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### **Plants Before Animals?: Aboriginal Rock Art as Evidence of Ecoscaping in Australia's Kimberley**

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### **Abstract and Keywords**

The multiple Aboriginal rock art traditions of Australia's Kimberley contain primary evidence of commensal human-plant relationships that we term 'ecoscaping'. Produced over tens of thousands of years, Kimberley rock art contains up to 25% of sites with plant depictions in some of its earliest traditions, which date to at least 16,000 years ago. A finite range of food and medicinal plants are depicted (yams, tubers, fruits, as well as paint-soaked grasses pressed onto rock walls) in structured iconographic and landscape contexts. Very few gatherer-hunter rock arts globally offer such plentiful, detailed, and archaeologically and palaeoenvironmentally contextualized evidence of plants in both daily life and symbolic thought. We suggest that this rock art is evidence of an entangled landscape that combines geography, hydrology, biological vitality, and anthropological dynamics—an 'ecoscaping' that differs from more deterministic formulations such as 'domiculture'. Kimberley plant rock art is best understood as a key artefact and practice in how people managed the often extreme environmental and concomitant social change the Kimberley has experienced.

Keywords: Aboriginal, archaeology, Australia, ecoscaping, Kimberley, palaeoenvironments, plants, rock art

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## **Rock Art and Plants: A Conundrum**

Globally, gatherer-hunter rock arts are dominated by depictions of humans, animals, geometric motifs, and artefacts (e.g., David 2017; Davidson this volume; McDonald & Veth 2012). Yet plants are seemingly absent—despite the central role they play in gatherer-hunter life (e.g., Sterling 2014: 154–155; see Bogaard et al. 2009 for the differential representation of plants and animals in early farming societies). Perhaps plants are

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present, hidden in visual codes unintelligible to outsiders or only present as constituent ingredients of paint recipes. But iconographically, unambiguous depictions of plants are rare or absent. This absence may sometimes be real. For example, European gatherer-hunters utilized glacial refugia for habitation and art production. Their focus on large herding animals seems to predominate in their rock art, with no known depictions of plants in the Aurignacian and Magdalenian. Hodgson and Helvenston (2006: 27) conclude that while '[a]nimals are one of the major subjects for the Palaeolithic artists in Europe, plants are not depicted, at least not in any recognisable form.' Plant motifs are similarly rare in North America (e.g., Hays-Gilpin 2013) and Africa (e.g., Mguni 2009). While rock art is never a simple 'menu', with food resources often not being depicted, the apparent absence of plants in the art leads research into a double bind. It both encourages assumptions about the centrality of animals while underplaying the role of plants in everyday and extraordinary life. A related bias is the 'man-the-hunter and woman-the-gatherer' stereotype (Sterling 2014).

Here, we examine the unusually plant-rich rock art of northern Australia's Kimberley region and its relation to 'ecoscaping'—the active social and economic interaction between people and plants in the landscape—as a way of addressing how to overcome such bias and to generate new models of gatherer-hunter-plant relations. Our modern analogue is the traditional practice of 'wild harvesting' by Aboriginal people within 'ecoscaping' or ecosystems that contain more than one biological community (Lidicker 2008) and which are subject to sustained human interaction. Wang et al. define 'ecoscaping' as:

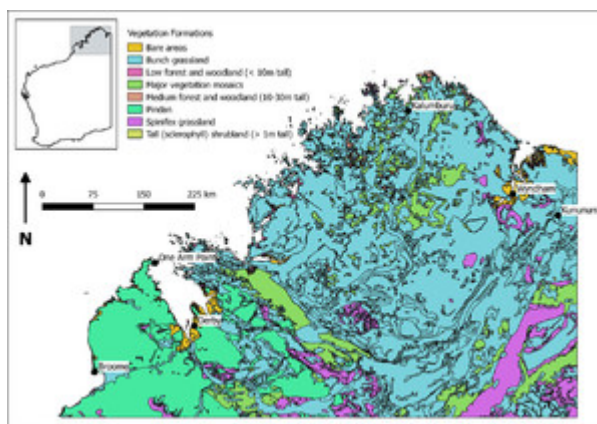
the organisational shape or layout of an ecosystem. It is a multidimensional landscape of a social-economic-natural complex ecosystem, combining geographic patterns, hydrological processes, biological vitality, anthropological dynamics and aesthetic contexts.

(Wang, Downton & Douglas 2011: 638)

'Wild harvesting' is when people gather plants that have not been subject to domestication or cultivation. Such gathering is aligned with the optimum accumulation of valuable nutritive and biologically active substances in the plant. Their harvesting is often from the same locality and is dependent on seasonal availability as well as on an acute awareness and management of where in the landscape different plants grow. The locales in which plants harvested by people naturally occur are defined as an 'ecoscape', and the practice of wild harvesting is referred to as 'ecoscaping'. This differs from the more intensive manipulation known as 'domiculture' that has been reported from northeast Australia and elsewhere (cf. Chase 1989; Greaves and Kramer 2014). The problem with the term 'domiculture' is its derivation from the Latin '*domus*', which suggests plant domestication. Hynes and Chase (1982: 38) characterize the process thus: 'Most importantly, some plant communities may have been not merely modified but created by Aboriginal cultural activity.'

## Plants in Northern Australia

Northern Australia's Kimberley stands out in world rock art by having plant motifs in up to 25% of rock art sites (Veth, Myers, Heaney, & Ouzman 2017). In contrast to the European legacy of focusing on animals within glacial landscapes, Australia's tropical north today supports monsoon and riverine rainforests, savanna woodlands, shrublands, and grasslands (Figure 1). Plants with tubers, roots, and corms are commonly harvested, as are fruits and berries significant to Aboriginal people as staple and fall-back foods (e.g., Kenneally, Edinger, & Willing 1996; Welch 2003). Though subject to major climatic changes over the past 65,000 years (representing the approximate period when people have existed on the Australian continent), the Kimberley would always have offered a rich and varied set of plant resources for Aboriginal gatherer-hunters.



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Figure 1 Vegetation formations of the Kimberley, Western Australia.

Image by Mark Cowan, Department of Parks and Wildlife, Western Australia.

In the context of the colonization of Australia ~65,000 years ago (Clarkson et al. 2017) and subsequently, tubers, roots, and corms may have provided reliable resources for peoples on the move. Root and tuber crops are thought to be of ancient origin and are often regarded as relics of early forms of cultivation (e.g., León 1976, Sandweiss 2007). Species of one yam genus

(*Dioscorea*) were cultivated independently in Southeast Asia, west-central Africa, and tropical America but, under the conventional definition of plant 'cultivation', were never grown in Australia. In the Kimberley, *D. bulbifera* and *D. transversa* were wild harvested, processed, and utilized by Aboriginal people. The generally infertile soils in the Kimberley do not favour cultivation, and the impact of climatic oscillation may have stimulated novel adaptive responses among plants, which people may have manipulated further. This is an underresearched field. Bowman et al. point out that 'The paucity of fossils and palaeoecological studies in the Australian Monsoon Tropics (AMT) makes understanding the biogeographical patterns individually and collectively problematic' (2010: 1-16). Nested within the AMT are centres of endemism and concentrations of species with restricted ranges. This could indicate that areas such as the sandstone plateaux in the Kimberley acted as refugia while elsewhere sea level and climate changed, especially from c. 65,000-10,000 years ago, altering local ecosystems. As aridity increased in the AMT during the Last Glacial Maximum (LGM), peaking c. 19,000 years ago, bulbs would

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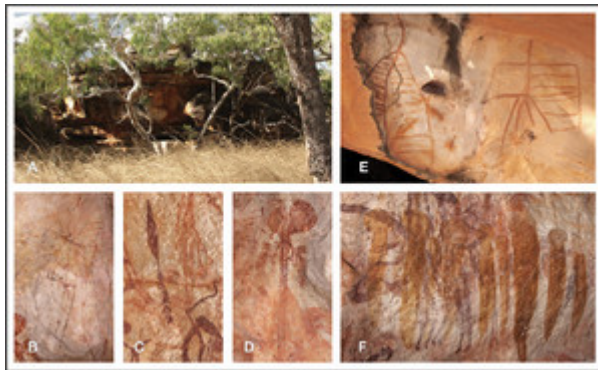
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have had the advantage of being protected from fire, only producing their vegetative structures during the wet season when rainfall was pronounced. The use of fire as a management tool by Aboriginal people would have modified ecoscapes in a constant interplay among people, plants, technology and environmental conditions.

We propose that Aboriginal people in the Kimberley have always placed a premium on the depiction in rock art of plants for economic, ritual, totemic, and potentially other purposes. These are examples of Aboriginal peoples' ecoscaping, with plants being a nexus of social identity.

## Plants in Northern Australian Rock Art

The Kimberley contains tens of thousands of rock art sites spread over c. 423,000 square kilometres (Walsh 2000). Veth, Myers, Heaney & Ouzman et al. (2017) examined the types, distribution, and numbers of plant depictions from 3,750 previously rock art sites (e.g., Figure 2). We use this data from a primary source of archaeological evidence, to develop our understanding of how people-plant relationships developed over time.



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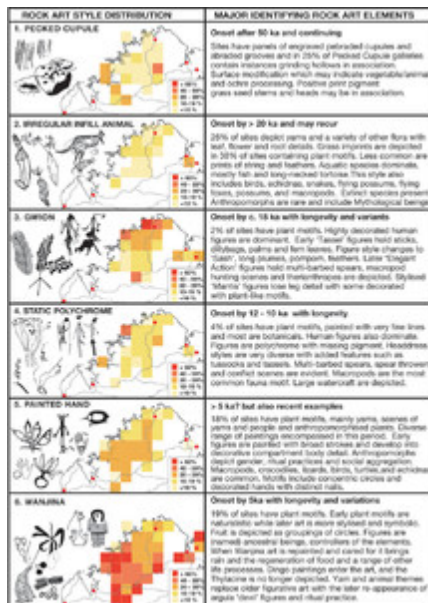
*Figure 2* A) Typical Kimberley rock art shelter. B-F) Plant motifs from different art periods, from oldest to youngest: B—Irregular infill Animal Period; C—Gwion Period; D—Static Polychrome Period; E—Painted Hand Period; F—Wandjina Period.

Image by Pauline Heaney and Takarakka Nowan Kas archive.

Previous research has characterized multiple Kimberley rock art 'styles', which we refer to here as 'Periods'. We acknowledge that absolute dates for Period boundaries are still nascent or missing; that some Periods might overlap temporally and may be clinally transitional and, indeed, may also recur at multiple, discontinuous times (e.g., Brandl 1977: 233–234; Lewis 1988, 1997; Ross, Westaway, Travers,

Morwood, & Hayward 2016; Travers 2015). While new Periods and variants are likely to be identified with further research, the currently identified major Periods provide our study with a working relative sequence (e.g., Walsh 1994, 2000; Welch 1993; although see Ross et al. 2016). We place Kimberley rock art into six main temporal Periods as shown in Figures 2 and 3. The dating and modelling of plant-related Kimberley rock arts (Figure 3) links them to other northern Australian rock arts. For example, iconographic similarities have long been noted between the Kimberley's 'Elegant Action Figures', which are thought to have been produced during or near the Gwion Period, and Arnhem Land's 'Dynamic Figures' (Lewis 1988, 1997; Walsh 2000). These iconographic similarities suggest that geographical, temporal and social connections can be made (Aubert, 2012; Jones, Levchenko, King, & Nayingull et al. 2017; Ross et al. 2016; Travers & Ross 2016; also Watchman 2000). Ross et al. (2016) demonstrate that some Kimberley rock art can be reliably attributed to the Pleistocene. For example, a yam-like motif was dated by optically stimulated luminescence (OSL) to a minimum of  $16,000 \pm 1,000$  years ago. Significantly, another 'star yam' motif was OSL dated to  $650 \pm 100$  years ago (Ross et al. 2016) supports the ongoing importance of yams in Kimberley rock art.

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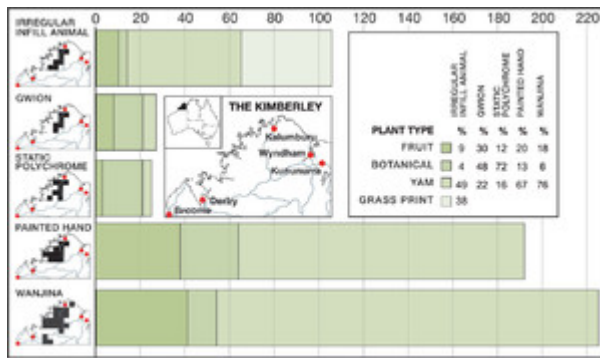
Figure 3 A model for the distribution and proposed dating ranges and characterisation of major Kimberley rock art Periods with plant motifs (from Veth et al. 2017). Distribution maps show percentage of sites recorded on 1:100 000 map sheets that contain art attributed to each Period.

Image by Pauline Heaney and Takarakka Nowan Kas archive.

## Early Plant Depictions in Kimberley Rock Art

Cupules and engraved rock markings have no recognizable plant motifs, though sites with cupules often have an unusually direct presentation of painted plant evidence in the form of grass stems and seeds being dipped in pigment and imprinted onto the rock wall. The grass prints most likely belong to a more recent period, but their apparent selection for cupule sites is here noted and is a worthy subject for future research. Cupules are not plant grinding hollows and often occur on vertical surfaces. The Kimberley's earliest known painted art—the Irregular Infill Animal Period (IIAP)—displays an impressive 25% of sites with plant depictions, comprising yams (49%), grass prints (38%), fruit (9%), and botanical depictions (4%; see Figure 4). As with animal depictions, which occur at 76% of IIAP sites, large, naturalistic plant depictions show diagnostic detail such as roots, tendrils, and flowers. Grass imprints are common and often occur more than 2 metres above rock shelter floors, although their temporal range is not well-understood.

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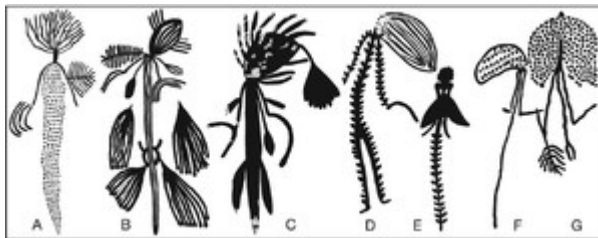
Figure 4 Numbers of sites containing plant motifs, with percentages of different plant types within each major Kimberley painted rock art Period

(after Veth et al. 2017).

The dominance of plants and seeds in this earliest figurative art may index the relative importance of plants as staples during the terminal Pleistocene. The repeated depiction of a select group of plant motifs suggests long-term and particular relationships with those species, which is strongly indicative of ecoscaping.

## **Intermediate and Recent Plant Depictions in Kimberley Rock Art**

Plant motifs decrease dramatically in subsequent Gwion and Static Polychrome Periods, occurring at only 2% and 4% of sites, respectively (Figure 3). Animal depictions also decrease, making this an anthropomorph-dominated tradition with perhaps only the 'mantis' Gwion variant suggestive of plant-human therianthropes or 'phyto-anthropomorphs'. These Periods are currently modelled to date from after the LGM to the early Holocene, a period of significant environmental and climatic change (e.g., Williams, Veth, Steffen, Ulm, & Turney 2015). However, despite low numbers of plant motifs, those plants that are represented are consistently represented as integral parts of complex dress and accoutrements and possibly as body parts (e.g., Figure 5).



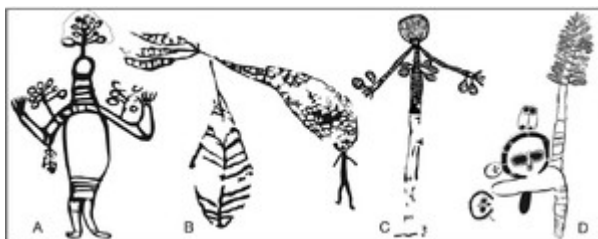
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*Figure 5* Human-plant confluences in the Gwion Period (A-C) and in the Static Polychrome Period (D-G).

Image by Pauline Heaney and Takarakka Nowan Kas archive.

This focus on anthropomorphs individually and collectively performing a range of secular and ceremonial behaviour has been argued to be a product of shifts in information exchange and group boundary formation at the Pleistocene–Holocene transition (Veth.

Myers, Heaney & Ouzman 2017). Current dating of Gwion, Static Polychrome, and Painted Hand Periods points towards a post-LGM to mid-Holocene age range (Jones et al. 2017; Ross et al. 2016; Travers 2015; Travers & Ross 2016). Overlapping distributions of late Gwion and Dynamic Figures in the Bonaparte Catchment from the Kimberley to the Northern Territory (e.g., Taçon, Mulvaney, Fullagar, & Head 1999) suggest a shared cultural landscape during the terminal Pleistocene–early Holocene. Plants show individual anthropomorphs or distinct classes of anthropomorphs associated and even merged with plants, suggesting plants as integral to human identity—a recursive 'scaping' of human and plant identities.



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*Figure 6* Human-plant conflations in Painted Hand Period (A-C) and an important Wandjina Period mythological site with plant motifs (D).

Image by Pauline Heaney and Takarakka Nowan Kas archive.

By the mid- to late-Holocene, Painted Hand and Wandjina Periods show increased numbers of plant motifs, with yams,

fruit, and human-plant therianthropes occurring at *c.* 20% of sites (e.g., Figure 6). Seemingly 'naturalistic' plant depictions often morph into a more symbolic and stylized repertoire. Some yam clusters, fruit (often plum-like), and vines are depicted in large composite scenes which connect Wandjina figures, humans, plants, and totemic beings in possible mythological narratives. Ethnographically informed approaches suggest that these image clusters serve iterative purposes in (re)mobilizing complex origin narratives in which plants may have played a central role.

## **Wild Harvesting, Ecoscapes, Plant Depictions, and Social Relations**

Depictions of yams, anthropomorphized yams, and humans with yam/plant attributes occur in the six main Kimberley rock art Periods (Veth, Myers, Heaney & Ouzman 2017). In Arnhem Land, Hammond (2016) has analysed 335 'phytomorphs' and 120 'phyto-anthropomorphs', concluding that yams played practical and symbolic roles from at least the mid-Holocene and possibly from as early as 7000 BP (cf. Berry 2011). Chaloupka (1993) argues that anthropomorphized 'Yam figures' evolved out of stand-alone yam motifs in Arnhem Land. Welch (2003) describes similar Kimberley motifs between 0.5–10 metres long, while Crawford (1968) provides drawings from Kuri Bay, in the northern Kimberley, of anthropomorphized *kanmangu* or 'long' yams. The anthropomorphizing of plant motifs suggests a level of systematic plant exploitation, management, and co-identification not previously modelled for Australian gatherer-hunters. Atchison and Head (2012) note that systematic harvesting of yams created increasing human–yam co-dependency and, we suggest, co-identification across the Kimberley region and over an extensive period of time; possibly from the time of first colonization as people brought with them existing plant-human ecoscaping strategies.

Ethnography illustrates the centrality of plants in the recent religious and cultural lives of Kimberley people. Petri (2011: 23) outlines how lilies, bush onion, and yams 'play a certain role in the mythical traditions of the tribe.' Schulz (1956) describes a site with numerous plant motifs associated with the depiction of a mythic rock pigeon which carried the yam there, making it an important ecoscape for yam increase ceremonies. In the Kimberley, increase ceremonies (or, more appropriately, 'maintenance' ceremonies), as in many other parts of Australia, were performed at semi-regular intervals to ensure the ongoing fecundity of species and were undertaken by Aboriginal elders of appropriate Dreaming affiliation with both ancestral beings and places. Akerman (2016) reports on supernatural 'yam-spirits' and 'spirit-men of the harvest' associated with plants. Plants were clearly more than food. Whilst valuable information about daily life, climate, and ecology is available through iconographic study of plant-related rock art, a dual approach that integrates vital mundane details into contextualized cultural contexts is required. It is useful to note that plant 'rock art' is not restricted to paintings but also occurs as 'stone arrangements' in which yams and grapevines have been constructed by purposefully placing stones on the ground (Love 1936).

Reliance on known and curated plant stands—as ecoscapes—is, we suggest, predicated on collective plant gathering, processing, and social activity. Making rock art at such 'collective nodes' underwrites larger ceremonial gatherings such as the widespread Kunapipi fertility ceremony, which originated in Arnhem Land, and provides another cultural undergirding (Berndt 1951). Just as the perishable organic component of early lifeways has been underprofiled in northern Australia (e.g., Dilkes-Hall 2014), so, too, has the cultural role of plants. Repeatedly depicted key economic species across all Kimberley

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rock art Periods suggest that northern symbolic landscapes must be reimagined as plant-rich, with human identity as botanically geared (also David, Lamb, & Kaiwari 2014). Reexamining plants in Kimberley and Arnhem Land rock art allows a reframing of both first encounters and subsequent social crafting of a shared cultural identity and landscape. Inherited and pernicious eighteenth- and nineteenth-century European notions of societal evolution do not easily allow for states 'in-between' gathering-hunting and agriculture (see Hynes & Chase 1982). Indeed, ecoscaping is not an 'in-between' state, but a separate socio-economic lifeway, sustained and nurtured over millennia. Increasingly, research is showing a discontinuous spatial and temporal patchwork of societies adopting, modifying, and jettisoning, aspects of plant management—often millennia earlier than has been acknowledged through the often problematic gathering-hunting versus agriculture dichotomy (e.g., Greaves & Kramer 2014). Concepts like ecoscaping also help to normalize interesting but exceptionalized explanations for intensive plant manipulation in the name of, for example, 'competitive feasting' (cf. Piperno 2011). These intense but fluid ecoscaping processes are occasionally caught in archaeological glimpses like Kimberley rock art. These glimpses caution us to be aware of the gaps in our theoretical modelling of cultures other than our own—and spur us on to be more daring in our imagining of them. As Tim Ingold (2000: 198) has suggested

Human beings do not, in their movements, inscribe their life stories upon the surface of nature ... ; rather, these histories are woven, along with the life-cycles of plants and animals, into the texture of the surface itself.

Plants remain an under-researched domain of gatherer-hunter life when compared to other research domains such as archaeozoology. This is in part due to significant issues of preservation, visibility, and gender bias. Encouragingly, recent research is helping bring plants as part of ecoscaping into sharper focus. Plants also remain an under-researched domain of rock art research. We suggest that greater attention to especially agentive and theoretically informed artefacts like rock art, as situated in a wider archaeological and environmental context, offers genuinely new and exciting possibilities for innovative insights into past human adaptations, including emic animal-plant binaries and perhaps gendering of rock art and its makers.

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