, silent bark canoes. On the west side of the river was an area called the Kurrajong – likely a well-known place for Aboriginal women to gather bark and plant fibre from trees and shrubs such as the Kurrajong tree (*Brachychiton populneus*) and the shrub Native Rosella (*Hibiscus heterophyllus*), to make *carrejun*, string for their fishing lines, twine and woven bags. Deep holes dug at the sides of the lagoons were artfully covered with grass to snare unwary creatures. Perhaps they were also holes from women's yam digging. Among the most common artefacts amassed by white collectors on the river around Yarramundi were grinding stones, used by Aboriginal women to grind yams and fruit. The camps on the river must have rung with the sound of stone on stone, preparing food for meals.<sup>49</sup>

\*\*\*\*\*

---

<sup>48</sup> Benson and Howell, *Taken for Granted*, p. 144; M. T. Ferreira, F. C. Aguiar and C. Nogueira, 'Changes in riparian woods over space and time: Influence of environment and landuse', *Forest Ecology and Management* 212 (2005): 145-59; C. N. Hancock, P. G. Ladd and R. H. Froend, 'Biodiversity and management of riparian vegetation in Western Australia', *Forest Ecology and Management* 85 (1996): 239-40; H. F. Recher, P. A. Hutchings, and S. Rosen, 'The biota of the Hawkesbury-Nepean catchment: reconstruction and restoration', *Australian Zoologist* 29 (1993): 3-41; James H. Johnson, 'An investigation of the groundwater conditions of the Nepean River Valley, Penrith, New South Wales', B. Eng. (Applied Geology) thesis, University of New South Wales, 1961.

<sup>49</sup> Collins, *Account*, I, p. 462; Atkins, *Journal*, entry for 14-15 November 1792; Good, *Journal* p. 120; Karskens, *People of the River*, chap. 2.

These days the reasons Aboriginal people burned the bush have become something of a mantra: to keep the country clear, to create greenpick for kangaroos, prey for male hunters, or, as shown in Joseph Lycett's well-known painting, to drive and trap game in the great inter-clan kangaroo hunts. I wonder if these assumptions may be overly gendered, and whether the idea of universalised fire management has obscured women's roles more generally. Here on Dyarubbin, at least some of those clear patches near confluences and crossing places could just as easily have been burned by women, to make it easier for them to dig for yams – plants with edible, carbohydrate-rich, fleshy parts that grow underground, such as tubers, rhizomes, corms and bulbs. John Hunter thought this was why they burned – to get at the roots. The importance of yams to Aboriginal people across Australia is well-documented, and they were invariably cultivated, harvested and prepared by Aboriginal women. On the Hawkesbury-Nepean, their importance is unmistakable: Dyarubbin was later recorded as a word for 'yam'. Aboriginal women thrust their pointed wooden digging sticks into the earth to loosen and lift them. Their digging and the tread of feet would have kept these places open. Clear places at creek and river junctions would have been handy for launching and landing their canoes during fishing and other trips too.<sup>50</sup>

Gammage makes yams the centrepiece of his account of the Hawkesbury-Nepean, rightly linking them to the frontier war that erupted after settlers arrived in early 1794. But he argues that people fought for the yams' sacred, totemic status more than for their food value, and he makes men their defenders:

---

<sup>50</sup> Joseph Lycett, Untitled [Aborigines using fire to hunt kangaroos], c1820, PIC MSR 12/1/4 #R5689, National Library of Australia; Hunter, *Historical Journal*, pp. 43, 55, 104; Bradley, Journal, entry for 7 July 1789; Beth Gott, 'Indigenous use of plants in south-eastern Australia', *Telopea* 12 (2008): 215-26; Beth Gott, 'Ecology of root use by the Aborigines of Southern Australia', *Archaeology in Oceania* 17 (1982): 59-60; Sylvia J. Hallam, 'Aboriginal women as providers: the 1830s on the Swan', *Aboriginal History* 15 (1991): 38-53; Lesley Head, Jennifer Atchison and Richard Fullagar, 'Country and garden: Ethnobotany, archaeobotany and Australian landscapes near the Keep River, northwestern Australia', *Journal of Social Archaeology* 2 (2002), 179-80; Jennifer Atchison and Lesley Head, 'Yam landscapes: the biogeography and social life of Australian *Dioscorea*', *The Artefact* 35 (2012): 69-71; Collins, *Account*, I, p. 357; R. H. Mathews, *Some Mythology and Folklore of the Gundungurra tribe*, edited by Jim Smith (Wentworth Falls, NSW: Den Fenella Press, 2003), p. 29. Hawkesbury Regional Gallery in Windsor NSW holds a fine collection of digging sticks.

The Hawkesbury's yams were a major totem and a staple famous among distant people...the farmers took land, yam, totem and trade. The clans fought back for 22 years, until all were dead or hiding. Few Europeans understood why they fought so hard, but the yams say. They say not only, perhaps not mainly, because they were food. They were totem allies needing help...On the Hawkesbury yam men may have decided whether to fight, but others fought with them. Totems share the Dreaming so all are responsible for all.<sup>51</sup>

Yams may have been sacred totem, but so far we have no evidence either way. In any case, given that yam culture was women's culture, yams were unlikely to have been men's totems. Men focused on hunting and meat, so the possum seems more likely, or perhaps the kangaroo so often depicted in the area's rock art.

Gammage's account also elides the fact that food *was* an urgent, long-term reason for frontier conflict. The male elders summoned by Governor King in December 1804 to explain ongoing attacks on settlers explained that 'they did not like to be driven from the few places that were left on the banks of the river, where alone they could procure food'. But there were so many other flashpoints for conflict: assaults, abductions, rapes, thefts; and the spiralling cycle of violence that both resulted in and followed massacres perpetrated by the military and settlers.<sup>52</sup> It is important to note, too, that despite dispossession and conflict, Dyarubbin's Aboriginal people were not 'dead or hiding' after 1816. Bands of family groups continued to live on the river throughout the nineteenth and twentieth centuries. Hundreds of Aboriginal people live in the region today.

In any case yams were quickly supplemented or replaced in the Aboriginal diet by maize, also a

---

<sup>51</sup> Gammage, *Biggest Estate on Earth*, pp. 129-130.

<sup>52</sup> Phillip in Hunter, *Historical Journal*, pp. 341-2; Tench, *Complete Account*, pp. 225-6; McCarthy, 'Lapstone Creek excavation', pp. 27-8; King to Lord Hobart, 20 December 1804, *HRA*, V, 166-7; Karskens, *The Colony*, chapt.13.

carbohydrate, which could be prepared in similar ways. Dyarubbin's Aboriginal people began to harvest maize from settlers' farms as soon as it ripened, and continued to do so for years. Settlers called these visits 'raids'. Remembering that the yam beds were women's places, it is likely that these maize raids were closely connected with women –they certainly took part in them, and also in later raids aimed at driving settlers out altogether. Perhaps it was Dyarubbin's women who mobilised their bands to go into the fields, which were once their yam patches, to take the maize, the food of their Country.<sup>53</sup>

\*\*\*\*\*

The Aboriginal river landscape in turn profoundly shaped the settler one, and settlers' experiences. Those intermittent clear places and yam beds on the Hawkesbury-Nepean attracted the earliest white farmers in 1794. The first farms were established by ex-convicts and soldiers themselves, independent of government, on the clear area that Collins described, north of the Hawkesbury's confluence with South Creek. They called it the Green Hills. The earliest harvests were so bountiful that in a short time the colony was self-sufficient in grain, the river acquired its mythological status as a kind of Eden, and Australia's first land rush began.<sup>54</sup> But the cleared patches were soon taken, so later settlers faced instead the massive, unburned River-flat Forest. Clearing in these areas was likely to have been slow, and cultivation limited. At Castlereagh on the Nepean, for example, two-thirds of the forest was still standing twenty years after settlers first arrived. Settlers used existing Aboriginal paths along the river and up into the ranges, which became their roads. They also crossed the river at the same cobble rapids used by Aboriginal people, so their roads converged at these points too. Later they established ferries and/or built bridges nearby, as well as water mills to grind wheat and corn.<sup>55</sup>

Gammage makes extensive use of European paintings as evidence for Aboriginal-managed fire

---

<sup>53</sup> Collins, *Account*, I, pp. 304, 348, 371; Karskens, *People of the River*, chap. 5.

<sup>55</sup> Karskens, *ibid.* chaps 3, 5, 6, 7.

landscapes, their ‘farms without fences’. But this evidence becomes problematic when we read these images in their historical and ecological contexts. Artists began painting Hawkesbury-Nepean landscapes from the early years. They too made a beeline for the clearest, most open and attractive farmed areas: the longest-settled farms where the settler landscape both echoed and obscured the Aboriginal one. John Lewin painted the Green Hills near South Creek around 1810, sixteen years after settlers arrived (Fig. 10). George Evans painted the rapids at Yarramundi about 1809, five years after the first grants were made here (Fig. 11). Joseph Lycett painted the area around the Castlereagh Neck/Blacks Falls around 1822, two decades after settlers arrived in that area (Fig. 12).

**PLACE FIG. 10 HERE**

Caption: Fig. 10 John Lewin, ‘A View of the River Hawkesbury N. S. Wales’ c1810, showing the farms around the Green Hills (later Windsor) and South Creek (Mitchell Library, State Library of New South Wales).

**PLACE FIG. 11 HERE**

Caption: Fig. 11 George Evans, ‘View of Part of Hawkesbury River at 1<sup>st</sup> fall and connection with Grose River N. S. Wales, 1809’, showing the cobble rapids at Yarramundi (Mitchell Library, State Library of New South Wales)

**PLACE FIG. 12 HERE**

Caption: Fig. 12 Joseph Lycett, ‘View on the Hawkesbury above Raymond’s [ie Richmond] Terrace above Windsor and part of the Blue Mountains’, c1822 showing the area around the Castlereagh Neck/Black’s Falls (Dixson Galleries, State Library of New South Wales).

These pictures remind us of two important points. First, it was not the cessation of Aboriginal fire regimes which ultimately dramatically altered the river landscape after Europeans arrived, but clearing, building, crops, and the hard-hoofed, free-ranging animals turned out into the bush to graze. It was a slow but inexorable process. And second, contra Gammage, it is impossible to distinguish Aboriginal-made landscapes from settler-cleared ones in such post-settlement pictures. They don’t show an unaltered Aboriginal landscape. In fact these artists *focused* on cleared farms, crops, cottages and dead trees because they were the symbols and evidence of settler progress and ‘civilisation’. The River-flat Forests themselves were never the subject of their pictures. They appear in the backgrounds instead, a dense, dark line of Aboriginal

‘wilderness’, a fast-receding past, framing the colonial project.<sup>56</sup>

But one artist did focus on the forest. William Westall, visiting with a scientific expedition led by the famous botanist Robert Brown, was on the Hawkesbury-Nepean in 1802. Westall’s intricate pencil sketches of the river (see for example Fig. 13) help us turn the telescope around, so to speak, for they show the river landscape on the cusp of invasion and settlement. And it is a thickly forested one, with the broad river flowing through. Westall also included glimpses of what appear to be small farms on the river bank, newly hacked out of the bush. His sketches are powerful reminders that both Aboriginal-made clear areas *and* the earliest farms were intermittent and very limited in extent. Both were surrounded and dominated by those immense forests, themselves shaped more by soil and light, by floods, flows and moisture than by fire.<sup>57</sup>

PLACE FIG. 13 HERE

Caption: Fig.13 William Westall, ‘Hawkesbury River, view no 7’ 1802, showing the River-flat Forest and possibly a cleared farm on the left (National Library of Australia)

\*\*\*\*\*

I am in sympathy with Bill Gammage’s overarching quest, and his message – he seeks to change not only minds but hearts. ‘We have a continent to learn’ he writes ‘If we are to survive, let alone feel at home, we must begin to understand our country. If we succeed, one day we might become Australians’. But surely understanding country also means genuine bioregional and local understandings, integrating ecology and history, the kinds of histories which can distinguish between places where fire shaped and defined extensive areas, and places where large scale burning was avoided, places where other elements and human practices were more important.

---

<sup>56</sup> Compare with Gammage, *Biggest Estate*, 34 and other early images used.

<sup>57</sup> See T. M. Perry and D. H. Simpson, *Drawings of William Westall, landscape artist on board H.M.S. Investigator during the circumnavigation of Australia by Captain Matthew Flinders, R.N., in 1801-1803*, London, Royal Commonwealth Society, 1962; T. G. Vallance, D. T. Moore and E. W. Groves, (compilers), *Nature’s Investigator: The Diary of Robert Brown in Australia 1801- 1805* (Canberra: Department of Environment and Heritage, 2001).

Gammage's eloquent, fiery meta-narrative must surely serve as a beginning, not an end – an invitation to the larger project of unpacking that astonishing 'tsunami of evidence', of reconstructing and reimagining this great continental story, 'landscape by landscape'.<sup>58</sup>

---

<sup>58</sup> Gammage, *Biggest Estate*, 323; Rod Fensham, 'The Biggest Estate on Earth', review, *Australian Geographer* 43 (2012): 325-7.

I wish to thank Doug Benson, Tom Griffiths, Paul Irish, Daniel May, Scott Mooney and two anonymous referees for their generous assistance and helpful feedback with this paper.