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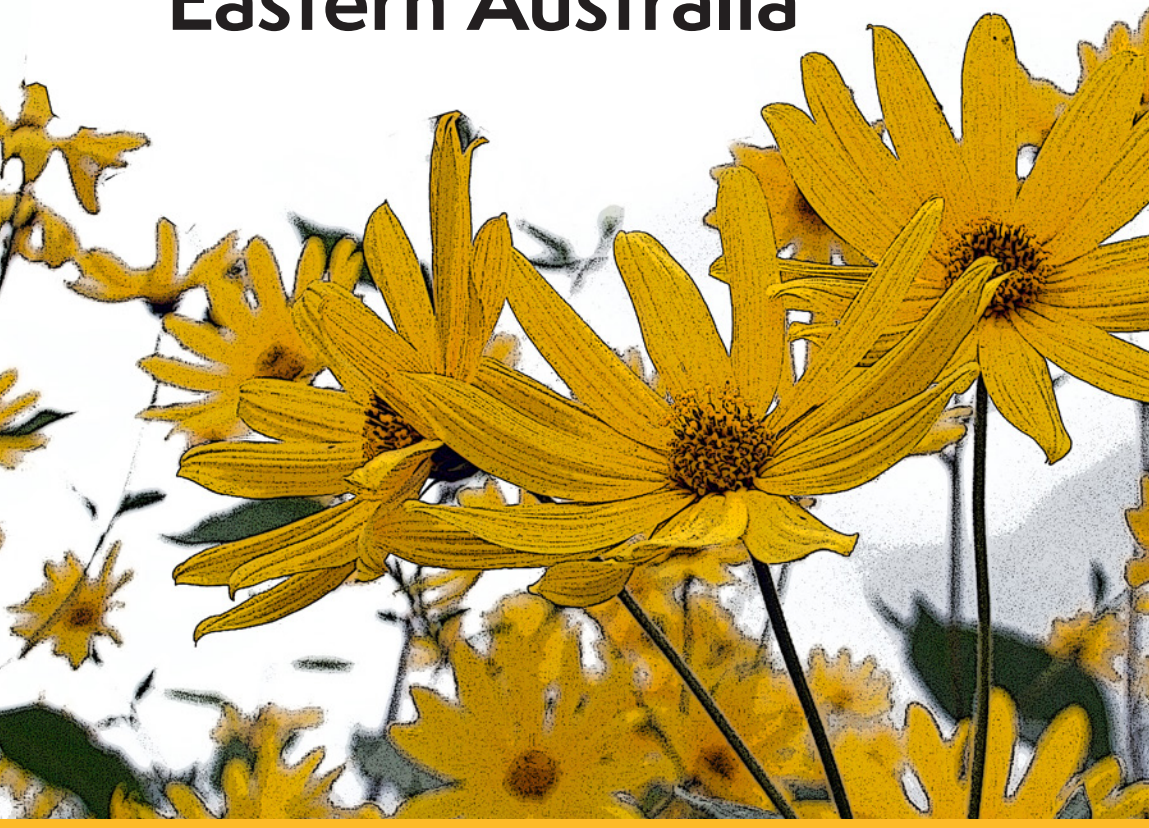
Wetland Plants and Aboriginal Paludiculture in North- and South-Eastern Australia



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ABSTRACT

Aboriginal peoples in north- and south-eastern Australia practiced paludiculture, the cultivation of wetland plants for consumption, for many thousands of years before Europeans invaded them in the 1830s and 1840s. This article focuses on the yam daisy (*Microseris* spp.) in south-eastern Australia and the bulkuru sedge (*Eleocharis dulcis*) in north-eastern Australia in historical and recent accounts of wetlands in both regions. Aboriginal people in both places cultivated and harvested the tubers of both plants. Recent debates about Aboriginal peoples' cultivation of native plants and whether they constitute agriculture apply the European value-laden yardstick of stages of human development with agriculture as the pinnacle of land use and constitute 'hunting and gathering' as lower in a hierarchy of value. They fail to appreciate not only the sophistication of the latter, but also that Aboriginal people cultivated grasses and grains on drylands (agriculture) and yams and sedges in wetlands (paludiculture).

KEYWORDS

wetland plants, paludiculture, Aboriginal peoples

The yam daisy (*murnong,* Native Dandelion, *Microseris* spp.)[1] was a prominent plant and food source for Aboriginal peoples in south-eastern Australia prior to Europeans invading them in the 1830s and 1840s and in the following years, when its cultivation and use were observed and documented by early explorers, such as Thomas Mitchell, officials, such as George Robinson, and pastoralists, such as Isaac Batey (Atchison and Head 2012; Cahir 2012; Frankel 1982; Gott 1983, 1987, 2008). The yam daisy is a wetland plant and wetlands proliferate in mid-western Victoria. It is an indicator plant species for paludiculture, from the Latin '*palus*' for mire or marsh. Paludiculture is in current usage to refer to the cultivation of the

1 Beth Gott refers to both *Microseris lanceolata* and *M. scapigera.* Gott (1982: 59) classifies *M. scapigera* as a 'dry-land' plant. Gott (2008) later lumps them together and does not distinguish between their dry-land or wetland habitats. Philip Clarke (2013) refers to *M. lanceolata* and later regards *M. scapigera* as the former name for *M. lanceolata* (Clarke 2015: 250, n5). Neville Walsh (2016) taxonomises *M. lanceolata, M. scapigera* and *M. walteri*. I am grateful to an anonymous reviewer for providing these references.

peatlands of England and northern Europe in the past and present and for the future (Milner and Smart 2022; Wichtmann et al. 2016). The history of the use of peatlands in northern Europe has been researched and traced recently by Ruuskanen (2016). I use the term 'paludiculture' more broadly to refer to the cultivation of plants for animal and human use and consumption in all types of wetlands, including bogs, lagoons, marshes and swamps. I define paludiculture as the cultivation of local, native (endemic) plants in wetlands for animal and human use and consumption, including eating and heating. Paludiculture forms the basis for the broader expression of wetland culture in artefacts (canoes, spears, sticks, nets, baskets, houses, household vessels, etc.) and the arts, including storytelling, song, dance, writing, painting, textiles, jewellery and basket-weaving (Giblett 2024).

'Palus' is also incorporated into the common word 'palusplain' where it is used to refer to a seasonally waterlogged, flat wetland. It is in current usage to describe much of the Swan Coastal Plain of south-western Australia, encompassing Perth, 'a city of wetlands', including palusplains.[2] 'Paludal' has been used recently to describe swamp lovers and wetland conservationists as 'paludal heroes', as Ryan and Chen (2020) call them. 'Palustrine' has been used recently by the Queensland Museum (2022: 7) to describe 'primarily vegetated non-channel environments with more than 30% emergent vegetation'. Examples of palustrine wetlands include 'grass, herb and sedge swamp; wet heath swamps (wallum); *Melaleuca* spp. and *Eucalyptus* spp. tree swamps' and other swamps (Queensland Museum 2022: 7). Aboriginal people cultivated many of these wetlands for sustenance in many regions of Queensland in north-eastern Australia, as documented throughout *Wetlands of Queensland* (Queensland Museum 2022).

THE BULKURU SEDGE AND ABORIGINAL PALUDICULTURE IN NORTH-EASTERN AUSTRALIA

An early European shipwreck survivor, James Morrill (2006), observed Aboriginal paludiculture in Queensland, documented it and gained sustenance from it too. In 1846 Morrill was shipwrecked on the coast

2 For further discussion of Perth as a city of wetlands with its palusplains, see Giblett (2013, ch.15).

of Queensland north of the Burdekin River. He lived among the local Aboriginal people for seventeen years before returning to colonial society, writing his account of his sojourn and publishing it in 1864. The coastal area in which Morrill spent much of his sojourn was 'low and swampy in many places' (Morrill 2006: 70). The abundant animal and plant life of the swamps was a reliable food source for the local Aboriginal people. Morrill (2006: 33, 70) learnt how to 'snare ducks, wild turkeys, geese and other wild fowls' 'with snares … placed in the thick grass and reeds in the swamps'. Women not only gathered food in swamps (55) and dug in the earth for roots (55), but also cultivated roots in swamps. He observed women and very young children 'working in the swamps with their mothers, setting roots' (52). The old women made cakes from the roots gathered from swamps (67). This is 'digging-stick farming' and paludiculture.

Land is the site of the clash of cultures, not least with the colonisers over possession and perceptions of lands wet and dry. Morrill (50–51) relates:

> I told them the white men had come to take their land away. They always understood that might, not right, is the law of the world, but they told me to ask the white man to let them have all the ground to the north of Burdekin, and to let them fish on the rivers; also the low grounds, they live on to get their roots – ground which is no good to white people, near the coast and swampy.

Morrill (71) concludes by emphasising that 'the low swampy grounds' were 'no good to anybody but themselves.' Aboriginal people understood that colonising white people viewed swamps as no good to them. The same story was repeated throughout Australia and was part of the cultural baggage colonisers brought with them from western Europe that denigrated and destroyed wetlands.[3]

In the 1980s, J.W. Winter mentioned the same area as Morrill in a chapter on 'The Swamps: A Habitat in Motion' he contributed to an edited collection devoted to the natural history of Queensland (Winter 1983). Winter focuses on swamps as water-bird habitat, rather than as homes for Aboriginal people, though he does acknowledge that swamp plants were a food source for Aboriginal people, albeit in a caption to a photo:

3 For further discussion of western attitudes to wetlands, see Giblett (2021).

> the tubers [of the bulkuru sedge, *Eleocharis dulcis* (water chestnut)][4] are rich in carbohydrates and form the major food supply of both brolgas and magpie geese (and formerly, Aboriginals). Bulkuru is a tall perennial freshwater sedge. It is the most abundant water-plant on the coastal swamps of the Burdekin/Townsville region. (Winter 1983: 180)

He does not describe how bulkuru was cultivated in paludiculture, unlike Morrill. This is Winter's only mention of Aboriginal people.

Referring to previous studies of water-birds in Queensland, Winter highlights the fact that 'the coastal swamps of the Burdekin/Townsville region were identified as amongst the finest wetland habitat for water-birds in north Queensland' (Winter 1983: 148; see also 150 for more detail). This region of Burdekin River and Townsville is precisely where Morrill lived with Aboriginal people for seventeen years. After being shipwrecked in 1846, Morrill in fact landed at the site of present-day Townsville/Cleveland Bay as confirmed in the indication on a map published as a frontispiece to his book (Morrill 2006: vi).

The Queensland Museum, in *Wetlands of Queensland*, concurs recently with the Aboriginal people of the Burdekin/Townsville region that swamps are good and useful, that they have traditional and spiritual significance and that they provide physical sustenance (without acknowledging paludiculture much, or the cultivation of wetlands as such).[5] It also elaborates on Winter's discussion of wetland types and specific wetlands in Queensland, including in the Burdekin/Townsville/Cleveland Bay region and Bowling Green Bay, east of Cleveland Bay (Queensland Museum 2022: 344–49). It also acknowledges and discusses Aboriginal people's sustainable use of wetlands. Aboriginal people in Queensland cultivated the abundant animal and plant life of wetlands for food for many thousands of years in paludiculture. It concurs with Winter that bulkuru is a food source for First Nations' peoples and water-birds (Queensland Museum 2022: 295).

Wetlands of Queensland, published by the Queensland Museum in 2022, is a lavishly illustrated book and weighty tome of over 400 pages that the sets a benchmark for the other state museums in Australia and

4 This edible wetland species is discussed in early ethnobotanical literature using former scientific names; see Roth (1901: 13) and Thozet (1866: 7). I am grateful to an anonymous reviewer for drawing my attention to their work.

5 For further discussion of the sacred and spiritual significance of wetlands for Aboriginal peoples, see Giblett (2020).

should be a source of envy for them. It documents and presents extensively the ecological values of wetland types and selected individual wetlands in five regions of Queensland. It also discusses briefly and periodically the role of these wetland types and individual wetlands in the lives of Traditional Owners/First Nations People. Yet there is no discussion of the people who colonised and destroyed wetlands in Queensland. It is as if the only people in Queensland are Aboriginal peoples. Non-aboriginal people and their role in the colonial, agricultural and urban destruction of wetlands in Queensland, and their conservation, are written out of this account.

The only evidence for this history is aerial photographs of urban areas abutting wetlands (Queensland Museum 2022: 218–19, 221) and of 'canal estates,' or 'modified wetlands' (221) and the brief acknowledgement that

> most of the human population of Southeast Queensland lives on lower floodplains and coastal areas, and consequently these areas are highly modified. Many wetlands in these areas have been cleared, drained or filled. (Queensland Museum 2022, 221)

Or modified into canal estates, in a word, 'canalised'. One wonders when were these wetlands cleared, drained, filled or canalised? Why? By whom? Presumably by 'the human population of Southeast Queensland', though not all members of this population are equally culpable, certainly not Aboriginal or First Nations people or Traditional Owners. Colonial history is largely written out of *Wetlands of Queensland*, including the present when history is in the making. For instance, the Queensland Museum does not mention nor discuss the development proposal to modify the Ramsar-listed wetlands of Toondah Harbour and their environs in Southeast Queensland by constructing even more canal estates. Nor does it is discuss the campaign to save these wetlands from destruction (Readfern 2023).

By contrast with the unnamed colonial wetland drainers, fillers or modifiers, early on *Wetlands of Queensland* states that

> wetland ecosystems are of profound material and cultural importance to First Nations people. Almost all wetland plant and animal species have some form of traditional use – particularly vegetation, crustaceans, fish, reptiles, mammals and waterbirds (especially their eggs) – or are valued for their cultural significance. Wetlands supply medicine and tools for Traditional Owners … Wetlands are also story places and centres for cultural activity … Aboriginal knowledge of

> wetland management provides an important basis for natural resource management, which has evolved over several hundred generation of people living on and managing custodial responsibility for country. (Queensland Museum 2022: 18)

In other words, Aboriginal knowledge of wetlands is reduced to its contribution to the neo-colonial and institutional discourse of 'management'. Aboriginal wetland people are dispossessed from their traditional ways of life gaining sustenance from wetlands unless they can demonstrate 'Native Title' to the National Native Title Tribunal and Federal Court by proving traditional ties of hunting, gathering and foraging, and ceremonial uses, from which colonists have largely dispossessed them. Paludiculture and agriculture do not count as a test of 'Native Title' under the current legislation.

The neo-colonial and institutional discourse of management in *Wetlands of Queensland* persists in discussing the Budjiti people and the wetlands of Currawinya National Park. These 'nationally and internationally renowned wetlands' are part of the Paroo River country, in turn, part of the Murray-Darling Basin (Queensland Museum 2022: 180). These wetlands 'form part of Budjiti cultural landscape' (180). In other words, they also form part of the coloniser's natural landscape. Aboriginal people and colonisers are made to sit either side of the nature/culture divide, with land regarded as cultural by the former and as natural by the latter, that denies the work of the former and their ancestral beings in creating the land and 'managing' it. As the Queensland Museum goes on to state:

> for thousands of years before the colonisation of the Paroo River country, Budjiti peoples sustainably managed their ancestral lands and waters. (Queensland Museum 2022: 180)

Yet more than merely 'managing' ancestral lands and waters for their own sake, or only for their environmental 'sustainability,' these peoples also used sustainably their 'resources' for human sustenance and health:

> of great cultural significance to the Budjiti peoples, the lakes, springs and other wetlands of Currawinya National Park provide an important source of food, medicines and material resources. Budjiti Ancestors built dikinj (camps) by the lakes and made nets to catch waterbirds, including guturu (swan), yuli (wood duck), mingara (black duck) and gultaba (teal duck). They also collected the bird eggs and fished in the water, catching gupiri (black bream), bugili (crayfish) and birriri (turtle). (Queensland Museum 2022: 180)

Budjiti are settlers who built camps and who practiced aquaorniculture and aquaculture, and possibly paludiculture too, as

> These places with the cultural landscape – including birthing and burial places, hunting grounds, sowing and harvesting areas, fish traps, campsites and ceremonial grounds – give shape and form to the stories, traditions and memory of Budjiti peoples, and support the continuity of these cultural practices into the future. (Queensland Museum 2022: 180)

Which species of plant are, or were, sown and harvested is not specified. The cultural practices of aquaorniculture and aquaculture, and possibly paludiculture, in the places in which they are performed also give shape and form to the stories, traditions and memory of Budjiti peoples.

Similarly the Wanjuru-Yidinjii peoples of the Russell River catchment practised aquaorniculture and paludiculture in Eubenangee Swamp before the arrival of the colonisers. In this swamp 'they burnt the grasslands to facilitate the growth of fresh shoots in order to attract wallaby, ducks, geese and other animals' that they would 'hunt and trap' (Queensland Museum 2022: 326). The swamp 'provides a rich hunting and fishing ground within the catchment' that

> revolves around ganyarr [the saltwater or estuarine crocodile] and the wet and dry seasons. Ganyarr permanently reside in Eubenangee but are more active during the wet season when breeding occurs … Wanjuru people share Eubenangee with ganyarr during the relative safety of the dry season. (Queensland Museum 2022: 326)

Ganyarr is the apex scavenger of the swamp that occasionally takes and consumes with regularity a human that ventures into its territory. Saltwater crocodiles have been typecast as monsters, regarded with horror and associated with the uncanny.[6] Jaban, the freshwater eel, resides in the upper catchment of Russell River and is 'the keeper of water' as it 'keeps the water clean.' The Queensland Museum goes on to argue that

> Protecting jaban – the apex predator in the upper reaches of the catchment – means caring for the waterways, which results in healthy aquatic ecosystems for all other species and, in turn, plentiful supply of food for Wanjuru. (Queensland Museum 2022: 326)

6 For further discussion of monstrous crocodiles, horror and the uncanny, see Giblett (2018, ch. 4; 2019a, ch. 2; 2019b, ch. 3).

Healthy land and water mean healthy people; no healthy people without healthy land and water. Human health includes mental and spiritual health.

The Queensland Museum concludes of this swamp that,

> Today, Eubenangee is an ecologically significant palustrine wetland, and one of the last remaining associations of specific ecological communities (vine forest, grassland, sedge and melaleuca paperbark swamp forest) occurring on nutrient-rich basaltic alluvium. (Queensland Museum 2022: 326)

All good reasons for caring for and conserving Eubenangee Swamp.[7]

Aboriginal paludiculture in north-eastern Australia is also expressed in artworks that show appreciation for wetlands as sources of foods and medicines. Such is the case with the paintings of Mavis Ngallametta of the Kugu-Uwanh people, Putch clan, who lived and worked in the Aurukun area of the Gulf of Carpentaria in far north Queensland. This is an important area for wetlands and local Aboriginal people as documented by the Queensland Museum (2022: 351–413). Local Aboriginal people point out that for them 'wetlands mean life' (Queensland Museum 2022: 412–413).

Mavis Ngallametta's traditional and contemporary swamp paintings are exquisite and intimate artworks that embrace both eras. Rather than swamps with their negative connotations, the wetlands they depict are sometimes described as lagoons:

> Mavis Ngallametta / *Little Swamp on the Way to Obun* 2018 / Natural pigments and charcoal with acrylic binder on linen primed in synthetic polymer paint / 271 x 200cm. Accession No: 2018.393 / Collection: Queensland Art Gallery of Modern Art / © the estate of Mavis Ngallametta c/- Martin Browne Contemporary.
>
> Accessed online 13 May 2023: https://collection.qagoma.qld.gov.au/objects/32442

The gallery comments on this painting that:

> A popular site for fishing, Obun is a place where the people of Aurukun, in far north Queensland, go to relax and catch food for their families. The little swamp in the painting is one of the main freshwater lagoons found near the massive saltwater estuary of Archer Bay. (Queensland Art Gallery of Modern Art, ND)

7 For further discussion of Aboriginal peoples and Queensland wetlands, see Giblett (2024, ch. 1).

Mavis said in an artist statement in 2018 that:

> There are plenty of birds there. When it's dry time, you see wallabies in that area, but in the wet time, you see only birds and lily flowers and lots of swamp flowers. There are little swamps everywhere when the wet sets in. (cited by Queensland Art Gallery of Modern Art, ND)

The gallery also comments that this painting is 'one of the most refined of the artist's *pamp* (swamp) works, which developed considerably in style over the last decade of her life.'

A decade before she painted another painting of a swamp:

> Mavis Ngallametta / *Pamp (Swamp)* 2009 / Synthetic polymer paint on linen / 116 x 111cm116 x 111 cm / Accession No: 2015.096 / Collection: Queensland Art Gallery of Modern Art / © the estate of Mavis Ngallametta c/- Martin Browne Contemporary.
>
> Accessed online May 13, 2023: https://collection.qagoma.qld.gov.au/objects/21952

The gallery comments on this painting that this is 'one of the artist's earliest works.' Mavis said in her artist statement that it depicts:

> the big swamp near Aurukun. There are many different coloured waterlilies and plenty of birds at the swamp. People used to go to the swamp and get the roots of the waterlilies for food and medicine. (cited by Queensland Art Gallery of Modern Art, ND)

The gallery comments that:

> Many associate swamps with stagnant water, algae and putrid mud. In contrast, Ngallametta's swamps are picturesque lagoons that ring the community of Aurukun in the post-wet season. In these lagoons, crystal clear fresh water abounds, tainted only by the tea-coloured tannins of the melaleuca trees lining the banks. (Queensland Art Gallery of Modern Art, ND)

The gallery acknowledges swamps' negative associations and lack of pleasing qualities in the minds and for the bodies of many gallery-goers, members of mainstream western culture. The gallery then gives a revisionist reading of Mavis Ngallametta's lagoon paintings as positively picturesque, not pejoratively swampy. The good, crystal clear fresh water of the lagoons is posed against the bad, stagnant water and putrid mud of swamps. Yet lagoons and swamps are both wetlands, and wetlands can have both sorts of water. They should be appreciated for both and not moralised in a Manichean, fundamentalist and triumphalist conflict of good versus evil.

Mavis Ngallametta's paintings take the aerial and close-up view of swamps or lagoons and produce two exquisite and intimate artworks that invite the viewer to wade into the wetland and experience it bodily through the senses of sound, smell, touch and sight. Her paintings portray (they are not landscapes) wetlands in the horizontal plane as exquisite (to use Rebecca Solnit's apposite term). Solnit applies the exquisite to contemporary artworks of female bodies, but it can equally be applied to contemporary artworks of femininised bodies of water, such as swamps and lagoons (Solnit 2003: 205–18).

THE YAM DAISY AND ABORIGINAL PALUDICULTURE IN SOUTH-EASTERN AUSTRALIA

Recent debates about Aboriginal peoples' cultivation of native plants and whether they constitute agriculture apply the European value-laden yardstick of stages of human development, with agriculture as the pinnacle of land use, and constitute 'hunting and gathering' as lower in a hierarchy of value (Clarke 2018a: 71). They fail to appreciate not only the sophistication of the latter, but also Aboriginal peoples' differing uses of fire in their cultivation of native plants both on the drylands and in the wetlands of Australia according to season, vegetation and type of country (as recently brought together brilliantly by Victor Steffensen 2020). Aboriginal people cultivated grasses and grains on drylands (agriculture) and tubers and sedges in wetlands (paludiculture).

This is no less the case with the yam daisy and the wetlands of mid-western Victoria in south-eastern Australia. Philip Coutts, the Victorian government archaeologist in the 1980s, wrote that in mid-western Victoria,

> from the viewpoint of *Aboriginal settlement*, the most significant features of the area are the large numbers of perennial and intermittent lakes, swamps, streams and rivers which attract abundant wildlife and provide favourable environments for aquatic plants. (Coutts 1985: 23; my emphasis).

Mid-western Victoria was already settled by Aboriginal peoples when colonisers came to (re)settle it. For the colonisers to settle the already settled land, and so in fact to *re*settle it, they had to dispossess the original settlers by one means or another, often violent with many massacres.

Coutts goes on to state that of the wildlife and aquatic plants 'special mention needs to be made of eels and the daisy yam', or yam daisy (*murnong,* native dandelion). The yam daisy was one of a number of what Philip Clarke calls 'calendar plants' which 'to Aboriginal people indicate the change of the season' (Clarke 2018c: 274). Drawing on Clarke's work, John Charles Ryan elaborates that calendar plants 'provide – often simultaneously – a time-keeping measure and a source of physical sustenance' (Ryan 2021: 118). The yam daisy is seasonal eating.

Traditionally, botanists might classify the yam daisy as a helophyte, literally 'sun lover', a category of plants that 'rests in water or in soaking soil' with its petals turned towards the sunlight and soaking up solar energy to photosynthesise, though recent botanists would regard it is an example of a plant that can adopt 'an aquatic habitus' (and so perhaps as a hydrophyte, literally 'water lover' with its roots in water) in response to ecological constraints, such as excessive saturation in a rainy season (Ryan 2020: 101–02). Wetland plants, like wetlands themselves, defy and upset taxonomies based on a hard and fast distinction between wet and dry lands. Like wetlands, wetland plants transition between the two. The yam daisy can be classified as a helophyte and a hydrophyte depending on the dryness or wetness of the land and the season. Either way, the yam daisy is a lover (whether of sun and water) which attests to what Ryan (2020: 101) calls 'the affective affinities' between it and its 'paludal habitats'. Affective affinity was also exercised between Aboriginal people and their paludal habitats in mid-western Victoria with their love of country and their seasonal 'habitations', or *wurrns,* of built houses. The yam daisy is 'much more than a food' as Cahir (2012) puts it.

Aboriginal people of mid-western Victoria are paludiphiles, lovers of wetlands and practitioners of paludiculture, the cultivation of wetlands using fire. Australian Aboriginal peoples practiced 'fire-sticking farming' in the wetlands on the fertile plains of mid-western Victoria to cultivate food for themselves, such as the yam daisy (paludiculture), and to cultivate pasture of native grasses, such as kangaroo grass, for grazing mobs of native kangaroos and wallabies (what I have called pasturalism, as distinct from pastoralism, the herding of introduced sheep and cattle on drylands; see Giblett 2023: 25, 67). This material circle and seasonal cycle of sustenance sustained their livelihoods and lives for tens of thousands of years.

An early European encounter with the yam daisy illustrates and affirms its seasonality and relation to water, but not its vital importance as a food source. In the very wet spring of September 1836 Major Mitchell, the Surveyor-General of the colony of New South Wales, travelled into what is now mid-western Victoria and captioned an illustration of a 'yellow flower abundant on the plains of Australia Felix' and saw it is as a sign of reaching 'the good country' (cited by Giblett 2023: 68). No doubt for him this meant fertile and well-watered country good for pastoralism. Mitchell observed that,

> in many places the ground was quite yellow with the flowers of the cichoraceous plant tao whose root, small as it is, constitutes the food of the native women and children. The cattle are very fond of the leaves of this plant and seemed to thrive upon it. (Mitchell 1839; cited by Gott 1983, 12; 1987, 37)

The Murnong was 'one of the major food sources for Victorian Aboriginal people' (Clarke 2018a: 55–56; Cahir and McMaster 2018: 120). Mitchell does not acknowledge that cattle and Aboriginal people were in competition for the same food source.

Mitchell also observed two Aboriginal women and their children

> at work separately on a swampy meadow … They were spread over the field much in the manner in which emus and kangaroos feed on plains, and we observed them digging in the ground for roots. All carried bags. (Mitchell 1839; cited in part by Gott 1983, 9; 1987, 38)

Mitchell equates working Aboriginal people with grazing emus and kangaroos. They are part of the landscape for him. He does not recognise that native animals graze on the plains because of the work of Aboriginal people in managing grasslands. He also relegates Aboriginal people and their work to the wetland of 'a swampy meadow.'

A European encounter five years later with the yam daisy illustrates and affirms its seasonality, relation to water, importance as a food source and use of fire to harvest it. Aboriginal people's use of fire in summer flushed out black swans and in winter made the presence of the yam daisies and their invisible roots visible. In the winter of July 1841 George Robinson, the Protector of Aborigines, observed and described 'Aboriginal (presumably Djabwurrung) women' using fire to harvest the yam daisy by burning 'the grass, the better to see these roots but this burning is a fault charged against them by the squatters' (cited by Cahir and McMaster 2018: 120). For Cahir and McMaster (2018: 120) this

wet season cool burning 'supports the argument that Aboriginal people in Victoria deliberately used fire as an agent of greater yield change for tuberous food plant ecosystems', such as the yam daisy.

This is no longer the case. Philip Clarke relates that, 'although once common, the Yam Daisy has disappeared from many regions through being trampled out by European grazing stock' (Clarke 2018b: 66). Sheep, horses and cattle were indeed the foot soldiers of the European invasion of colonisation led on horseback by explorers and followed up by squatters with the result that, as Clarke (2018c: 274) later puts it, 'the yam daisy … has become locally scarce since the country was transformed into a rural landscape'. More precisely, Aboriginal country was transformed from their agricultural, aquacultural and paludicultural drylands and wetlands with cultivated native plants and animals and managed fire into a European-style pastoral and rural landscape with introduced plants and animals. The irony and now cliché of history is that Aboriginal co-created lands looked like European park lands. Colonists thought they were a gift of God or nature (and not a co-creation of Aboriginal cultures) and so that they were ready and available for transformation into a rural landscape.

Some squatters charged Aboriginal people with the fault of lighting fires because the squatters saw Aboriginal people's use of fire as a dangerous and destructive threat, quite rightly when Aboriginal people used it as an offensive weapon against the squatters (Cahir and McMaster 2018: 124–28). In symmetrical reciprocity, some squatters used fire as an offensive weapon against Aboriginal people such as when they 'deliberately burnt a village of large Aboriginal huts … in a bid to spatially dislocate Aboriginal people from districts which the squatters coveted' (Cahir 2018: 170). Squatters stole land, water and fire and wrested rights to them from Aboriginal people. Squatters arrogated to themselves the position and role of the titan Prometheus in Greek mythology who stole fire from the gods and brought it down to earth.

Similarly fire in Aboriginal mythology originated in the Skyworld, was stolen and brought down to earth. One legend from Lake Condah in the lands of the Gunditjmara people in mid-western Victoria tells how an Aboriginal man 'threw a spear towards the clouds; to the spear a string was attached. The man climbed up with the aid of the string and brought fire to the earth from the sun' (cited by Clarke 2018b: 12–13; 258). This sounds like an ancient antipodean version of Benjamin

Franklin's experiment in the early eighteenth century of attaching a long piece of wire to a kite and confirming that storm clouds carried electricity and that lightning was a heavily charged spark of electricity. The legend from Lake Condah is also an antipodean, or upside down, version of Franklin's experiment as the Aboriginal man went up his string and brought fire down to earth whereas Franklin's string brought fire down to earth where he stayed.

Whereas fire was only a destructive agent for titanic squatters, to be used or feared, fire for Aboriginal people was a sacred trust to be used wisely and productively. It was a delicate and productive instrument that they adroitly and seasonally applied in caring for country that not only maximised the yield of food sources, but also minimised the build-up of fuel loads. The devastating consequences of *not* using Aboriginal fire techniques to do the latter has been seen in Australia recently with disastrous conflagrations and devastating consequences with the loss of human and more-than-human lives, and the destruction of the habitats of both with burnt bush and houses. The cross-cultural struggle between Aboriginal people and colonists over fire, land and water continues to this day, with some hopeful recent signs of dialogue and willingness on the part of non-Aboriginal people to learn from Aboriginal people about their traditional use of fire in caring for country (Steffensen 2020).

The land these squatters stole from Aboriginal people was the product of Aboriginal people's use of fire to create the park-like landscape of a pleasing pastoral prospect the squatters coveted, found and re-settled. One squatter in the 1840s in Victoria (then the Port Phillip District of the colony of New South Wales) observed 'fire-stick farming' when he wrote that 'the fire stick' is 'an [Aboriginal] instrument … which must be credited with results it would be difficult to over-estimate' (Curr 1883: 188). By and large squatters did not estimate it at all, except as a threat, or recognise, or acknowledge, Aboriginal people's work in co-creating the land with creator beings, or their ownership of the land, or their settlement of it, or their improvements, or their civilisations. All these aspects of Aboriginal people and their place were beneath estimation and not worthy of esteem, let alone respect and acknowledgement – legal, cultural, or any other way.

The wetlands of mid-western Victoria had, as Harry Lourandos (1987: 298) describes them, 'a high capacity for annual regeneration. Their resources included both local and migratory species: fish (especially

eels), birds, eggs and a range of edible plants. The location of wetlands also allowed access to a diverse range of neighbouring environments, such as the fertile open plains and forests. Plants were staple items of diet'. Wetland plants were not only foraged and collected, but also cultivated; eels and fish were not only hooked and gathered, but also trapped; and birds were not only hunted, but also netted. Cultivation, trapping and netting required artifice and labour with the tending of plants, the building of traps and the weaving of nets. Lourandos (1987: 293) calls the Aboriginal peoples of mid-western Victoria 'swamp managers' who 'practised intensive gathering, hunting and fishing economies that included the management and manipulation of plants, animals and fish. They established semipermanent base camps and their ceremonial and political life involved large social networks'. Lake Connewarren would also have been a case in point as 'a favourite swamp and camping place', as Ian Clark (1990: caption to plate 14, 198) puts it, for the Girai wurrung (see Giblett 2023: ch. 5). The Girai wurrung were a wetlands people.

Coutts (1985: 23, 63 n2) concludes that in mid-western Victoria its

> wetlands were potentially [*sic*] rich and reliable sources of food for the Aborigines and were the focus of much economic activity during … the period immediately prior to the European invasion, *circa* 1830 CE.

This period dates back about 2,000 years and is usually described by archaeologists as the period of 'intensification' of nomadic hunting and gathering (see Coutts 1985: 62–63; Lourandos 1987), rather than as a shift to the construction of settlements and the cultivation of wetlands in paludiculture.

No greater evidence for the abundance of wetlands as food sources for Aboriginal people is the number of oven mounds, or *myrnongs,* constructed around them dating back 5,000 years (Coutts 1985: 31–38). Phillip Chauncy in the 1870s sketched several oven mounds at 'the outlet of Lake Connewarren, about five miles south-west from Mortlake' in mid-western Victoria in the lands of the Girai wurrung peoples. Chauncy (1878: 233) noted that these *myrnongs* 'must be of great antiquity' and that 'the adjacent lagoon abounds with large eels.' The Reverend Peter McPherson (1884–85: 56–57) in a classic article of early Australian archaeology wrote that 'the large oven-mounds ... are numerous about Mortlake'. He observed that 'the necessity for water accounts at once for so many oven mounds being situated near creeks,

rivers, lagoons, and lakes [which] abound with water-fowl, fish, and eels'.

Recent evidence gathered in mid-western Victoria in southern Australia in the lands of the Gunditjmara people in and around Lake Condah from the past 5,000 years also indicates the construction of stone houses (architecture), the engineering of stone fish and eel traps (aquaculture) and the cultivation of reed beds (paludiculture) to attract waterbirds to hunt and gather their eggs (aquaorniculture, from the Latin '*aqua*' for water and the Greek '*orni*' for bird). These practices demonstrate Aboriginal farming of rich sources of food. Paludiculture also provided and produced materials for weaving nets and baskets for catching and carrying fish, eels, birds and eggs.[8]

These practices are also the basis and indicators of Aboriginal civilisation as they involved 'making improvements', to use John Stuart Mill's definition (cited by Giblett 2023: 25). Aboriginal people also demonstrated ownership of the land as they 'mixed their labour with nature' to use John Locke's definition (cited by Giblett 2023: 26). Applying these definitions of civilization and land ownership to Aboriginal peoples demolishes the doctrine of *terra nullius*, meaning 'nobody's land', and so land legally uninhabited. It was applied most famously to Australia by Captain James Cook who could then claim and proclaim British royal sovereignty with impunity. It denies the work of Aboriginal hunter-gatherers, nomads, architects of stone houses, engineers of aquaculture, pyrotechnicians of the bush, cultivators of grasslands, graziers of pasturalism and farmers of paludiculture and aquaorniculture. In all these practices they mixed their labour with nature, demonstrated their ownership and inhabitation of the land, expressed their civilisation in it and proclaimed their sovereignty over it. Australia 'always was, always will be' Aboriginal country.

The Gunditjmara people of Lake Condah in mid-western Victoria constructed a system of stone channels that not only trapped fish and eels in aquaculture, but also cultivated water plants in the practice of paludiculture to provide sustenance (rather than merely 'subsistence'). These wetlands were traditionally a rich source of animal and plant foods (Gunditjmara People with Wettenhall 2010: 7, 13–16, 67). This site is

8 For further discussion of Aboriginal peoples and mid–western Victorian wetlands, see Giblett (2023, chs 3 and 5).

called 'Budj Bim', 'the world's oldest and largest aquaculture system' (Langton 2021, 65–66). It is now a World Heritage site (AAP 2019). More than intensive hunters, gatherers, fishers and foragers, and more than merely managers and manipulators of plants, animals and fish, the Gunditjmara people of south-eastern Australia were designers and builders of eel and fish traps, or 'engineers of aquaculture' (Gunditjmara People with Wettenhall 2010: 16–22), architects of stone houses and cultivators of wetland plants (Gunditjmara People with Wettenhall 2010: 7, 13–16, 67), or practitioners of paludiculture in their civilisation, as were other Aboriginal people in north-eastern Australia. Aboriginal paludiculture in Australia should be valued as highly as colonial agriculture and pastoralism, if not more so. It is much more suited to, and sustainable in, many areas of Australia.

The Gunditjamra stone houses have been dated to 6,700 years old, older than Stonehenge. Coincidently this is also roughly the period of the seventh and sixth millennia BCE in which the rich alluvium of Mesopotamia between the two rivers of the Tigris and Euphrates was what James C. Scott (2017: 47, 127) calls 'a … wetland paradise' where marshlanders practiced 'an exuberant diversity of livelihoods'. He argues that 'the earliest large fixed settlements sprang up in wetlands' (Scott 2017: 47) in the 'Fertile Crescent' of Mesopotamia. Drawing on Jennifer Pournelle's (2003) work on Mesopotamian marshlands, Scott goes on to relate that these settlements 'relied overwhelmingly on wetland resources … for their subsistence' (Scott 2017: 47). Or more precisely, they relied overwhelmingly on wetland resources for their sustenance as these wetlands were traditionally a rich source of animal and plant foods as Scott (2017: 47–57, 127–28) goes on to discuss. As the marsh Arabs regulated the flows of water and cultivated water plants in wetlands, they were not only hunters, gatherers and foragers (as Scott calls the Mesopotamian marshlanders), but also paludiculturalists.

Pournelle (2003: 219) chooses to focus on

> one feature of the Iraqi wetland terrain – the ubiquitous reed – that, even in the face of overwhelming evidence of its cultural and social importance through time has remained largely invisible to those who could not or did not recognize the real significance of wetlands or the (economic, social, or cultural) value of 'non-agricultural' products or communities.

Reeds are important as a cultural and social resource produced by their cultivation in the marshes and to the productive economy of paludiculture. As Pournelle (2003: 219, 240) maintains,

> reeds were themselves at all times a valuable resource; an ecological component of the agro-pastoral[-paludal] system that have contributed significantly to rural surplus generation in the service of urban populations … In all of [the distinct zones of the wetlands of the southern delta] the predominant activity is reed-cutting for construction, fodder, fuel, basketry and reed matting produced for barter or sale.

The use of reeds plays a central and vital role in the wetland productive economy and as the foundation for urban settlements and cities discussed by Pournellle.[9]

As with their north-eastern Australian counterparts and Mavis Ngallametta's paintings, Aboriginal paludiculture is expressed in artworks that show appreciation for the wetlands of south-eastern Australia. Patricia Clarke retells her father Banjo's story of the Rainbow Serpent of the Hopkins River in a book of that title (Clarke 2008) and in her father's book *Wisdom Man* (Clarke with Chance 2003: 179–80). She also portrays the serpent in her painting of the 'Map of the Western District (Banjo Clarke's Country)' reproduced inside the front cover of *Wisdom Man* (Clarke with Chance 2003).

The Rainbow Serpent's head is placed in the Telegraph Hills near the town of Ararat and its tail in the estuary near the regional city of Warrnambool on the south coast of Victoria. Rather than being crescent-shaped, the Hopkins River is 'S'-shaped, with the head of the serpent as the head of the river in the hills and its cloaca is its estuary on the coast. Rather than a fertile crescent, the watery volcanic plain between the mountains, the river and the sea is a 'Fertile Serpent'. The circles nestled in the curves of the serpent in her painting map camps dotted around kindred wetlands with oven mounds. The lines linking these places map the 'song-lines,' storylines and dreaming tracks between them. This map is a portrait of his country; it is not a landscape to view and master from a distance; it is land to live in, own and know intimately. It does not freeze a moment in time, unlike cadastral maps; it tells a story of a place and its creation.

9 For further discussion of the marsh Arabs and Pournelle's work, see Giblett (2024, ch. 2).

Colonial and industrial paludiculture is another, vexed question in eastern-Australia. Industrial rice-growers in the Murray-Darling Basin proclaim on their roadside fence signs that 'you can't eat a wetland'. In a swift rejoinder, Emily O'Gorman (2021: 5) relates how 'many Aboriginal people will tell you [that] you can eat a wetland by cultivating and harvesting plants in them, hunting animals such as duck, and catching fish'. Flooded rice paddies are, as O'Gorman (2021: 16, 100, 105, 118) points out on several occasions, 'a kind of wetland' anyway and you can eat them. Industrial and Aboriginal paludiculture should work together with sustainable allocations of water for all living beings and livelihoods. Long live wetlands and their plants!

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