Persistent Places and Places of Memory: Archaeological Markers of Long-term Connection to Country in the Inland Pilbara, Western Australia

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Introduction: Mobility, Tradition and Memory in Arid Western Australia

Mobility is a key feature of hunter-gatherer societies. Ecological approaches to the analysis of archaeological settlement patterns generally focus on economic principles and environmental variables. However, hunter-gatherers move through the landscape to fulfil not only economic needs, but also a range of social and religious obligations (Oetelaar and Meyer 2006; Whallon 2006). Movement across the land follows "a network of paths connecting important places on the landscape" (Oetelaar and Meyer 2006: 356). Ingold's metaphor of significant places as nodes in an interwoven 'meshwork' of entangled journeys stresses that travelling through the land does not simply 'connect the dots', but is intrinsically a

creative act, contributing to the fabric of the world (2007: 83–84). People thus transform a natural landscape into a cultural landscape by interweaving their actions with the distribution of resources and landforms.

In Aboriginal Australia, the sacred geography expressed in the Dreaming is a clear and well-known example of the transformation of a natural into a cultural landscape. For Aboriginal people, ancestral creative spirits travelled the land during the Dreaming, shaping and naming the land, creating all the people, plants, animals and places within it and establishing the Law. The Law prescribes how creation must be sustained and nurtured so that humans may prosper. Songs, stories and ceremonies recount the journeys and acts of the creative ancestors and their performance at appropriate times and places is crucial to caring for the land. A web of relationships and obligations thus connects land and people (Bradley 2008). The whole landscape is imbued with meaning for the knowledgeable: the spiritual and the ecological are inextricably entangled (Lewis 1976). This socialisation of the natural landscape is commonly expressed as 'Country'. Aboriginal people commonly talk about Country as they would a person. Country is a "living entity with a yesterday, today and tomorrow, with consciousness, and a will toward life. Because of this richness, Country is home, and peace; nourishment for the body, mind and spirit; heart's ease" (Rose 1996:7).

It is a common feature of mobile societies that particular sites, localities or even whole regions remain unvisited for a range of cultural and practical reasons and for different periods of time. Some absences occur as part of the regular scheduling of seasonal activities. Other absences may last for longer periods. In arid Australia, drought is undoubtedly a major factor affecting large tracts of land that may remain unvisited for years or even generations (Veth 2003). Arguably, the knowledge encoded in the Dreaming provides a mechanism for maintaining and passing on information, in order to maintain connection with Country through such periodic episodes of 'abandonment' (Holdaway and Allen 2012). In Australia's Western Desert, for example, the *Jukurrpa* (Dreaming) explains the creation of the landscape and maps the location of water sources, as well as defining people's identity and locating them within a network of rights and obligations to Country and kin (McDonald and Veth 2013a).

Rock art is well recognised for its role in socialising landscapes through placing marks on the land (McDonald and Veth 2012; Taçon 1994). For example, the recursive nature of art practice and shared graphic vocabulary in a variety of media, including painted rock art and recent crayon drawings, illuminates long-term Martu cultural attachment to place over the last 5000 years at *Jilakurru* (also known as Durba Hills) in the Little Sandy Desert of Western Australia (fig. 1). The presence of older engravings, which Martu people today identify as part of the Dreaming, no doubt extends this cultural landscape even further back in time (McDonald and Veth 2013a). Clearly, however, locations with rock surfaces suitable for rock art production and preservation are necessary to communicate the presence of a cultural landscape. In other locations,

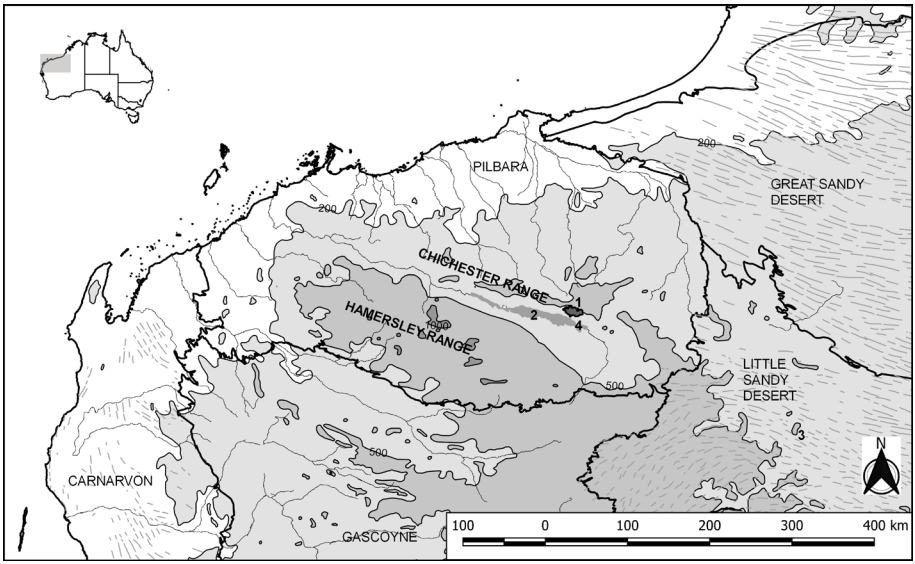

Fig. 1. North-west Australia, showing bioregions, based on Interim Biogeographic Regionalisation of Australia (IBRA) (after Thackway and Cresswell 1995), and places mentioned in the text. 1. Christmas Creek study area. 2. Fortescue Marsh. 3. Jilakurru (Durba Hills). 4. 14 Mile Pool. Base map data: Geoscience Australia. (Archae-aus Pty Ltd.)

forms of art such as earth and sand drawings, and stone arrangements, also mark the land, although only the latter will survive over time. Whether other types of archaeological evidence can be characterized in terms of marking the land, thereby signposting the transformation of a natural into a cultural landscape, has not been sufficiently explored in Australian archaeology.

The Study Area

The Pilbara biogeographic region in the north-west of Western Australia extends from the Indian Ocean coast inland to the Great and Little Sandy Deserts (McKenzie et al. 2009) (fig. 1). In contrast to the sandy deserts to the east, the terrain is dominated by uplands and ranges, and drained by major river systems, which provide relatively well-watered corridors into the arid interior. The Pilbara, like other arid regions, is characterized by high annual and inter-annual variability in rainfall. Prolonged periods of drought, punctuated by extreme flooding events resulting from tropical cyclones, create a 'boom-bust' environmental productivity cycle (Rouillard et al. 2015).

Palaeoenvironmental proxies from the Pilbara are scarce. Evidence for mid-Holocene aridity, often associated with the intensification of the El Niño-Southern Oscillation, is, however, widespread in northern Australia (McGowan et al. 2012; Reeves et al. 2013; Shulmeister and Lees 1995; Williams et al. 2015). A postulated collapse of desert populations in central Australia about 3000 years ago has been linked to these changes (Smith et al. 2008). In the inland Pilbara, the only local record comes from 14 Mile Pool, which today is a perennial pool on the Fortescue Marsh, located about 15 km south-east of the study area. The Fortescue Marsh is the largest wetland of inland Western Australia, but its hydrology is highly variable and unpredictable. Over the last century it has been dry roughly four in every ten years on average and droughts occasionally continued for several years (Rouillard et al. 2015). During this period, major flood events resulting in surface water persisting locally for 12 months occurred one year in four on average. The 14 Mile Pool sequence covers about 2000 years and indicates that the wettest conditions, with more regular inundations of the Fortescue Marsh and recharge of groundwater within

its catchment, have occurred within the last 400 years (Rouillard et al. 2016). By contrast, severe drought conditions prevailed from before 2000 years ago, lasting until about 1200 years ago. The period from 1200 to 400 years ago saw a trend towards wetter conditions and climatic amelioration. This general pattern is consistent with broad Holocene climatic trends in northern Australia (Fitzsimmons et al. 2013).

Archaeological investigation in the inland Pilbara has focused on the Hamersley Range, and is primarily associated with mining development. To the north, lies the less-explored Chichester Range, the southern reaches of which border the Fortescue Marsh. The Christmas Creek study area, which is the focus of our investigations, lies in the foothills of the eastern Chichester Range (figs. 1 and 2). The traditional owners of the study area are the Nyiyaparli, whose Country includes the Fortescue Marsh, the Fortescue River upstream of the Marsh plus its headwaters, and extends eastward as far as the edge of the Little Sandy Desert and the Country of their Martu neighbours. Archaeologists from heritage consultancy firm Archae-aus Pty Ltd conducted compliance surveys in association with the development of Fortescue Metals Group's iron ore mining operations at Christmas Creek from 2006 to 2012. This resulted in an intensive field survey of 430km^2 and the recording of hundreds of new sites in the foothills and adjacent alluvial plains. Most sites are surface artefact scatters but there are also 38 rock shelters with surface cultural remains, sub-surface cultural deposits, or both (Bird and Rhoads 2015, in press; Dias and Rapley 2014).

Rock Shelters in the Christmas Creek Study Area

In advance of development at Christmas Creek, test-pitting formed part of the site assessment procedures. This showed that 19 rock shelters had subsurface deposits. A further 19-some with multiple chambers-had surface cultural material, stone features, or both (fig. 2). There are also overhangs, cavities or clefts that are too small to be considered habitable, but may contain cultural material or stone features. Rock shelters often occur in the sides of gullies within outcrops of banded iron formation or conglomerates. Ephemeral creeks, sometimes with rock holes or soaks, occur in the valley bottoms. These rarely flow, and rock shelters with

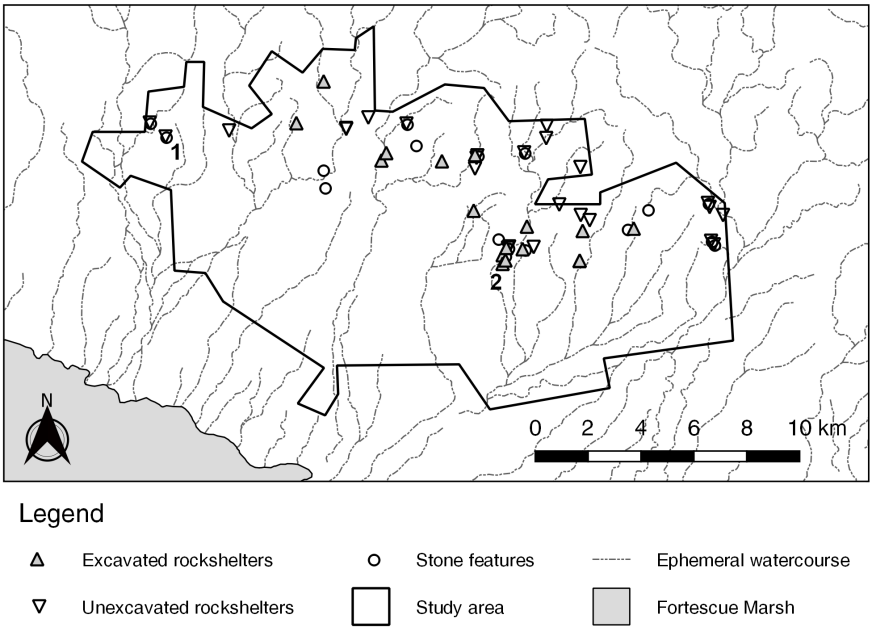

Fig. 2. The Christmas Creek study area showing locations of shelters and stone features. 1. CB08-103 site complex. 2. Kakutungutanta Creek. (Archae-aus Pty Ltd.)

surviving evidence of occupation are located above the level at which occupation deposits would be subjected to scouring by occasional flood waters. Most rock shelters are small, whether they have excavation potential or not (mean floor area 47.5m^2±68.9, range 1–352m^2), and deposits are shallow (mean 29cm±19, range 11–87cm) (Dias and Rapley 2014). The only difference between rock shelters with accumulated archaeological deposits and those without is in aspect, or direction the entrance faces. Shelters with accumulated deposits usually face either east, or more often, west, while shelters with only cultural material or stone features are more commonly north- or south-facing (fig. 3). Although paintings and engravings occur elsewhere in the Pilbara region, the banded iron formation bedrock in the Christmas Creek area is not conducive to rock art production or preservation.

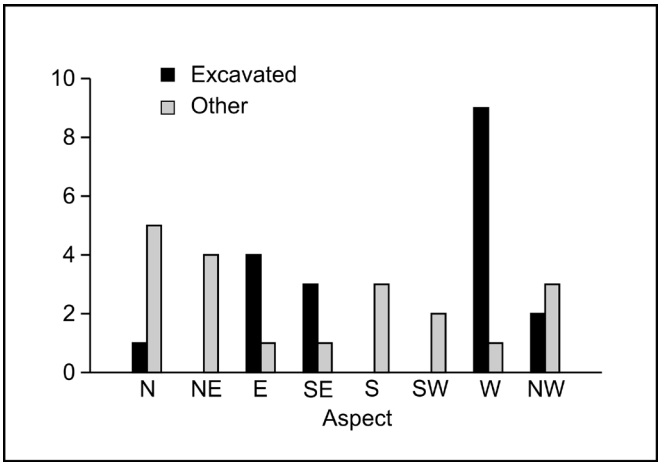

Fig. 3. Aspect of shelters in the Christmas Creek study area. (Archae-aus Pty Ltd.)

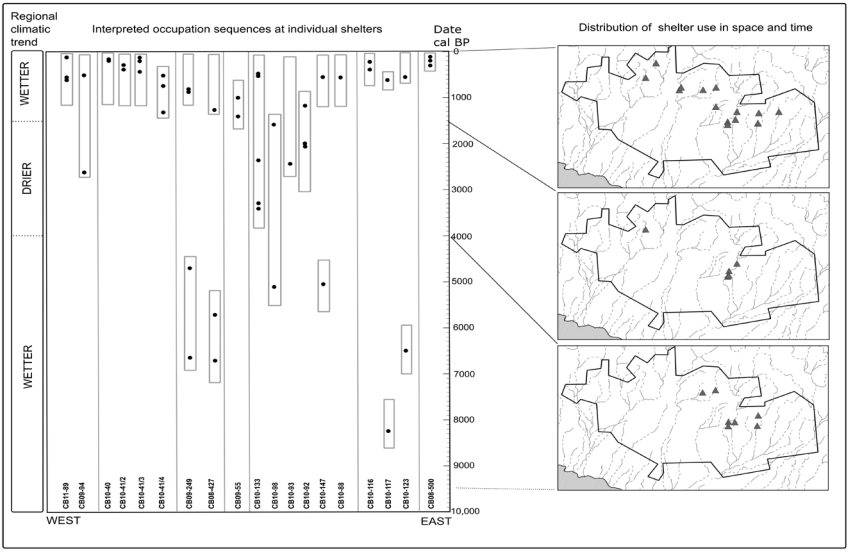

Fig. 4. Summary of inferred occupation history and distribution of individual excavated rock shelters at Christmas Creek in relation to local environmental change. Points are median calibrated radiocarbon dates. (Data from Bird and Rhoads, in press).

Holocene archaeological evidence from the distribution of dated episodes of occupation in the 19 excavated rock shelters in the Christmas Creek study area shows a pattern of expansion and contraction in visits to the area, broadly synchronised with inferred climatic change (fig. 4) (Bird and Rhoads, in press). Evidence of Early Holocene occupation is widely distributed and occurs at a few rock shelters. This can be interpreted in terms of small groups with a wide-ranging foraging pattern, moving out of possible refuge areas in the Hamersley Range, to take advantage of more reliable water availability. About 4000 to 2000 years ago, coinciding with a period of extreme aridity, the only evidence of shelter use occurs in a single creek system—Kakutungutanta Creek, where three out of the six excavated shelters show evidence of continuing use from about 4000 years ago. Around 1500 years ago, inhabited shelters become widely distributed in our area of study. Some shelters are used again after a period of abandonment, while others are used for the first time. At this local level, there is clear evidence for the reorganisation of land-use patterns in response to periodic drought conditions, resulting in absence from particular key localities or very infrequent visitation with little to no archaeological visibility.

Structural Features

A range of structural features was recorded in association with the Christmas Creek rock shelters (fig. 5). Such features occur widely in the Pilbara and numerous functions have been documented or suggested, including storage, burial and hunting (Wallis and Matthews 2016). Clearing roof fall to create living space, use of stones to support windbreaks, and stacking stones to access high ledges and niches can all produce structural features. Where shelters have multiple entrances, one or more may be blocked with stones to prevent prey from escaping. However, by far the most common documented use is storage, with walls or individual stones used to block access to areas of varying sizes. Some cairns also created spaces for storage. The use of caves and shelters for storage of ceremonial items is well documented in the region, while personal gear and food were also stored in these places (Akerman 2006; Bindon and Lofgren 1982; Kimber 1981: 16; Smith 2002: 70–71; Tindale 1974: 239; Wallis and Matthews 2016:

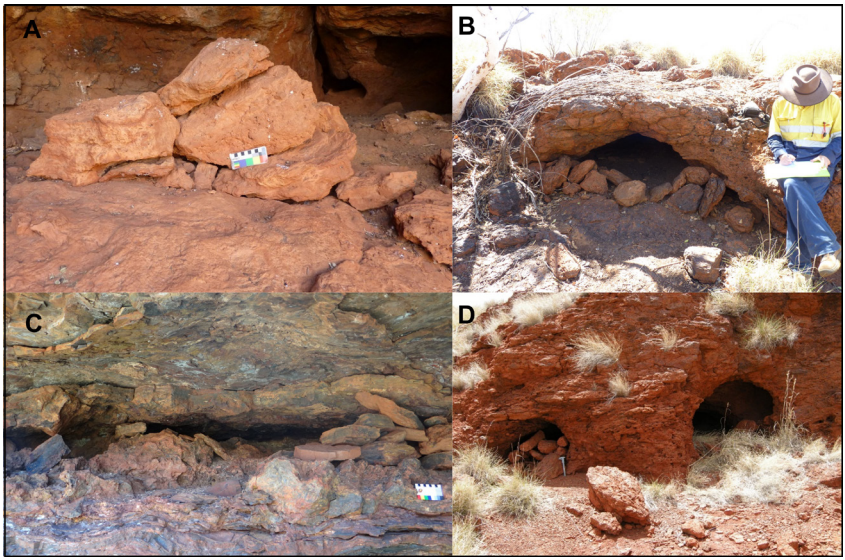

Fig. 5. Examples of stone features. A. Cairn (CB09-250). B. Walled enclosure (CB10–42). C. Walled niche (CB09-264). D. Rockshelter with two entrances, one blocked (CB08–509). (Photographs by Archae-aus Pty Ltd.)

4–5). There are accounts of stone walls built to exclude dogs from food stores in shelters (Brown 1987: 17).

In the study area, most stone features were walled enclosures that blocked off a part of the shelter or one of the entrances to a shelter (Bird and Rhoads, in press) (fig. 5, B, D). There were also smaller walled niches and cairns (fig. 5, A, C). Most seem to be for storage, although Nyiyaparli people attribute some to hunting. None of the structures in our study area had other associated cultural material. While some storage is clearly short term, the existence of these structures indicates an investment in facilities that can be repeatedly reused and an intention to return to that place.

Surface Artefact Assemblages in Shelters

The surface assemblages in the rock shelters generally differ from both excavated assemblages and surface scatters (Bird and Rhoads, in press). A typical surface scatter in the study area is flake-dominated. In contrast,

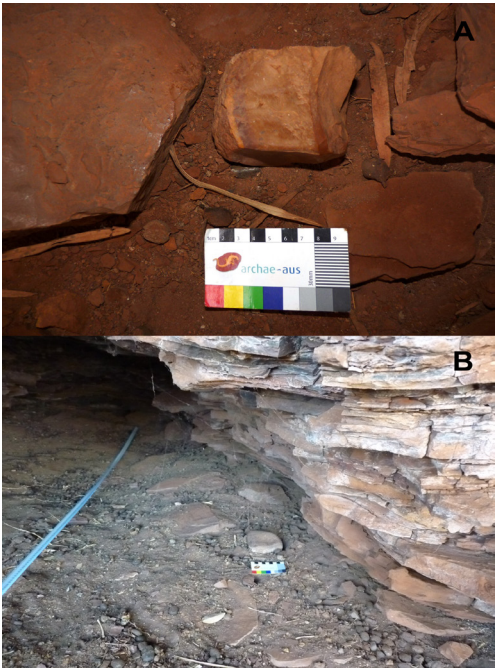

Fig. 6. Examples of artefacts stored in shelters. A. Cached single platform core (CB11-108). B. Lower grindstone placed near shelter wall (CB10-41/2). (Photographs by Archae-aus Pty Ltd.)

scatters within shelters—whether they have excavation potential or not—contain mostly grinding material (millstones or mullers), cores and hammer stones, as well us unmodified stones, or 'manuports', deliberately brought to the site (fig. 6). In some cases, the only surface artefacts in the shelter are cores or manuports. Sometimes they are just lying on the floor, but they can also be cached in the back of the shelter, or on a ledge. In several cases, there is a typical surface scatter on the slope outside the shelter, while the shelter itself may only contain a couple of cores or a manuport. Occasionally, pieces of wood have also been cached in the shelters.

Clearly, these are not typical flaked stone assemblages dominated by waste flakes, nor have the cores been discarded because their potential for flake removal was exhausted. Rather, these cores and manuports seem to represent deliberate provisioning of these places with supplies of raw material for planned future use. Moreover, this is a landscape where

suitable raw material for flaking is commonly encountered. Thus, the presence of raw material that has been translocated and already prepared in a specific shelter can be viewed in terms of the use of material culture to 'mark' the place (cf. Wragg-Sykes 2012).

Millstones or mullers were found in several shelters. In one case, at CB09–83, a dolerite muller was cached in a niche within the shelter wall. Ethnographic evidence from the Western Desert indicates that millstones were often left in shelters or other regular camping places for future use (Gould 1980: 10, 71–72; Nicholson and Cane 1991; Tonkinson 1978: 33). This practice is also documented in the Pilbara (Guruma Elders Group et al. 2001: 87–88). Palmer (cited in Brown 1987: 45) suggests that women may have used rock shelters for milling seeds during windy conditions. Like stone features, grinding stones are facilities or site furniture. Like raw material supplies, they mark the place and indicate the intention to return.

Site Complexes

Rock shelters often occur as part of site complexes within rocky landforms. Such complexes may include several shelters with surface cultural features and/or subsurface cultural deposits. Clearly, the distribution and configuration of shelters is primarily related to surface geology. Shelters that are close to one another often seem to represent different and complementary uses, and are commonly clustered with other types of site, including surface artefact scatters and quarries (Bird and Rhoads, in press).

CB08–103, in the west of the study area, is an example of a site complex. It comprises two small rock shelters, a stone arrangement and a surface artefact scatter (Bird and Rhoads, in press). The shelters occur on the north face of a prominent rocky hill that commands a wide view of the surrounding terrain (figs. 7 and 8). Neither shelter is sufficiently large to use as living space and neither has accumulated archaeological deposits. Shelter A faces north and has a second chamber. Two openings in the western wall of the main chamber are blocked off by stacked roof fall. A hammer stone, a chert single-platform core and a complete banded iron formation flake were discovered within the shelter; two additional

hammer stones were found on the talus outside. Shelter B is a small, single-chambered north-east facing shelter. Five chert flakes were recorded at its entrance. The stone arrangement on the hill-top immediately above the two shelters comprises banded iron formation cobbles and boulders up to 40 cm in size stacked to form an east-west aligned structure 8 m long, 5 m wide and about 0.5 m high (see fig. 7B). The chert-dominated artefact scatter includes several concentrations, including three interpreted as reduction areas. The densest concentration was recorded about 25 m east of the rock shelters and included a dolerite anvil and three hammer stones. In this complex, the shelters provided storage, shown by the stone features, core and hammer stone within Shelter A, while other activities clearly occurred throughout the general area.

While the use of CB08–103 is undated, other site complexes in the Christmas Creek study area attest to varied histories of occupation. Along Kakutungutanta Creek, for example, continuity throughout the Holocene

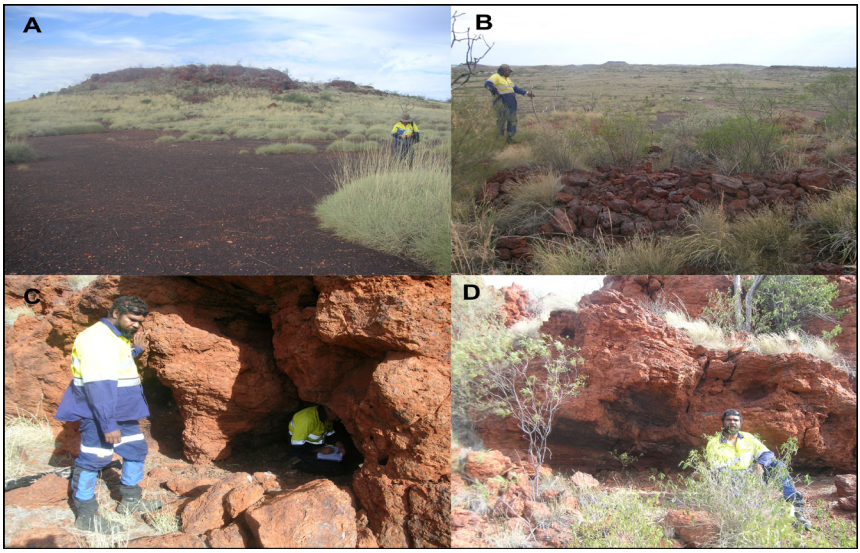

Fig. 7. The site complex at CB08-103 and its landscape setting. A. General view of prominent rocky hill, looking towards the two shelters. B. View of surrounding country from the stone arrangement immediately above the two shelters. C. Shelter A. D. Shelter B. (Photographs by Archae-aus Pty Ltd.)

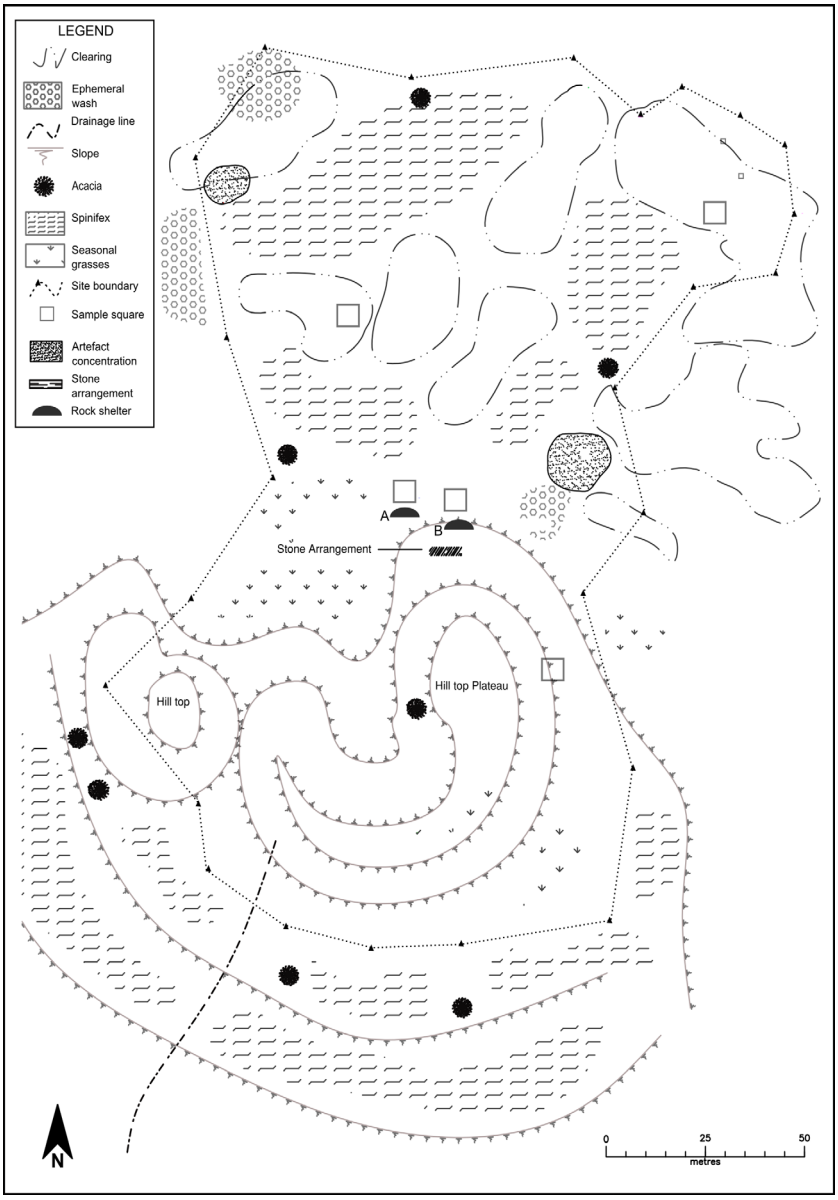

Fig. 8. Plan of the CB08-103 site complex. (Archae-aus Pty Ltd.)

is documented in archaeological deposits from several shelters, even though most of them have intermittent histories of individual use (Bird et al, in press). By contrast, other creek systems in the study area appear to have an intermittent occupation history, with an episode of 'abandonment' through the period of extreme aridity during 4000 to 2000 BP. Increasing frequency of flood events in the Fortescue Marsh over the last 1200 years offered opportunities for groups using the nearby ranges, resulting in a more widespread and diverse archaeological signature. Previously used shelters were once again visited, while other nearby shelters were used for the first time (see fig. 4) (Bird and Rhoads, in press).

Discussion and Conclusions

Most rock shelters with cultural remains in the Christmas Creek area have either shallow or no occupation deposits (Bird and Rhoads, in press). This pattern is typical for the Pilbara uplands and, together with ethnographic information about rock shelter use in the region, has encouraged archaeologists to view them as ephemeral sites and unrepresentative of past Aboriginal use of the landscape (Bird and Rhoads 2015; Ryan and Morse 2009). The evidence discussed here suggests that this view is too simplistic. Shelters that are close to one another commonly represent different and complementary functions, and are often associated with other site types, including surface artefact scatters and quarries. Provisioning and storage, documented both by structural features creating storage spaces as well as by the presence of raw material supplies and grinding material intended for future use, demonstrate regular and repeated use for a range of tasks. The co-occurrence of different archaeological features at a specific topographic location requires them to be considered as site complexes rather than discrete sites. These site complexes can be characterised as 'persistent places' or the "conjunction of particular human behaviours on a particular landscape" (Schlanger 1992: 97), where topographic features such as rock shelters, and their use as storage facilities, serve to focus long-term repeated visitation of particular localities. This is consistent with ethnographic evidence from Australia that shows complex and differentiated use of space focused on localities at a scale much larger than conventionally defined archaeological sites (Memmott 2002; O'Connell 1987; Pickering 2003).

Structural modification of some shelters can be viewed as a form of marking the land, and implies that they formed part of socialised landscapes (cf. Taçon 1994). Similarly, provisioning with prepared supplies of raw material and grinding stones serves to mark them as localities within a cultural landscape, and in turn shapes long-term associations with particular shelters through time (Bond 2009; Wragg-Sykes 2012). Undoubtedly, the visibility and permanence of these places in the landscape made them foci of attention and places of memory (Bailey and Galanidou 2009). Rock shelters can thus be viewed as fixed and prominent landscape features offering contingent opportunities for occasional shelter and storage. Although archaeological evidence of use for individual shelters may appear ephemeral, in fact their use was primarily logistic. These persistent places formed long-term nodes in a network of planned visitation. They are the knots within the meshwork of repeated visits by Nyiyaparli and their ancestors over perhaps millennia.

This pattern of complex sites, provisioning places and structural modifications can be identified in other parts of the inland Pilbara. For example, distinctive surface assemblages comprising cores and manuports as banks of raw material, as well as grinding material and even spinifex resin, have been documented in several rock shelters in the Hamersley Range (Brown and Mulvaney 1983; Brown 1987: 23, 29–32; Veitch et al. 2005). We have already noted that stone features are widespread (Wallis and Matthews 2016). Rock art and stone arrangements appear elsewhere in the region (Hook and Di Lello 2010; McDonald and Veth 2013b). Bedrock grinding patches, which also occur widely in the Pilbara but are absent at Christmas Creek, might also have played a role in marking the land (Fullagar and Wallis 2012; Fullagar et al. 2017; Reynen and Morse 2016).

In the Christmas Creek area, structural modification of shelters and strategic placement of artefacts exemplify the creation of a cultural landscape, and the establishment and maintenance of long-term connections to Country. These memories of particular places persisted despite substantial reorganisation of land use, including periods of 'abandonment' of whole areas, linked to extended periods of aridity. Moreover, the intentional placement of artefacts and facilities serves to affirm long-term associations

with specific places in the Chichester Range. This behaviour, documented here for Nyiyaparli Country, is comparable to rock art sites in the neighbouring Martu Country in the Little Sandy Desert (fig. 1). There, iterative and repetitive elements of practice displayed in rock art facilitate the transmitting of information, and affirm Martu custodianship and responsibilities to particular places over thousands of years (McDonald and Veth 2013a).

Of course, a temporal dimension, evident in both relative and absolute chronology, can often be inferred for rock art and this implies ongoing connections between a group and their country. By contrast, there is little evidence at present with which to date stone features or cached artefacts at Christmas Creek, other than that they certainly relate to the most recent use of these sites. Dating stone features is difficult and the limited evidence available from elsewhere in the Pilbara region also suggests they date to the last 1000 years (Wallis and Matthews 2016). However, identifying stone features and stored artefacts in datable contexts also presents considerable difficulties. At Christmas Creek, the strong spatial association of intermittently used rock shelters and evidence for persistent places offer compelling grounds for suggesting a considerable timescale for this behaviour. Therefore, we suggest that, like rock art, structural features and material culture evidence for provisioning places associated with prominent landscape features at Christmas Creek also mark the land in ways that suggest long-term connections between people and Country. Marking the land in these diverse ways is a critical part of Aboriginal lifeways that allows them to successfully navigate the uncertainties and risks of living in the desert and semi-desert regions of Australia

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