

Plant-Human Futurisms in the Australian Tropics: Native Grasses and the *Carbon_Dating* Art Project

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Abstract

The tropics have been first to suffer from the effects of unsustainable practices on land and sea. The *Carbon_Dating* project (2019 to 2025)—an artwork and cultural campaign designed to provoke a re-imagining of human-grass futures that builds relationships with native grasses—has worked in Far North Queensland, Australia, with two First Nations participants: Mbabaram Elder, knowledge-holder, and ethnobotanist Gerry Turpin, and Kuku Yalanji Master Weaver and artist Delissa Walker Ngadijina. Using traditional knowledge and creative works to forge new imaginaries that selectively choose or refuse those of the coloniser, the contributions of these two participants are an assertion of Indigenous relationalities in the tropics, and offer others a way of re-imagining plant-human futures in the wider world.

Keywords: native grasses; socially-engaged art; plant blindness; Indigenous Futurisms; Australian Tropics, plant-human relations

Introduction: Futuring Relationships with the Plant World

As a plant throws seed, or a person offers ideas or practices, is this not an action of trust, hope, and generosity to the future? (Artist and participant in the *Carbon_Dating* project Liz Capelin, 2024, p. 14)

The Australian *Carbon_Dating* project¹ uses processes of socially engaged art, grass growing, consultation, journaling, critical writing, yarning, and art-making to generate a deeper engagement with Australian native grasses among its many diverse participants. Its title, a play on the idea of 'getting to know' and caring about grasses as carbon-based life forms and ecological 'family', also resonates with the science of Earth's time scales and decarbonisation. *Carbon_Dating* has been distributed across several Queensland communities, framed through processes of consultation with First Nations knowledge-holders, scientists, and the community. Ultimately, a series of related artworks was then commissioned and developed for a touring exhibition (2023-2025). As a socially engaged art project (Helguera, 2011), *Carbon_Dating* is aimed at provoking new ways of seeing, interacting with, and caring about/for native grasses, and this paper is one of many outputs. In it, we aim to demonstrate how the project located native grasses in Far North Queensland at the intersection of historical invisibility and tropical obscurity (to Western eyes); we show that First Nations participants in Far North Queensland were able to foreground these grasses, through bringing both grasses and humans—Indigenous and non-Indigenous—into closer relation with local Indigenous knowledges and cultural traditions.

We ground this work of weaving together concepts, activities, and ethics by focusing upon the contributions of two North Queensland First Nations participants, Mbabaram Traditional Custodian, knowledge-holder, and ethnobotanist Gerry Turpin, and Kuku Yalanji Master Weaver and artist Delissa Walker Ngadijina. Both of these participants work with temporality: the connection between the past (i.e. traditional knowledge maintained in the face of colonisation), the present ((re)building a sense of futurity based on action), and imagined futures. The issues we discuss—the role of art in enabling a re-imagining of future plant-human relations and the connection of imagination with hope and an ethics of care—are arguably most urgent in the context of the tropics.

¹ <https://www.carbondating.art>

Figure 1. Mbabaram Traditional Custodian, knowledge-holder and ethnobotanist Gerry Turpin



Screenshot from the *Carbon_Dating* project documentary video, 2023,
<https://www.carbondating.art/learnings/gerry-turpin-ethnobotanist>

Image: Josaphine Seale

The tropics have been the first to suffer from the effects of global climate change (Hartnett, 2021, p. 141), and an anti-colonial approach within climate change studies is now “imperative” to “prevent the world’s elite from taking economic, social, and political advantage of those most vulnerable” (Hartnett, 2021, pp. 152-153). Anthropologist Sophie Chao, whose work is centred on West Papuan communities where palm oil plantations have destroyed/displaced traditional lifeways, suggests that a more “capacious” imaginary is required in which “we cease failing those whose imaginations are occluded from epistemic and moral purview” (Chao & Enari, 2021, p. 35).

Futures studies scholars have asked: “What future is silenced?” (Inayatullah, 2013, p. 44), and whose voices are heard (Ahlqvist & Rhisiart, 2015, pp. 95-97; Milojević & Inayatullah, 2015, p. 160). A recently published collection of works on Australian Indigenous futures (Carlson et al., 2024) is a scholarly examination of systems and structures that need to be transformed, the nature of Indigenous identities and relationalities, and the opportunities and challenges for Indigenous futures presented by digital technology (see also Centre for Global Indigenous Futures, 2024). Several contributors to this volume analyse the idea of Indigenous futurisms and its converse, settler futurity (see, for example, Alizzi, 2024; Carlson, 2024; Saunders, 2024).

The creative works of Indigenous Futurisms are different from scholarly futures inquiry: they include, for example, “a form of storytelling whereby Indigenous authors use the speculative fiction genre to challenge colonialism and imagine Indigenous futures” (Kwaymullina, 2018, p. 149). The arts more broadly, including theatre, film, and literature, are used to warn, educate, and call for witnesses (Hobart, 2021; Nsah, 2022;

Nsah et al., 2023); while these roles can also be performed in mainstream and social media (Leimbach & Palmer, 2022), creative works provide a culturally powerful way to “engage with complexity, and...point to new or different possibilities and futures” (Nsah, 2023, p. 20).

In her poem ‘Indigenist Futurisms’ Ambelin Kwaymullina (2024) envisions “futures born of connection between all life.” Such futurisms resonate with *Carbon_Dating*’s objectives of replenishing and restoring native grasses, “clung to as a promise” and “inscribed into a reoriented imaginary” (Jackson, 2024, p. 9) that connects all plant and human life.

The *Carbon_Dating* Project

Carbon_Dating is a multifaceted, experiential, and durational artwork, strongly connected to place(s) and reliant on community partnerships that converge at particular points in time. As director Keith Armstrong notes, projects like these aspire to foster “Communities of Care” and have the potential to “create shared understandings that transcend differences and imagine and enact direct, and indirect, supporting actions” (Jackson & Armstrong, 2024, p. 12). The project began in 2019-2020 with a ‘creative incubator’ process that cross-fertilised ecological science, human physiology science, environmental philosophy, and media arts. From this emerged an early key aim of the project: to uncover the scientific and poetic connections between the ‘lungs of the earth’ and human breath physiology in ways that might best activate participants’ minds, bodies, and emotions, and promote their reflection, care, and ‘reverence’ (Armstrong, 2022a). The project subsequently developed over two further stages.

Stage 1 involved identifying suitable locations across Australia and local people (predominantly artists and First Nations knowledge-holders) interested in engaging with the project’s aims by becoming local carers/ grass growers/ respondents/ supporters. Native grasses endemic to that area were then planted in small managed mounds at locations accessible to these local guardian(s). The guardian(s) also each received an ‘Interweaver’ artwork (Figure 2) created by project lead artist Donna Davis, that was designed to support their growing experience and journaling processes. Stage 2 (2023-2025) involved commissioning these guardians to create artworks inspired by their experiences of caring for the grasses. The resulting 14 new works, created in a broad range of mediums including sculpture, weaving, textiles, photography, new media, film, and performance, formed the basis of an Australian touring exhibition, which will be shown in tropical Northern Australia in early 2025 (Armstrong et al., 2022).

Figure 2. *Personal Interweaver* (detail).



Carbon_Dating Project Team, 2022. Mixed media interactive sculpture: video, audio, grass card provocations, timber, glass, acrylic, mirror, digital frame, pen, grass seed, metal, headphones. Video and tech design by Keith Armstrong, sound design by Luke Lickfold, Grass Card provocations by Daniele Constance, object design and construction by Donna Davis. Image: Donna Davis

‘Grass Blindness’ and the Othering of the Tropics

Concerns with deteriorating landscapes are global, as indicated by the United Nations’ 2021 declaration of a “Decade on Ecosystem Restoration.”² Grasslands in particular have become a focus of concern as they are an important repository of biodiversity and carbon storage (Gibson, 2008, pp. 15, 16). However, they are now under serious threat, and many have been extinguished, by agriculture, livestock, mining, and invasive species (Gibson, 2008, pp. 4-12). The remnant regional ecosystem vegetation of Queensland, which is of relevance to the *Carbon_Dating* project and this paper, includes richly diverse landscapes spread across the Wet Tropics, Mulga Lands, Mitchell Grass Downs, Desert Uplands, Woodlands, Brigalow, and more. Each of these biomes is under pressure from high clearing rates and the sheer scale of loss— 4.2 million hectares in only 22 years.³ The degradation of native grasslands in the tropical savannahs of Far North Queensland, for example, is imbricated with loss of language, culture, and traditional land use practices.

² <https://www.decadeonrestoration.org/>

³ <https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/remnant>

One of the reasons for the lack of widespread knowledge and response to the loss of native grasslands is the broader issue of plant blindness, defined as the inability to notice plants in one's environment, recognize the importance of plants in the biosphere and human affairs, or appreciate plants' aesthetic and unique biological features, along with an anthropocentric ranking of plants as inferior to animals and thus unworthy of consideration (Wandersee & Schussler, 1999, p. 84). This has resulted in histories of deep time that foreground animals rather than plants (Vujaković, 2019) (but see Thomas (2019) for a history that restores the visibility of the grass known as dandelion), and concerns that greater public awareness and better education are needed in recognizing and valuing plants (Jose et al., 2019; Knapp, 2019; Krishnan et al., 2019; Marcos-Walias et al., 2023; Nyberg et al., 2019; Pedrera et al., 2023; Simões & Ferreira, 2023; Stroud et al., 2022).

The history of art also reflects the marginalisation of plants; according to critic and curator Giovanni Aloi (2020, pp. 10, 11), such that the painting of plants "has been grossly diminished by our critics, curators, and art historians," and plants are often represented as symbols of something else, inviting "us to see ourselves in the subject rather than see the subject itself." Counter to this historical vision, artists whose work aims to deepen humans' attention to plants themselves include Lucinda Law (Law, 2019), Maura Flannery (Flannery, 2019), Melissa Oresky (Pluymers & Oresky, 2020) and Diana Scherer (Scherer & Sanders, 2020).

Tropical native grasses have suffered from a double invisibility. Tropical native grasslands, or Tropical Grassy Biomes (TGB), are often mistaken for degraded forests, and restoration perceived as a matter of reforestation, reflecting an "historical prejudice against open ecosystems" (Buisson et al., 2021, p. 2). This displays a lack of knowledge among non-Indigenous peoples about the value of these biomes as ecosystems. Moreover, it reflects a lack of knowledge about the Australian tropics. The enthusiastic planting by Northern Australian pastoralists of African gamba grass (*Andropogon gayanus*) since the 1930s has turned this grass from pasture into "a threat to sustainable fire regimes, ecosystems and biodiversity [so] that significant irreversible change has already occurred in parts of northern Australia" (AFAC, 2017, p. 2):

Gamba grass grows up to four metres tall and can produce up to five times the biomass of native Australian grasses. In the highly flammable savanna environment of Australia the combination of vertical height and high fuel loads has proved catastrophic. Quite simply, our savanna trees have evolved magnificently to cope with fire, but only if fires are frequent, low intensity and low to the ground (Petty, 2013).

Consequently Armstrong, in discussing the drivers behind the *Carbon-Dating* project, notes:

My interest in grasses was further increased by their extreme invisibility for many, beyond lawn or pasture—and also the way I began to understand that native species had become absent from much of the landscape in Australia due to introduced and highly invasive pasture grasses (Armstrong, 2022a).

As Sanders (2019, p. 132) notes, “a wider repertoire of stories is needed to draw on when endearing human attention to ‘Life as Plant’.” We suggest that despite longstanding scientific knowledge (for example, Tothill & Hacker, 1983), native grasses now stand in need of such stories; this paper argues that these stories lie at the intersection of latitude, history, and culture, where particular species, particular knowledge, and particular ignorance have converged.

Re-weaving Native Grasses into the Socio-Ecological Imaginary

Recent creative writing has called for closer attention to grasses. This includes examples such as the WordPress blog “Tuesdays in the Tall Grass”⁴ (“Perhaps learning to love something as seemingly simple as leaves of grass comes from seeing grasses in all their variety”) and books of ecopoetry such as Brian Teare’s (2013) *Companion Grasses* and Leila Wilson’s (2013) *The Hundred Grasses*. In her review of these books, poet Cecily Parks points to the ways writers can make the invisible present:

These poets write with the awareness that, as environmentalist Bill McKibben puts it, “There is no future in loving nature.” There may be no future in loving grass. In the meantime, poets reveal the presence, pleasure, and friction of what is so often under our feet. (Parks, 2014)

In Robin Wall Kimmerer’s book *Braiding Sweetgrass*, she writes as a member of the Potawatomi First Nation of the sacred place of sweetgrass in her culture; its use in fire ceremonies and as a tool to bind generations and remind individuals of their commitments to larger stories and collective obligations: “Sweetgrass is best planted not by seed, but by putting roots directly in the ground. Thus, the plant is passed from hand to earth to hand across years and generations” (Kimmerer, 2020 (2013), p. 8). Kimmerer’s words speak of intimate relationships across time and gently critique contemporary transactional cultures; they also speak to the connection between plant, place, and culture.

⁴ <https://tuesdaysinthetallgrass.wordpress.com/2015/11/10/in-praise-of-grass/>

There is a rich legacy of art practitioners who have offered alternative ways to relate to/with other species in a time of mass extinction. Linda Tegg's work *Grasslands* (2014) at the State Library of Victoria, for example, involved richly diverse plantings of grasses textured with flowering biennials. The *Carbon_Dating* project draws particular inspiration from Tegg's work, which involved horticulturist John Delpratt and landscape architect Anthony Magen attempting to recreate the pre-European settlement grasslands that were once on the site of the State Library of Victoria in Melbourne. Other grass-related art provocations include Tijn Meulendijks' grass exhibition in Cairns⁵, the Serpentine *General Ecology* project, Zena Holloway's artworks,⁶ and historically, the works of Hans Haacke and Herbert Bayers⁷.

Shaped by a foreshadowed concern—the disappearance of grassland habitats and the eradication of native grasses—*Carbon_Dating* is necessarily less didactic than direct activism, inviting participants and audiences into relational contact zones that allow the forming of new 'patterns' (Lundberg et al., 2021) where new worlds can be cultivated and imagined. In sympathy with these aims, Chao and Enari (2021, p. 34) note the need to re-imagine "environmental crisis and tropical futures" in "radical forms...that are grounded in an ethos of inclusivity, participation, and humility" rather than viewing some forms of more-than-human life as "surplus life—those lives deemed sacrificeable, unvaluable" (Chao, 2022, p. 178).

Carbon_Dating's participants Gerry Turpin and Delissa Walker Ngadijina exemplify such approaches to knowledge-keeping in Far North Queensland, on Mbabaram Country and Kuku Yalanji Country. The relational worldviews Turpin describes in his work as an ethnobotanist (the study of cultural plant use and perception of plants), and the woven artwork that connects Walker Ngadijina to her ancestral knowledge and her community reveal to the non-Indigenous viewer/listener ecological and ethical proximities within the more-than-human across time (Creet, 2009; Rose, 2013; Rose & van Dooren, 2017), and the possibility of radically re-imagining these relationships for the future. These possibilities are described by Chao and Enari as:

Radical imaginations...[that] invite experimental forms of expression within and beyond the written text—oral storytelling, poetic recitation, everyday rituals of care, dream-sharing, artistic production, among others...open space for critically thinking and emotionally feeling our

⁵ <https://incineratorgallery.com.au/gramineae/> Gramineae (2020) is both an art exhibition and online resource by Netherlands-born, Cairns-based artist Tijn Meulendijks. Presented via the Incinerator Gallery website, this project documents the collaborative research, conservation and growth of native grasses across the high, mid and low-lands of Queensland. Spanning over 8 weeks, this project culminates in the creation of a large-scale grass sculpture harvested and constructed in the artist's studio.

⁶ <https://zenaholloway.com/root>

⁷ <https://www.aspenmod.com/places/grass-mound/> (Herbert Bayers *Grass Mound* 1955), <https://www.newmuseum.org/exhibitions/view/hans-haacke> (Hans Haacke *Grass Mound* 1969).

way through (and potentially out of) crisis (Chao & Enari, 2021, pp. 45-46).

De-colonising Creative Practice

Bifurcated ways of viewing plants as inanimate background material run deep within Western culture and philosophy which can be traced back to Aristotle (Hall, 2011). Recent multispecies studies, however, produce a rich description of a different world using modes of representation that call upon us to engage affectively, aesthetically, and ethically, with the more-than-human. Deborah Bird Rose describes her writing as “*pull[ing] readers into ethical proximity*” with events (2013, p. 9, italics added). Elsewhere, we have discussed the ways in which social media can usefully pull us into such new proximities (Leimbach & Palmer, 2022).

Carbon_Dating seeks to mediate relationships between humans and grasses in all of these dimensions. Armstrong describes the development of the project’s connection with Indigenous worldviews as follows:

From the outset we intended that our process would develop through listening to the advice of local Indigenous consultants. Hence early in the project (October 2021) we held a consultation session with Freja Carmichael, a Ngugi woman, weaver and curator belonging to the Quandamooka People, with the intention of both gathering some feedback on our project progress and also receiving counsel on how to better orientate our work in ways consistent with First Nations principles of Care for Country. At that meeting Freja challenged us strongly to think more closely about the community dimensions of the work and each site, suggesting that we might wish to work more actively to build community both locally and at each location in which we were working, or intended to work. She encouraged us to actively reach out to key First Nations people both locally and around Queensland - to ensure that the networks of communications between what we began to call our ‘grassland carers’ would be strengthened.

This led us to develop a series of guiding principles consistent with these learnings that privileged/embedded Indigenous wisdom into our project, in the understanding that the proper ways to care for Country already exist and are well understood. This provocation led us to a move away from our initial focus upon observation of grasses through a science lens, to rather (in Freja’s words) experience ‘being with grasses’, and hence consider the grasses we were growing as being

part of larger ecological communities - rather than simply discrete species.

We decided that each site should be led by or guided by Indigenous carers or consultants, to better align our processes with First Nations wisdoms and knowledges. (Armstrong, 2022a)

The results of this approach can be seen in the relational imaginaries generated by two First Nations participants in Far North Queensland: grass futurisms based on contemporary storytelling of Country using traditional knowledge and cultural practices.

Grass Futurisms in *Carbon_Dating*

Marking what has been lost, *Carbon_Dating* celebrates the beauty of remnant native grasses, making them visible within the contemporary cultural and ecological fabric as something to hold onto—a promise—for the future. In the *Carbon_Dating* project in Far North Queensland, native grasses emerge and are merged with Indigenous traditions of caring for a particular kind of Country and particular skills and cultural knowledges that have been passed down through many generations. These knowledges are specific to the Queensland tropics, a point parallel to that made by Lakota scholar Vine Deloria, Jr: when First Nations American peoples “talk about the immediate environment in which they live...what is important is the relationship you have with a particular tree or a particular mountain” (Deloria, 1999). Concern about the future of Country is concern about Country for which one has responsibility, but sharing of knowledge and values more widely has been, as we shall see, an important contribution made by the North Queensland participants.

In their aesthetic and eco-political orientation to the future, the artworks and dialogue generated through *Carbon_Dating* resonate with the creative work of Indigenous Futurisms in science fiction and speculative fiction (Cornum, 2015; Dillon, 2012, 2016), in video (Hobart, 2021) and poetry (Hogan, 2017), and stories and ceremonies “through which worlds come into being in acts of resistance, refusal and resurgence” (Theriault et al., 2020, p. 901). Indigenous Futurisms have emerged in the face of what, for many Indigenous peoples, is already a dystopian present (Birch, 2017, p. 202; Kwaymullina, 2018, p. 150; Palmer et al., 2022, pp. 5-7; Whyte, 2018, p. 227), where, for example, the catastrophic consequences of climate change on small island nations like the Marshall Islands are seen by Western nations simply as bellwether phenomena for assessing impacts on themselves (Hobart, 2021). The creative works of Indigenous Futurisms, Afrofuturisms, and others, offer “a way out of no way to the future” and “an aesthetic spring from the trap” of the present (Dillon, 2016, pp. 2, 3) that ensures the continuation of spiritual and cultural traditions. These traditions, as Lou Cornum (2015) notes, are “themselves a type of advanced technology” that can

be brought into the future “to foster the kind of relationships that make futures possible.”

Through affective, aesthetic, cognitive, and ethical dimensions, *Carbon_Dating* aims to have effects that “outlast its ephemeral presentation” (Helguera, 2011, p. 12); this can be seen in the knowledge-gathering, conversations, reflections and artwork generated in Far North Queensland. The *Carbon_Dating* artwork *Native Fence* (Figure 1) in Yirrganydji Country (Cairns) by Delissa Walker Ngadijina is built upon traditions and relationships between humans and plants, as we explore further below. The artwork also looks to the future: “this piece will live on...and hopefully do its part to encourage others to look after Country” (Walker Ngadijina, 2024, p. 34).

Figure 3. *Native Fence*



Delissa Ngadijina Walker, 2023. Native bamboo [*Neololeba atra*], native grasses: Black Spear, Scented Top and Barbed Wire, raffia, 115 x 165 x 7cm.
Image: Josaphine Seale

The multiple strands of the *Carbon_Dating* project were described earlier. Each of the grass ‘guardians’ involved in the project undertook their own journey of building understanding with their local species of native grasses, so that online audiences, and later a gallery audience, could join with them in their discoveries. Delissa Walker Ngadijina, based in Cairns, was one of the ‘guardians’, constructing and planting a mound with Barbed Wire Grass (*Cymbopogon Refractus*), Black Spear Grass (*Heteropogon Contortus*) and Scented Top Grass (*Capillipedium Spicigerum*). Walker Ngadijina had earlier participated in the Yarning Circle convened as part of the project at the Home of the Arts (HOTA) on the Gold Coast; she described the way intergenerational knowledge, in this case of traditional weaving practices, can be passed down to younger generations despite the suppressions of colonisation, and the connections between creative practice, honouring memory, and ecology:

My grandmother passed away when I was 18. And I wasn't really into it [weaving] at that stage, I only remembered how to know, I knew how to weave, baskets. But I was a run-amok teenager doing all different things. And when my grandmother passed away, I just felt like this was something that I had to take on too, which I feel like...we all get that feeling of that time, when we know that...this is the right time to take this a little bit more serious, and keep that tradition going.... So I taught myself how to cut the palm properly. And then I had to teach myself how to make the handle of the basket, which is out of our lawyer cane which was a big process...it was all like this big emotional journey for myself, and also very hard because I didn't have Nana there to ask her... [L]ucky I had spent all that time with her as a child sitting down and weaving with her, I had all these little memories of that knowledge. Until [it] came back to me and that was part of my journey, learning how to do it. And I felt like we shared a connection like that, because my grandmother actually didn't have anybody to teach her how to weave.

Because that practice was taken away, you know, you weren't allowed to practice your traditional practices like that. Or speak language, and all that. So she, same thing, Granddad went and got her black palm, because he was making all different tools and stuff out of the woods.... And so, she sat down and she sang out to the Elders, it was you know, a week or two just sitting there practicing [by] herself and getting frustrated. And again, getting encouraged, encouraged by granddad, you know, just think about them old people, and how they used to do it, and then she'd bring that back. So we...sort of shared a journey with, with that. Learning on our own, but also having that guidance there, from our old people. So yeah, I made my first dilly bags, and I took that on. I didn't know what to do with them.... It was just something that we did, as you know, that's what we would do. We do our weaving, we do our hunting, we do our fishing. So I didn't know about the art scene or anything like that, and galleries and exhibitions, and all this. So I just took my three dilly bags into the Cairns regional art gallery and was like, I've made these and do you buy, how does it work? Like, can I put them in your shop and they were like, 'Oh my God, these are amazing. And who are you?'

And yeah, from then on, I just have been doing exhibitions. I've got work around Australia and the galleries and stuff like that. And I've also got two daughters, three daughters, but two older daughters that know how to weave also. And they've taken on that practice as well. They

know how to weave and they helped me and assist me which is so beautiful to watch because that's exactly what I was doing with my grandmother. At that age, I was traveling with her and assisting her, and I totally get it now when you have a big mob of people and you can't get to everybody and you have that extra support. So, yeah, I'm very, very proud of them. And my son likes to, you know, help collect the fibre as well....

...I just wanted to bring this [basket] in [an artwork selected as a finalist in the Darwin-based Telstra National Aboriginal and Torres Strait Islander Art Awards⁸]. Yeah, share it with you.... And this is just in memory of my grandmother because she was actually hidden inside a basket when she was a baby up at the Mossman Gorge there. And when the white authorities came to take the children, she was hidden in the basket. And she was given these seeds to keep her quiet. And she wasn't taken that day. But later on she was, but that saved her for that amount of time being [put] in that basket. And I think that's why the dilly bag, we say 'Baljie' for basket, is so special to us. And then I'm why she really wanted to bring that back. And now I've taken that on. And yeah, just trying to keep that tradition alive through my children.... I think that's important. (Walker Ngadijina & Armstrong, 2023)

Walker Ngadijina's family members continue to care for Country, growing "our native grasses, plants, our medicine plants, artefact trees, and bush tucker trees as well, to keep that going for the next generation" (Walker Ngadijina & Armstrong, 2023).

The new artwork that grew out of Walker Ngadijina's *Carbon_Dating* guardianship is titled *Native Fence*; in it, she has used her traditional skills as a Master Weaver to knot together single strands of native grass in a grid that hangs on a wall and can be observed up close by viewers who are encouraged to notice the form and texture of each blade of grass. She describes her approach to the artwork, and its connection with Country, with increasing awareness and care in an interview: "I tried to go for a different point of view...from when I'm over at the [grass] mound you know, looking down on it and looking through it...when it's up on the wall you can...take in each individual...piece of grass as a whole. It does remind me of looking after Country and my family..." (Walker Ngadijina & Armstrong, 2023). In her artist's notes for the *Carbon_Dating* Exhibition Catalogue, Walker Ngadijina reiterates this idea of grasses as family: "Our native grasses grow in clumps like a big family, yet like our families each one is unique" (Walker Ngadijina, 2024, p. 34). Resonating with the poetry of Bill

⁸ <https://www.magnt.net.au/natsiaa>

Neidjie cited by Matthew Hall (2011, p. 102), these comments subvert the dominant Western hierarchy of beings where humans are (vastly) higher than grasses: “Grass...just like your brother | In my blood in my arm this grass” (Neidjie, 1988).

The *Carbon_Dating* team also worked with Mbabaram Elder, knowledge-holder, and ethnobotanist Gerry Turpin. Turpin’s biocultural knowledge is being combined with Western knowledge at the Tropical Indigenous Ethnobotany Centre in Cairns, with the aim of reinvigorating soils and grasses, and hence those ecosystems that depend upon them. A documentary film of Turpin sharing knowledge on Mbabaram/Bar-Barrum Country,⁹ west of Innisfail on the Atherton Tableland in Far North Queensland (Armstrong, 2022b), explains Indigenous ways of understanding and caring for native vegetation. Turpin notes that traditionally almost every plant was used by Aboriginal people. The bush was not just a source of medicine or bush tucker—it acted as a ‘Bunnings’ (hardware), a chemist (including the supplying of dyes), and a bakery. “Whatever they needed, they just found in the bush.” Turpin’s interest lies particularly in the ways the biocultural knowledge of Aboriginal people and Western science can work together in resolving present-day problems. The rate of change occurring in the bush has accelerated, and Traditional Owners acknowledge the need to work with others to maintain Country. Biocultural knowledge can provide answers that Western science cannot, including the interconnecting indications across all parts of Country. For example, the time when a particular tree blooms is the best time for fishing mullet, but as environmental conditions change, the same tree is now blooming at different times, disrupting those interconnections, and potentially creating less beneficial outcomes for people and the environment.

Turpin points out that grasses play a significant role in caring for Country, not just as a source of food and medicine, but also to produce smoke during hunting and in cultural burning, which benefits both humans and animals. In the film, he demonstrates that the sustenance provided to humans by spear grass lies at the base of long shoots, which can only grow after the right kind of burning. With the arrival of the pastoral and mining industries and the resulting tree-felling and spread of invasive grasses, out-of-control fires have resulted in the depletion of soil nutrients and soil erosion (AFAC, 2017; Petty, 2013). With support from Victor Steffensen and the Firesticks organisation¹⁰ (Odenthal, 2020; Steffensen, 2020) cultural burning has been reintroduced to help restore the ecological balance on Mbabaram Country, control the amount of fuel available for bushfires, and support the growth of native grasses.

⁹ See location of Mbabaram (Bar-Barrum) country on map inset at http://www.nntt.gov.au/Maps/QLD_Northern_NTDA_Schedule.pdf

¹⁰ From <https://www.firesticks.org.au/about/> ‘Firesticks is a not-for-profit Indigenous network that aims to activate and increase the use of cultural burning by facilitating cultural learning pathways to fire and land management.

In describing the interdependencies between grasses, people, and all other living and nonliving things, Turpin noted the importance of re-building Indigenous language and hence Traditional Ecological Knowledge about caring for Country: “In language is the secrets of Country...and when you learn it, it opens it up and opens your eyes to...that Country” [8.01-8.12]. Even where much language has been lost, simply “being on Country” can teach people connections between, for example, a wattle tree flowering and good conditions for hunting [8.36-8.50]. He reminds us that culture is not static, but “always building” and dynamic, and can thus be rebuilt by returning to Country, learning from language, and learning from Elders. Currently there are projects on Mbabaram lands to teach young people about Country and develop a sense of belonging.

This film draws our attention to the beauty and utility of grasses, but also to their connection with more-than-human lifeways on Mbabaram Country. Through sharing his knowledge, Gerry Turpin shows other connections across time, between past loss, current imperatives, and a restored future: of culture, of knowledge, of ecosystems.

Conclusion: Generative Re-imaginings

Imagination, as Chao and Enari point out, “is a perspective on the world *and* the grounds for inhabiting the world otherwise” (Chao & Enari, 2021, p. 36). As Indigenous Futurisms use creativity to forge new imaginaries that refuse those of the State or colonisers, works such as *Carbon_Dating* are a refusal of current non-Indigenous relations with the world; a refusal that is also generative in the sense that Leanne Betasamosake Simpson’s ‘radical resurgence project’ of refusal is generative: “it is a process from which grounded, real world, Indigenous alternatives are manifest and realized” (2017, pp. 35, 34). In the case of the tropics, Indigenous alternatives are already underway through the work of Turpin and others, and projects such as Firesticks. These constitute a refusal of Western imaginaries that see the tropics as, for example, a super-fertile environment for the growing of ‘better’ imported pastures. Indeed, through their restoration of tropical knowledge ecologies, these projects are opening up the Western perspective to “a time and space through which the repressed may return” (Benitez et al., 2024, p. 8).

Overcoming grass blindness requires a re-imagining of relations with the more-than-human. McKim and Halpin (2019) “developed a one minute cure for plant blindness that’s free and easy to do. Simply stop what you’re doing and look around” and as Henry et al. argue, in their inclusive reframing of weeds, “[i]n the lushness of tropical flora, *valuing begins with noticing*, picking out a plant from others that crowd around it” (Henry et al., 2023, p. 243, emphasis added). We need to allow time for “fungi, bacteria, insects, or plants...to root themselves in our theoretical and ethical imaginations” (Lawrence, 2022, p. 629). Hence *Carbon_Dating* has been focused on

enabling its audiences to *notice* native grasses, and to *re-imagine* them as both beautiful and valuable, in order to see them as entitled to “moral considerability”—either because our own future wellbeing depends on it (Hall, 2011), or, as Deborah Bird Rose (2013, p. 8) suggests, because “[t]o turn our backs on those who are targeted for destruction, or who are abandoned on a spiral of loss...is to refuse the ethical call. Inevitably, of course it entails turning our backs on ourselves. To face others is to become a witness.”

To choose to re-imagine, to respond to creative work with a reconception of what might count now and in the future, rather than turning our collective backs, is to begin a process that can ripple outwards from an artwork or a conversation to a wider community.

Figure 4. *Fascinator*



Kilagi Neilsen 2023. Native harvested Kangaroo Grass and Lomandra from Kabi Kabi Country, 28 x 31.5 x 8.5cm. Image: Carl Warner

Already, there are changes spiralling outwards across space and time from the work of the artists and knowledge keepers in the *Carbon_Dating* project, including for the artists and participants themselves. Delissa Walker Ngadijina notes that, “personally, this has really opened up my mind about...maybe I should be doing a little bit more.... [W]hen the exhibitions do take off with all the [art] pieces that we’re making, that will spark more interest...just how they [*Carbon_Dating*] were bringing grasses for people

to take...to go and plant on their own...and then they'll take those plants home and then someone will come over to their house and be like "Hey, what's this?" and then...it's just that domino effect of having that conversation about our native grass." (Walker Ngadijina & Armstrong, 2023). As a result of Walker Ngadijina's involvement in the project, the Mossman Botanical Gardens is now considering the inclusion of grasses in a design for a 'weaving garden'. She also intends to replant her uncle's degraded block of land at Cooya Beach, Far North Queensland, with native grasses.

We have seen that native grasses in Far North Queensland lie, for non-Indigenous eyes, at the deeply invisible intersection of tropicality and the more-than-human. As grasses, they are seen, if indeed they are seen at all, as less useful than imported pasture grasses that grow faster and taller. As a part of the tropics, they fall within an 'othered' impenetrable biosphere about which nothing much is known or needs to be known. Les Murray's (1982, p. 46) famous remark about the Australian wilderness and the invader's failure to see Country already cared for and tended applies even more so in the tropics:

It was a *paysage humanisé* and *moralisé* which the Aborigines had maintained for untold centuries; the wilderness we now value and try to protect came with us, the invaders. It came in our heads, and it gradually rose out of the ground to meet us.

Carbon_Dating's Far North Queensland site has shown us that the tropical more-than-human has a long history of being cared for and valued. A work such as Delissa Walker Ngadijina's *Native Fence* reveals the skills of a master weaver passed on through generations of Kuku Yalanji people to create an object of enchantment that speaks of the interconnectedness of small things that make up a whole, across generations, honouring the past while offering us a way to see those native grasses in the future of Country. The work of Gerry Turpin is based on a vision of a future where knowledge of Country is restored in a way that also enables its custodians to manage change. Delving into archives, teaching young people on Country, combining the Elders' knowledge with Western science, and supported by organisations such as Firesticks to restore cultural land management practices, Turpin's work is a multidisciplinary, multifaceted, approach to reshaping the future of Mbabaram Country and elsewhere.

Turpin's and Walker Ngadijina's knowledge-keeping and knowledge-sharing go beyond raising awareness of humans' relationships with grasses and the natural world. The relational worldview described through Turpin's ethnobotany and Walker Ngadijina's artwork bring all of us—Indigenous and non-Indigenous—into proximity with the more-than-human. These works are first and foremost a strategy for future-proofing intergenerational transmission of knowledge and cultural practices within First Nations; they also show non-Indigenous viewers that the 'tropical', just like the other

more 'settled', understood, and temperate parts of Australia, might need attentiveness to the specifics as well as the whole: to latitude, climate, ecologies, beauty, and structure, in order to create a future in which relations between all things, including humans, can flourish.

References

- AFAC. (2017). *Fire Risks from the Management of Gamba Grass in Northern Australia*. <https://www.afac.com.au/docs/default-source/doctrine/fire-risks-from-the-management-of-gamba-grass-in-northern-australia-revised.pdf?sfvrsn=16&download=true>
- Ahlqvist, T., & Rhisiart, M. (2015). Emerging pathways for critical futures research: Changing contexts and impacts of social theory. *Futures*, 71, 91-104. <https://doi.org/10.1016/j.futures.2015.07.012>
- Alizzi, A. (2024). Utopianism, eco-criticism and colonial fantasy: Germaine Greer's *White Beech* as a case study in settler futurity. In B. Carlson, M. Day, S. O'Sullivan, & T. Kennedy (Eds.), *The Routledge Handbook of Australian Indigenous Peoples and Futures* (pp. 210-225). Routledge.
- Aloi, G. (2020). Editorial. *Antennae: The Journal of Nature in Visual Culture* (51), 10-11. <https://www.antennae.org.uk/back-issues-1>
- Armstrong, K. (2022a). *Carbon Dating: A brief history*. Carbon_Dating Project. Retrieved 30 October 2023 from <https://www.carbondating.art/learnings/a-brief-project-history>
- Armstrong, K. (2022b). *Carbon Dating: Interview with Gerry Turpin, Ethnobotanist*. Carbon_Dating Project. Retrieved 30 October 2023 from <https://www.carbondating.art/learnings/gerry-turpin-ethnobotanist>
- Armstrong, K., Davis, D., & Higgins, A. (2022). *Carbon Dating: Exhibition*. Carbon_Dating Project. Retrieved 30 July 2024 from <https://www.carbondating.art/live/exhibition>
- Benitez, C. J. R., Chwala, G. L., Lundberg, A., & Nyeck, S. N. (2024). Queering the tropics: A cartography of tropical materialism, queer ecology and spectral tropicality. *eTropic*, 23 (1), 1-17. <https://doi.org/10.25120/etropic.23.1.2024.4079>
- Birch, T. (2017). 'The Lifting of the Sky': Life outside the Anthropocene. In J. Adamson & M. Davis (Eds.), *Humanities for the Environment: Integrating Knowledge, Forging New Constellations of Practice* (pp. 195-209). Routledge.
- Buisson, E., Fidelis, A., Overbeck, G. E., Schmidt, I. B., Durigan, G., Young, T. P., . . . Silveira, F. A. O. (2021). A research agenda for the restoration of tropical and subtropical grasslands and savannas. *Restoration Ecology*, 29 (S1), 1-18.
- Capelin, L. (2024). Artist's notes. In B. Jackson & K. Armstrong (Eds.), *Carbon Dating Exhibition Catalogue* (pp. 14-15). <https://www.carbondating.art/live/catalogue-page>
- Carlson, B. (2024). The future is Indigenous. In B. Carlson, M. Day, S. O'Sullivan, & T. Kennedy (Eds.), *The Routledge Handbook of Australian Indigenous Peoples and Futures* (pp. 9-25). Routledge.
- Carlson, B., Day, M., O'Sullivan, S., & Kennedy, T. (Eds.). (2024). *The Routledge Handbook of Australian Indigenous Peoples and Futures*. Routledge.
- Centre for Global Indigenous Futures. (2024). *Centre for Global Indigenous Futures* (website). Retrieved 8 December 2024 from <https://www.globalindigenousfutures.com/>
- Chao, S. (2022). (Un)worlding the Plantationocene: Extraction, extinction, emergence. *eTropic*, 21 (1: Special Issue. Tropical landscapes: Nature~culture entanglements), 165-191. <https://doi.org/10.25120/etropic.21.1.2022.3838>
- Chao, S., & Enari, D. (2021). Decolonising climate change: A call for beyond-human imaginaries and knowledge generation. *eTropic*, 20 (2: Special Issue. Tropical imaginaries and climate crisis), 32-54. <https://doi.org/10.25120/etropic.20.2.2021.3796>
- Cornum, L. (2015). The space NDN's star map. *The New Inquiry*, 36: Stars (January). <https://thenewinquiry.com/the-space-ndns-star-map/>

- Creet, J. (2009). Calling on witnesses: Testimony and the deictic. *Journal of Aesthetics and Culture*, 1 (1), 1-9. <https://doi.org/10.3402/jac.v1i0.4622>
- Deloria, V. (1999). *Spirit and Reason: The Vine Deloria, Jr., Reader* (B. Deloria, K. Foehner, & S. Scinta, Eds.). Fulcrum Publishing.
- Dillon, G. L. (Ed.). (2012). *Walking the Clouds: An Anthology of Indigenous Science Fiction*. University of Arizona Press.
- Dillon, G. L. (2016). Indigenous Futurisms, *Bimaashi Biidaas Mose, Flying and Walking towards You. Extrapolation*, 57 (1-2), 1-6. <https://doi.org/10.3828/extr.2016.2>
- Flannery, M. C. (2019). Interview with Maura C Flannery: Drawing trees to see and appreciate them. *Plants People Planet*, 1 (3), 150-152. <https://doi.org/10.1002/ppp3.47>
- Gibson, D. J. (2008). *Grasses and Grassland Ecology*. Oxford University Press.
- Hall, M. (2011). *Plants as Persons: A Philosophical Botany*. State University of New York Press.
- Hartnett, R. (2021). Climate imperialism: Ecocriticism, postcolonialism, and global climate change. *eTropic*, 20 (2: Special Issue. Tropical imaginaries and climate crisis), 138-155. <https://doi.org/10.25120/etropic.20.2.2021.3809>
- Helguera, P. (2011). *Education for Socially Engaged Art*. Jorge Pinto. https://www.sholetteseminars.com/wp-content/uploads/2018/01/Helguera-Pablo_Socially-Engaged-Art.pdf
- Henry, R., Ramoutsaki, H., Long, D., Acciaioli, G., Foale, S., Pocock, C., . . . Wood, M. (2023). Weedy life: Coloniality, decoloniality, and tropicality. *eTropic*, 22 (1: Special Issue. Decolonizing the tropics), 236-269. <https://doi.org/10.25120/etropic.22.1.2023.3985>
- Hobart, H. J. K. (2021). Atomic histories and elemental futures across Indigenous waters. *Media+Environment*, 3 (1), 1-19. <https://doi.org/10.1525/001c.21536>
- Hogan, L. (2017). Backbone: Holding up the future. In J. Adamson & M. Davis (Eds.), *Humanities for the Environment: Integrating Knowledge, Forging New Constellations of Practice* (pp. 20-32). Routledge.
- Inayatullah, S. (2013). Futures Studies: Theories and methods. In N. Al-Fodhan (Ed.), *There's a Future: Visions for a Better World* (pp. 36-66). BBVA.
- Jackson, B. (2024). Fields of Vision. In B. Jackson & K. Armstrong (Eds.), *Carbon_Dating Exhibition Catalogue* (pp. 4-9). <https://www.carbondating.art/live/catalogue-page>
- Jackson, B., & Armstrong, K. (Eds.). (2024). *Carbon_Dating Exhibition Catalogue*. <https://www.carbondating.art/live/catalogue-page>.
- Jose, S. B., Wu, C.-H., & Kamoun, S. (2019). Overcoming plant blindness in science, education, and society. *Plants People Planet*, 1 (3), 169-172. <https://doi.org/10.1002/ppp3.51>
- Kimmerer, R. W. (2020 (2013)). *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants*. Penguin.
- Knapp, S. (2019). Are humans really blind to plants? *Plants People Planet*, 1 (3), 164-168. <https://doi.org/10.1002/ppp3.36>
- Krishnan, S., Moreau, T., Kuehny, J., Novy, A., Greene, S. L., & Khoury, C. K. (2019). Resetting the table for people and plants: Botanic gardens and research organizations collaborate to address food and agricultural plant blindness. *Plants People Planet*, 1 (3), 157-163. <https://doi.org/10.1002/ppp3.34>
- Kwaymullina, A. (2018). Literature, resistance, and First Nations futures: Storytelling from an Australian Indigenous women's standpoint in the twenty-first century and beyond. *Westerly*, 63 (2), 140-152.
- Kwaymullina, A. (2024). Indigenous Futurisms. In B. Carlson, M. Day, S. O'Sullivan, & T. Kennedy (Eds.), *The Routledge Handbook of Australian Indigenous Peoples and Futures* (pp. xxiii-xxiv). Routledge.

- Law, L. (2019). Interview with Lucinda Law: Finding inspiration in plants - the life and work of a botanical artist. *Plants People Planet*, 1 (3), 146-149.
<https://doi.org/10.1002/ppp3.50>
- Lawrence, A. M. (2022). Listening to plants: Conversations between critical plant studies and vegetal geography. *Progress in Human Geography*, 46 (2), 629-651.
<https://doi.org/10.1177/03091325211062167>
- Leimbach, T., & Palmer, J. (2022). #AustraliaOnFire: Hashtag activism and collective affect in the Black Summer fires. *Journal of Australian Studies*, 46 (4), 496-511.
<https://doi.org/10.1080/14443058.2022.2121744>
- Lundberg, A., Vasques Vital, A., & Das, S. (2021). Tropical imaginaries and climate crisis: Embracing relational climate discourses. *eTropic*, 20 (2), 1-31.
<https://doi.org/10.25120/etropic.20.2.2021.3803>
- Marcos-Walias, J., Bobo-Pinilla, J., Iglesias, J. D., & Tapia, R. R. (2023). Plant awareness disparity among students of different educational levels in Spain. *European Journal of Science and Mathematics Education*, 11 (2), 234-248.
<https://doi.org/10.30935/scimath/12570>
- McKim, S., & Halpin, C. (2019). 'Plant blindness' is obscuring the extinction crisis for non-animal species. *The Conversation*. <https://theconversation.com/plant-blindness-is-obscuring-the-extinction-crisis-for-non-animal-species-118208>
- Milojević, I., & Inayatullah, S. (2015). Narrative foresight. *Futures*, 73, 151-162.
<https://doi.org/10.1016/j.futures.2015.08.007>
- Murray, L. A. (1982). Eric Rolls and the golden disobedience. *Quadrant*, 26 (12), 44-53.
- Neidjie, B. (1988). *Story about Feeling*. Magabala Books.
- Nsah, K. T. (2022). The ecopolitics of water pollution and disorderly urbanization in Congo-Basin plays. *Orbis Litterarum*, 77 (5), 314-332. <https://doi.org/10.1111/oli.12323>
- Nsah, K. T. (2023). Conserving Africa's Eden? Green colonialism, neoliberal capitalism, and sustainable development in Congo Basin literature. *Humanities*, 12 (3), 1-24.
<https://doi.org/10.3390/h12030038>
- Nsah, K. T., Malung, L. N., & Ngonyam, N. M. (2023). The slow integration of sustainability into contemporary theatre and performance practices in Cameroon. *Peripeti*, 37, 58-71. <https://tidsskrift.dk/peripeti/article/view/135191/179950>
- Nyberg, E., Hipkiss, A. M., & Sanders, D. (2019). Plants to the fore: Noticing plants in designed environments. *Plants People Planet*, 1 (3), 212-220.
<https://doi.org/10.1002/ppp3.40>
- Odenthal, F. (2020). *Preventing fire with fire (interview with Victor Steffensen)*. Fair Planet. Retrieved 9 November 2021 from <https://www.fairplanet.org/story/preventing-fire-with-fire/>
- Palmer, J., Walsh, A., & Batorowicz, B. (2022). Parallel futures? Indigenous resurgence and the haunting of the settler. *Futures*, 141.
<https://doi.org/10.1016/j.futures.2022.102969>
- Parks, C. (2014). Blades of grass: On ecopoetry and an unnatural world. *LA Review of Books*. <https://lareviewofbooks.org/article/blades-grass-ecopoetry-unnatural-world/>
- Pedraza, O., Ortega-Lasuen, U., Ruiz-González, A., Díez, J. R., & Barrutia, O. (2023). Branches of plant blindness and their relationship with biodiversity conceptualisation among secondary students. *Journal of Biological Education*, 57 (3), 566-591.
<https://doi.org/10.1080/00219266.2021.1933133>
- Petty, A. (2013). Field of nightmares: Gamba grass in the Top End. *The Conversation*. <https://theconversation.com/field-of-nightmares-gamba-grass-in-the-top-end-12178>
- Pluymers, K., & Oresky, M. (2020). Composting in the herbarium. *Antennae: The Journal of Nature in Visual Culture* (52), 157-172. <https://www.antennae.org.uk/back-issues-1>

- Rose, D. B. (2013). Slowly ~ writing into the Anthropocene. *TEXT* (Special Issue 20: Writing Creates Ecology and Ecology Creates Writing), 1-14.
<http://www.textjournal.com.au/speciss/issue20/Rose.pdf>
- Rose, D. B., & van Dooren, T. (2017). Encountering a more than human world: Ethos and the art of witness. In U. Heise, J. Christensen, & M. Niemann (Eds.), *Routledge Companion to the Environmental Humanities* (pp. 120-128). Routledge.
- Sanders, D. L. (2019). Editorial: Standing in the shadows of plants. *Plants People Planet*, 1 (3), 130-138. <https://doi.org/10.1002/ppp3.10059>
- Saunders, M. (2024). Future Tweed: Envisioning the possibilities of Bundjalung Country, community and culture through speculative fiction. In B. Carlson, M. Day, S. O'Sullivan, & T. Kennedy (Eds.), *The Routledge Handbook of Australian Indigenous Peoples and Futures* (pp. 322-335). Routledge.
- Scherer, D., & Sanders, D. L. (2020). Plantrootweaving. *Antennae: The Journal of Nature in Visual Culture* (52), 25-33. <https://www.antennae.org.uk/back-issues-1>
- Simões, H., & Ferreira, S. (2023, 28 August-1 September). *Biodiversity and plant blindness in pre-service teacher education* European Science Education Research Association (ESERA) Conference, Cappadocia, Türkiye.
- Simpson, L. B. (2017). *As We Have Always Done: Indigenous Freedom through Radical Resistance*. University of Minnesota Press.
- Steffensen, V. (2020). *Fire Country: How Indigenous Fire Management Could Help Save Australia*. Hardie Grant.
- Stroud, S., Fennell, M., Mitchley, J., Lydon, S., Peacock, J., & Bacon, K. L. (2022). The botanical education extinction and the fall of plant awareness. *Ecology and Evolution*, 12 (7), 1-14. <https://doi.org/10.1002/ece3.9019>
- Teare, B. (2013). *Companion Grasses*. Omnidawn.
- Therault, N., Leduc, T., Mitchell, A., Rubis, J. M., & Gaehowako, N. J. (2020). Living protocols: Remaking worlds in the face of extinction. *Social and Cultural Geography*, 21 (7), 893-908. <https://doi.org/10.1080/14649365.2019.1619821>
- Thomas, H. (2019). Grass blindness. *Plants People Planet*, 1 (3), 197-203.
<https://doi.org/10.1002/ppp3.28>
- Tothill, J. C., & Hacker, J. B. (1983). *The Grasses of Southern Queensland*. University of Queensland Press.
- Vujaković, P. (2019). Battle of the giants: Plants versus animals in idealised landscapes of 'deep time'. *Plants People Planet*, 1 (3), 188-196. <https://doi.org/10.1002/ppp3.10058>
- Walker Ngadijina, D. (2024). Artist's notes. In B. Jackson & K. Armstrong (Eds.), *Carbon_Dating Exhibition Catalogue* (pp. 34-35). carbondating.art.
- Walker Ngadijina, D., & Armstrong, K. (2023). 'The Native Fence', Delissa Walker Ngadijina, *Carbon_Dating carer (Kuku Yalanji woman) working on Yirrganydji Country/Cairns: Video interview with Josaphine Seale, Cairns* Brisbane, carbondating.art.
<https://www.carbondating.art/community-sites/yirrganydji-country-grasses>
- Wandersee, J. H., & Schussler, E. E. (1999). Preventing Plant Blindness. *American Biology Teacher*, 61 (2), 82-86.
- Whyte, K. P. (2018). Indigenous science (fiction) for the Anthropocene: Ancestral dystopias and fantasies of climate change crises. *Environment and Planning E: Nature and Space*, 1 (1-2), 224-242. <https://doi.org/10.1177/2514848618777621>
- Wilson, L. (2013). *The Hundred Grasses: Poems*. Milkweed Editions.

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Keith Armstrong (PhD) is an experimental artist profoundly motivated by issues of social and ecological justice. His engaged, participative practices provoke audiences to comprehend, envisage and imagine collective pathways towards sustainable futures. He has specialised for thirty years in collaborative, experimental practices with emphasis upon innovative performance forms, site-specific electronic arts, networked

interactive installations, alternative interfaces, art-science collaborations and socially and ecologically engaged practices. Keith's research asks how insights drawn from scientific and philosophical ecologies can help us to better invent and direct experimental art forms, in the understanding that art practitioners are powerful change agents, provocateurs and social catalysts. Through inventing radical research methodologies and processes he has led and created over sixty major art works and process-based projects, which have been shown extensively in Australia and overseas, supported by numerous grants from the public and private sectors.

Jane Palmer (PhD) is an Honorary Research Fellow in the Centre for Heritage and Culture, at the University of Southern Queensland. She has research interests in the use of ethnographic storytelling methods in post-conflict or marginalized communities, to explore the processes of trauma, grief, resilience and adaptation. She has undertaken ethnographic fieldwork in Aceh, Indonesia and in regional and remote Australia, and has published in the areas of ethics, Australian studies, fieldwork methodologies and futures studies.

Delissa Walker Ngadijina (b.1990) is a Kuku Yalanji master weaver based in Cairns, Far North Queensland. Brought up in Mossman and Daintree learning traditional practices, Delissa is part of a large, culturally active family. Since 2018 weaving has become a full-time passion and responsibility. Delissa Walker's works have been collected and exhibited nationally. In 2017 she was a finalist in the Telstra National Aboriginal and Torres Strait Islander Art Awards (NATSIAA). In recent years, her woven contemporary works have included wearable pieces featured in First Nations runways. Her cultural focus is teaching weaving at schools and cultural events, ensuring this once almost eradicated practice lives on.

Gerald Turpin is an Mbabaram man from north Queensland with familial links to Tableland Yidinji, Nadjon, and Kuku Thaypan. Mr Turpin began his more than 30-year career with the Queensland Government, with the Queensland Herbarium's Ecological Survey and Mapping team. He is now a senior ethnobotanist and leads the Tropical Indigenous Ethnobotany Centre (TIEC) at the Australian Tropical Herbarium in Cairns. Mr Turpin works tirelessly with many Traditional Owner groups on Cape York, across Queensland and around Australia. As an Indigenous ethnobotanist, he has a strong cultural commitment to facilitating effective partnerships that support Indigenous communities to protect, manage and maintain their cultural knowledge on the use of plants. Through his work, Mr Turpin has helped ensure that the botanical, biocultural and language knowledge of Traditional Owners is recorded, shared and passed forward to future generations within Indigenous communities. In 2025 he was awarded a Public Service Medal (PSM) Queensland for outstanding public service to Ethnobotany and championing Indigenous science and research.

