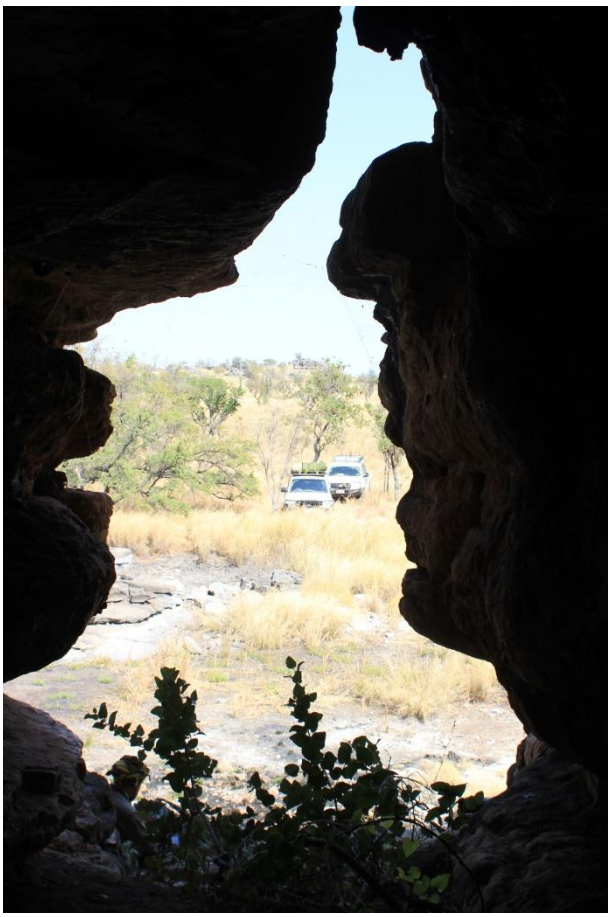
Burrudi yatharra thirrili ngarri. Still Here. Still Strong.

Continuity and Connections. Rock art in Bunuba and Gooniyandi Country, Kimberley, Western Australia.



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Abstract

This research investigated whether the rock art in the southern Kimberley region (northwestern Australia) reflects the geographic and linguistic differences that have differentiated the Bunuba and Gooniyandi people from their neighbours over time.

Until the *Lifeways of the First Australians* Project, 2011-2015 (LP100200415), there had been limited archaeological investigation in the southern Kimberley. Two sites dated to >40,000BP, revealed a deep antiquity for the region (Balme 2000; O'Connor 1995). In addition, a dense assemblage of rock art from the region has been mentioned and discussed in the past (e.g. Donaldson 2013; Playford et al. 2007), but its broader significance in understanding the complexity of the past lifeways of the Bunuba and Gooniyandi people has yet to be explored. Given rock art's ability to act as symbolic markers to encode information about how people expressed their ideas and identities, and communicated with others, my thesis systematically investigated the role rock art played in shaping the southern Kimberley cultural landscape.

Between 2011-2012 I worked with Bunuba and Gooniyandi people at 43 sites across c.18,000km^2 to document their rock art, and classify motifs and styles for more than 2,000 rock art images. Data analysis was undertaken using a hierarchical classification system with nine motif classes, refining those through analysis of the form, attributes, and compositions, and their meaning informed by Traditional Owners. Superimpositions were identified in situ and further unravelled with digital analysis. Harris Matrices were used to visualise superimpositions and analyse changes in styles and motifs over time while a spatial analysis was used to identify patterns of motifs and styles across the region.

Using Information Exchange Theory (Wobst 1977) as a framework to explore how people communicate through shared motifs and style, I demonstrate there are likely affinities between the southern and north/northwestern Kimberley for c.5,800 years (Veth et al. 2021), based on stylistic similarities of distinctive *Waliarri* motifs in Bunuba Country and *Wanjina* motifs in Ngaranyin/Unggumi Country.

Spatial analysis shows that concentrations of styles and motifs occurred in distinctive patterns; large sites with rock art and large floor spaces were surrounded by a number of small sites with rock art and space for small families. There are more of these groupings close to the Bunuba/Unggumi border than elsewhere in the study area, likely meeting places where ideas exchanged, resulting in greater similarities in the rock art motifs in the border areas than elsewhere in Bunuba and Gooniyandi Country.

Chronological analysis revealed that *Waliarri/Wanjina* motifs were visible in all superimposition layers, interspersed with a range of other styles and motifs, as well as superimposed on themselves, suggesting that the alliances formed and information exchanged has been maintained over time through its repetition in the rock art. Local styles are more recent, but contemporary with *Waliarri/Wanjina* motifs. Bunuba and Gooniyandi people use their rock art to communicate that they are allied with their neighbours, while they maintain and express their own unique identities.

Declaration

I certify that this thesis:

1. Does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any university
2. And the research within will not be submitted for any future degree or diploma without the permission of Flinders University; and
3. To the best of my knowledge and belief, does not contain any material previously published or written by another person except where due reference is made in the text.

Jane Louise Fyfe

Date: 6 March 2025

All drawings, CAD plans and diagrams unless otherwise acknowledged have been created by Jane Fyfe.

Unless otherwise cited or acknowledged all photographs (including enhancements) in this thesis have been taken by Jane Fyfe.

Acknowledgements

It has been a long trek. It seemed like it could go on forever. Finishing a major study on the rock art in the southern Kimberley does not come without many contributors and lots of support and the following, in no order of importance, have been part of it along the way.

A huge thank you to Joakim Goldhahn who took on the task of getting me through the last three years when even I had almost given up on getting this finished. His support and encouragement, constructive feedback and discussion made me feel like an adult with a brain again, and I could not have done it without him.

My thanks to Liam Brady and Daryl Wesley for taking on supervision, along with Joakim, to get the research finalised and ready for submission through Flinders University. Liam was my supervisor in the first year, getting me started with a framework for systematic analysis of rock art and encouraging me to write and publish my work, and his support and guidance in getting over the final hurdles and making the whole thing make much more sense was second to none.

Without Jane Balme (*aka* General Jane) this would never have been possible. Jane provided the opportunity and support to be part of the *Lifeways of the First Australians*. My thanks for taking on a raw recruit with no idea what she was doing or would get out of it, an inspiration for women in archaeology.

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Sincere thanks to David and Ann Welch who were generous with photographs, discussion and information on the *Yam* people which populate the rock art in other areas of the Kimberley. Thanks also to Pauline Heaney & CC Myers for access to digitised images from the Grahame Walsh collection.

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particularly those who helped with some rock art recording in 2012; especially India Ella Dilkes-Hall, B'Geella Romano and Brett Nannup. Thanks to the crew who came out in 2012 from ANU to help with excavation, surveying and just being generally great fun, Pushke, Rosie and Ella, and Tiina Manne who came up just in case there were faunal remains and boiled the life out of barramundi from Bandilngan just to get the bones.

Thanks to the Traditional Owners for welcoming me to Country and working with me through two seasons of field work, sharing their culture and rock art along the way and their support beyond. In Bunuba Country, June, Marylin, Raylene & Mona Oscar, Selena Middleton, Patsy Bedford, Kaylene Marr, Jasmin, Kevin, Dylan Andrews and family, Christopher Dann, Kamika Oscar, Johnny Bell, Natalie Davey & the Bunuba Rangers. In Gooniyandi Country, Lorraine, Jimmy and the whole Shandly family, Isaac Cherel, Tommy Dick, Rosemary Nuggett, Mervyn Street, the late June Davies (Bunuba/Gooniyandi superwoman), Dorothy Surprise, and Helen Malo.

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UWA Ethics Approval RA/4/1/5159

All subsequent research was self-funded while I was caring for sick aged parents.

Glossary

I have chosen, following discussions with Traditional Owners, to use the Bunuba and/or Gooniyandi names for places, features and flora and fauna wherever I can. In the past Traditional Owners have been protective of Country and had different relationships with archaeologists. They have not always been willing to either share the traditional names or to have them published. This glossary lists the Bunuba/Gooniyandi names and the English names for previously used/published English language names, as well as providing information on specific terminology that will be encountered in this thesis.

Glossary

Aboriginal

Indigenous, Aboriginal or Aboriginal people are the preferred terms in Western Australia, wherever cultural/language group names are not used. They are interchangeable with Aboriginal and/or Torres Strait Islander people, ATSI people, Indigenous or Indigenous people in other contexts. Aboriginal is the predominant term used in this thesis (as advised by Elders in Noongar Boodjar where I live). Indigenous is also used in generic contexts.

Ancestral Beings

This term is used to describe the creators of the land, water and sky. There are many stories which tell how Ancestral Beings rose up from the earth or came from the sky to create and mark the land.

In the Kimberley they played and fought with one another. They were good and bad, and their behaviours were used as lessons for humans when they were turned into birds or stars, or rocks and waterways. Ancestral Beings never leave. They exist in and of the land and are with Aboriginal people all the time providing them with their knowledge of the land, their sense of being part of it and guiding them in how they look after it, interact with it, exploit it and live in it.

In some places these are also called Culture Heroes (Brady 2010:44-45; McDonald 1994). In others the Ancestral Beings themselves are also known as Dreamings (Brady et al. 2016; Brady et al. 2024) and, like in Gooniyandi Country, they are manifest in natural features (Pannell 2000), plants and animals as well as preserved on the rock faces in paintings and engravings.

Anthropomorph

Figures resembling or with recognisable human attributes. This includes body parts that are definable as human, such as hands, feet, digits, heads, facial features, bodies, limbs with human musculature, genitalia, hair. This does not include stencilled human hand or feet

which in this study are classified as tracks.

Bandaral ngadu — The Fitzroy River (Bunuba). Note this is also shown on maps with the Nyikina name Martuwarra, which is more often used on published maps.

Bandilngan — Windjana Gorge.

BP and cal BP — BP and calBP are both used in this thesis. BP indicates dates Before Present (before 1950) in accordance with standard archaeological practices. In this thesis I have chosen to use the +/- convention for dates. Published dates and dates provided by different laboratories vary in which convention they follow, so the dates in this thesis will not always look identical to those in publications.

calBP indicates calibrated dates Before Present. This means that a radiocarbon date has been calibrated against a radiocarbon curve which accounts for atmospheric fluctuations over time and reduces uncertainty in radiocarbon dating. The current curve used for calibration (terrestrial) in the southern hemisphere is known as SHCal20. Where calBP dates in this thesis have used other calibration curves the sources are cited in table notes.

The use of calBP and BP is dependent on the source of the dates either in publication or laboratory reports as cited and noted after tables presenting such dates.

Ceremony — Ceremony encompasses a range of activities including dance, song and story telling, and is central to continuity of connection to and maintenance of Country. Ceremonies which include singing and dancing often involve body decoration, from painted symbols and use of specific colours to headdresses, cloaks and other accoutrements which vary across cultures. The purpose of many of these community wide ceremonies is to pass on knowledge, share and reinforce cultural practice. Ceremonies may include a single cultural group, many related or neighbouring groups, the wider community of non Aboriginal people or be limited within families, genders or specific people (e.g. see Elkin 1930b;1977; 1979:30; Welch 1997).

Ceremonies are conducted for a variety of reasons ranging from birth and death to marriage and initiation and ultimately connecting with ancestors and Ancestral Beings. Such ceremonies can be related to

rock art too, for example, Elkin describes the process of the 'Wondjina' being painted and refreshed as important for producing rain, and the female forms as promoting birth (1930b: 350-351, see also Blundell & Woolagoodja 2012; Mowaljarlai 7 Peck 1987; Mowaljarlai et al. 1988; O'Connor et al. 2008; Woolagoodja 2020).

In modern life Indigenous people continue to have ceremonies to share culture, art, dance and story telling, often shared with the wider community. In the Kimberley the Mowanjum Festival in the (https://mowanjumarts.com/festival) has been running annualy since 1999 inviting the whole community to enjoy, learn about and celebrate Mowanjum culture and art through story-telling, song and dance. In the south central Kimberley the Gaadmungungardi Festival runs intermittently at different venues across the region Centre (by Kimberley Aboriginal Law and Culture Centre which is based in Fitzroy Crossing) where 'the elders call their people to one place so they listen and learn the stories, songs and dances that connect them to the land' (KALACC n.d). Other ceremonies such as smoking and water ceremonies are a form of cleansing, which welcome visitors to country and ward off evil spirits.

To Aboriginal people in the Kimberley ceremonies keep the land alive, keep it strong and therefore keep the people strong (KALACC 1994). In the early twentieth century anthropologist/botanist Herbert Basedow observed ceremonies in the Kimberley in which the dancer 'endeavour[s] to commune with the spirits of his dead … and he beseeches his deities to protect his person and to bless his haunts with an abundance of game' (1925: 372). These ceremonies, the connections with ancestors and their care of the land are among the reasons it suggested for the depiction of ceremonies in rock art in the Kimberley and northern Australia (Welch 1997).

Country

In the Australian context 'Country' is the term used by Indigenous people to describe the land which their ancestors (and they) occupy, own and look after as an intrinsic part of their cultural obligations and responsibilities, and to which they are forever connected. It is sometimes referred to as a tribal area, a Native Title area, ancestral lands, territory, or the land.

Country is used predominantly in this thesis as this is how Bunuba and

	Gooniyandi people talked about their ancestral lands.
Dimalurru	Bunuba Name for Tunnel Creek. Note in most cases Dimalurru/Tunnel Creek is used in this thesis, as the Bunuba name was not known before all maps had been prepared.
Djurru and Djuru East	Windjana Gorge Water Tank and Windjana Gorge 2 sites in Bunuba Country respectively. Abbreviated to WWT and WG2 respectively on maps created prior to advice on correct Bunuba names.
Dreaming/Dreamtime	These are generic terms which encompass a range of Aboriginal concepts of how the world was created. This is not as definitive as a western or religious view of creation, because it is not static, and time is not linear in an Aboriginal world view. For more in-depth scholarly discussion on this concept see Rose 1988, Stanner 1984, Flood 1989, and for Yanyuwa people in northern Australia Brady, Bradley & Kearney 2016; 2024.
Galurru	The rainbow serpent in Bunuba and Gooniyandi languages.
Gayi-ingga	Crocodile in Bunuba language.
Geometric rock art	Complete and incomplete recognisable shapes and variants of shapes, lines and groups of lines that cannot be readily interpreted as representing a figurative motif by researchers or Traditional Owners.
Girrgani	Chicken hawk in Bunuba language.
Historical rock art	Writing, dates and associated punctuation and lines or shapes enclosing those that may only have been created since colonisation. This may also animals, dress, tools, vehicles introduced since colonisation, as shown in some Kimberley rock art outside of this study (see Balme & O'Connor 2015).
ILUA	Indigenous Land Use Agreement. These are agreements between Indigenous Native Title Holders and other stakeholders (e.g. a mining or pastoral company) regarding land rights, use and access and how they work to the benefit of all parties.
Jariny jariny	Conception dreaming sites in Bunuba language.
Kartiya	White man/woman (variations in several Kimberley languages). In southern Western Australia this is Wadjela (Noongar language).
Langurmurru	Carpenter's Gap 3, in Bunuba Country. Abbreviated to CG3 on maps

	created prior to advice on correct Bunuba name.
Largarri	Boab tree.
Material Culture	Motifs which are recognisable or representative as items which people would use in a range of activities such as hunting, food preparation, digging, making tools. This includes items such as boomerangs, spears, bags, axes in rock art in the Kimberley, Western Australia.
Moonggaroonggoo	Painted Rocks 1 in Gooniyandi Country. Abbreviated to PR1 on maps created prior to advice on correct Gooniyandi name.
Mud Maps	Mud maps are informal hand drawn guides to get from point A to point B, when a site or feature is not on a map and/or a map is not of sufficient scale to add it to it. They can be in the form of a visual representation of a pathway with drawn or written markers along the way, such as instructions to turn right/left, or proceed to a certain landmark (sometimes drawn on the map), or that an incline is steep. Mud maps will also contain information such as GPS readings at points that may include turnings, features or way markers such as a creekline, or a road crossing, or distances between places or features. Mud maps are not to scale and are created in the field, sometimes as a precursor to a scale map to be completed on a GIS Mapping system, or used in the field to revisit sites prior to more precise mapping.
Native Title	Through Native Title Aboriginal and Torres Strait Islander people are recognised as having rights and interests to the land and waters according to their traditional law and customs. This is set out and governed by the *Native Title Act 1993* (Cth). Grant of Native title confirms an ongoing and continuous connection to the land/Country and is granted for a defined geographic area.
Ngarranggani	The Dreaming, or creation times. (Bunuba spelling, Gooniyandi spell it Ngarranggarni, though pronunciation is very close).
Ngarranggani Jawiy	Dreamtime Lily Hole.
Nyitting	Noongar term for the Dreaming or Dreamtime.
PXRF	Portable x-ray diffraction. A non-destructive method of scanning surfaces and layers to identify elements and their proportions.
Pama-Nyugan/	Pama-Nyungan is the name for the most widespread family of

Non-Pama-Nyungan	Australian Aboriginal Languages. There are 300 estimated languages in this grouping. Non-Pama-Nyungan language is a generic name for the other Aboriginal languages in Australia, and the Bunuba and Gooniyandi speak two dialects of one of those, called Bununban. This is different to other languages spoken in the Kimberley.
Phytomorph	Motifs recognisable as realistic or representations of plants, treesm seeds or other vegetation, with attributes such as seed/pod shapre, stems, roots, foliage, flowers.
Ray	Spirit children.
Riwi	Tracts of land. This is also the name of a site in Gooniyandi Country.
Tangalma	Carpenter's Gap 1 in Bunuba Country. Abbreviated to CG1 on maps created prior to advice on correct Bunuba name.
Tarakula	Dingo Gap in Bunuba Country. Abbreviated to DG on maps created prior to advice on correct Bunuba name.
Thanggari	Water lilies.
Therianthrope	A motif that shows characteristics that are both distinctly human and distinctly animal. Both sets of characteristics must be clear and present in the same motif to be classified in this way. For example. Traditional Owners relate tales of 'featheries' that display characteristics of birds (wings) and humans (body shapes, legs, heads). These may initially be perceived as birds, but display clear characteristics of both forms (Mona Oscar 2012 pers comm.)
Tracks	Recognisable symbols that are real or represent prints or tracks observed in rock art, such as animal tacks, foot or hand stencils and prints. Stencils of human hands and feet are included in this category because they denote the presence of actual humans, rather than a representation in figures such as anthropomorphs.
Veganthrop	A motif that shows characteristics that are both distinctly human and distinctly vegetable. For example, a depiction of a vegetable or vegetation that is clearly recognised that has anthropomorphic head and/or arms added. Both sets of characteristics must be clear and present in the same motif to be classified in this way.

Wajarri	Nuts of the Boab Tree.
Wanggu	Yam.
Wanyjirri	Kangaroo.
Wawanyi	Goanna.
Wunaamin Miliwuni Ranges	Formerly the King Leopold Ranges. Renamed in 2019.
Yolngu	An aggregation of Aboriginal clans who are the Traditional Owners of northeastern Arnhem Land, Northern Territory, Australia. Within this group of people there are two major moieties (descent groups), Yirritja and Dhuwa, which are clan groups with language and socio-cultural variations.
Zoomorph	Figures resembling or with recognisable animal attributes, such as feathers, animal head shapes, tails, digits, bodies, limbs, ears. This includes complete and incomplete figures which are recognisable to the researchers or Traditional Owners as representing animals.

Cultural Statement

This thesis contains names, and images, of people who may have died. These are only included to acknowledge the contribution the people have made to the research and should not be used outside the context of this thesis.

This research was conducted with the permission and participation of Elders and their families (including children) in Bunuba and Gooniyandi Country, and the analysis and writing on Whadjuk Noongar and Binjareb Noongar Country, Western Australia. The images below are intentionally blurred to respect cultural norms for Bunuba and Gooniyandi people who may have died.

BUNUBA WOMEN AND CHILDREN ENJOY A BREAK DURING FIELD WORK NEAR MARAWUN IN 2012.

GOONIYANDI ELDERS RELAX AFTER VISITING MOONGGAROONGGOO IN 2011.

Rock Art: A Cultural Landscape

Our country is a living, cultural landscape

(GAC & KLC 2015:12)

Introduction

In the southern Kimberley the land sings. Not everyone hears its song. It glows, but not everyone sees the elusive incandescence, or feels the sense of belonging permeating through their body. It is a strong land in an evocative landscape. Every year it survives floods and droughts. Traditional Owners describe the blood of many generations coursing through its veins. Their ancestors built the land; from the ridges and mountains arising from the earth to the rivers and streams that feed the wide plains. For millennia rock art introduced each generation to the stories and songs and connected them to their ancestors through the images of ancestral beings embedded in the rocks. It is still there.

This continuous connection to Country is embedded in the language and stories of creation. The Bunuba and Gooniyandi people say that *Ngarranggani*[1]*/Ngarranggarni* (Dreamtime) is a time when the animals, birds and humans all behaved like sentient beings. Stories include how rocks and landscape were created by *Galurru* (the rainbow serpent), how fire was taken from *Gayi-ingga* (the crocodile) and shared with everyone by *Girrganyi* (chickenhawk), how *Ray* (the spirit children) who live in the creeks, streams and waterholes come to people in dreams to tell them of children to come, and how floods occurred around *Ngarranggani Jawiy* (a Dreamtime Lily Hole) when people would not share their food with one another (Chungul et al. 1988).

[1] The underline is a pronunciation guide for specified letters detailed in *Thangani Bunuba* (Chungul et al. 1988:85).

Vistors to the southern Kimberley are welcomed by Traditional Owners in different ways, all to let the Ancestral Beings and spirits of the ancestors know they mean no harm and to do no harm to the visitors. In Bunuba Country this includes water and smoking ceremonies and in Gooniyandi the Elders call out to the spirits of the Ancestral beings to let them know who is there.

This is the essence of the Kimberley region of Western Australia, where an abundance of well-preserved rock art is extant in caves and rockshelters. This research focusses on the southern Kimberley, north Western Australia, where both painted and engraved rock art are present. The study area (Figure 1.1) extends from Bandilngan/Windjana Gorge in the west to Riwi in the southeast; Country[2] of the contemporary Bunuba and Gooniyandi people (Figure 1.2). The Bunuba and Gooniyandi peoples' oral histories begin in *Ngarranggani* (the Dreaming), and archaeological evidence confirms their presence in the region for at least 50,000 years (e.g. Balme 200; Hiscock et al. 2016; O'Connor 1995; O'Connor et al. 2014; Vannieuwenhuyse et al. 2016; Veth 2017; Veth et al. 2019; Veth et al. 2021; Ward et al. 2017; Wood et al. 2016). This is amongst the earliest occupation recorded in Australia (e.g. Balme 2014; Clarkson et al. 2017; Florin et al. 2020; Harberle & David 2012).

Marks left by many people remain in the Kimberley region. Macassan people sailed from Sulawesi in Indonesia to fish for trepang, and left remains of smoke houses and tamarind trees (Crawford 2001; McKinnon et al. 2013; Morwood & Hobbs 1997), explorers and seafarers touched the shores over centuries (Bloomfield 2009; Dampier 1698; Saldanha 2011), and the British began to change the landscape, expanding the Swan River Colony to the north in the nineteenth century (Ayris 1996; Battye 1915; Bohemia et al. 1993; Bohemia et al. n.d.; Brockman 1902; Bryan 1938; Cowan 1988; Forrest 1996; Grey 1841; Harrison 2002a, 2002b; Hercock 2009; Hughes & Kinnane 1999; Kinnane 2008; Richardson 1914; Willing & Kenneally 2002).

The places we have made our own (Ingold 2011:145-164) are delineated by language, culture, beliefs and the traces of our ancestors. The marks they have left in the land in the motifs and styles in the rock art are read by successive generations (Ingold 2013:125-141) to interpret and add to their own experiences and cultural understanding.

This research investigates one of the ways the Bunuba and Gooniyandi people marked the landscape before and during the times of these visitors: rock art. Traditional Owners say that rock art has been there since *Ngarranggani*, impressed on the rocks by Ancestral

[2] See Glossary for a description of this term

Beings[3] and that they (the people) are responsible for its maintenance (Blundell & Woolagoodja 2012; Mowaljarlai & Peck 1987; Mowaljarlai et al. 1988; O'Connor et al. 2008b; Perkins & Langton 2010; Utemara & Vinnicombe 1992; Vinnicombe & Mowaljarlai 1995; Whitley 2001). The cultural landscape has been carefully curated through the preservation of shelters and pathways during this time (Balme 2013; O'Connor et al. 2014; Wood et al. 2016). Pathways lead Bunuba and Gooniyandi people (and the modern researcher) to the rock art and a myriad of cultural artefacts, adding to the richness of our knowledge of lifeways in the region (e.g. Balme 2000; Hiscock et al. 2016; Langley et al. 2016; Maloney 2015; Maloney et al. 2017a; Maloney et al. 2014; Maloney et al. 2016; Maloney et al. 2018b; McConnell & O'Connor 1997; O'Connor 1995; O'Connor & Fankhauser 2001; O'Connor et al. 2014; Vannieuwenhuyse 2016; Vannieuwenhuyse et al. 2016; Whitau et al. 2016a; Whitau et al. 2016b; Whitau et al. 2018; Whitau et al. 2017; Wood et al. 2016).

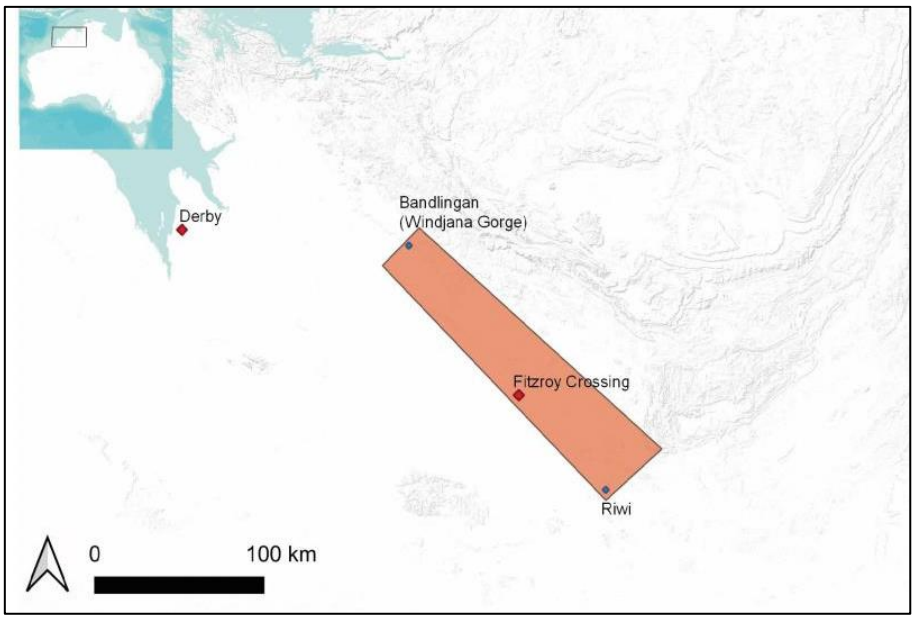

FIGURE 1.1 THE STUDY AREA FOR THIS RESEARCH, SOUTHERN KIMBERLEY, WESTERN AUSTRALIA.

[3] Ancestral Beings may be described in one way as the creators or the land, sea and sky, and in the other as the ancestors of Aboriginal people. They are intrinsically linked with creation, which is also referred to generically as Dreaming, but in an Aboriginal worldview they are responsible for laying down the fundamentals for life, lore and law while simultaneously existing in real time, the past, and the future. See Glossary for more information on this.

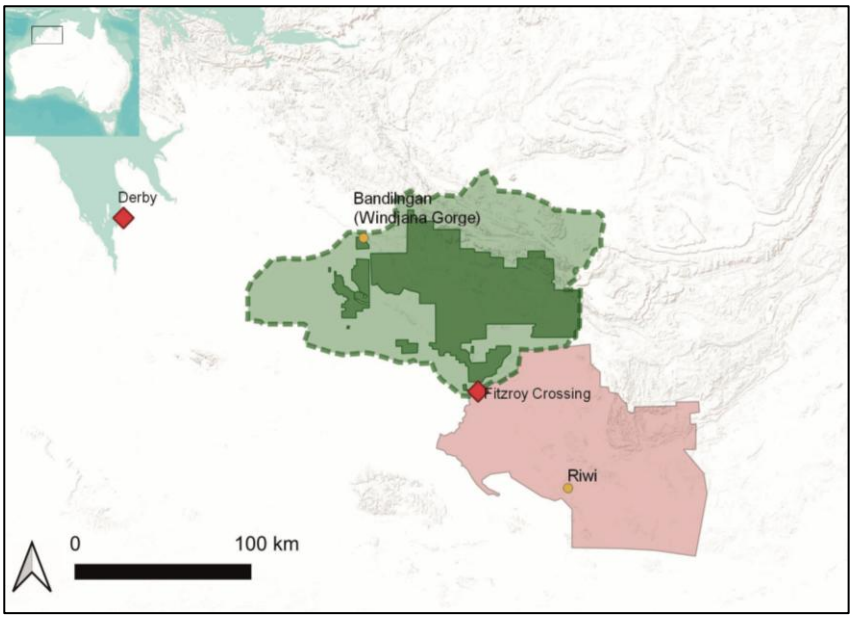

FIGURE 1.2 COUNTRY DEFINED BY NATIVE TITLE FOR THE BUNUBA (GREEN SHOWS GRANTED AREA, AND THE LIGHTER GREEN SHOWS THE EXTENT OF COUNTRY CLAIMED) AND GOONIYANDI (PINK) PEOPLES OF THE SOUTHERN KIMBERLEY.

For this research rock art is defined as images on rock intentionally created by humans (after Taçon & Chippindale 1998:6). It is also important to consider the Aboriginal world view, that Ancestral Beings also left their imprints on rockfaces (e.g. Akerman 2009a; Blundell & Woolagoodja 2012; Crawford 1964; 1968; Rosenfeld 1997b). When working with Traditional Owners, this helps to understand perceptions of rock art, and the stories which connect motifs to the land and the people.

Rock art research has been undertaken in the wider Kimberley region for more than 50 years, highlighting specific motifs or areas (e.g. Akerman 2014; Blundell 1974; Doring 2000; Doring & Nyawarra 2014; Huntley et al. 2015; Jones 2010; McNiven 2011; Porr & Veth 2017; Ross et al. 2016; Travers & Ross 2016; Walsh 2000; Welch 2016). In the southern Kimberley there are examples of rock art photographed by archaeologists, anthropologists, geologists, enthusiasts and travellers in other contexts, or associated with other studies in neighbouring areas (e.g. Akerman 2009, 2014; Balme 2000; Crawford 1968; Donaldson & Kenneally 2007; O'Connor 1995; O'Connor et al. 2008a; O'Connor & Fankhauser 2001; Playford 1960, 1981; Smith 2006; Walsh 1988a, 1994, 2000; Wilson 2006). However, there have not yet been investigations that have focussed on the wider assemblage in the southern Kimberley. This research aims to fill part of this gap by recording and analysing the rock art, its relationship to the identity of the people, and whether it has changed over time to reflect changes in ideas, identity, and territorial boundaries.

Research Direction

The Issues

Archaeological research in the southern Kimberley has generally been selective and site-specific (e.g. Balme 2000; Donaldson & Kenneally 2007; O'Connor et al. 2008a; O'Connor et al. 2014). The result is that while there have been people present in the landscape during the last 50,000 years, there are still geographic and chronological gaps in our knowledge of occupation, land use, movement, economic, social and behavioural aspects of peoples at other than key sites during that period (Balme et al. 2018c; Hiscock et al. 2016; Langley et al. 2016; Maloney et al. 2017a; Maloney et al. 2014; Maloney et al. 2018a; Maloney et al. 2016; Maloney et al. 2018b; O'Connor et al. 2014; Whitau et al. 2016a; Whitau et al. 2016b; Wood et al. 2016).

Two of those key sites, Tangalma[4] (previously Carpenter's Gap) and Riwi, are located in the study area (Figures 1.1 and 1.2). This makes the region highly significant because there are only a few sites of comparable antiquity in Australia, such as Devil's Lair in the southwest, Ganga Mara (renamed Yurlu Kankala) in the Pilbara, Willandra Lakes in the southeast and Madjedbebe in the Northern Territory (Bowler et al. 2003; Clarkson et al. 2017; Fifield et al. 2001; McGrath & Jebb 2015; Morse et al. 2014; O'Connell & Allen 2003, 2004, 2015; Roberts et al. 1990; Stern 2015; Turney et al. 2001; Veth 2017; Veth et al. 2019; Veth et al. 2021). These sites are like islands of information from which conclusions on the settlement patterns and lifeways for the first Australians may be inferred. Their separateness leaves gaps in our knowledge of the interconnectedness and continuity of cultures across Australia.

Extant rock art contributes to our knowledge and understanding of past lives, and, like other archaeological investigations in the region, it has been patchy and selective. Since the 1980s, research in the Kimberley has been concentrated on two distinct, prolific, and widely distributed styles of painting; the Wanjina and Gwion Gwion[5] (Figure 1.3). Direct dating of rock art remains the focus, and recent research widened the dating regime to include irregular infill and naturalistic rock art dating it between 20,000BP and 14,000BP (Ouzman

[4] In this, and subsequent chapters, the Bunuba and/or Gooniyandi language names are used at the request of Traditional Owners (June Oscar, Mona Oscar, Raylene Oscar 2011, 2012 pers. comm., 7 September, 16 August). English language names have been used previous publications (McConnell 1998; O'Connor 1995; O 'Connor & Fankhauser 2001; O'Connor et al 2008; O'Connor et al 2014), also at the request of Traditional Owners at the time (O'Connor, Balme 2012 pers. comm., 14 July).

[5] Note: These images are known by many different names across the Kimberley, but for consistency the name Gwion Gwion is used in this thesis because it is a Ngaranyin name, one of the close neighbours of the Bunuba, in the southern Kimberley, and is now widely used in Australian rock art research (e.g. Crawford 1968; Donaldson 2010, 2014; Doring 2000; Woolagoodja 2020; Worms 1955)

2018, Veth 2013, Veth et Al 2018, Veth et al 2021), along with Gwion Gwion images in the northern Kimberley at between 14,000 and 10,000BP (Finch et al. 2021b; Finch et al. 2020; Gleadow et al. 2013-2016; Green et al. 2017a; Morwood et al. 2010).

As a region renowned for its prolific and important rock art (Akerman 2014; Balme et al. 2009; Blundell & Woolagoodja 2012; Crawford 1968; Morwood et al. 2010; O'Connor 1990; Schulz 1956), it seems remiss that rock art research has mostly investigated those two major motifs/styles in any detail. Research has concentrated in the north and western Kimberley (e.g. Huntley et al. 2015; Moore 2015; Ross et al. 2016; Travers & Ross 2016; Veth et al. 2018b) and the northern Pilbara (Veth et al. 2017a; Veth et al. 2017b; Veth et al. 2017c; Ward et al. 2017), resulting in scant investigation into rock art in the southern Kimberley.

FIGURE 1.3 (TO THE LEFT) A DEPICTION OF A WANJINA FIGURE FROM EARLY COLONIAL EXPLORATION IN THE WEST KIMBERLEY (GREY 1841:202-203) (TO THE RIGHT) YWONA GWION IN THE EAST KIMBERLEY (WALSH 1994:195).

Potential for other styles has been noted (e.g. Akerman 1976; Crawford 1968; Gunn et al. 2019; Ouzman et al. 2017; Veth 2013; Walsh 1988a; Welch 1993b) and photographs of different motifs published (e.g. Crawford 1968, 1973; Donaldson 2012a, 2012b, 2013; Donaldson & Kenneally 2007; Playford 1960). Consistent and focused archaeological research in the southern Kimberley did not begin until 2011 through the Australian Research Council funded *Lifeways of the First Australians* project (henceforth *Lifeways*). This study is part of that research, and it has resulted in further evidence of occupation and land and resource use (e.g. Balme & O'Connor 2015; Balme et al. 2018c; Dilkes-Hall 2015; Langley et al. 2016; Maloney et al. 2017a; Maloney et al. 2014, 2017b; Maloney et al. 2018a;

Maloney et al. 2016; Maloney et al. 2018b; O'Connor et al. 2013; Whitau et al. 2016b; Whitau et al. 2018; Wood et al. 2016) and symbolic behaviours (Balme & O'Connor 2014, 2015; Balme et al. 2018b; O'Connor et al. 2013).

This thesis is focussed on the systematic recording and analysis of the rock art in Bunuba and Gooniyandi Country to provide further insight into the behaviours of people from the late Pleistocene to the present. These include the extent to which people used rock art to define territories. This approach was elucidated by David and Chant (1995) in northern Queensland, using a stylistic, temporal and spatial analysis of rock art to study changes in stylistic behaviours and land use patterns. Their results suggested that a 'regionalisation of territorial networks' (David & Chant 1995:513, 514-515) was demonstrated by the change from homogenous to heterogeneous styles, with the emergence of clear geographical boundaries over time.

The environment is also an important part of the context for rock art creation. The establishment of open and closed social networks are suggested as possible responses to environmental stress (McGowan et al. 2012; Smith 1992b; Vannieuwenhuyse 2016). This may be expressed through the relative heterogeneity or homogeneity of the rock art (Smith 1992b:39-40), or by the tighter/looser definitions of territory through stylistic differentiation or geographic distancing (David & Chant 1995). The response to changes in environment in the study area is a context that will inform questions about the movement of people, the alliances they formed, how they changed over time, and the continuities or discontinuities of occupation communicated in the rock art.

Following the influential study on clothing style choice and display in Yugoslavia as an expression of group identity by Martin Wobst (1977)[6] rock art has proven to also be an expression of identity, ideology or belief systems (Conkey 1978, 1997; McDonald 1999; Schaafsma 1985; Smith 1992a, 1992b, 1996, 2008; Wiessner 1983). Identifying the motifs and attributes which distinguish one style from another (building on Maynard 1977), and superimposition are important considerations for this study in defining the boundaries of styles, temporal changes and rock art's role in social systems (see, among others Conkey 1978; Conkey & Hastorf 1990; David & Chant 1995; David & Lourandos 1998; McDonald 1991, 2008a, 2008b; McDonald & Veth 2006, 2012b; Smith 1992a, 1992b; Veth et al. 2021). Similarly, the locations of sites, types of sites, size and access to economic resources may

[6] See Chapter 4 for further detail.

fill in gaps in knowledge about how sites relate to one another, and therefore, their role in the social and symbolic lives of people over time.

Rock Art and Archaeology

Being static in the land rock art provides immediate and direct evidence that people marked surfaces purposefully in specific locations and not others (Chippindale & Nash 2004). The similarities and differences in the rock art over space and time is evidence that people have interacted with one another, shared ideas and used images, scenes and placement to communicate those. Rock art is unique as an artefact; its relative permanence provides a connection to both physical and social aspects of life from its creation to the present. Rock art study is largely non destructive (see below), giving it a special place in archaeological research; it can be investigated many times and in different ways.

New digital and photographic technologies mean that rock art recording is easier and has less impact on the rock art. Direct tracing, rubbing or moulding media (Bahn 2010:52-74; Schulz 1956) that may damage rock art are rarely used in Australia. New technologies complement drawing and visual interpretation in situ and provide greater scope for post-field analysis. Comprehensive and systematic recording of rock art is now possible with never needing to touch surfaces.

Rock art does, however, change and become damaged over time. Environmental and geological changes, animal activity, and human interaction and intervention may have an impact. Associated archaeological activities including excavation, undertaken at the same time, create dust and detritus which may also damage rock art.

Other aspects of photographic technology are of great benefit in the study of rock art. Photographic enhancement, digital zooming and colour manipulation increase the capacity for close-up study of rock art and rock surfaces. Deteriorated images can be enhanced to discern detail not otherwise visible (e.g. Bahn 2010; Bednarik & Seshadri 1995; Brady 2006, 2007; Brady & Gunn 2012; Clogg et al. 2000; David et al. 2001; Gunn et al. 2010; Henderson 1995; McNiven et al. 2002).

Non-invasive examination of pigments and layers in rock art are now also available, providing further insight into the types and origins of rock art, pigment, and dating (e.g. Aubert 2012; Aubert et al. 2014; Aubert et al. 2007; Green et al. 2017b; Huntley et al. 2015; Huntley et al. 2014; Huntley et al. 2018; Huntley et al. 2011; McDonald & Veth 2008; Pecchioni et al. 2019; Roberts et al. 2018; Sauvet et al. 2017; Scadding et al. 2015; Steelman & Rowe 2012; Taçon et al. 2012).

It is not disputed that rock art was present in the Kimberley for millennia prior to European exploration and colonisation. Focus on the antiquity of rock art has been ongoing, along with discussion about dating methods (Aubert 2012; Bednarik 2010; David et al. 2019; Dorn 2001; Finch et al. 2021a; Finch et al. 2021b; Finch et al. 2020; Gleadow et al. 2013-2016; Morwood et al. 2010; Walsh 1988b; Watchman et al. 1997).[7]

In the study area ochre pigment has been recorded in excavations at two sites (Tangalma and Riwi) dated to between 40,000BP and 30,000BP (Balme 2000:3-4; O'Connor & Fankhauser 2001:298). Pigment was likely to have been in use during that time, but how it was used is debatable. For example, it may be that pigment on a limestone slab recovered in excavations at Tangalma (O'Connor & Fankhauser 2001) relates to rock art, but it is less clear that ochre pieces found in excavations at Riwi (Balme 2000) were used for this purpose. There may have been other activities such as body decoration, rituals associated with burial, portable hunting items which used pigment. By extrapolation it may be suggested that the use of pigment at the sites is of similar antiquity to the occupation of the sites (see Balme et al. 2018c; Franklin & Habgood 2007; O'Connor et al. 2014; Vannieuwenhuyse et al. 2016; Ward et al. 2017; Wood et al. 2016). Without further corroborating evidence the dating cannot be as certain at these sites, as it has been through the geochemical analysis correlating pigment sources in a Wanjina painting and paint drops in dated stratigraphic units at Borologa in the northern Kimberley (David et al. 2019).

This archaeological evidence makes the southern Kimberley, and the wider Kimberley region, highly significant in the colonisation of Australia by modern humans (Balme 2013; Balme et al. 2009; Balme et al. 2018b; Balme et al. 2018c; Clarkson et al. 2017; O'Connell & Allen 2004; Watchman et al. 2001). Systematic recording and analysis of extant rock art is important in revealing more about life during that time.

The first principle of archaeology is superimposition. The most recent layer of occupation is superimposed on older layers, creating a stratigraphic view of most recent at the top, to oldest at the bottom. Rock art follows this principle; newer rock art superimposes older rock art. When superimposition is identified it is possible to describe relative chronologies of rock art. However, rock art must be considered in conjunction with other archaeological evidence such as excavation or surface collections. Goldhahn (1999:13) notes that sometimes rock art stands so far outside the discipline, that the goal becomes ‘discovering, recording, and

[7] This is informed by our western archaeological approaches, and sometimes detracts from the richer, nuanced and more complex perceptions of Traditional Owners, where what they know about rock art is steeped within the continuity of their connection to, and embeddedness within, Country since creation times (Woolagoodja 2020: provides a keen insight into his own understanding of this connection).

sometimes, publishing rock art' without thinking about research questions underpinning why we do it in the first place.

The interpretation of the rock art in this study is informed and supported by other archaeological evidence and the context in which it is found, including excavations, surface collection, environmental factors and geological conditions (Balme 2000; Maloney et al. 2014; Maloney et al. 2016; McConnell 1998; McConnell & O'Connor 1997; O'Connor 1995; O'Connor & Fankhauser 2001; O'Connor et al. 2014; Vannieuwenhuyse 2016; Vannieuwenhuyse et al. 2016; Wallis 2001). Importantly, it is is also informed by recorded and oral history, and the continuing connection of the Bunuba and Gooniyandi people to their Country. Involvement of Traditional Owners is crucial in identifying sites, understanding their connection to Country, and its importance in continuous and intertwined lifeways (including, but not limited to Bohemia et al. 1993; Bohemia et al. n.d.; Chungul et al. 1988; Federal Court of Australia 2012; Hawke 2008; Hughes 2000; Kaberry 1938, 1939; KALACC 1994; Kimberley Language Resource Centre 2000; Kinnane 2008; McGregor 1988b, 2004, n.d.; Morphy 2010; Mudeling 1998; O'Connor et al. 2013; Oscar & Anderson 2009; Pannell 2000; Smith 2001; Street & Chestnut 1983; Toussaint et al. 2005; Treloyn 2003).

New Knowledge of Rock Art in the southern Kimberley

The paucity of archaeological research focussed on the southern Kimberley, and the ongoing concentration on Wanjina and Gwion Gwion as the major rock art of the wider region, means it is essential to fill the gaps in knowledge for all sub-regions to begin to learn about the dimensions of human settlement and activity in the Kimberley. Recording the rock art as part of the multifaceted *Lifeways* project brings new knowledge by identifying where, and if, cultural territorial borders exist and the extent to which these define identity and change over time.

Research on the Wanjina and Gwion Gwion resulted in the development of relative chronologies that are notionally applied to the Kimberley region (e.g. Veth 2013; Veth et al. 2021; Walsh 1988a; Welch 1993a, 1993b). This study will add to this research, providing additional temporal perspectives where there are style and motif commonalities (as suggested by Akerman 2014; Crawford 1968; Donaldson & Kenneally 2007; Morwood et al. 2010; O'Connor 1995; Playford 1960; Schulz 1956; Wilson 2006). It will create a richer and possibly more complex chronology of rock art.

Recording of rock art in the southern Kimberley has not used spatial or temporal analysis of rock art. There are published images of rock art from sites in the study area (Crawford 1968;

Donaldson 2013; Donaldson & Kenneally 2007; Walsh 1988a). However, examination of source materials[8], show that the number and variety of sites visited by earlier researchers were limited, and photography either selective or motifs only described in field notes. This is likely due to technology, time, interest, or access to areas, which were not as limited during the field work for this study. Data recorded in this study means it is possible to identify specific motif types, possible styles and territorial boundaries, as well as develop a relative chronology for rock art styles and/or motifs for the southern Kimberley.

In sum, this study has the potential to add new knowledge about:

1. The range, diversity and density of rock art in the southern Kimberley, to add to the Kimberley archaeological assemblage;
2. The distribution of rock art types and styles in contemporary Bunuba and Gooniyandi Country;
3. The extent to which ideas have been shared across borders between Bunuba and their west/northwest neighbours where Wanjina rock art is dominant, reflecting changing social alliances and territories over time (David & Chant 1995; David & Cole 1990); and
4. Sharing of ideas between Bunuba and Gooniyandi people over time.

This new knowledge may be used for comparative study across the wider Kimberley region and northern Australia, where there has been movement and exchange over time (e.g. Franklin & Habgood 2007; Lewis 1997). It will enable development of a specific rock art sequence for the southern Kimberley, contributing to a holistic picture of lifeways from the late Pleistocene via the *Lifeways* Project.

Aims

Bunuba and Gooniyandi people know that they have been custodians of their Country since the beginning of time (June Oscar, Patrick Green, Selena Middleton 2011, pers. comm. 15/16 September). The systematic approaches of archaeology bring new dimensions to that connection to Country, particularly through rock art. Many older people are not able to visit sites but have strong memories of their rock art and stories. Recording the rock art and

[8] Crawford 1964: with access to the Grahame Walsh photographic archive provided by Cecilia Myers 2012 and photographs and drawings from David Welch 2014, along with site files from the Department of Aboriginal Affairs, WA; 1964-1968

sharing digital images enables them to reconnect with sites and share their histories with the next generation.

The Bunuba and Gooniyandi people share a language, unique in the Kimberley (Evans 2003; Koch & Nordlinger 2014). They speak a non-Pama-Nyungan language, and their neighbours speak Pama-Nyungan languages. There are interchangeable and understandable words across the these language groups, likely developed through trade, marriage and ceremony[9] over millennia, but there are also parts that are substantially different and unintelligible to other language speakers. This makes the Bunuba and Gooniyandi different from their neighbours and from one another because of dialectic variance. The result is that there are cultural differences between the Bunuba and Gooniyandi and their neighbours; differences which may also be present in the rock art, signalling territoriality and/or identity (e.g. Conkey 1990; David & Cole 1990; Franklin 1989; McDonald 1998b, 2008a, 2008b; McDonald & Harper 2016; McDonald & Veth 2006, 2007, 2012b; Officer 1992; Smith 1989, 1996; Veth et al. 2011; Wobst 1977).

The primary aim of this study is to analyse rock art images, styles, distribution and density, and chronology to determine whether Bunuba and Gooniyandi people have distinct identities which distinguish them from one another and their neighbours to the west, and whether this has always been so.

To achieve this, I have broken the aim into 4 parts, each with several questions to be addressed.

Rock Art and Style

1. *What are the major types of figures in Bunuba and Gooniyandi Country?*

   This is the framework which underpins the analysis of differences and/or similarities between the rock art in Bunuba and Gooniyandi Country. To do this I divided the images into those which could be consistently and easily recognised (determinate), and those which were too deteriorated or lacking in any recognisable form (indeterminate). I then sorted determinate images into nine motif types in a hierarchical classification arrangement described in Chapter 5, guided in interpretation and naming of some forms by Traditional Owners during fieldwork. This is presented at an aggregate level for the study area, by cultural area, and by site in Chapter 6, in conjunction with all the data

[9] *Ceremonies might include dances, songs and story telling to celebrate new seasons, births, deaths and marriages, initiation rites, or to celebrate or appease the spirits of the ancestors. See Glossary.*

gathered for sites and image characteristics, including colour, technique and placement, to provide a statistical overview of the rock art and its context and to set the scene for the next stage of analysis.

The nine rock art classes are analysed by their density at sites, site groupings and their distribution across the two cultural areas, including their occurrence and/or concentration along areas of contemporary borders, in Chapter 7. The types are also further analysed in terms of their superimposition relationships as a basis for developing a possible chronology for styles in Chapter 8.

2. *Are there styles that are particular to the study area? (see also 3, 8 and 9 below)*

Building on the work of Wobst (1977), Weissner (1983) and many others (e.g. Conkey 1978, 1990; Conkey & Hastorf 1990; Lanteigne 1991; Sackett 1977, 1985, 1986), rock art research in Australia has demonstrated clear connections between the style of the rock art and the identities and territorial boundaries of cultural and/or linguistic groups (including, but not limited to Balme & O'Connor 2015; Brady & Bradley 2014; David & Chant 1995; David & Cole 1990; Franklin 1989; McDonald 2000, 2008a, 2008b; McDonald & Veth 2006, 2007, 2012b; Smith 1992a, 1992b). This is key to discovering whether the contemporary identities of Bunuba and Gooniyandi people are as clearly differentiated in the rock art as they are by their linguistic differences.

To determine what styles are represented in the southern Kimberley I identified common components across the nine figure classes described in Chapters 5 and 6 at a broad level from initial field identified styles before drilling down to compare more detailed components. One of the aspects of the styles addressed is whether some figures are simpler versions of more complex motifs, or their own distinct identities. This is presented in Chapter 7, where the results of this analysis are described.

Style is further analysed in Chapter 9, which examines the distribution and density of each. It concludes with a case study focussing on three anthropomorph dominated styles which have similarities, and, while not exclusive to, are concentrated in the west of Bunuba Country. Conclusions suggested from these analyses are discussed in Chapter 10.

3. *How do rock art figures and style profiles compare to those of western neighbours? (see also 8 below)*

In an ideal research world, it would be possible to analyse the border areas of the six cultural groups who share contemporary borders with Bunuba and Gooniyandi people to

determine the extent to which they have shared rock art motifs, figures and styles, and therefore the extent to which they may have shared aspects of identity. However, the Kimberley is a vast region with limits to the rock art recorded to date, and only areas to the west/northwest of Bunuba Country have sufficient rock art recorded to afford comparison, which is itself also limited. In addition, it was noted during research and field work that there are more sites with rock art around this contemporary border area than in other areas in Bunuba Country.

The analysis of density and distribution in Chapter 9 informs the discussion of these borders in Chapters 10 and 11.

Change Over Time

4. *Do rock art types and/or styles change over time? (see also 8 below)*

The western geopolitical system resulted in an approach to nations and territories which distinguishes one Country[10] from another by lines on a map, which is shown in the non-intersecting Bunuba and Gooniyandi Native Title claims (see Figure 1.2), and is heard to an extent in their separate, but intertwined languages. Identity and culture are important to Bunuba and Gooniyandi people, and these language and geographical constructs give a picture of contemporary distinct but entangled cultural groups. From a Bunuba and Gooniyandi perspective they are confident that they know who they are and what their histories are, with and without one another. They tell me they do not need to be told, but they also like to have the 'scientific back up' (Patsy Bedford, Patrick Green 2011, pers. comm, 14 September) that addresses the modern and western ideas of how they are linked, but distinct, and how they have changed.

Tracking changes in rock art figures and styles over time is one way it in which it may be possible to measure changes in identity, ideas and links between the two cultural groups. To do this:

(i) superimposition of images was recorded in the field, refined using DStretch©, and ultimately documented in Harris Matrices (Appendix 10);

(ii) Maxime Aubert took samples of surface deposits containing calcite layers on identifiable rock art, with the advice and support of the Traditional Owners, to chronometrically date the rock art; and

[10] See Glossary for a description of what Country means in an Australian context as it relates to Indigenous people.

(iii) remains of ochre and marked flakes were recovered in excavations at sites for dating by stratigraphic association.

The results are also presented and analysed in Chapter 8.

These results are brought together in Chapter 10, where it is compared with other proposals for chronologies of rock art in the Kimberley region (e.g. Veth 2013; Veth et al. 2021; Walsh 1988a; Welch 1993a, 1993b), concluding in Chapter 11 that there are likely both commonalities and differences between the southern Kimberley and the wider region.

Rock Art Locales

5. *Are rock art sites chosen for particular characteristics and if so, what are the characteristics that define site choice?*
6. *Do site characteristics vary for figure types or styles, and are these the same in Bunuba and Gooniyandi Country?*
7. *Are site characteristics the same in Bunuba and Gooniyandi Country?*

Different site types have different accessibility, visibility and surfaces available for creating rock art. Visibility is an important aspect of information exchange in rock art, particularly in determining to whom the message is communicated, and to what extent they it will be understood (Wobst 1977). Chapter 4 presents this idea in the context of rock art visibility and the communication processes that may be intended and/or result.

Questions 4, 5 and 6 build upon one another to define site characteristics, examine whether they are related to images and styles, and identify where there are similarities and/or differences in the two cultural areas. This begins with the different site types observed and recorded in the southern Kimberley presented in Chapter 6 (detailed for all sites in Appendix 5), concluding that the predominant sites for rock art are rock shelters located within easy access of water and food sources.

Using visible markers to define territorial boundaries is shown to be prevalent in other regions of Australia (e.g. David & Chant 1995; Smith 1992b; Veth et al. 2011). This is explored in the analysis of the distribution and density of motifs and styles in Chapter 9, and site characteristics used to form and test hypotheses on site choice and chronology.

Kimberley Chronologies

8. *Are there clear rock art borders between Bunuba and Gooniyandi, and between Bunuba and western neighbours, and if so, did such borders change over time? (see also 3 above)*

   This question builds on earlier questions to focus on differences between the two cultural groups. This is presented in the analyses in Chapter 8 and 9, where superimposition for sites with >100 figures are used to develop stylistic sequences. The results indicate that there are both styles which have been present over time in Bunuba and Gooniyandi Country and others which show clear chronological sequences. This is in keeping with the circularity and interlaced nature of time in an Aboriginal World view (Harrison 2005; Janca & Bullen 2003; Morphy 1999) rather than the linear past-present-future concept in Western academic cultures.

   The strength of differences in identity and clarity of borders are discussed directly in Chapter 10, with respect to both the Bunuba and Gooniyandi, and the Unguumi/Ngaranyin to the west.

9. *Does the southern Kimberley share a rock art style chronology with the wider Kimberley region (Ouzman et al. 2018; Ross et al. 2016; Veth 2013; Veth et al. 2021; Veth et al. 2018a; Walsh 1988a; Welch 1993a, 1993b)? (see also 2, 3, 4 and 8 above)*

   The Bunuba and Gooniyandi peoples' non-Pama-Nyungan language sits apart from their neighbours' Pama-Nyungan languages (Bouckaert et al. 2018; Evans 2003). This does not mean that they did not travel, trade with, or marry people from other places as we see from the presence of marine shell beads at inland sites in the southern Kimberley (Balme & O'Connor 2017, 2019; Maloney et al. 2018a). It is not only possible, but likely, that there have been influences in the southern Kimberley rock art from other areas, and that the changes in Bunuba and Gooniyandi Country may reflect similar changes elsewhere. This is examined in the context of Australian rock art provinces, particularly those in the north with likely close connection to the Kimberley in Chapter 10, through comparison to motif types and styles, and to proposed chronologies for Kimberley rock art.

   Like cultural identities over time, the questions are intertwined, and cannot be discussed in isolation, or in static combinations. Chronologies are the focus of other questions above, and this part is added to situate the study area within the wider Kimberley region and examine the extent to which those are shared across the region.

Structure

This thesis is in 4 parts.

Part 1. Background. The first 5 chapters introduce the study area, review previous research and provide a contextual and methodological framework for the research.

Part 2. Data and Analysis. Chapters 6-9 report the results of the fieldwork and describe the rock art in context. These chapters are building blocks beginning with descriptive statistics, using those to define rock art styles, plotting the motif types and styles geographically across Bunuba and Gooniyandi Country and bringing those together to examine whether they have a chronology that may reflect changes or differences for the two cultural groups.

Part 3. Discussion and Conclusions. The final two chapters (10 and 11) bring together the themes of the research and conclude how it answers research questions.

Part 4. Appendices. Eleven appendices provide details for each site, additional statistical data, associated archaeological information. The original and manipulated digital images of rock art, sites and associated archaeology recorded in this study may be available on request to scholars depending on permissions from Traditional Owners.

Here follows a more detailed roadmap for the parts and their component chapters.

Part 1 Background

This chapter provides an introduction and rationale for undertaking the research, and outlines the aims of the project, and the questions which are posed to build towards achieving those aims.

Chapter 2 describes the study area, the cultural and colonial history of the southern Kimberley. This includes the geography, geology and flora and fauna to set the physical context, major themes in the colonial/post-colonial history, and the cultural environment of the southern Kimberley.

Chapter 3 reviews previous archaeological and related research in the area and describes how it relates to and informs this research. This includes previous archaeological, rock art specific, chronological and anthropological research relevant to the thesis aims, rock art and the southern Kimberley.

Chapter 4 presents the ideas which determined how this research was approached, and the theoretical framework on which it is based. This includes an adaptation of an art model incorporating the concept of information exchange, that may apply to communication as a

continuum in rock art. Discussion of the model also explores the concepts of style in rock art and how different research approaches have been used over time.

Chapter 5 outlines the methods used to gather and analyse the data in this study. This chapter describes the process of selecting and recording sites in conjunction with Traditional Owners, the methods and equipment used for recording them, and the processes used for managing and organising the data following the field seasons in 2011 and 2012. The classification structure and the data analysis process are also explained in this chapter.

Part 2 Data and Analyses

This Part reports the results of the field work undertaken over 2 seasons in 2011 and 2012 and the subsequent analysis of those results. Reference to later field work in 2013 and 2014 (Balme et al. 2018c; Dilkes-Hall 2015; Langley et al. 2016; Vannieuwenhuyse et al. 2016; Whitau et al. 2016b; Whitau et al. 2018; Whitau et al. 2017; Whitau 2018; Wood et al. 2016), and 2016 (Maloney et al. 2017a) is also included where relevant.

Chapter 6 describes sites and site types with an overview of the site locations. Figures are quantified by site and classified into nine types using the classification system from Chapter 5. Additional site information and statistics are in Appendix 5 and 7 respectively. The statistics in this chapter are reported by site, cultural area and a wide range of criteria including colour, technique, size and the surface on which the rock art is situated. The result is that anthropomorphs and zoomorphs dominate the assemblage.

Chapter 7 develops the styles for the assemblage; identifying stylistic attributes and figure forms, through a process of identifying broad similarities and gradually refining those to focus on criteria that result in distinctive styles across the area and localised styles within Bunuba and Gooniyandi Country.

Chapter 8 uses styles to develop chronological sequences and proposes relative chronologies for styles across the study area. This chapter also explores the potential for chronometric dating of rock art through Uranium/Thorium dating, an opportunity afforded by Maxime Aubert (Aubert 2012; Aubert et al. 2014; Aubert et al. 2007; Taçon et al. 2012), accompanying the *Lifeways* team for the 2011 and 2012 field seasons. In addition, the presence of ochre/pigment pieces and ochre marked flakes in excavations at several sites led to consideration of dating of rock art by stratigraphic association.

Chapter 9 plots spatial distribution and density of motif types and styles and introduces how this may establish or maintain territorial boundaries in the study area, as well as with their neighbours to the west. The spatial analysis uses styles and figure types to show some

styles are grouped in specific areas, an indicator of potentially porous borders with more interaction between different cultural groups.

Part 3 Discussion and Conclusions

Chapter 10 discusses the results in terms of how figures, styles and chronologies may define cultural identity and territorial boundaries and affinities to answer the research questions. This chapter also provides the first opportunity to bring together the research results and analysis to discuss how the southern Kimberley fits into rock art chronologies proposed for other areas of the Kimberley (e.g. Ross et al. 2016; Veth 2013; Walsh 2000; Welch 1993a).

Chapter 11 concludes the thesis by bringing together the results under five themes to discuss and describe whether the research has achieved the aims of the study. The conclusions suggest that the Bunuba and Gooniyandi people do indeed have distinct identities expressed through the rock art, that these are not likely to have been static over time, nor static in relation to their neighbours to the west.

Part 4 Appendices

The appendices provide additional information not directly essential to answering questions in this thesis. They provide archaeological information from excavations and include unpublished (not publicly accessible) reports or theses provided by generous scholars which have been cited and/or informed this study.

Bunuba and Gooniyandi Country

There are areas of our country where we hunt particular foods. The river country, the plains and the mountain ranges all provide shelter for different animals that we hunt.

(Chungul et al. 1988)

Introduction

The physical, cultural, and historical environments in which rock art is created is as important as the rock art itself. Physically challenging environments, or those not intimately explored, may prevent rock art ever being rediscovered by new generations. The Kimberley, the northernmost region of Western Australia, is one of those environments, it is physically challenging, lightly populated and had minimal colonial interest until the end of the nineteenth century. Despite this, there is a fascination with the rock art. Since publication of Grey's (1841) and Bradshaw's (1891; 1892) journals there has been national and international focus on the Wanjina and Gwion Gwion figures. People are fascinated by these large iconic figures and travel to the remote and often inhospitable landscape to see and photograph them (e.g Brockman 1902; Crawford 1968; Elkin 1930a; Lommel & Lommel 1959; Schulz 1956).

The environments of the Kimberley are diverse. Distinct cultural groups have produced varied and complex rock art. The southern Kimberley is a small portion of this region and has its own environmental and cultural diversity with two linguistically linked cultural groups. This chapter introduces the physical, cultural and historical environment of the southern Kimberley.

Physical Environment

Climate

The southern Kimberley (Figure 1.2) is Bunuba and Gooniyandi Country (Department of Indigenous Affairs 2011; 2012; Federal Court of Australia 2012b; 2013). The climate is tropical, semi-arid, with annual rainfall of 500-800mm, maximum temperatures of 35-45°C and high humidity during the 'build up' and the 'wet' season (September/October–March). There is periodic flooding on plains, with high water levels in the many rivers, ephemeral creeks and springs, making some areas inaccessible for months.

Today, access is possible year-round most years, where there are major sealed and well-maintained gravel roads and air services. Some areas are only accessible in the dry, or cold, season (April–August/September), during which flooded creeks abate and daytime temperatures fall to 25-35°C (Bureau of Meteorology 2009), making outdoor working conditions comfortable.

In the late Pleistocene the climate in the study area may have been more humid than today, with the Australian Summer Monsoon (ASM) strong (see Bowman et al. 2010). The ASM weakened towards the Last Glacial Maximum c.29,000BP-10,000BP (Hughes 2021), creating cooler, drier conditions than the present day (Figure 2.1). This is confirmed in the study area, through micro-morphological analysis of deposits at Tangalma and Langurmurru (CG1 and CG3 on Figure 2.1), and the speleothem from a site to the west (Denniston et al. 2013). Vannieuwenhuyse et al. (2016) note that though at a general level the changes described are present in the region, the archaeological records for sites around the study area do not show this as linear a progression of climatic change as the general progression might suggest.

One of the likely constants in climate over the last 50,000 years appears to have been the presence of the ASM. This suggests that high precipitation/low precipitation periods oscillated during that time. It is probable that there were periods of very low precipitation during the period of maximum aridity during the LGM (Pepper & Keogh 2014:1448; Vannieuwenhuyse 2016:Chapter 2). Despite the variability of conditions shown at sites and over time, and decreased predictability as the ENSO strengthened in the mid Holocene, anthropogenic signals are visible over more than 40,000 years; increasing from the terminal LGM to the present. This suggests that the climate of the western part of the study area, and by extrapolation, most of the southern Kimberley, has been sufficient to sustain humans from the Pleistocene to the present.

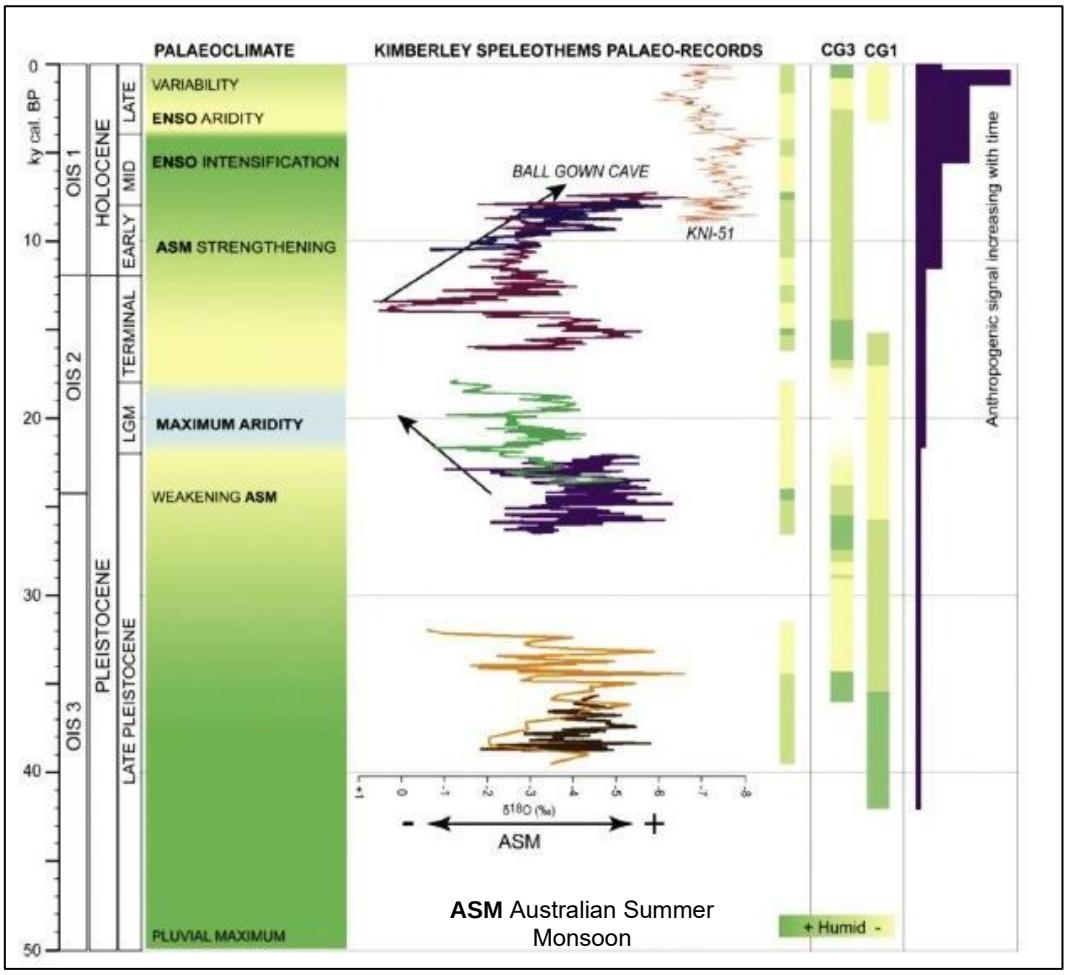

FIGURE 2.1 NORTH AUSTRALIAN PALAEO CLIMATE TRENDS OVER THE LAST 50,000 YEARS, INCLUDING SPELEOTHEM PALAEO-RECORDS FROM BALL GOWN CAVE CLOSE TO CG1 (TANGALMA) AND CG3 (LANGURMURRU), AND KNI-51 ON THE NORTHERN KIMBERLEY COAST (FIGURE 20 IN VANNIEUWENHUYSE ET AL. 2016: 189) REPRINTED WITH KIND PERMISSION FROM DORCAS VANNIEUWENHUYSE.

Geology

The Oscar and Napier Ranges are part of the Devonian reef complex which 'form[ed] a series of rugged limestone ranges that extend along the northern margin of the Canning Basin in a belt some 350km long and as much as 50km wide' (Playford et al. 2009:8). This is the dominant geological feature of the southern Kimberley (Figure 2.2). During the period of reef development karstification formed caves, rock shelters and exposed rock surfaces suitable for creating and preserving paintings and engravings (Playford et al. 2009:8).

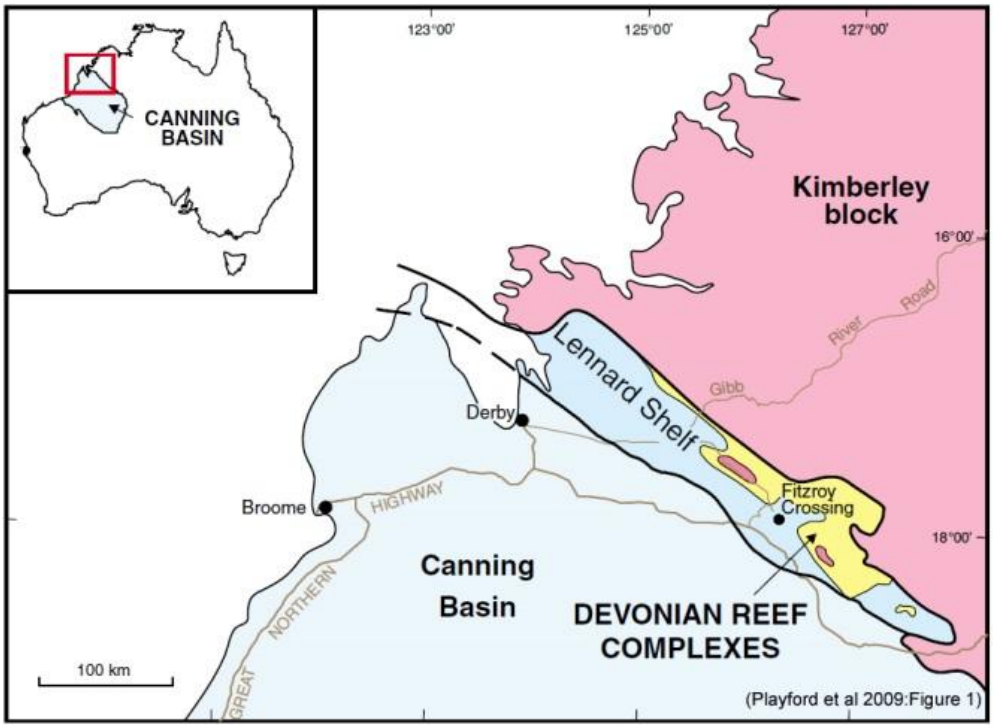

FIGURE 2.2 THE LOCATION OF THE DEVONIAN REEF COMPLEXES TO THE NORTHEAST AND WEST/SOUTHWEST OF FITZROY CROSSING, THE MAIN GEOLOGICAL FORMATION IN THE STUDY AREA (PLAYFORD ET. AL 2009: FIGURE 1) IMAGE IS COURTESY OF GEOLOGICAL SURVEY AND RESOURCE STRATEGY DIVISION, DEPARTMENT OF ENERGY, MINES, INDUSTRY REGULATION AND SAFETY © STATE OF WESTERN AUSTRALIA..

The reefs, which came to be known as the 'Devonian Great Barrier Reef', were first recognised as early as 1883 by ET Hardman (Playford et al. 2009:3) and formed around 350mya. The ranges are 30-80m high, and typified by rough karst formations, with sharp ridges which can be treacherous to walk through and climb.

Water Courses

Bandaral ngadu (the Fitzroy River) is a permanent water source which dominates the southern Kimberley (Figure 1.2). The English name was given in 1838 by Lieutenant JL Stokes of *HMS Beagle*, after the ship's second Commander, Captain Robert Fitz-roy. Bandaral ngadu begins in the Wunaamin Miliwundi Ranges[1], around 100km northwest of Halls Creek in the east Kimberley, running for 622km to the west where it flows into King Sound, 15km southwest of Derby. Combined with its major tributary, the Hann River, Bandaral ngadu flows for 733km (Landgate nd) providing sustenance to most of the people of the southern Kimberley.

The Lennard River flows through Bunuba Country and the Margaret River, a tributary of Bandaral ngadu, flows through Gooniyandi Country. Both are important water and food sources in the southern Kimberley. The Lennard and Margaret were named in 1879 by

[1] Formerly known as the King Leopold Ranges.

explorer/surveyor Alexander Forrest, the Lennard for the woman he was to marry the following year, Amy Eliza Barrett-Lennard, and the Margaret for his sister in-law, Margaret Elvire Forrest. While these rivers are wide and strong when they are flowing, this may only be for few months of the year (Landgate nd; Playford et al. 2009:342). However, each river has several permanent water holes brimming with birds, fish and reptile life.

The Kimberley is also home to hundreds of creeks, streams, waterholes and springs. Some of the smaller water sources have reliable but small water flows, whilst others are ephemeral and only flow during and shortly after the wet. They supplement the major waterways to provide sustenance for humans and animals in the tough and changeable environment.

Flora and Fauna

Lying between the edge of the Canning Basin and the Great Sandy Desert, with Bandaral ngadu running east to west, the southern Kimberley has a semi-arid/semi-tropical climate. The monsoonal weather patterns nurture a wide variety of flora and fauna; the abundance or scarcity of which is subject to seasonal variation. Both are essential for survival in this region; for food and food procurement, for social interactions to establish and maintain relationships (e.g. trade), and cultural (e.g. marriage) and spiritual connections (e.g. belief systems) which nurture the productivity of the land.

Flora

Trees, grasses, scrub and shrubs, many with edible components, form the bulk of vegetation in the Kimberley. Trees (Figure 2.3) include:

- *Eucalyptus* varieties such as Coolibah (*Eucalyptus microtheca),* Snappy Gum *(Eucalyptus brevifolia),* Woollybut *(Eucapyptus miniata);*
- Northern Kurrajong (*Brachychitron diversifolius*), and numerous examples of the *Brachychitron* genus (Figure 2.4), and
- Native fig (e.g. *Ficus platypoda* (Figure 2.5), *Ficus virens* and *Ficus aculeate)*, an important food source in the region.

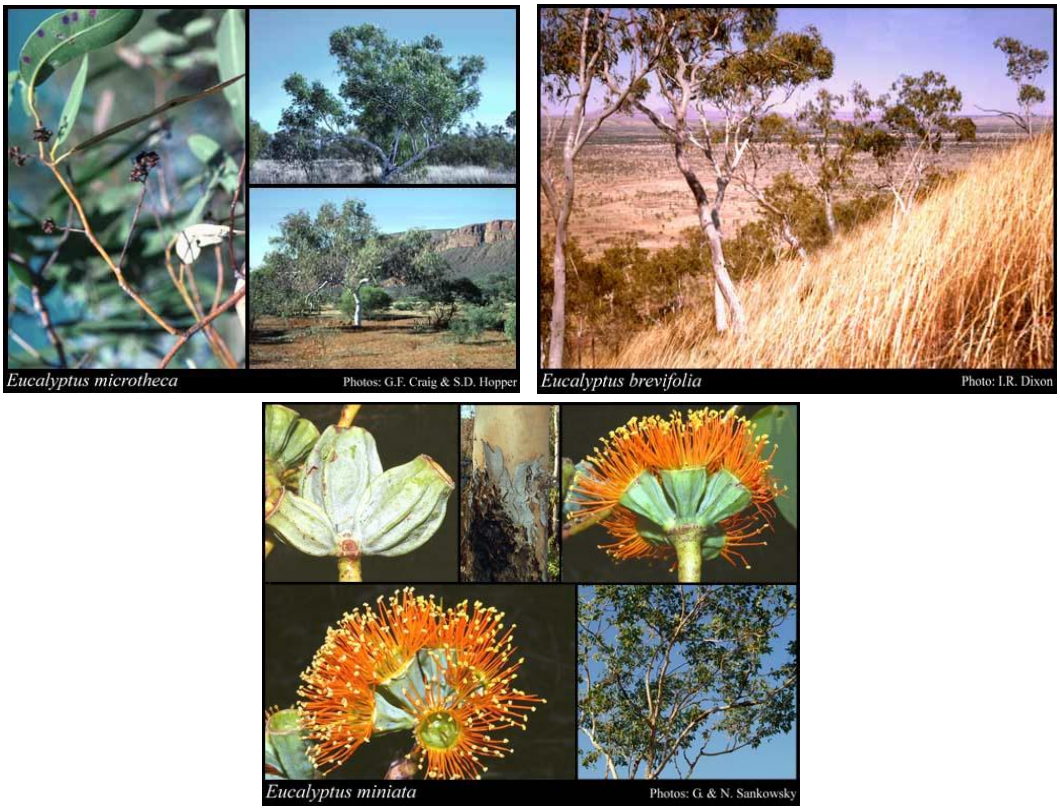

FIGURE 2.3 *EUCALYPTUS* GENUS FOUND IN THE SOUTHERN KIMBERLEY[2].

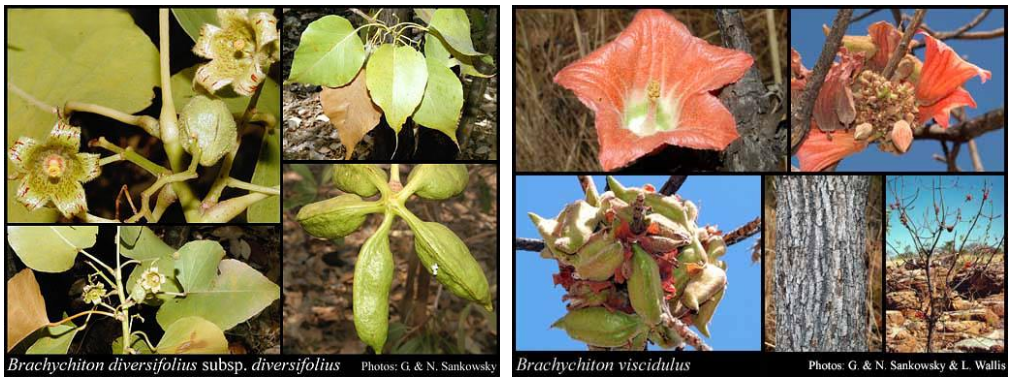

FIGURE 2.4 *BRACHYCHITON* GENUS FOUND IN THE SOUTHERN KIMBERLEY[2]

FIGURE 2.5 *FICUS PLATYPODA* FOUND IN THE KIMBERLEY. [2]

[2] Photography by GE Craig, SD Harper, IR Dixon, E Conway, G & N Sankowsky & L Wallis in Figures 2.2, 2.3 and 2.5. Images used with the permission of the Western Australian Herbarium, Department of Biodiversity, Conservation and Attractions (https://florabase.dbca.wa.gov.au/help/copyright). Accessed on 4 March 2022.

Kapok Trees (*Cochlopermum fraseri*) are scattered throughout the Kimberley. They have large yellow flowers and a drooping woody seed (Figure 2.6) filled with cotton-like hairs (Western Australian Herbarium 2008). They flower in the southern Kimberley when freshwater crocodiles lay their eggs, an important marker for the collection of a tasty and nutritious treat (Chungul et al. 1988).

Trees are important in food procurement in the southern Kimberley, as well as food sources. Excavations at Riwi, Gooniyandi Country, have confirmed the use of wood (Langley et al. 2016; Whitau et al. 2016b) and string (Balme 2013; Balme et al. 2009) associated with the manufacture of boomerangs, nets and bead necklaces in the study area.

FIGURE 2.6 THE WOODY FRUIT OF THE KAPOK TREE AFTER FLOWERING AT TARAKALU, SOUTHERN KIMBERLEY.

Re-analysis of 1990s excavations from Tangalma, Bunuba Country, identified part of an edge-ground axe head. This would have been attached to a wooden handle using plant materials for string and glue (Hiscock et al. 2016; Maloney et al. 2017a; Maloney et al. 2018a), reinforcing the importance of the trees and other vegetation for people in the region from around 50,000BP (Hiscock et al. 2016) to the recent past (Langley et al. 2016; Maloney et al. 2017a; Maloney et al. 2018a; Whitau et al. 2016b) and in the wider northern Australian region from around 65,000BP (Clarkson et al. 2017; Florin et al. 2020).

The iconic tree of the southern Kimberley, *largarri* (boab/*Adansonia gregorii*), is found primarily in the western part of the southern Kimberley. It is one of the most noticeable features along the escarpments. There are fewer largarri to the south and east, where the climate is more arid. Like many trees and shrubs in this region the wajarri (nuts) are a food, described in stories (Chungul et al. 1988) and personal recollections, and depicted in rock art (Figure 2.7).

FIGURE 2.7 WAJARRI AT FAIRFIELD 2, BUNUBA COUNTRY.

Archaeobotanical investigation at Tangalma in the 1990s dates the largarri's presence to at least 3,000 years (Figure 2.8), or as long as 39,700 +/- 1,000BP if the few dated remains are reliable. The remains of *Terminalia* (Figure 2.8), another deciduous fruiting tree, have been dated by association at the same site between 39,700 +/- 1,000BP and 650 +/-90BP (McConnell & O'Connor 1997:23, Figure 4).

Sedges and grasses are prolific on the plains and talus slopes along the escarpments of the southern Kimberley. The most noticeable, and prolific, grasses across the study area are tough, spikey tussock grasses known as spinifex (*Triodia*). Some varieties are only found in the Kimberley and northern and central desert areas (e.g. Phillips Range Spinifex/*Triodia diantha*, Lobed Spinifex/*Triodia intermedia* and Rock Spinifex/*Triodia racemigera*). Spinifex is found across the southern Kimberley and is prolific in the south-east (Figure 2.9).

Shrubs and sedges like *Celtis*, Eight Day Grass (*Fimbristylis dichotoma*), Bunched Kerosene Grass (*Aristida contorta*) and Golden Beard Grass (*Chrysopogon fallax*) grow in the southern Kimberley. They provide tufted coverage along ridges, in sandy areas close to creeks and rivers, and between loose rocks on slopes across the region (Figure 2.10). Grasses and their seeds are used in food processing, string making (e.g. making nets, hafting tools and weapons) and for social, ritual and symbolic purposes (e.g. beading shells for necklaces, headdresses and other adornments).

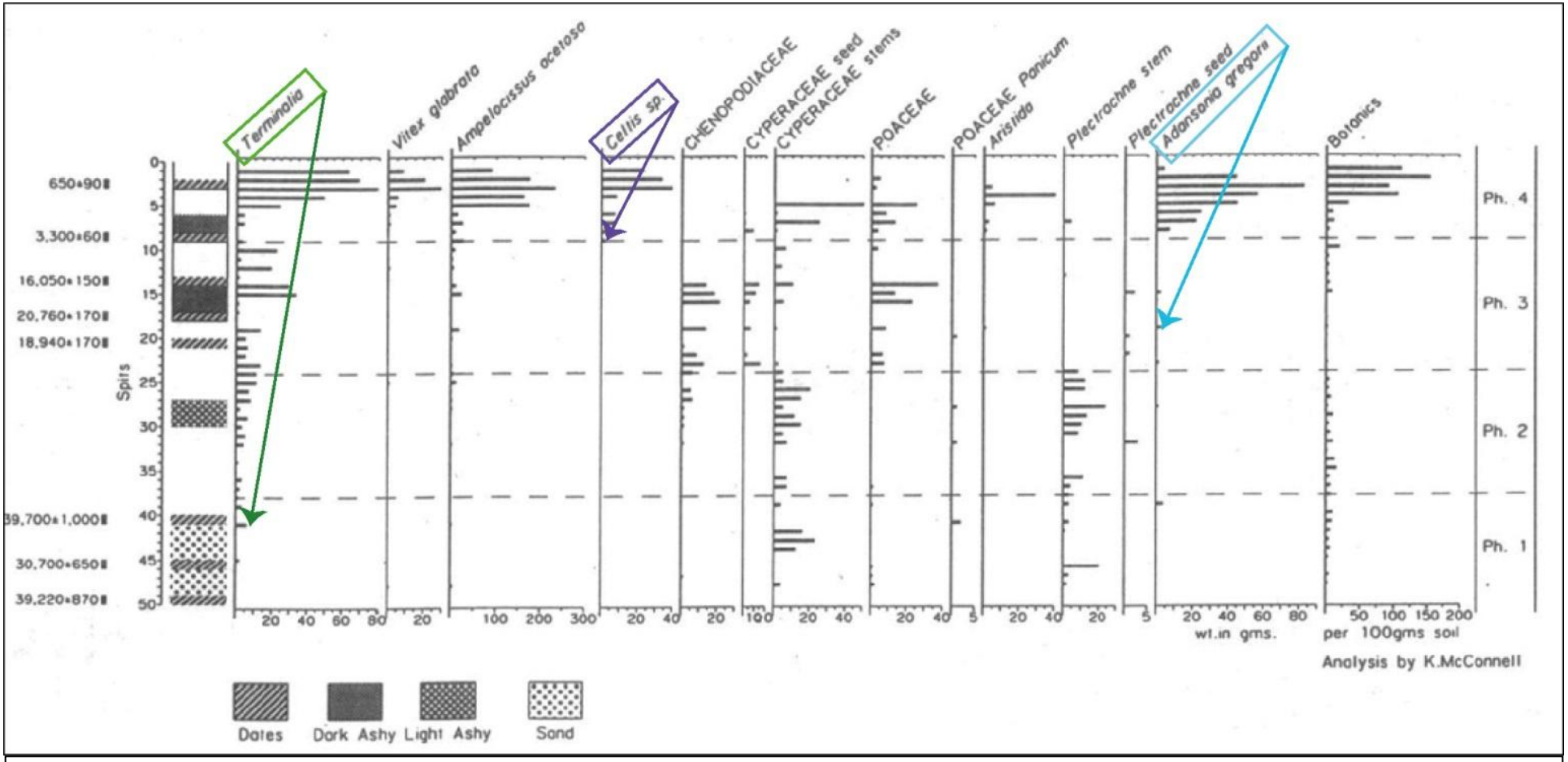

FIGURE 2.8 THE MAJOR PLANT REMAINS FROM EXCAVATIONS AT TANGALMA (CG1), WITH DATES FROM ANU, WK AND AMS NZ ON THE LEFT AND SELECTED REMAINS REFERRED TO IN THE TEXT HIGHLIGHTED (MCCONNELL& O'CONNOR 1997:23). *IMAGE COURTESY OF TAYLOR & FRANCIS INFORMA UK 2025.*

FIGURE 2.9 SPINIFEX COVERS MUCH OF THE GROUND SURFACE AROUND RIWI, GOONIYANDI COUNTRY. PHOTOGRAPHED AFTER THE WET SEASON IN 2011.

Celtis seeds were found in the excavations at Mount Behn 1 and dated in the modern era around 730 +/- 100BP (Fallon et al. 2010), suggesting that their presence in the environment is relatively recent. This is supported by remains of *Celtis* at Tangalma, dating the grass's presence in the archaeological record to at least 3,300 +/- 60BP (McConnell 1997; McConnell & O'Connor 1997).

The wanggu (yam/*Dioscorea bulbifera*) is a carbohydrate staple in the southern Kimberley. It is a long tuber with different coloured exteriors and mostly yellowish fleshy interiors. The wanggu is one of the most often depicted foods in the Kimberley rock art (Veth et al. 2018; Welch 2003). In the southern Kimberley there are examples of wanggu in both engraved and painted rock art, mostly in western sites (Figure 2.11). Remains of wanggu have not been identified in the *Lifeways* Project excavations to date.

FIGURE 2.10 GRASSES IN THE SOUTHERN KIMBERLEY (IMAGES FLORABASE, ONLINE RESOURCE FOR THE DEPARTMENT OF PARKS AND WILDLIFE, WA HTTPS://FLORABASE.DPAW.WA.GOV.AU).

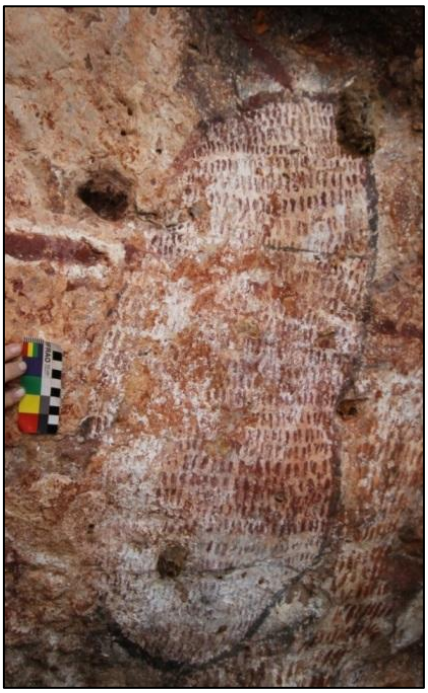

FIGURE 2.11 ONE OF MANY LARGE PAINTED WANGGU AT MOUNT BEHN 1.

Thanggari (water lily/*Nymphaea violacea, Nymphaea hastifolia* and/or *Nymphaea lukei*) are found in water holes in the southern Kimberley. The bulbs, seeds and flowers of the thanggari are all edible, making it and important and nutritional food source. The Traditional Owners I worked with in the *Lifeways* Project have strong childhood memories of the flowers, bulbs and roots being gathered and eaten, and readily identified them in the rock art (Figure 2.12) at Moonggaroonggoo (June Davis & Helen Malo 2011 pers. comm., 1 September). While an important food source in colonial times, there is not yet evidence of the remains of this plant in the *Lifeways* excavations in Gooniyandi Country.

Seed remains from excavations at Moonggaroonggoo sites are yet to be analysed, but the only dated layer at this site suggests either recent occupation at 388+/- 75BP, or that deposits may have been destroyed by water flow across the shelter floor (Maloney et al. 2017a:180); a similar event to those at other sites in the southern Kimberley with shallow stratigraphy and late Holocene deposits (Vannieuwenhuyse 2016).

Trees, sedges and grasses are all important food sources, and central to food procurement activities such as making nets, spears, fishing lines and carrying and capturing animals (McConnell & O'Connor 1997; Veth et al. 2018). They are also significant in social and symbolic behaviours, in making adornments, painting rock art, representations in rock art and ephemeral decorations on boomerangs, spears and shields (Balme 2013; Balme et al. 2009; Balme & Morse 2006; Bohemia et al. 1993; Chungul et al. 1988; Kimberley Language Resource Centre 2000; Kinnane 2008; w et al. 2018).

FIGURE 2.12 ONE OF THE MANY THANGGARI AT MOONGGAROONGGOO.

While remains are preserved in the archaeological record dating from c.30,000BP, to the late Holocene, there are many current Kimberley flora not in the archaeological record. This does not mean that they were not present in the past, only that, like many other organic remains the ideal conditions for conservation (Beck & Dotte-Sarout 2013) were rarely present in the southern Kimberley in the last 50,000 years (Vannieuwenhuyse et al. 2016:189).

Fauna

The Kimberley is one of the recognised 'centres of endemism on the Australian continent' home to 'more than 65 species of endemic fauna' (Pepper & Keogh 2014:1448), with considerable diversity and distinct bioregions. It is suggested that this came about through creation of 'microtopographical refugia' because of the isolation of caves systems, valleys and gorges in times of climatic variation (Cameron 1992 cited in Pepper & Keogh 2014:1449). Describing changes in fauna over time is not yet possible in the Kimberley; there are few samples to analyse, access is costly and limited and the area is vast. This limits comparison of current fauna with those dated remains from excavations. Analysis of faunal remains from excavation deposits in the region is limited at this stage, although included publications related to the *Lifeways* project and previous research by the *Lifeways* CIs (e.g. Balme et al. 2009; Balme & Morse 2006; Balme et al. 2018c; Balme et al. 2018c; Maloney et al. 2017a; Maloney et al. 2018a; Maloney et al. 2016; Maloney et al. 2018b; O'Connor et al. 2014).

Bunuba and Gooniyandi people tell many stories about animals in their Country, hunting them and using parts in hunting and fishing. The story of spearfishing *Wudiga'ni* told by Jalakbiya (Chungul et al. 1988:63-64) describes how the sinews from wanyjirri (kangaroo) tail were used for string tied to spears and secured with spinifex resin. Wibiy's story *Milha-bilinyi* describes how her father would spear small *wawanyi* (goannas) and wanyjirri, while her mother fished (Chungul et al. 1988:58-61).

Many stories emphasise the importance of meat and fish as food sources. Stories about birds are more anthropomorphic and related to Ancestral beings. One Bunuba story tells the tale of the Pheasant Coucal, his two wives Nightbird and Crow (Figure 2.13), and the Wedge Tailed Eagle in *Thuthulu Jiyani Wanggura Warrana* (Chungul et al. 1988:24-31). In this tale the Pheasant Coucal's lies about bringing his wives a butchered wanyjirri he had caught himself are exposed, resulting in the wives tricking him into crossing a deep river where he is drowned and turned into a bird.

Other stories show the caring side of animals, designating them companions, rather than food (e.g. the dogs that feature in *Yilimbirri* in Chungul et al. 1988:19-21). The species depicted in these stories, and others from the Kimberley region (e.g. Akerman 2009b; 2014; Love 1946) provide a broad view of the species that are likely to have been present for millennia.

Copyright clearance for the use of this image has not yet been resolved, and it has been redacted from this version.

FIGURE 2.13 THE STORY OF THE PHEASANT COUCAL IS TOLD IN THIS CONTEMPORARY ARTWORK (CHUNGUL ET AL. 1988:26).

The major species in the southern Kimberley are mammals and marsupials, such as wanyjirri (e.g. the red kangaroo/*Macropus rufus*) and small macropods, including Antilopine Wallaroos (*Macropus antilopinus*), sometimes referred to as the Euro, and Agile Wallabies

(*Macropus agilis*). Smaller animals are present but not often seen, such as Bandicoots (*Peramedlidae*) and Quolls (*Dasyurnini hallucatus*), Rock Wallabies (*Petrogale penicillata*), Dunnart (*Sminthopsis*), Marsupial Moles (*Notorycytes caurinus*) and Bilbies (*Macrotis lagotis*). Few macropods are depicted in the rock art of the area, either as figurative images or tracks.

The Echidna (*Tachyglossus aculeatus*); the egg laying monotreme that seeks out cooler, covered spaces and nooks is present in the Kimberley. Dingoes (*Canis lupus dingo*) are also in the Kimberley, mostly described as a companion animal, rather than a food source (Smith & Litchfield 2009). Despite its prevalence in the milieu of Indigenous society (Balme & O'Connor 2016; Rose 2000; Smith & Litchfield 2009) there are few depictions of the Dingo in the southern Kimberley rock art (Figure 2.14), perhaps because of its relatively recent arrival c.3,500BP (Fillios & Taçon 2016:3; Savolainen et al. 2004), and its limited presence in *Ngarranggani* (Dreaming) stories.

Other mammals have been present in the past in this region. Whilst little evidence has been found to support their presence in archaeological excavations there is both fossil and rock art evidence to support the presence of the extinct Thylacine (*Thylacinus*) in the north of Western Australia (Akerman & Willing 2009; Kendrick & Porter 1973; Mulvaney 2009: as well as in this study).

Birds are prolific in the southern Kimberley, with many important symbolic figures in the oral teaching tradition (Chungul et al. 1988). The range of birds is abundant and diverse, and best described by experts such as Storr (1980), or in Avibase (Lepage 2017) which lists 284 species in the central Kimberley, two of which are introduced (the Helmeted Guineafowl/*Numida meleagris,* and the Rock Dove/*Columbia livia*).

During fieldwork for the *Lifeways* Project, we saw and heard many of the birds around camps, rockshelters and in the trees and gorges. Emus (*Dromaius novaehollandiae*) ran parallel to our vehicles on bush tracks, while Wedge Tailed Eagles (*Aquila audax)* hovered above. We saw many of the smaller birds, Terns (*Gelochelidon macrotarsa*) and Cuckoos (*Cacomantis variolosus*), flitting around the trees avoiding the large Australian Crows (*Corvus orru*) and Magpies (*Gymnorhina tibicen*).

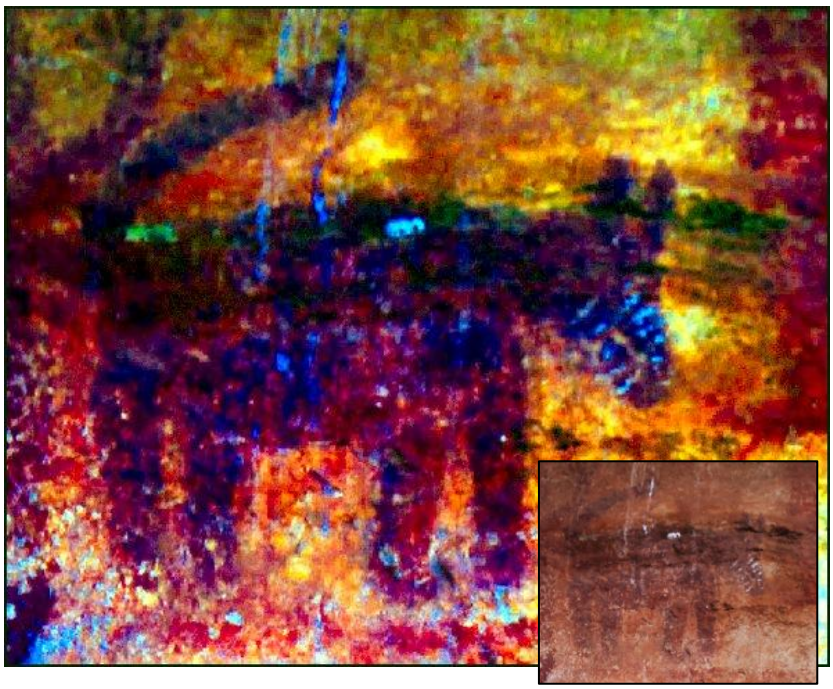

FIGURE 2.14 A DINGO AT ROCKSHELTER FAIRFIELD 2 (ENHANCED WITH DSTRETCH © LDS20).

We, the *Lifeways* team, did not see the legendary Pheasant Coucal (*Centropus phasianinus*) or Nightbird (his other wife), but we heard the Australian Owlet-Nightjar (*Aegotheles cristabus*) and the Southern Boobook (*Ninox boobook*) called out to us from *Bandilngan* (Windjana Gorge) on the nights spent in Bunuba Country. We saw, hunted, cooked and ate the Bush Turkey (Australian bustard/*Ardeotis australis*) with Traditional Owners.

FIGURE 2.15 THE REAR VIEW OF A 'BUSH TURKEY' AT TANGALMA.

Birds in rock art in the southern Kimberley are limited, with the few portrayed most likely to be food sources (larger birds), and each represented in a different way. Emus were not observed in the rock art, but Emu tracks were, Bush Turkeys are painted at a single site in a rear view only (Figure 2.15), and a single Australian Stork identified by Gooniyandi Traditional Owners (similar to the Black Necked Stork, *Ephippiorhynchus asiaticus*) is

painted in profile. Whilst an important food source, and important in many stories (Chungul et al. 1988) birds were not widely represented at rock art sites in this study.

Omnipresent in the southern Kimberley are reptiles: Crocodiles, Freshwater (*Crocodylus johnstoni)* and Saltwater/Estuarine (*Crocodylus porosus*); snakes (like the Black Headed Python/*Aspidites melanocephalus* in Figure 2.16); lizards (*Lacertilia*); and the Kimberley Long Necked Turtles (*Chelodina walloyarrina*). All these reptiles were observed in the landscape and rock art during fieldwork.

Crocodile, turtle, lizard and snake figures are at many sites in the study area, in many colours, sizes and shapes. Like other fauna the reptiles, particularly the snakes, are important aspects of Australian Aboriginal spirituality (e.g. Berndt & Berndt 1964; Kolig 1982; Tonkinson 2002) and a food source.

FIGURE 2.16 THE BLACK HEADED PYTHON (*ASPIDITES MELANOCEPHALUS*). DJAMBALAWA AT ENGLISH WIKIPEDIA, CC BY 3.0 <HTTPS://CREATIVECOMMONS.ORG/LICENSES/BY/3.0>, VIA WIKIMEDIA COMMONS

In 2004 there were 37 species of fish in the Kimberley, 23 freshwater and 14 marine/estuarine, identified at 70 sites along Bandaral ngadu (Morgan et al. 2004:151). More species continue to be identified across the Kimberley region in in recent years as part of studies to 'assess the extinction risks of the unique fish fauna of the Kimberley' (Dempster 2016; see also Le Feuvre et al. 2015).

The most visibly dominant fish in rock art in the southern Kimberley is the Eel (*Anguillidae)*, with its distinctive fins close to the head. Eels and snakes are, at times depicted together in the rock art. One example (Figure 2.17) in this study is close to the Lennard River at Bandilngan, where I observed an eel being caught and returned to the river in 2011. This is not a familiar part of the modern diet for Bunuba people as the younger men who caught it did not know what it was or what to do with it until an Elder came to help, but its presence in the rock art suggests that it has been known, and possibly eaten, in the past.

The flora and fauna of the southern Kimberley is rich and diverse. Availability is seasonal, and awareness and importance of the plants and animals is maintained through the oral tradition, contemporary written stories and preserved in rock art across the region.

FIGURE 2.17 SNAKES AND EELS AT DJURU, CLOSE TO THE LENNARD RIVER AT BANDILNGAN.

Cultural Setting

In 1788 it is estimated that Australia had at least 250 languages, between one and three million Aboriginal people (Murray 2003), and, by extrapolation, just as many cultural[3] groups. This has changed. Cultural groupings and borders are not always definitive, and languages and dialects are not always confined to a single cultural group.

From the west coast to the border of the Northern Territory the Kimberley has as many as 26 cultural groups, depending on how the distinctions of language and culture are drawn, and where the borders to the south and east are agreed. For Aboriginal Australians colonial/western borders and geography have little meaning in defining their language and cultural boundaries, so the number of cultural groups attributed to a region is not always consistent.

[3] While language groups is widely used in this context I have chosen to use cultural groups because Bunuba and Gooniyandi people I worked with did not refer to themselves that way, but cultures and cultural people and I prefer to use the language they use themselves as often as practical in this thesis.

A commonly used, sometimes disputed, contemporary grouping is shown on the AIATSIS Languages Map, identifying 26 cultural/language groups in the area defined as the Kimberley (Figure 2.18). At least four groups' 'borders' cross over into the region, with Gurindji and Ngarinman from the Northern Territory to the east and Walmajarri and Jaru from the Pilbara to the south, noting that there may be other groups or subgroups within those on the Map who have their own culturally distinct identity. Therefore, it is with some caution that in modern academic discourse we name groups, and I acknowledge and respect that this may vary between different people within each clan, language, cultural, nation or tribal group.

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FIGURE 2.18 LANGUAGE/CULTURAL GROUPS IN THE KIMBERLEY, WESTERN AUSTRALIA (EXCERPT FROM AIATSIS 1996 MAP DAVID HORTON)[4]

Cultural Groups in the Southern Kimberley

The main cultural groups identified in the southern Kimberley are from the sub tropics and the northern desert. A number of those (Figure 2.19) cross over into what is sometimes regarded as Bunuba or Gooniyandi Country. The Walmajarri, whose traditional lands border the southern parts of Bandaral ngadu, and the Wangkatjunga (both non-Pama-Nyungan speakers and mostly desert dwellers) have moved north in recent times. Figure 2.18 shows areas where some of the contemporary settlements in Gooniyandi Country are predominantly Walmajarri/Wangkatjunga communities (Morphy 2010:11-13). The five main cultural groups have come together over the years, and many now reside in the town of Fitzroy Crossing, in Bunuba Country. The town has come to be a meeting and shared place

[4] This map attempts to represent the language, social or nation groups of Aboriginal Australia. It shows only the general locations of larger groupings of people which may include clans, dialects or individual languages in a group. It used published resources from the eighteenth century-1994 and is not intended to be exact, nor the boundaries fixed. It is not suitable for native title or other land claims. David R Horton (creator), © AIATSIS, 1996.

since the dislocation of many people during development of cattle stations in colonial times. This movement occurred again later following the introduction of equal wages for pastoral workers in the late 1960s when many were evicted from stations (Bunbury 2002; Kinnane 2008; Smith 2000).

Bunuba Country is in the west of the study area (Figure 1.2 and 2.19). It extends

> *… north along the Fitzroy River to Jijidgu (Dimond Gorge), and follows Miluwindi ([formerly] King Leopold Ranges) to Napier Range in the west. It includes Bandilngan (Windjana Gorge) and Tunnel Creek national parks. The southern extreme extends from Malaraba (Erskine Range) to Dawadiya (Trigg Hill) near Fitzroy Crossing and includes Danggu (Geikie Gorge National Park).* (June Oscar in Chungul et al. 1988:vi).

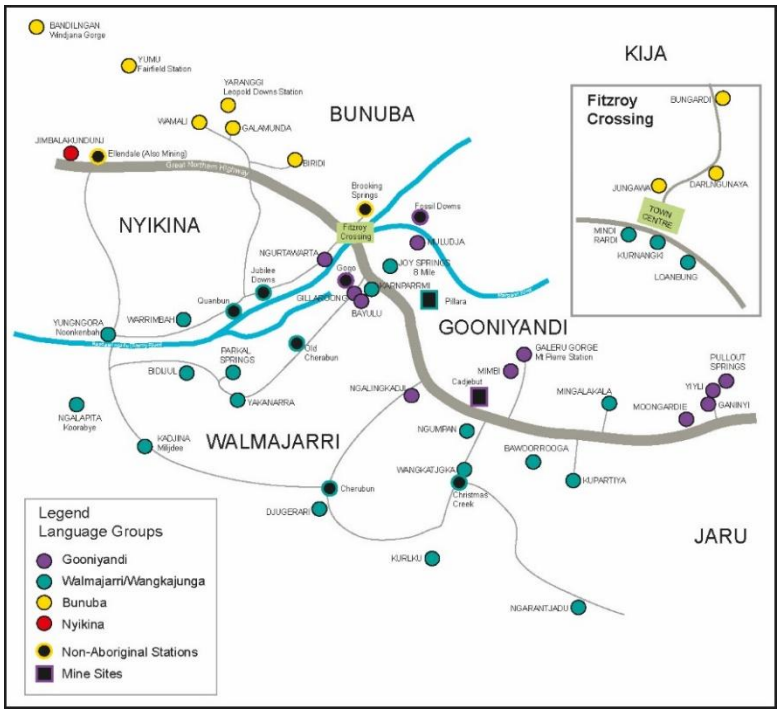


FIGURE 2.19 A FITZROY VALLEY CULTURAL MAP SHOWING MAJOR COMMUNITIES AND CLOSE NEIGHBOURS OF THE BUNUBA AND GOONIYANDI PEOPLE. (CAD, ADAPTED FROM CHUNGUL ET AL. 1988:VI; MORPHY 2010:11).

Gooniyandi Country is mostly to the east of Fitzroy Crossing (Figure 1.2 and 2.19), extending north to the Wunaamin Miliwundi Ranges and south to the Great Sandy Desert. It includes Birndiwa (Mt Huxley), Mimbi, Maanyjoowa (Margaret Gorge) and parts of the Margaret, Louisa and Mary Rivers, as well as Christmas Creek and Gooniyandi owned and run pastoral stations at Mt Pierre, Bohemia Downs and Louisa Downs (Department of Indigenous Affairs 2011; Federal Court of Australia 2013). Mimbi Caves are important in Gooniyandi culture, both as a spiritual centre and a key point in the traditional trade routes

(Balme et al. 2009:65; Balme & Morse 2006:802, 805-809; Balme et al. 2018b; Balme et al. 2018c; Toussaint et al. 2001:21).

The languages people speak are as important to identity as stories they tell, as important as their connection to Country and to rock art and contemporary paintings. The Bunuba people say

> *We know who we are by the language we speak.*
> *It joins us to our past and our old people, right back to the dreamtime.*
> *It ties us to our land and it makes us proud and strong.*
> (Bonnie Deegan in Chungul et al. 1988:iv),

Gooniyandi people decided that

> *… the community wanted the language written down, and wanted the children to learn and read Gooniyandi as well as speak it … In the past some linguists have written our language name as Gunian. … the people decided that the language name is really Gooniyandi, and they would like everyone to use this name in future. We spell it GOONIYANDI* (Street & Chestnut 1983:78).

Connection to Country is integral to culture, history and life in the southern Kimberley. It is part of what the Bunuba people call *Ngarranggani*[5] (Dreamtime), a time of creation. The Gooniyandi people call the time of creation *Ngarranggarni* (note the slightly different spelling), and 'identify ourselves through our connection to *riwi* (tracts of land) and/or their *jariny jariny* – conception dreaming sites' (Gooniyandi Aboriginal Corporation & Kimberley Land Council 2015:4). Most are around water sources or significant land formations (Pannell 2000) and connect Gooniyandi people to the land and water from that time onwards. The knowledge is passed to each new generation through stories, songs, and dance; passing on language and ensuring they spend time on Country teaching the young people its meaning and importance (Gooniyandi Aboriginal Corporation & Kimberley Land Council 2015:10-11; Street et al. 2015). Mervyn Street, respected Gooniyandi Elder, artist and a collaborator on *Lifeways* says:

> *When I look at the river I think of my country. The river is important for me, my people and the old people. … The river is who we are. We can't live without it*

[5] The underline is a pronunciation guide for specified letters detailed in *Thangani Bunuba* (Chungul et al. 1988:85).

(Mervyn Street in Gooniyandi Aboriginal Corporation & Kimberley Land Council 2015:15).

Like other cultural groups affiliated with the river the Bunuba and Gooniyandi people believe it is their responsbility to look after the river; an important economic, social and spiritual part of their Country (Hughes & Kinnane 1999; KALACC 1994; Morphy 2010; Pannell 2000; Toussaint 2008; Toussaint et al. 2005; Toussaint et al. 2001). The *Ngarranggani/Ngarranggarni* stories describe how rivers, creeks, waterholes and springs ensure there is water and food for people, and new life is created from the spirits of the waters.

The people care for Country both physically and spiritually, taking care to keep waterways clear (not dammed, or full of rubbish, silt buildup or poisons) so that they run clean and strong to provide food and water for the plants, animals and people who all rely on it. Songs are sung, ceremonies performed, and care is taken to make sure that people are introduced to the land and the water when they visit Country. The *Lifeways* team were introduced to the spirits by smoking and water spirit ceremonies when we stayed in Bunuba Country with Traditional Owners (June Oscar, Mona Oscar 2011 & 2012 pers. comm.; Toussaint et al. 2001:62), and when the Elders in Gooniyandi country called out to their ancestors to let them know who was there, who was with them and that they intended no harm.

The deep cultural connection to their Country is important for how it is nurtured, how it is approached by non-Aboriginal people. This is how we can start to learn to understand the significance of symbolic and material culture in excavations, surface scatters and rock art for Traditional Owners in their relationship to Country. To describe the full range and cultural depth of the life of the Bunuba and Gooniyandi peoples would need volumes. Published materials are a good place to start, although far from comprehensive. Kinship is detailed in Bates (2014; n.d.) and Kaberry (1937; 1939), language and historical stories are described and discussed in others (Allan 1989; Amadio 1990; Auty 2004; Bohemia et al. 1993; Bohemia & McGregor 1991; Bohemia et al. n.d.; evans 2003; Hodge & McGregor 1988b; 1989; 1996; 2004; 2009; n.d.; McConvell 1997; Treloyn 2003). Stories, histories and connections to Country are in film, theatre and books providing glimpses of different aspects of life and culture in the southern Kimberley (e.g. Bunuba Films & Hawke 2008; Chungul et al. 1988; Gooniyandi Aboriginal Corporation & Kimberley Land Council 2015; Hawke 2008; Kimberley Language Resource Centre 1988; Kimberley Language Resource Centre 2000; Kinnane 2008; Mudeling 1998; Oscar & Anderson 2009; Torres 2010).

Historical Setting

Some deep history of the Kimberley is known through archaeology, geology and related sciences, and through the stories, songs and rock art of the many cultural groups of the region. Written history since colonial expansion is supplemented by written or recorded oral histories, photographs, maps, ephemera, and extant structures, along with personal recollections on audio, film, theatre and, occasionally, in publication.

The arrival of pastoralists in the Kimberley was late in the Western Australian colonial experience, although exploration had begun soon after the 1829 settlement. George Grey and Phillip Parker King (1841) landed on the Kimberley coast in the late 1830s. They followed rivers inland in search of, and found, rich, tropical pastures, but there was little enthusiasm among colonists to move there at the time.

In the 1860s, others, such as Alexander McRae (1881a) sought new pastures, later setting up pastoral leases in the Pilbara (Battye 1915; 1924; Hardie n.d.; 1981; McRae 1881b; Withnell-Taylor 1980). One expedition was led by Alexander Forrest, who followed the Bandaral ngadu through the southern Kimberley. The success of that expedition led to the establishment of pastoral leases and further exploration. Discovery of gold in the 1880s resulted in a rush to the east Kimberley, and enthusiasm for the establishment of new pastoral leases to run cattle and profit from feeding the growing numbers of gold miners, policing and support industries (Battye 1915; 1923; 1924; 1985; Clement 1998; Cornish 2011; Gregory & Gothard 2009; Kinnane 2008; Willing & Kenneally 2002).

There was resistance and violence from the time of the explorers to the invasion of the pastoralists. Early explorers' journals include vivid descriptions of interactions with tribal warriors (e.g. Grey 1841; McRae 1881a), and these encounters continued and escalated with the arrival of pastoralists and gold miners (Auty 2004; Broome 1988; Harris 2003; Moran 1999; Nettelbeck 2014).

One of the best-known stories of resistance in the southern Kimberley in the 1890s is of Bunuba 'freedom fighter' Jandamarra (Kinnane 2008:235). Jandamarra's story is documented both in *kartiya* (white man) and Bunuba history. Jandamarra had been brought up on Yaranggi (Leopold Downs Station) where he became a skilled stockman and was befriended by head stockman Bill Richardson. When Richardson became a Police Constable he took Jandamarra with him as his 'right hand man' (Dillon Andrews in Kinnane 2008:236). Working with the police in one's own Country was unusual, and it put Jandamarra in a difficult position. He had to search out his own people for breaking the kartiya law and

arrest his respected Elders in their own Country. Among a group arrested one year was Ellamarra, who had taught Jandamarra Bunuba law. Whilst imprisoned at Lillimooloora (close to Bandilngan/Windjana Gorge, Figure 1.1 and others) Ellamarra talked with Jandamarra, reminding him of his culture and connection to Country. When Jandamarra learned the prisoners were to be walked to Derby he shot Richardson and set the prisoners free. An armed pursuit began within the week.

Jandamarra led his people in a guerrilla war against the police for more than three years, hiding out with family and friends. He accumulated weapons and followers, suffering wounds and setbacks as the police continued to hunt him and attempt to quell the resistance. A major confrontation occurred at Bandilngan. It has been described as a great battle, with guns firing from both sides and extra troops brought in from Queensland. Ellamarra died at that battle, Jandamarra escaped. He was soon pursued by police, troopers and trackers brought from the Pilbara, through Dimalurru/Tunnel Creek, Tarakalu (Dingo Gap) and the Oscar Ranges.

The final confrontation was at Dimalurru/Tunnel Creek in 1897. Jandamarra used his last bullet to shoot, and miss, the Pilbara tracker Micki. Micki returned fire and killed Jandamarra (Kinnane 2008:235-248; Pedersen 1984; Pedersen & Woorunmurra 1995).

Jandamarra is buried in Bunuba Country and remembered as a hero and freedom fighter by Bunuba people. His life and his resistance to the theft of his land and treatment of his people is remembered in books, plays and film (Hawke 2008; Kinnane 2008; Pedersen 1984; Pedersen & Woorunmurra 1995; Torres 2010; 2011). Resistance was a surprise for the colonial government:

> *The fact that Aboriginal people were prepared to stand and fight and had organised and had strategically thought out an ambush was a real shock, and that's when the official declaration of war came from the government* (Howard Pedersen in Kinnane 2008:248).

This marked the beginning of prolonged violence and death for Aboriginal people in the southern Kimberley. The kartiya brought in more police and troops, established police outposts. They forcibly removed people from their lands, often to distant places such as Rottnest Island, thousands of kilometres to the south (Figure 2.20).

By the early twentieth century many Aboriginal men were working as station hands, and women as domestic servants, in what amounted to virtual slavery, paid in flour and tobacco

(see Winter 2016 for a wider discussion on coerced labour in Western Australia, and the resolution of the Aboriginal Stolen Wages Class Action, WA Government 2024). Violence, poor treatment and removal did not stop (e.g. Owen 2003; 2016; Stevens 1968:15-19). People working on stations had varying interactions with pastoralists, being introduced to new foods and different lifestyles (Bohemia et al. 1993; Bohemia et al. n.d.; Marshall 2011; McGregor n.d.). Many station workers were paid in food and tobacco. Living in camps around the stations they were able to take time to hunt and fish to supplement the strange supplies given to them by the station managers (Crawford 2001; Harrison 2002b; 2005; Mangolomara et al. 2018; Marshall 2011; Smith 2000; 2001; Woolagoodja 2020).

FIGURE 2.20 MAP SHOWING FITZROY CROSSING IN BUNUBA COUNTRY AND ROTTNEST ISLAND WHERE SOME PRISONERS WERE SENT FROM THE 1890S TO THE 20TH CENTURY.

The *Aborigines Act 1905* formalised control systems, and removal of children from their families, particularly if they were of mixed parentage. Two large missions in the Kimberley where children were placed were at Beagle Bay and Moola Bulla, the latter only 20km to the west of Halls Creek and close to Gooniyandi Country (e.g. Bacon 2009; Human Rights and Equal Opportunity Commission 1997; Pannell 2000; Toussaint et al. 2001). Moola Bulla was

a large government owned cattle station, to which many dislocated people were sent. This was only one of many places that children were sent to become members the stolen generations; separated from family, Country, culture (Human Rights and Equal Opportunity Commission 1997).

While many aspects of life changed when Bunuba and Gooniyandi people began working on pastoral stations, others did not. People continued hunting and fishing, and expressed resistance in different ways, maintaining language, passing on stories, conducting ceremonies, and continuing to make traditional rock art (Bohemia et al. 1993; Bohemia & McGregor 1991; O'Connor et al. 2013).

In the 1960s there was resurgence in the push for equal wages for Aboriginal stockmen, with a walk off by the Gurindji stockmen at Wave Hill pastoral station in 1966. There had been earlier strikes and walk offs, such as the strike by workers on more than 20 Pilbara stations in 1946 (Hess 1994), however, the Wave Hill walk-off was seen as pivotal in the movement for equal pay. It was the beginning of a serious crusade for land rights and continued for nine years before the land was returned to the Gurindji people (Bunbury 2002; Stevens 1968).

Equal pay for Aboriginal pastoral workers was legislated in 1968. Stockmen in the southern Kimberley had been paid in flour, tea, sugar and tobacco, and wages retained by the pastoralists (see Anthony 2013; Kidd 2006; Kidd 2007; Smith 2000; Stevens 1968). Pastoralists cried poor, claiming that they could not sustain the wages. Employment of the pastoral workers was cut, and families moved from the land to missions, and town sites where they were foreigners, without language, without Country, without culture (e.g. Bunbury 2002; Kinnane 2008; Marshall 2011; Smith 2000).

In the 1960s the culmination of decades of campaigning also resulted in the success of the 1967 Referendum. This is generally understood to have granted Aboriginal people universal suffrage, although the *Commonwealth Electoral Act* had been amended to provide this in 1962, and citizenship. More than 90% of the Australian population voted to change the Australian Constitution to enable Aboriginal people to be counted in the census. Through this they became subject to Commonwealth laws, not just State laws. Those laws had made them a highly regulated and ‘rejected section of Australian society’ (Tilbrook 1983:5), who could be moved about, detained, educated (or not), andconfined to specific areas. They were financially and physically exploited and removed from culture, family and Country once again (Delmege 2005; Haebich 1992; Tilbrook 1983).

This landmark referendum and new laws around the country did not stop children being taken from their homes and families until 1970 in Western Australia. In 1975 Prime Minister Gough Whitlam began the first official handback of land to the Gurindji people (Bunbury 2002; Stevens 1968). It would be nearly 50 years before Bunuba and Gooniyandi people would gain title to their lands through the Federal *Native Title Act 1993* (Federal Court of Australia 1999; 2012a; 2013).

The detail and impact of colonial and post-colonial history is examined in other theses and publications (Anthony 2013; Berndt & Berndt 1987; Bohemia et al. 1993; Bunuba Films & Hawke 2008; Chalarimeri 2001; Choo 1996; Clement et al. 2012; Crawford 2001; Fox & Battye 1915; Harrison 2002a; 2002b; Hawke 2008; Kidd 2007; Kinnane 2008; Marshall 2011; Mowanjum Artists Spirit of the Wandjina Aboriginal Corporation et al. 2008; Owen 2016; Pedersen & Woorunmurra 1995; Torres 2010; 2011; Toussaint 2012; Zucker 1994), and informs this research in terms of how Bunuba and Gooniyandi people regard and interact with Country, one another and rock art.

In the twenty first century the Kimberley and the southern Kimberley is much changed. Aboriginal ownership and management of cattle stations, of land and commercial enterprises in Fitzroy Crossing has changed the dynamic of interaction between Indigenous and katiya people, providing independence and a degree of self-determination. Native Title has led to greater input into development and planning around a future to maintain and grow communities (e.g. Gooniyandi Aboriginal Corporation & Kimberley Land Council 2015). Social initiatives such as restrictions on alcohol, which had left gaps in cultural connection and knowledge, and the health of children suffering from Foetal Alcohol Spectrum Disorder (FASD) (Blagg et al. 2015; Fitzpatrick et al. 2015; Fitzpatrick et al. 2013; Kavanagh & Payne 2014) are beginning to improve the health and well-being of Bunuba and Gooniyandi people, and increase the understanding of the impact of the gifts and curses of colonisation.

Summary

The southern Kimberley is dominated by limestone escarpments and outcrops, forming the Oscar and Napier Ranges, the remnants of a great Devonian Reef from more than 350mya (Playford 1981; Playford et al. 2009). It is punctuated by three major seasonal rivers, and subject to monsoonal weather patterns, alternating between flooding and abundance, and drought and meagre subsistence. The flora and fauna are diverse and plentiful, and Bunuba and Gooniyandi people have been moving with the seasons from the time of the

Ngarranggani/Ngarranggarni, weaving their spiritual and educational stories into their lives through ceremonies of song, dance, stories and rock art.

Through many movements in and out of Country, both voluntary and forced, the Bunuba and Gooniyandi people have maintained their language and cultural connections. Despite dire times of colonial violence, conflicts, and disposessions, they have also adapted to include post-colonial economic and cultural norms into their contemporary lifeways (e.g. commercial enterprises), maintaining their connections and protection of Country in different ways.

Research History involving the Bunuba and Gooniyandi people

Every fence in Australia encloses land that was once the sole or shared possession of a particular group of Aboriginal people. There are virtually no exceptions to that statement.

(Stanner 1963:50)

Introduction

There were approximately 101,000 people living in the Swan River colony soon after settlement in 1829, mostly men from the United Kingdom (Australian Bureau of Statistics 2019; vanden Driesen 2009). It is not clear what the Aboriginal population was at that time, although Hallam (2009) estimates there may have been 100,000-200,000 Aboriginal people in the colony c.1829. The 2016 Census recorded 75,978 Aboriginal people in the state.

Today the population is concentrated in the south west, with close to 79% (1,943,858) of people living in the Perth metropolitan area. Less than 1% (0.6%) is Aboriginal and/or Torres Strait Islander. The sparsely populated Kimberley region is home to 1.4% (n=34,364) of the state's population, of whom 41.6% are Aboriginal and/or Torres Strait Islanders (Australian Bureau of Statistics 2017). This is likely to have been different at the time of colonisation, when the colony was a small settlement far to the south growing slowly until gold rushes at the end of the nineteenth century.

Using Hallam's (2009) estimates of Aboriginal population applies to the 2016 population distribution there may have been 1,400–2,800 people in the Kimberley c.1829. Others

suggest Aboriginal population was decreasing prior to colonisation; the result of previous contact with Macassan fishermen sailing from Indonesia (Morwood & Hobbs 1997) and European explorers bringing diseases to which they had no immunity (Campbell 2002; Cumpston 1989; Dobyns 1993; Fenner et al. 1988; Murray 2003). This suggests that populations in the Kimberley were greater over previous centuries than Hallam's (2009) estimates indicate.

When there are more people, there is greater competition for scarce resources, and more movement by groups to exploit those. Marking or defining territories would likely be used where people wished to protect resources, or to signal that others may access them. Rock art is one way to communicate the openness or restrictions of borders (David et al. 2006; David & Chant 1995; Smith 1992b). If there were fluctuating populations in the southern Kimberley, along with seasonal availability of resources, then communication was likely to be paramount to resource access and survival.

The Kimberley was one of the last areas in Western Australia to be colonised by Europeans (see Gregory & Gothard 2009). There has been anthropological and archaeological research in the Kimberley region, though less specifically in the southern Kimberley. Ethnographic and anthropological study in the southern Kimberley is patchy, difficult or restricted for cultural or legal reasons, or to protect commercial interests.

Anthropologists and archaeologists have immersed themselves in the lives of Kimberley peoples from time to time (see Akerman 1977; 2009b; Blundell 1975; 2003; Blundell & Layton 1978; Kaberry 1938; 1939; Kolig 1987; 2003; Morphy 2010; Toussaint 2008; Toussaint et al. 2005; Toussaint et al. 2001). Bunuba and Gooniyandi life has been documented in different ways, including:

- The legend of rebel fighter Jandamarra is commemorated in books, plays and film (Hawke 2008; Kinnane 2008; Pedersen 1984; Pedersen & Woorunmurra 1995);
- Individuals have contributed stories to researchers and publications (Bohemia et al. n.d.; Marshall 2011; McGregor n.d.);
- Colonial and post-colonial archaeology has been investigated on pastoral stations (e.g. Harrison 2002a; 2002b; 2005; Smith 2001); and
- Language from the southern Kimberley is well documented (Bohemia et al. 1993; Chungul et al. 1988; Kimberley Language Resource Centre 1988; McGregor 1988b; Oscar & Anderson 2009; Rumsey 2007).

Both published and unpublished research relevant to the archaeology, in particular the rock art of the southern Kimberley and surrounding areas, is reviewed in this chapter to determine how it may contribute to this study.

Anthropology: Understanding Humans

There are gaps in ethnographic knowledge about Bunuba and Gooniyandi people. Social behaviours are included in stories, linguistic analyses, language-based materials (e.g. Chungul et al. 1988) and histories (e.g. Bohemia et al. 1993). These inform this thesis in part, but systematic study which could be analogous to life before contact and interaction with Europeans is difficult to find, sporadic and selective at best.

Writer and raconteur Daisy Bates lived and travelled in the Kimberley in the early twentieth century. She collected voluminous information on the social, spiritual, cultural and linguistic aspects of life in Western Australia and South Australia, but there is little from the southern Kimberley. Bates (2014) travelled through the area from east to west and photographed spears from the region (Bates n.d.:Folio 95/36). Unlike her travels in the north, east and west Kimberley it does not appear that she stayed long enough in the south to learn Bunuba or Gooniyandi languages, dances, and marriage customs, as she did in other areas.

Elkin (1931:297, 324) is one of the few to include Bunuba social organisation in his research. His student, Phyllis Kaberry's (1937; 1938; 1939) anthropological studies developed these by focussing on women from pastoral stations. Her studies provide insight into lives and rituals of Gooniyandi people with close connections to Country and traditional lifestyles, maintained despite occupation of the land by pastoralists in the late nineteenth century. She describes how some who worked on the stations moved between station-work in the dry months and traditional hunting and foraging in the wetter seasons. This is also described in *Blood History* (Kinnane 2008), *Raparapa* (Marshall 2011), academic articles (Smith 2001) and the stories shared in linguistic studies (e.g. Bohemia et al. 1993; Hodge & McGregor 1989; McConvell et al. 2018; McGregor 2009; n.d.).

Elkin (1931) described marriage and kinship in the Kimberley and suggested that while the Bunuba people used what he referred to as a four-section system, they adjusted this to fit in with their neighbours (Elkin 1931:324). If Elkin is accurate, then this has been changed by the Bunuba people in the 20th century. According to at least one Bunuba Traditional Owner the system used for as long as anyone can remember, has eight sections (Patsy Bedford 2012 pers. comm., 14 August). Changing marriage and kinship systems over time in

response to interactions between cultural groups may be an indicator of changing interaction between people from different language and cultural groups.

In Australian Aboriginal cultures, kinship systems determine who may marry who, and where the children of a marriage will belong, along with obligations and taboos; an essential part of the social structure (e.g. McConvell et al. 2018). Marriage laws ensure that close relations, and part siblings, do not marry, resulting in healthy mixing in the gene pool, reducing the possibility of passing on genetic conditions. Kinship systems become more complex the more sections there are. Some contemporary cultural groups in less populated areas have 12 or more sections to ensure their cultural and linguistic continuity. Adjustments and agreements are made when people from different countries/clans marry. This has been an important aspect of exchange in Aboriginal cultures. The move from four to eight sections suggests that for the Bunuba people there was an imperative to maintain their genetic imprint to continue their culture at some time after Elkin's (1931) visits. The reasons for this may have been less contact with neighbours providing fewer marriage exchanges and therefore more need to marry within the Bunuba, or more intermarriage resulting in more complex relationships, requiring more complex rules to ensure continuity of the Bunuba.

Many Australian Aboriginal cultures follow matrilineal lines. Bunuba and Gooniyandi women carry their language and genetics through to the next generations. As Patsy Bedford explained:

> *We Bunuba women are just marrying out with those to the west and east to create more Bunuba. Because we lost so many to the drink since the katiya [white people] came to the stations we need to grow our language and culture strong again so we can look after this land* (2012, pers. comm., 12 August).

Akerman (e.g. 2005; 2007) spent many years living and working with Kimberley people. He wrote about material culture and ethnography, but not Bunuba or Gooniyandi people.

Toussaint (e.g. 2002; 2004; 2008; Toussaint et al. 2005; Toussaint et al. 2001) completed an anthropological study of the peoples across the southern Kimberley, particularly the Fitzroy Valley. Her work included the Bunuba, but her primary focus was Gooniyandi, Walmajarri and their northern neighbours.

The anthropological perspective offers ideas about how Kimberley people view their connection to land and water (e.g. Blundell 2003; Blundell & Layton 1978; Blundell & Woolagoodja 2012; Kolig 1989; 2003; Toussaint 2008; Utemara & Vinnicombe 1992; Vinnicombe & Mowaljarlai 1995), and continuation and sharing of the languages

(Gooniyandi Aboriginal Corporation & Kimberley Land Council 2015; Hodge & McGregor 1989; Kimberley Language Resource Centre 1988; Kimberley Language Resource Centre 2000; Oscar 2000; Oscar & Anderson 2009; Street & Chestnut 1983). Toussaint et al. (2005:61-62; 2001:14-28) describes the importance of water for people along Bandaral ngadu (Fitzroy River), and how they moved through the Country over time; 'desert people' moving into the lands of 'river people', and Gooniyandi moving towards the east. This is also part of a discussion regarding contemporary art; how it both reflects and reinforces the connection, and the complex relationships between language groups, men, women and neighbours along, and with, the river (Toussaint et al. 2005:68-69).

Connection and continuity of connection to their Country was confirmed for Bunuba and Gooniyandi people under the *Native Title Act 1993*. Native Title was granted for Bunuba in 2012 (Federal Court of Australia 2012) and Gooniyandi in 2013 (Federal Court of Australia 2013; 2016). Native Title Determinations rely on anthropological studies and genealogies (not publicly released in the judgements). In the Bunuba decision, for example, the genealogies compiled by Kaberry in 1935-1936, and research by Sandra Pannell, who has been working closely with the Bunuba and Gooniyandi people for many years, were the bases for the claims (e.g Pannell 2000). This material is not published, and rarely available for examination without connections to the authors, or specific permission from the Native Title holders. The full Kaberry collection, for example, is held in the Australian Institute of Aboriginal and Torres Strait Islander Studies in Canberra, ACT; access is permitted, and while it would have enhanced this study it was less of a priority (for limited funding) than fieldwork and working directly with Bunuba and Gooniyandi people.

Anthropological study in the Kimberley provides an awareness of some aspects of life, belief systems and ways of thinking since colonisation. There is not yet published work of a complete ethnography or anthropological study of the Bunuba or Gooniyandi peoples of the southern Kimberley. The contemporary and historical social alliances and networks of the Bunuba and Gooniyandi are little known in academic literature. It is an omission in wider Kimberley studies focussed on common links of Wanjina (e.g. Akerman 2014; Blundell 1974b), or movement from traditional to station life which occurred from the 19th century to the 1960s (e.g. Clement et al. 2012; Lowe & Pike 2009:142; Marshall 2011; Smith 2000).

Archaeology: Digging Deeper

Archaeological research in the Kimberley region has been sporadic and site specific until the last decade. This is not surprising, the region is vast, and accessibility is limited by

challenging terrain and monsoonal weather systems. Despite easy access through an excellent network of sealed and unsealed roads, walkable tracks and gentle slopes it is remarkable the southern Kimberley is less researched than some of the more remote and inaccessible areas.

In the west and coastal Kimberley, the region's archaeology, including rock art at sites with long occupation history, has been investigated since the 1980s (O'Connor 1987; 1989a; 1989b; 1990; 1994; O'Connor & Sullivan 1994; O'Connor & Veth 1993). While informative, much of this work is in areas that are environmentally, culturally and linguistically different to the southern Kimberley.

Archaeological research in the northern Kimberley has increased since the late 1990s (see Crawford 1964; David et al. 1997; Huntley et al. 2015; Huntley et al. 2014; Morwood et al. 2010; Roberts et al. 1997; Ross et al. 2016b; Travers & Ross 2016; Veitch 1996; 1999; Watchman et al. 1997). This has included research into environment, antiquity of occupation, and rock art. This area is distant from the southern Kimberley, with the Mitchell Plateau more than 400km north on a direct line from Fitzroy Crossing in the centre of the study area (Figure 3.1), a little under half the length of the United Kingdom. The environment in the north is characterised by high cliffs, and dense vegetation with many areas accessible only by boat or helicopter. The north is fully tropical, and monsoonal with very seasonal high rainfall. Along with cultural and language differences, the north is very different from the southern Kimberley. This research is important in a regional analysis and will contribute significantly to a Kimberley wide analysis of rock art, occupation, movement and interrelationships across northern Australia.

In the eastern Kimberley, bordering on this study area, there has been intermittent archaeological investigation. Harrison's (2000; 2002b; 2006) research at Old Lamboo Station in the south-east had both an Aboriginal and historical archaeological focus. Honours theses in archaeology also posed questions about sites in the east Kimberley (e.g. Anderson Bonavia 2012; Gibson 2001; Jestribek 1997). The Honours theses are of varying value in their contribution to the archaeological record of the region, as none resulted in peer reviewed publications, and there was no follow up research on those questions by the graduates or other researchers.

Research in the north and northeastern region (Figure 3.1) is near completion (e.g. David et al. 2019; Finch et al. 2021b; Finch et al. 2019; Finch et al. 2020; Genuite et al. 2021; Green et al. 2021a; Green et al. 2021b; Huntley et al. 2015; Motta 2019; Ouzman et al. 2017; Porr 2010; Porr & Balanggarra Aboriginal Corporation 2011; Porr & Veth 2017; Ross et al. 2016a;

Travers & Ross 2016; Veth et al. 2019; Veth et al. 2018b). Like the southern Kimberley, this area has mainly painted rock art, but the motifs are markedly different from those in the southern Kimberley (e.g. Balme & O'Connor 2014; 2015; Crawford 1968; Donaldson & Kenneally 2007; O'Connor et al. 2013). Monsoons, geology and geography, and cultural and linguistic differences make the north and east Kimberley distinctively different to Bunuba and Gooniyandi Country in the semi-arid/sub-tropical zone at the northern edge of the Canning Basin.

Blundell (1974b; 1975; 2003; Blundell & Layton 1978; Blundell & Woolagoodja 2012) and Crawford (1964; 1964-1968; 1968; 1972; 1973) both travelled in the southern Kimberley while conducting research in Worora and Ngaranyin Country to the west. Crawford's (1964) field notes show his travels through Bunuba and Gooniyandi Country. He notes staying the night at Leopold Downs and Brooking Springs in Bunuba Country (13/8/1964), visiting Gogo Station and Fossil Downs in Gooniyandi Country, and then travelling west back to Tangalma (19/8/1964). He recorded three rock art images at two sites before heading back toward the coast.

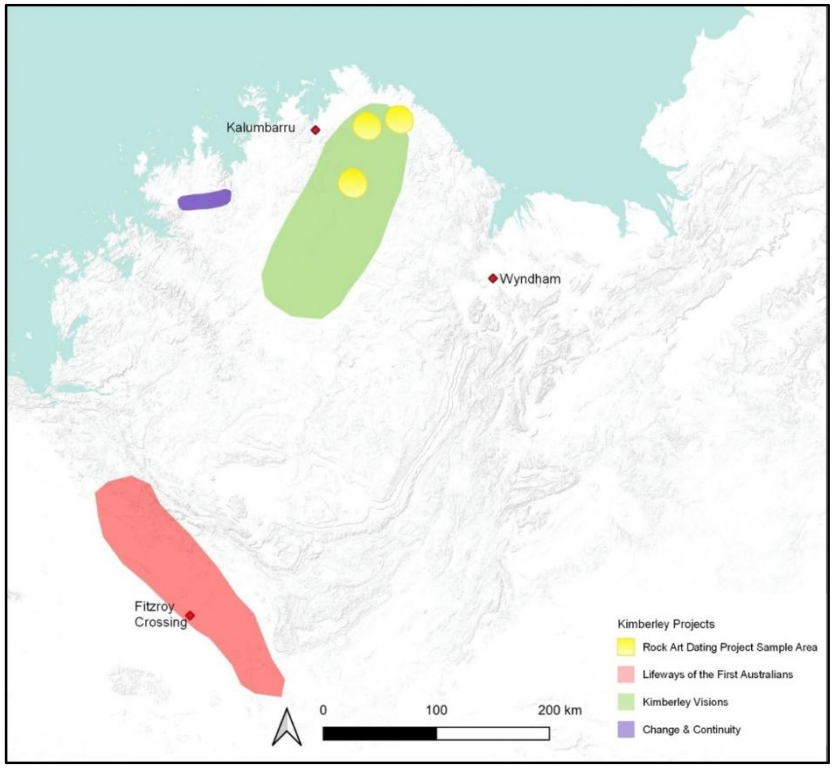


FIGURE 3.1 MAP OF THE KIMBERLEY SHOWING RECENT MAJOR PROJECTS WHICH INCLUDE THE INVESTIGATION OF ROCK ART.

Worora elder Billy Munro was Crawford's guide. He would not be as knowledgeable about sites and their importance as a Bunuba Elder, so the existence and significance of places may not have been as well known. The expedition ephemera and publications include

photographs and drawings of rock art at sites in the southern Kimberley, but little detail or site related information is recorded. Most of the research and analysis was to the west and north of the study area (Crawford 1964; 1964-1968; 1968; 1972; 1973; Smith 2006).

Blundell's PhD (1975) included sites close to Bunuba Country, in Worora, Umi-da, Unguumi, Ngaranyin and Unggarangi Country to the west and northwest of the study area. Blundell (1974b; 1975) investigated material culture and social organisation of the Worora people, concentrating on stone tools in traditional hunting and gathering. Her research on marriage patterns of the Worora provided insight into relationships and social organisation in the western Kimberley, and her inclusion of rock art was important in stressing its importance in archaeological investigation as early as the 1970s. Blundell later studied more of the rock art of the Worora, especially the Wanjina (Blundell 1974b; 2003; Blundell & Woolagoodja 2012).

This research gives some insight into the adaptability of Aboriginal people to changes, different Country, and environment and a preview of rock art in areas bordering Bunuba Country. The areas in which Crawford (Crawford 1964; 1964-1968; 1968; 1972; 1973; Smith 2006) and Blundell (1975) conducted their field work are more tropical than the southern Kimberley, rainfall is higher, vegetation denser and access to coastal resources is closer. The differences in those areas are helpful to identify where geographic and climatic borders exist, which provides some understanding of styles and motifs which might indicate 'open' or 'closed' borders determined in part by those characteristics (see Smith 2006), where ideas and beliefs are more or less likely to cross over. With little other archaeological research in the border area, the research of these two scholars is important to inform discussion on the research questions on identity and territoriality.

Kimberley Visions: The origin of Rock Art Provinces in Northern Australia 2015-2020 (funded by the Australian Research Council LP150100490) is one of the most recent research projects. The main anthropomorphs identified in the study area, the Gwion Gwion, are not found in the southern Kimberley. There is little doubt that this research is significant to create new pieces for a jigsaw that may eventually provide a more complete picture of the occupation, cultures, styles and motifs over time in the Kimberley region, and ultimately for links across northern Australia. There are several key publications from this project (David et al. 2019; Genuite et al. 2021; Gunn et al. 2019; Harper et al. 2020; Harper et al. 2021; Motta 2019; Ouzman et al. 2018; Veth et al. 2019; Veth et al. 2018a) and five PhDs completed or nearing completion.

With considerable crossover in the northeast Kimberley around the Drysdale and Barton River area the *Rock Art Dating Project* is examining innovative techniques to develop a timeline for rock art production in the Kimberley region. Recent results suggest that painted rock art in the area has been present for at least 17,000 years (Finch et al. 2021a), and research continues with the Traditional Owners to investigate the antiquity of the rock art, employing a variety of approaches (Finch et al. 2021a; Finch et al. 2021b; Finch et al. 2019; Finch et al. 2020; Green et al. 2021a; Green et al. 2021b).

Lifeways, of which this study is part, is the only project which focussed on the archaeology of the southern Kimberley. This is Bunuba and Gooniyandi Country. The neighbours include the Walmajarri and Nyikina to the south, and Kija, Worla and Ngaranyin to the north (Figures 2.18 and 2.19).

Archaeological research in the southern Kimberley identified the antiquity of occupation in the region (Balme 2000; O'Connor 1995) and described aspects of life in past millennia (Balme 2000; Balme et al. 2009; Balme & Morse 2006; Hiscock et al. 2016; McConnell 1998; McConnell & O'Connor 1997; O'Connor 1995; O'Connor et al. 2008a; O'Connor & Fankhauser 2001; Wallis 2000a; 2001; Watchman et al. 2001). O'Connor (1995) and Balme's (2000) work is key to this study. It identified rock art as an important marker of human activity during 40,000 years of occupation at the key sites of Tangalma and Riwi (Balme et al. 2018c; Maloney et al. 2018b; O'Connor et al. 2014), as well as at Djuru close to Bandilngan/Windjana Gorge (Balme 2000; Maloney et al. 2016; O'Connor 1995; O'Connor et al. 2008a; O'Connor & Fankhauser 2001).

Further research on the antiquity of rock art in the region was instigated following those key studies. An analysis of micro laminations of oxalate layers on rock art surfaces at Tangalma (Watchman et al. 2001) provided limited information on dating the rock art. Although layers in the study were dated at more than 20,000BP, micro excavations on the engraved or painted rock art were not permitted, so the results are only for lamination formation close to the images. The results were mixed. Crusts were of varying thickness and mineral composition and dating for layers at similar depths in the crusts was inconsistent (Watchman et al. 2001:815-816). Further analysis was recommended following this study, but none resulted, and it is unlikely change in the foreseeable future (Ingrid Ward 2015 pers. comm., 12 April).

Publications from the Masters' and PhD theses (McConnell 1998; McConnell & O'Connor 1997; Wallis 2001) provide context on environmental change over time. This is useful to provide context for rock art depicting vegetation. It also has the potential to place vegetation

within a chronology, where there is supporting evidence from other sources, such as ochres or flakes from the painting surface in datable stratigraphic excavation layers, such as those found at Borologa in the northeast Kimberley (David et al. 2019).

Prolonged occupation across the region highlights the potential for comparison of lifeways through archaeological research. Balme suggests that the 'excellent preservation of materials at ... [Tangalma and Mimbi Caves] for comparable periods' (2000:4) may provide a good basis for the comparison and identification of cultural, rather than natural, influences on the occupation of the region. *Lifeways* builds on this research, with publications, honours and PhD theses (Balme & O'Connor 2015; Dilkes-Hall 2015:Honours; Langley et al. 2016; Maloney 2015:PhD; Maloney et al. 2014; O'Connor et al. 2013; O'Connor et al. 2014; Vannieuwenhuyse 2016:PhD; Vannieuwenhuyse et al. 2016; Whitau et al. 2016a; Whitau 2018:PhD; Whitau et al. 2016b; Wood et al. 2016). This thesis and PhDs by Dilkes-Hall (2020) and Josue Gomez (in preparation), along with the many published papers provide insight into different aspects life in the southern Kimberley (the most recent are Balme & O'Connor 2019; Balme et al. 2018b; Balme et al. 2018c; Dilkes-Hall et al. 2020; Dilkes-Hall et al. 2019a; Dilkes-Hall et al. 2019b; Maloney 2020; Maloney et al. 2017a; Maloney et al. 2018a; Maloney et al. 2018b; Whitau et al. 2016b; Whitau et al. 2018; Whitau et al. 2017).

Environmental and geoarchaeological studies are helpful to provide insight into population fluctuations, which are important to answer questions on whether the rock art is linked to identity, territoriality, and exchange of ideas in the area. There is one geoarchaeological study in the southern Kimberley; Vannieuwenhuyse (2016; Vannieuwenhuyse et al. 2016) examined site formation processes using a 'fine-grained resolution geoarchaeological approach' (Vannieuwenhuyse 2016:Chapter 12: 1). She also employed micro morphology to enable precise and consistent definitions of stratigraphy. Sites were interpreted individually, to address complex and unique sedimentation processes, resolving observed discontinuities from her own and earlier studies (e.g. Balme 2000; O'Connor 1995). Previous research had suggested that areas in the semi-arid east of the southern Kimberley had been abandoned in favour of refugia zones (O'Connor & Veth 2008). The geoarchaeological study identified anthropogenic and palaeoenvironmental signals and confirmed that humans were almost continuously present at sites in the southern Kimberley (Vannieuwenhuyse 2016; Vannieuwenhuyse et al. 2016; Wood et al. 2016). This is important in understanding the continuities and/or discontinuities possible in the production of rock art.

Franklin and Habgood (2007) reviewed archaeological evidence across Australia (e.g. Balme & Morse 2006) to build an argument that the Kimberley was part of a northern

Australian zone of innovation. Archaeological evidence suggested movement between the coast and the ranges as early as 42,000BP. This may have been part of staged trade routes, or wider long-distance movements. Movement patterns are informative in determining if territories are marked and networks open or closed as each will influence rock art motifs and styles. These patterns may be discerned from distribution and density of rock art and its styles.

Rock Art: Making Its Mark

Many of the 100,000 or more rock art sites in Australia (Taçon 2001:531) have been subject to substantial and ongoing research (e.g. Akerman & Willing 2009; Blundell & Woolagoodja 2012; Brady 2010; Crawford 1968; David & Chant 1995; David et al. 2013; Elkin 1930a; Frederick 1997; Frederick 1999; Gunn et al. 2012; Gunn & Whear 2007; Lommel 1961; McDonald 2008a; McDonald & Veth 2012b; Mulvaney 2015b; O'Connor & Fankhauser 2001; Officer 1984; Ouzman et al. 2002; Paterson & Wilson 2009; Playford 2007; Ross 2013; Ross & Abbott 2004; Taçon et al. 2012b; Taylor & Veth 2008; Travers & Ross 2016; Veth 2006; 2013a; Veth et al. 2008; Veth et al. 2018; Vinnicombe 2002; Walsh 2000; Watchman 1997; Welch 2016; Worms 1955; Wright 1968). Two broad areas have been of interest:

1. Identification of function, style and chronological sequences of pre-contact rock art (e.g.Chippindale et al. 2000b; Franklin 1986; McDonald 2008a; Morwood 1998; Rosenfeld 1993; 1999); and
2. Aboriginal responses to contact and colonialism (e.g. Chaloupka 1979; Clarke 2000; Clarke & Frederick 2004; David et al. 1999; David & Wilson 2002b; Flood 2004; Frederick 1997; Frederick 1999; Gunn 2003; Huntley et al. 2018; Layton 1992b; McDonald 1991; Morphy 1991; Mulvaney 1996; Taçon 1994; 2002).

Research showing rock art as a form of information exchange, through the creation of stylistic identity markers and placement in the landscape has built on these (e.g. David & Chant 1995; McDonald 2008a; Smith 1992b). These theories will be further presented in the following chapter, but one of the results is that rock art was likely increasingly used in the late Holocene (c.2,500BP) to signal local and regional identities (Veth 2006:251-253). Greater aggregation, more territoriality and embeddedness of resource use was also suggested by stylistic variability of rock art in localised areas over shorter time periods than those seen in the earlier Pleistocene and the geometric and linear engravings in the Western Desert (Veth 2006:249). Smith’s (1992; 2008) research in the Northern Territory indicated

that territories had degrees of openness and closedness related to resource availability, signalled in rock art styles.

The Western Australian perspective in the land use/territoriality and aggregation model is useful. Veth (2006) contends that Western Desert people may have borrowed language and stylistic influences from Central Australia in the last 500 years through trade and exchange. The research included identification of social networks and affiliations, constant and changing regional boundaries and the expression of ideology through motifs, themes and composition of images related to cultural traditions and practices (McDonald 2013; McDonald & Veth 2012a; 2012c). It is a compelling precedent for using of Information Exchange Theory in this research, rather than assuming Aboriginal cultures all have the same practices and traditions.

In Western Australia rock art research in the Pilbara (e.g. Brady & Carson 2012; Davis et al. 2017; McDonald & Harper 2016; Mulvaney 2009; 2011; Paterson 2012; Paterson & Van Duivenvoorde 2013; Paterson & Wilson 2009; Taçon et al. 2012b), and the Western Desert has been published in the last decades (McDonald & Veth 2007; 2008; 2012a; 2013). This includes new approaches to rock art dating (McDonald et al. 2008; McDonald et al. 2014; Steelman & Rowe 2012), and social and spatial issues associated with gender, aggregation sites and the environment (McDonald & Veth 2006; 2012b; 2012c).

The Pilbara borders the southern Kimberley, and while there are tracts of desert between some places they are not inaccessible when people are used to living on the land and accessing the resources they need to move through it.[1] Movement of people in recent times (Marshall 2011; Morphy 2010; Smith 2000; Toussaint et al. 2005) and in the past (Balme et al. 2009; Balme & Morse 2006) suggests it is likely that there was exchange of ideas, spread of belief systems and similarities in language and motifs in the rock art between the regions. This is an important area for future investigation and data from this and other research will be useful to inform future research bridging the Pilbara and Kimberley (Harrison 2002b; 2005: McDonald & Veth 2016, pers.comm.).

Kimberley rock art, such as Wanjina and Gwion Gwion, have been the subject of extensive research and controversy (e.g. Crawford 1968; Elkin 1930a; Lommel & Lommel 1959;

[1] At Punmu, in the Western Desert on the shores of Lake Dora, Pilbara Western Australia, the Manyjiljarra people told me that they often travelled long distances to visit family and attend funerals. During one visit many people were attending a funeral at Kundat Djaru some 700km distant. They had many relatives there, and told me it was because of the marriage [kinship] rules, and their 'old people', who had not had contact with white people until the 1960s and 1970s, had often walked the northern tracks (part of which is now the Canning Stock Route) to meet up with new people to trade and arrange marriages.

McNiven 2011; McNiven & Russell 2002; O'Connor et al. 2008b; Walsh 2000; Welch 1993b). Research has also included dating beeswax art (Morwood et al. 2010) and the religious/spiritual perspectives on the Wanjina and Wungud[2] paintings (Vinnicombe & Mowaljarlai 1995; Woolagoodja 2020).

These studies illustrate the similarities and differences in rock art between the Bunuba and their neighbours to the west. Research has been selective, with only iconic, highly visual or special motifs examined and analysed. None has included analyses of all sites in an area. Access to some original data has been limited, leaving the picture of those regions incomplete. This emphasises the gaps in records and research in the Kimberley, and limits analysis of territoriality.

Rock art in the southern Kimberley has been photographed by travellers (Wilson 2006), the WA Geological Survey (Playford 2007; Playford et al. 2009), by archaeologists surveying for other reasons (e.g. DAA 1989; Marwick et al. 2003), professional photographers (Donaldson 2013; Donaldson & Kenneally 2007) and amateur archaeologists (Walsh 1988; Welch 1993b). Some has been sporadically and selectively included by archaeologists in their travels to other sites (e.g. Crawford 1964-1968). Crawford photographed rock art in Bunuba Country (Smith 2006:25-28), but not all images, or complete sites, during an archaeological investigation in neighbouring areas. Akerman (2007) spent many years working with Kimberley people, recording stories and analysing material culture. He observed rock art and commented on different styles and motifs in the study area but did not record sites (Akerman 1976: 2011, pers. comm., 25 March). Playford also observed different styles and motifs in the region during geological surveys from the 1950s (Playford 1960: 2011, pers. comm. 12 April). Blundell also observed bird, lizard and crocodile motifs in association with Wanjina in Worora and Unguumi Country (1974b:213).

Many photographs were taken in the 1960s and 1970s. There was no systematic recording or access to the digital equipment used today, which increased the number of photographs possible. Similarly, computing and database capability limited the capacity for information storage and cataloguing, restricting the depth and breadth of information that could be gleaned about the rock art. No analysis of the motifs, styles, spatial or temporal distribution of the images has been published since those photographs were taken.

Crawford (1968:91-136) identified motifs in the Kimberley other than Wanjina and Gwion Gwion (or Bradshaw), including some with similar names and forms to those found in the

[2] Also known as Unguud in Bunuba and Gooniyandi Country.

southern Kimberley. For example, a Djuari motif is described as the spirit of dead people. It is said to move about the Country like other evil or dangerous spirits (Crawford 1968:91) and is painted in places that should be avoided. Gooniyandi people also have a motif they name Djuari, recorded at Moonggaroonggoo. It is also described as a travelling spirit, described by Traditional Owners as a mischievous spirit who went about disrupting other beings, and was brought into line and placed on the rock (June Davis and Helen Malo 2011, pers. comm., 1 September). The form of the beings with this name are quite different. Crawford's (1968:93-94) Djuari is markedly different to the large black Djuari at Moonggaroonggoo (Figure 3.2) which has exaggerated male genitalia, numerous superimpositions, and is surrounded by many other motifs of vegetation, reptiles and anthropomorphs.

There are similarities in names and some characteristics of rock art motifs, but they are often different in form and character. Crawford's (1964; 1964-1968) expeditions covered much of the Kimberley, but I was only able to identify five sites in the southern Kimberley from his publications and photographs, Fitzroy Crossing, Fossil Downs (Moonggaroonggoo), Geike Gorge, Leopold Downs, Oscar Range (Linesman Creek), and two at Carpenter's Gap (Tangalma and Langurmurru) from his field notes and photographs. The rock art was selectively photographed or sketched, without scale, detail of context, or recording of the complete assemblage at the sites. The research was a good starting point for planning fieldwork but did not offer detail relevant to this study.

Crawford (1968:99-100) introduced the idea of yams transitioning to human form. Welch (2003) recorded many examples of the yam tradition, including 'yam people' from the wider Kimberley region. The motifs recorded by Crawford (1968:99-100) and Welch (2003) take the form of a yam shaped body/head with straggly hair/fronds, and sometimes feet. Welch did not go to many sites in the southern Kimberley, and all his yams with human characteristics had been recorded in the central, north and west (David Welch 2013 pers. comm., 14-15 November). Yams with human characteristics in the southern Kimberley are of a different form. They have a full yam body, straggly fronds from the base like roots, anthropomorphic arms, shoulders and heads, with faces and rayed headdresses, characteristic of the anthropomorph known as Waliarri (see Chapters 6 and 7). There may be a common belief that plants go through transitions to human form, but there are also different manifestations of the process, making their depiction in southern Kimberley locationally distinctive.

In Bunuba Country some authors have named anthropomorphs, such as *Narra Narra* or lightning men (Donaldson & Kenneally 2007:142), *Naranguni-Nowangu* or Dreamtime Father for the Waliarri (Donaldson & Kenneally 2007:141-142). These names may not be accurate, as they have not been told to authors by Bunuba or Gooniyandi people, and at no time during field work for the *Lifeways* Project did the Bunuba Traditional Owners refer to them by these names or attribute such characteristics to them. This is reinforced by inconsistencies such as incorrect attribution of sites in Bunuba Country east of Bandilngan as Unguumi sites (Donaldson & Kenneally 2007:140). These sites are identified as Bunuba by the Bunuba people, and confirmed through O'Connor's 1990s work and Native Title Determinations (Federal Court of Australia 2012; Frawley & O'Connor 2010; Hiscock et al. 2016; Maloney et al. 2016; McConnell & O'Connor 1997; O'Connor 1995; O'Connor et al. 2008a; O'Connor & Fankhauser 2001; O'Connor et al. 2014). Motif, styles or site names used in this study have come directly from Bunuba and Gooniyandi people involved in fieldwork and/or publication for this research (e.g. Balme & O'Connor 2015; Maloney et al. 2017a; O'Connor et al. 2013; O'Connor et al. 2014), rather than those who travelled with earlier researchers (Blundell & Woolagoodja 2012; Crawford 1968), emphasising the importance of working with the Traditional Owners on their own Country from the start in archaeological or anthropological research.

FIGURE 3.2 (A) BLACK DJUARI FROM GOONIYANDI COUNTRY (ENHANCED WITH DSTRETCH©), AND (B) DJUARI PAINTED AT WYNDHAM IN THE NORTHEAST KIMBERLEY (CRAWFORD 1968:93). REPRODUCED AS PER WA MUSEUM FAIR USE FOR EDUCATIONAL AND RESEARCH PURPOSES.

Rock art research in Australia, Western Australia and the Kimberley is important in creating the context in which this study has been conducted. It has been helpful in identifying sites in conjunction with Traditional Owners and has guided the research in selecting the theoretical approach outlined in Chapter 4. It also provides a useful basis for discussion about the borders between rock art provinces introduced in Chapter 9 and discussed in Chapters 10 and 11.

Chronology: Finding Time

Viewing rock art is like simultaneously looking at the top, visible layers of a landscape and trying to untangle multiple spider webs to see what is both within and under them. There are glimpses of uneven surfaces. Different colours and almost hidden features peek out from under the biggest and brightest images. Visible motifs promise hidden depths in rock art, in the way that surface deposits, disturbances or inconsistencies tantalise the excavator. We use scientific principles to seek chronometric dating and superimposition to develop relative chronologies to help us make sense of the layers we uncover. Neither is totally precise, nor is it possible to do either in every situation.

Relative Dating

The first principle in archaeological excavation is that the most recent deposits are found above older deposits (e.g. Harris 1979:112; 1989:7-13; Wheeler 1954). This is also a first principal in the stratigraphy of rock art (Harris & Gunn 2018; Pearce 2010; Russell 2000; 2012). Rock art superimposition may be likened to layers of sediment, interweaving soils, rocks and vegetation with artefacts and archaeological features. Layers of rock art may also be interwoven with layers of other deposits, like beeswax, calcite or oxalate.

What the chronologies tell us about the choices of creators is at the heart of research questions in this study. If superimposition is intended to replace one motif or style with another it may (Capitan 1925; Trezise 1971; Ucko & Rosenfeld 1967):

- Enhance the power of the images;
- Maintain relationships with the ancestral or spiritual beings (Bowdler 1988; O'Connor et al. 2008b; Vinnicombe 1992); or
- Impose a new ideology for the purposes of signalling affinity with new allies (Walsh 2000), or movement of new peoples into an area.

If the images are superimposed without direct intent the creators may:

- Be indifferent to existing rock art (Brentjes 1969; Graziosi 1960);
- Not have enough suitable space (Pager 1971; 1976; Rosenthal & Goodwin 1953); or
- Incorporate creation of rock art as part of established or traditional ceremonial or educational activities.

Motta contends that 'the study of superimposition has the potential to expand on how descendent groups engaged with and represented past inhabitants at both experiential and ontological levels' (2019:491). Using examples from the northeast Kimberley she suggests that some superimpositions are indicative of a continuity of culture where artists create new meaning from older images. Painting in a different colour will not fully obscure an older image, therefore the new motif engages with the old, retaining connection with the past. Some Australian researchers have seen superimposition as new ideas or identities replacing the old, or the evolution of ideas which obscure or eliminate links with the past (e.g. Chaloupka 1985; David & Cole 1990; Walsh 2000; Welch 1993b). Others in both the Australian and international context are more pragmatic and describe new motifs as new stories to add to or replace the old (e.g. Cole 2011; Hampson 2015; Jolly 1996; Ouzman 2005).

A Range of Approaches

Relative chronologies, based on stylistic change and superimposition have been developed for rock art in the Kimberley (Gunn et al. 2019; Ross et al. 2016a; Veth 2013b; Veth et al. 2021; Walsh 1994; Welch 1993b; 2016). This is a useful point of comparison for relative chronologies in the southern Kimberley (Veth 2013b; Veth et al. 2021), to position it within wider chronological sequences where possible. Relative chronologies are developed in rock art by:

- Identifying antiquity through weathering differentials (Mulvaney 2013);
- Historical documents;
- Oral history; or
- Superimposition sequences (Brady & Gunn 2012; Chaloupka 1984; Chippindale & Taçon 1998).

The advantages in using weathering differentials in engraved rock art may be outweighed by many assumptions made about the relative impact of environmental and climatic variables. Mulvaney (2013; 2010:159-161) developed a relative chronology for rock art at Murujuga in the Pilbara by identifying elements of the 'weathered state' of engravings. A

large assemblage with varying degrees of weathering enabled him to identify five consistent contrast states (Mulvaney 2010:168). Mulvaney acknowledges limitations for this technique, and the factors which influence the degree of contrast in engraved motifs (2010:183-188). The relative lack of superimposition (6.9%, n=392, see Mulvaney 2010:189) meant that identification of contrast states was the most useful approach to relative chronologies in this instance.

Ridges and outcrops of granophyre boulders are the canvas for engravings in Murujuga. The southern Kimberley has a canvas of soft sedimentary limestone in caves and shelters along the escarpments. Painted art dominates in the southern Kimberley, with few engravings (7.3%, n=219). The surfaces for rock art are both exposed to and protected from the environment, and subject to drips and seepage from limestone overhangs. Mulvaney's (2010) identification of weathering differentials relied on a large sample, executed on hard surfaces that have been exposed to the arid conditions of Murujuga. The smaller assemblage of engravings in the Kimberley, and the different environmental factors make it impossible for the same type of comparisons or development a similar system for the study area.

Watchman et al. (2001) analysed micro laminations in chipped pieces from boulders at the edge of the Tangalma rockshelter to try to understand how climate and environment interacted with the rock surface. They established the potential to provide approximate dates for pigment rock art in micro laminations, where the base date of the surface is known, for engraved and pigment rock art over which a crust has formed (Watchman et al. 2001:809). Cross sections of samples from the site show clear stratigraphy. If similar samples were taken from rock art motifs the resulting stratigraphy may point to multiple rock art creation events. This type of analysis would give both relative and chronometric dating, particularly if layers are linked to identifiable motifs with superimposition relationships.

Sampling of laminated crusts may deliver a reliable date range for rock art creation. It would need to be applied to each image and/or sequence in an assemblage to test consistency, and comparison with other dating methods. This destructive process would remove part of the rock art, as, even from a single motif, samples would need to be taken from multiple points to provide consistent and reliable results. This also affects the integrity of the rock art for Traditional Owners, often with a risk of upsetting its powers and their connection to Country and ancestral beings.

Comparative weathering, cation ratios and varnish micro lamination chronologies (Bednarik 2010; Dorn 1982; 1983; 2001; Lui 2003; Watchman 2004; Whitley & Dorn 2010), possible

with engraved rock art, have the potential to provide chronometric anchor points for motifs. Engraved motifs in this study offer comparatively little variation compared to large assemblages like Mulvaney's (2010). Therefore, developing or accessing this expertise would have yielded limited results. This discounts the potential for relative chronologies for engraved rock art in this study. Deep incisions and tracks are at many sites in the study area, but figurative engravings at only four sites, in low numbers, insufficient to develop relative chronologies.

Differentiating painting episodes is possible. Microscopic analysis of flakes from paintings in the Napier Ranges was used in the analysis of the interaction between pigments, and pigments and rock surfaces, in differing environmental conditions (Ford et al. 1994). This showed clear differentiation between layers. Huntley et al. (2014) show it is possible to identify painting layers in a motif through detection of the mineral composition of layers using PXRF (Huntley et al. 2015; Huntley et al. 2014; Huntley et al. 2011). Samples from a Wanjina in the west Kimberley were used, where there is a tradition of retouching, and therefore known layers (Blundell 1974a; Bowdler 1988; Crawford 1968; Ross et al. 2016a; Travers & Ross 2016; Vinnicombe 1992). This analysis assists in isolating specific pigments and is used to match ochres with ochre sources (Huntley et al. 2015). Separating layers can be problematic, as multiple layers may have used the same ochre sources, with the same mineral signature. Identifying pigments is useful in archaeology to posit movement, trade, and meetings of language or cultural groups. It may be useful to clarify the stratigraphy of motifs, if it can be linked directly to motifs or styles.

Such techniques suggest anchoring motifs between the oldest and most recent dates during which rock art may have been created. There are other techniques promising more accurate individual chronometric dating for rock art. Scientific advances in dating by stratigraphic association, radiocarbon, U-series dating and mineral deposition (Aubert et al. 2014; Aubert et al. 2019; Finch et al. 2021a; Finch et al. 2021b; Finch et al. 2019; Finch et al. 2020; Gleadow et al. 2013-2016; Green et al. 2017a; Green et al. 2021a; Green et al. 2021b; Green et al. 2017b; Pecchioni et al. 2019; Sauvet et al. 2017) are at the forefront of new developments in rock art dating. The new techniques should not be dismissed, as single piece of art might be dated according to the presence, and place in the chronology of an extinct or introduced species (e.g. Gunn et al. 2011b).

Superimposition and the Harris Matrix

The Harris Matrix is a powerful tool for tracking and visualising often complex chronological relationships which are not always clear in stratigraphy. It is also useful to visually represent the palimpsests in rock art. It can include the motifs/makings and the environmental and biological layers that lie under, upon and between them (Loubser 2013:35). Studies explicitly describing this are infrequent (Brady & Gunn 2012; Chippindale et al. 2000a; Chippindale & Taçon 1993; Gunn et al. 2012; Harper 2017; Harris & Gunn 2018; Loubser 1997; Pearce 2010; Russell 2000; Swart 2004). It seems likely that this or a similar construct would be used to order layers and ascertain the potential relative time depth of motifs and/or styles.

A cautionary approach to relative chronologies from superimposition is important. It may be clear that a superimposing motif was created more recently than the motif it superimposes, but the time between their creation may be as short as time to dry, such as described in Arnhem Land by Josie Maralngurra (Goldhahn et al. 2020:71), or as long as thousands of years. For rock art, a Harris Matrix does not identify layers in the same way as in excavation (Pearce 2006), where each layer and associated features and artefacts may be aligned with dates from radiocarbon or other dating methods. Similarly, adjacent motifs at the same level as the top layer in a superimposition sequence would not necessarily have been created at the same time as one another. There may be cultural or environmental reasons why some motifs are untouched, and others are superimposed (Clottes 2013; Harper 2017; Loubser 2013; McDonald 2013; McDonald & Veth 2013; Motta 2019; Ruseeell 2012; Troncosco & Francisco 2013). This is not reflected in a mechanical representation like a Harris Matrix but must be revealed through conversation with Traditional Owners and/or, when suitable, inferred by theoretical and interpretative archaeological analyses.

Drawing out relationships between sequences, even those at the same site, is both complex and problematic, and this is also a consideration in comparing motif sequences at different sites. When possible, chronometric dating may help overcome such difficulties. Dating each layer of rock art in a superimposition sequence is destructive and expensive. Without unique chemical signatures from the pigments, it is difficult to link specific layers with specific motifs, especially where other factors have been at play (e.g. environmental events).

In this study I have constructed matrices for all sites (see Appendix 10), showing:

1. At least one superimposition; and
2. Separate sequences with a single motif in each sequence where there is no superimposition.

The result is multiple matrices for most sites, as there are multiple superimposition relationships not visibly related to one another. This does not determine where the motifs sit in an overall chronological sequence, or their association with other motifs without superimposition.

Despite its limitations the Harris Matrix is a useful tool to gain a broad view of the chronological relationships between motifs and styles at each site. I use it to make comparisons between sites where the motifs appear in similar sequences and discern the extent to which they may be chronologically related. This will be further discussed in Chapter 9.

Chronometric Dating

By Association

Painted flakes and pigment marked rocks recovered from excavations where the stratigraphic layer is radiocarbon or OSL dated could be dated by association. If a flake can be accurately matched with a motif on a rock art panel this would be an extremely valuable dating method. However there have been limited published records of matches and dating by association to date, and none were possible for the flakes found in excavation in this research (David et al. 2019).

Similarly, if ochre is found in a stratified deposit with the same chemical and mineral composition as that of a motif, it does not automatically follow that that ochre was used to create that motif. Unless there is a closer connection between ochre and a motif, such as both coming from a different source than any other motif at the site, suggesting that any relationship between the two must be backed by evidence (e.g. David et al. 2019). At a broad level ochre, flakes and ‘slabs’ of rock with pigment markings give an indication of how long rock art may have been present or created at a site (O'Connor & Fankhauser 2001), but not necessarily a specific motif or style of motif.

Radiocarbon

Dating results from oxalate crusts on rock surfaces may yield further information about the continuity or discontinuity of site use relating it to the presence of engraved rock art (Watchman et al. 2001). The study at Tangalma was limited. Samples were taken from boulders with pigment markings partially protected by the overhang at the southeast of the rockshelter, despite access to an exposed ledge to the west with abundant engravings, including a large deeply incised crocodile. The results provide limited insight into the

antiquity of rock art at this site or encourage future use of this technique on different surfaces.

Radiocarbon dating of organic pigments has been used since the 1980s. Reliability has been questionable because of potential external contamination in samples (Hedges et al. 1987:299). Researchers still urge a degree of restraint despite refinements and sophisticated precise sampling. Separating organic components and pigments from the rock face without contamination is particularly risky (Steelman & Rowe 2012:566-567). Plasma oxidation to 'extract organic matter from ancient paint samples' (Steelman & Rowe 2012:576) has reduced contamination, presaging greater reliability.

In a further cautionary note, radiocarbon dating of charcoal in motifs may not relate as closely to the creation dates for rock art as we may wish. Charcoal may have been created thousands of years prior to, or on the same day as its use for rock art. This makes radiocarbon dating charcoal in rock art a useful tool, but problematic in dating motifs or styles (see also Bonneau et al. 2011; 2017a; 2017b for examples of South African research on this issue).

Radiocarbon and OSL dating have also been used effectively for beeswax rock art (Nelson et al. 1995; Taçon et al. 2004; Watchman & Jones 2002), and mud wasp nests adjacent to rock art (Finch et al. 2021a; Finch et al. 2021b; Finch et al. 2019; Morwood et al. 2010). Beeswax contains pollens and other organic particles enabling radiocarbon dating. It appears to be preserved well in Kimberley and northern Australian environments, particularly when protected by rock shelter overhangs. Radiocarbon dates for beeswax overlying 'Classic Wandjina-style' paintings range from 1,350BP to modern, and for beeswax figures in northern Australia up to 4,000BP (Nelson et al. 1995; Watchman & Jones 2002). The Rock Art Dating Project in the northeast Kimberley has used advances in radiocarbon dating with wasp nests over and underlying painted rock art to date the creation of a kangaroo motif at 12,000 BP (Finch et al. 2020), and naturalistic animal paintings between 13,000 and 17,000BP (Finch et al. 2021b). Other anthropomorphs, club shapes, and boomerangs have been dated up to 30,000BP. Where motifs are created using beeswax, the same issue arises as it does for dating charcoal; there is no indication for how long the beeswax was present before being used for rock art. Morwood et al. (2010) contend that fresh wax was used for their samples.

Like oxalate crusts (Watchman et al. 2001), dating of adjacent features like wasp nests will not date specific rock art. Radiocarbon dating (C^{14}) using calcium oxalate (CaC_2O_4) deposits sandwiching pigment art has been used to some effect on pigments on limestone surfaces

(Steelman & Rowe 2012:575-576). Like many methods for dating rock art further research and comparison of results is needed to ensure reliability (Aubert 2012; Steelman & Rowe 2012:578). In the northeast Kimberley, samples of mineral accretions, mostly associated with engraved rock art, are being analysed with radiocarbon and other dating techniques (Green et al. 2021a). Radiocarbon dating has been successfully and reliably used to date the calcium/oxygen accretions (Green et al. 2021b). This method has the potential to reliably date more engraved rock art, particularly the cupules and engraved markings thought to be the oldest in the Kimberley rock art corpus (Veth et al. 2021; Walsh 2000), which is discussed in the context of Kimberley wide chronologies in Chapters 10 and 11.

Uranium/Thorium

Uranium/thorium dating (U-series) of calcite deposits associated with rock art has been developing alongside other dating methods. Uranium traces are found in water soluble materials, making calciferous deposits in the Kimberley excellent candidates for this method. Limestone reefs have a component of decomposing calciferous materials, which combine with water flow over the rock surface to form a calcite crust. Crusts are found over and under extant rock art, but also leaving new surfaces for rock art to be created. It often leaves multiple sandwiched layers of pigments/calcite. U-series dating has been used successfully in combination with C^{14} dating at Chauvet Cave (Clottes & Geneste 2012:598-599), in China (Taçon et al. 2012a), East Timor (Aubert et al. 2007; O'Connor et al. 2010), Spain (Pike et al. 2012) and Sulawesi (Aubert et al. 2014; Aubert et al. 2019; Brumm et al. 2021). Conditions have varied. Sauvet et al. (2017) still advise prudence in trusting U-Series dates without a second source of confirmation, preferably C^{14} dating, to ensure consistency.

Maxime Aubert joined the *Lifeways* team in 2011 and 2012, taking samples from suitable deposits to assess if U-series dating was possible. There are limits in using this method. Any contamination compromises the results (Aubert 2011, 2012 pers. comm.). Limits include:

- Thickness of calcite deposits;
- Contamination from dust;
- Animal and insect activity;
- Interactions with sediment and vegetation; and
- The monsoonal weather patterns bringing wind borne contaminants.

Most deposits in this study were not thick enough or had too much contamination for U-series dating. In addition, if a motif is not identifiable, or layers recognisable through the

small cores taken from the deposits the same issue arises as it does with flakes or rocks with markings found in excavations (O'Connor & Fankhauser 2001), matching with motifs. Without a linked motif a date would only be indicative of when there was rock art or pigment on a surface, not a specific motif type or style.

Extinct and Introduced Species

Using an extinct or introduced species in rock art to date its creation is mired in uncertainty. An extinct species may suggest antiquity in rock art, and an introduced species may suggest modernity; especially where species have been conclusively identified and extinction/introduction confirmed. This may provide context for creation of a motif of the species, and place anchor points within a superimposition sequence.

Gunn et al. (2011) claim that giant bird species *Genyornis newtoni* is depicted in a painting in Arnhem Land, Northern Territory, Australia. This bird is likely to have become extinct 30,000 to 50,000 years ago (Field & Boles 1998; Miller 1999). It is suggested that the painting may be of similar antiquity (Gunn et al. 2011b). The motif form broadly resembles the extinct species, and support was forthcoming from a palaeontologist in early studies (Gunn et al. 2011b:1). However, doubt has been cast on the presence of the *Genyornis* in the Northern Territory. Dated fossils and eggshells have only been found in southern Australia (Bednarik 2016:173-174), and motifs are not necessarily naturalistic images of what they represent. The authors acknowledge these limitations (Gunn et al. 2011b:2). Further analysis was undertaken of the rock art and superimposition relationships, geochemistry and excavation as close to the rock art as possible. While these did not discount the possibility of the image representing the extinct bird, the geomorphological analysis of the site, and the panel on which it is painted, to conclude that it could not have been painted contemporaneously with the *Genyornis* in Australia, as the surface only became available after 13,000 years ago, and there is no current evidence for the *Genyornis'* survival to that time (Barker et al. 2017; Chalmin et al. 2017),

Other motifs of extinct species are equally problematic in interpreting and dating their creation. This includes the extinct Marsupial Lion/*Thylacoleo carnifex* (Akerman 1998), and Thylacine/*Thylacinus cynocephalus* (Mulvaney 2009). The same goes for introduced spices such dingoes, and later, horses, donkeys, goats, sheep, camels, water buffalo, pigs, just to name a few, which might be depicted.

In this study motifs of a thylacine (extinct) and eight dingoes (introduced) may provide a broad indication of the antiquity of some of the rock art. The timing of extinction and

introduction of species changes with new evidence emerging on a regular basis (e.g. Balme et al. 2018a; Cairns et al. 2017; Smith et al. 2019). Using such dates as reference points will be circumspect.

Whilst the limits of science and its potential for destruction of rock art may constrain the extent to which rock art may be reliably dated, the development of chronological sequences is possible using the relative chronologies of superimposition; with the proviso that these can only be said to be reliable within one set of superimposition relationships.

Summary

The unevenness of research in the Kimberley means that the *Lifeways* Project will fill in gaps in archaeology and rock art research across the region, particularly the sparsely documented rock art of Bunuba and Gooniyandi people. There has been scholarly interest and publication on linguistics, aspects of history (e.g. station life and rebellions), and broad anthropological research that, by default, has included parts of Bunuba and Gooniyandi language, culture and marriage and kinship systems. The latter has tended to group these linguistically distinct peoples with their neighbours, rather than recognise their cultural characteristics as separate.

Fortunately, Balme (2000) and O'Connor's (1995) early research is built on through the *Lifeways* Project to fill these gaps. The *Lifeways* research covers a wide range of specialities to develop a more holistic view of life over millennia in the southern Kimberley:

- Occupation and adaptation (Balme & O'Connor 2016; 2017; Balme et al. 2018c; Maloney et al. 2018b; O'Connor et al. 2014);
- Rock art (Balme & O'Connor 2014; 2015; O'Connor et al. 2013);
- Lithics (Hiscock et al. 2016; Maloney et al. 2014; 2017b; Maloney et al. 2018a; Maloney et al. 2016; Maloney et al. 2018b; Maloney 2015; O'Connor et al. 2014);
- Geoarchaeology and environment (Balme et al. 2018c; Vannieuwenhuyse 2016; Vannieuwenhuyse et al. 2016; Wood et al. 2016);
- Anthracology (Whitau et al. 2016a; Whitau et al. 2016b; Whitau et al. 2017; Whitau 2018); and
- Palaeobotanical analysis (Dilkes-Hall 2015; 2020; Dilkes-Hall et al. 2020; Dilkes-Hall et al. 2019a; Dilkes-Hall et al. 2019b; Langley et al. 2016; Whitau et al. 2018).

This thesis is also part of this research, and it aims to contribute to advancing our knowledge of how rock art is, and was, made meaningful in Bunuba and Gooniyandi Country. Before

the results can be presented and discussed it is necessary to develop a theoretical perspective through which the data may be analysed to help understand the role of rock art in Bunuba and Gooniyandi life over time.

In the next chapter I present a discussion of the style concept which can enable the discussion of how people may use material culture, including rock art, as a medium of communication and expression of identity over time.

Ideas and Approaches

… in theory artists can depict anything they want, but they don't.

(Smith 1992a:29)

Introduction

Rock art is valued for its capacity to inform and broaden the interpretation of human lifeways, including symbolic and social expression, in the deep and recent past. It is important in telling the story of our ancestors because it mostly remains where they left it, if not always complete or intact. Rock art is visible and varied and it includes images to which we, as modern scholars and viewers, may relate, and those which we may spend a lifetime trying to interpret.

UNESCO recognises rock art as an important cultural asset and aims to protect and conserve it through its listings. There are 41 sites where rock art is the main or a significant component of its outstanding cultural value on the World Heritage List including Áísínai'pi (Writing-on-Stone) in Canada, Prehistoric Rock Art Sites in the Côa Valley, Siega Verde in Spain and Kakadu National Park in Australia (UNESCO 2024).

As researchers we investigate the origins, importance, function, and purpose of creating rock art, the techniques and tools used to create it, the rituals that may surround it and the resulting images and styles. At the heart of our understanding is that to put all those together requires cognition, giving us insight into how our ancestors may have been thinking about themselves, their place in the world and their relationships with one another.

In a Western academic framework, rock art has been described as intentional marking by humans (cf. Taçon & Chippendale 1998). Some Australian Aboriginal people will say it is the imprint or embodiment of their Ancestral Beings (e.g. Akerman 2009a; Blundell &

Woolagoodja 2012; Brady et al. 2016; Crawford 1964; 1968; Rosenfeld 1997b; and Bunuba and Gooniyandi Traditional Owners 2011 and 2012 pers. comm.), of their deceased ancestors, or of spirits existing in the landscape (e.g. Brady and Taçon 2016; Goldhahn et al. 2012; Porr & Bell 2012). When working with Traditional Owners this helps to put the information they share, their interpretations, and descriptions of rock art in context.

Contemporary rock art research in Australia is collaborative, and often driven by, or in partnership with, Traditional Owners (e.g. Brady et al. 2016; 2024; Finch et al. 2021; Goldhahn et al. 2021; Taçon et al. 2022; Veth et al 2021). This provides considerable insight into the social and cultural connections to rock art, the reasons for its creation and the role it plays in contemporary social and cultural life (e.g. Smith 1992a; b; 1999; 2008) and, by extension, its place in the lives of people in the past.

A range of approaches have been considered in rock art investigation, including those based on:

- Social interaction, which suggests that style and stylistic change is determined by the degree and stability of social interactions (Hill 1985);
- Information Exchange Theory where style is the basis for communicating identity and belonging (Wobst 1976; 1977; 2000);
- The economies of trade and exchange (e.g. Fisher 1997; Wiessner 1982);
- Rituals have been discussed as a means through which rock art is created, a reason for its creation, or a way to connect with ancestral spirits (e.g. Basedow 1925; Elkin 1930; Lommel & Mowaljarlai 1994; Welch 1997).
- Recording and reporting of rock art, using collaborative Indigenous approaches to address research questions from informed cultural understandings and theoretical frameworks (e.g. Brady et al. 2004; 2016; 2024); and
- Scientific dating and spatial distribution (Bednarik 2003; Huntley et al. 2011).

For the purposes of addressing the aims of this research, how people interact, and the information they share is, I suggest, more likely to be reflected in rock art observed in the southern Kimberley than their economic or trading relationships. While ritual is discussed as a mechanism for sharing some information it does not necessarily provide a framework for the ways in which all rock art and rock art styles may be created or develop.

The research approach in this study is underpinned by the participation, guidance and sharing of cultural knowledge, information, and perspectives of Traditional Owners who worked with me to record the rock art. They shared their knowledge and expertise on

interpretation, provided names for places and Ancestral Beings, and shared the stories and experiences which form their world view (see Chapter 5 for methodology). This shaped the development and refinement of the hierarchical classification and is reflected in the inclusion of Bunuba and Gooniyandi knowledge, stories, and names throughout the thesis.

Dating and spatial distribution are not excluded as part of the overall approach, they are the foundation for developing chronological sequences which track stylistic change over time and space. They are important aspects for examining how identities, affiliations and borders may have formed or changed.

While the different approaches outlined above are all important to the way rock art is investigated, it is the mechanism of sharing information through social interaction that is how they are brought together to answer the questions of identity and change in the southern Kimberley, and the application of those theories in this research is tied to the notion of style.

The remainder of this chapter addresses definitions of the key terms of style and stylistic variation, followed by an outline of how this will be applied in terms of Information Exchange Theory incorporating social interaction.

Style

Defining Style

What is style? George Chaloupka (1993) said ‘you gotta have [it]’, and assumed that his readers knew what he meant in relation to rock art. It may be fashion, personal charm or chutzpah, or a collection of characteristics peculiar to a person or object. We may all have different ideas of what makes up a style.

In archaeology, style is less comfortably or socially defined, yet widely used. Style is more than the mechanics of how rock art is made, the component parts of it. It underpins what it is made up of, why it even exists, whether it has a function or purpose.

Lorblanchet (1977) and Sackett (1977) suggested that creating schema for rock art within the parameters of societally defined ways for creating images, reflecting the morés of the time, might give us an idea of how to identify styles. This would mean a dominant feature was identified, and motifs were compared to one another. Such an approach might be useful to allow categorisation in an academic context, though not necessarily an Indigenous one, and could be somewhat static.

McDonald (2006:60) described rock art as 'human made marks on natural immovable surfaces', and the various styles as pieces of raw data within a system of markings or motifs arranged according to schema designed by researchers, a highly individualistic approach to determining style. McDonald (2008a) used this approach in her work in the Sydney Basin (southeastern Australia). Using such a process it may be possible to find identifiable or recognisable attributes to describe style according to defined parameters, but the differences are likely to be substantial between researchers, and are, therefore, subjective. For example, the idea of 'culture hero'[1] motifs, like those McDonald (2006) identified in the Sydney Basin, throughout Australia is an attractive proposition. Their similar appearance might suggest a stylistic link between the figures in the Sydney Basin the southern Kimberley, but there are many differences between the assemblages which make them difficult to compare:

- Different rock art traditions, painting versus engraving;
- General similarities in creation stories, but far from identical;
- Different environments, mild temperate versus semi tropical; and
- The anthropomorphic figures don't 'look' the same.

Whitley (2011) suggests care in defining style, because attributing age, linear or evolutionary process to rock art by ordering it chronologically is problematic when there is no chronometric dating to anchor it; an issue being addressed through recent research (e.g. Aubert et al. 2014; Finch et al. 2019; 2021; Green et al. 2017; 2021; Steelman et al. 2021).

A practical and consistent way to define styles that change from place to place and time to time is Maynard's approach, defining style as 'the sum total of its technique form, motif, size and character' (1977:399). This is not without ambiguity in the definitions, particularly in consistent differentiation between form and motif (see below), however, it can work well for style classification when criteria within the attributes are clearly defined.

- Technique is determined to an extent by the tools, materials and surfaces available as well as traditional practices in the area. This characteristic has many subheadings under the broad descriptions of extractive (e.g. scratched, incised, abraded) and additive (e.g. drawn, painted, stencilled).
- Form. Maynard described this as 'the organisation of dots, lines and masses which comprise individual figures … regardless of technique' (1977: 393).

[1] These may be described as mythological heroes from oral history, or part of creation stories or Dreaming for other Indigenous people (e.g. Brady & Bradley 2016:85; McDonald 2006:27).

- Motif is the ‘standardised pictorial forms which result from consistent mental templates (consistent within the cultural group of the artist)’ (Maynard 1977:396), which is how the artist or viewer recognises recurring and/or familiar figures in rock art such as shapes, natural objects, animals. The names given for motifs will vary between researchers, between Western and Indigenous people, between countries and different academic communities. Definitions of motifs are essential.
- Size is usually the measurement of the longest part of a figure, but can incorporate a range of measurements depending on the questions asked. Size may be used comparatively, comparing motif size across sites, across a region or comparing different motifs to one another within a single site. Size can be related to visibility, for example, large highly visible motifs may define and maintain borders (e.g. Franklin 2007b; McDonald 1999; Smith 1992a; Wobst 1976; 1977).
- Character leaves much to individual interpretation but can be informed by Traditional Owners. It is more about variations from the ‘norm’ of figures by having elements that are emphasised, absent, specific. This applies to motifs which could be classified as anthropomorphs in a broad sense (arms, legs, head etc) but possess additional elements that make them different such as headdresses, accoutrements, a different face form, an infill pattern or multiple colours which together make a unique or rare rock art figure, such as a Wanjina.

The idea of breaking down the elements of motifs or figures and then using the same elements to group into our own taxonomies is a feature of Western education and etic approaches. This works for making comparisons in an academic framework. However, it may not make sense of changes from an Aboriginal perspective, where history is oral, and time is non-linear, continuous, and recursive. Styles and taxonomies resulting from this research may be reframed by elders and community members to reflect an emic approach when re-interpreted, or one reflecting Bunuba and Gooniyandi worldview.

Hierarchical approaches provide the means to group rock art in different ways while allowing for finer level grouping of the characteristics that make them distinct. In defining and refining rock art using this approach, style may be the refining characteristic.

Applying Maynard’s (1977) approach to anthropomorphs would work as follows:

- The rock art is painted (technique);
- There are lines in curves and shapes to make a figure (form);
- Anthropomorphs have some human-like characteristics, for example, head, long torso, arms, and legs in a familiar and recognisable combination (motif);

- Specific characteristics are added to some anthropomorphs and not others, e.g. gender markers, infill patterns, headdresses (character); and
- Putting the above together with size (if needed) each anthropomorph can be analysed with the presence or absence of a wide range of additional characteristics which could be observed or measured (e.g. colour, hands/feet) and together they make up a distinctive style.

Thus, within the class of anthropomorphs there would be refinement that took all the elements into account to define each style. This makes it possible to apply consistent definitions of style within a hierarchical structure, thus, applying a taxonomic approach increasing distinct levels of specificity.

In this thesis I will be using Maynard's (1977) approach to style because it allows the macro-observation of rock art that an individual researcher may call a style to be broken down into elements that describe that style and make its application consistent within an analysis, because as Smith so succinctly puts it '"Style" is the combination of some of the features … it is not dependent on any single feature, especially in the sense of that feature being a diagnostic trait' (2008: 222). This makes it possible to identify variations within a style, differences between styles and possible change over time, as each element contributes to a different part of what makes up the overall style, as shown in the anthropomorph example above.

Stylistic Variation

Within each rock art style there is likely to be variation. Artists are not working with a template and a colour and size guide, but within cultural norms, internal and external influences and the availability of space and materials. This allows variation within parameters that maintain the overall style, while characteristics may vary such as the difference between a dotted and a dashed infill pattern in a figure that is otherwise the same.

Stylistic variation may be identified as a change within a group over time, such as changing from using red ochre only to using white ochre only, as differences between different places and people, or as indicative of different forms of social organisation or different world views.

Since the 1970s there has been interest by rock art researchers in why style varies, and what variation signifies in terms of individual and group identities, geographic and social borders and the degree to which these change over time with social and economic interaction, territory and boundary marking and maintenance, environmental challenges and

information exchange (e.g. David & Chant 1995; Franklin 1986; Hill 1985; Maynard 1976; Smith 1992a; 1992b; 1999; Wiessner 1985; Wobst 1976; 1977; 2000).

This has led to discussion around terminology to describe different ways styles vary[2]:

- Isochrestic. Variation developed within repetitive practice imitating others such that it becomes automatic, whereby differences reflect function and materials, while a broad template is followed (Plog 1980: 62; Wiessner 1985: 160). This would be at the motif stage of definition in Maynard's (1977) process of defining style, with character and technique likely the missing elements. Variation within this definition would be limited but may be useful in determining social or cultural boundaries.
- Symbolic. Variation that comes about through 'stylistic and social comparison' (Plog 1980: 62), such that change and variation exist between groups and over time. Researchers suggest that this may create, maintain, or disrupt social relationships, and be an indicator of regional, group, and/or personal identity and social or cultural boundaries (e.g. David & Chant 1995; Franklin 1986; Plog 1980; Smith 1992a; 1992b; 1999; Wiessner 1985). This includes all elements of Maynard's (1977) approach to defining style, and is useful for identifying differences, similarities and change in social relationships, a key question in this research.
- Iconological. Variation within a style with specific messages aimed at a target population (Plog 1980:62). This touches on the use of more refined characteristics which can be used as a form of communication and is relevant in the context of Australian rock art, where Traditional Owners identify Ancestral Beings depicted in rock art with roles and powers relating to creation and daily life (e.g. Akerman 1977; 2014; Brady et al. 2016; 2023; Woolagoodja 2020).

These definitions are relatively academic, and would be useful in statistical analyses, but they have also been integral to discussions about the role of style, how and why it is formed and what it is used for and by whom. Information Exchange Theory, and the extent to which social interaction has been a part of that. has developed through decades of anthropological observations and analysis (e.g. Sackett 1985: 1986; 1990; Wiessner 1982; 1983; 1984; 1985; Wobst 1976; 1977; 2000). While there have been other archaeological applications[3]

[2] While much of this work was based on ceramic and lithics styles it has been adapted and applied successfully in rock art in Australian contexts (e.g. David & Chant 1985; Franklin 1988; McDonald 1994; 1998a; 1999; 2008a; Morwood 1984; Smith 1992a; 1992b; 1996; 1999).

[3] The other archaeological applications have been the subject of widespread discussion in academic research (e.g. Sackett 1977; 1982; 1985; 1986; 1990; Wiessner 1982; 1983; 1984; 1985; 1989), and while interesting, these are outside the scope of this thesis.

of Information Exchange Theory its wide use in rock art research is the focus of this study (e.g. Conkey 1978; 1989; Schaafsma 1985; McDonald 1994; 1998a; 1998b; 1999; 2000; 2008a).

Information Exchange and Style

Social Interaction

Social interaction models suggest that style does not function in terms of social relationships but is simply passed on, or learnt, through different degrees of interaction (Hill 1985:363; Whallon 1968).

Traditionally, greater interaction was thought to result in more homogeneity of styles. This meant that when interaction was stable, regular, and less risky, style did not change much, as there would be continuous sharing and gradual enculturation via learning. The implication is that communication processes are also stable, and minor variations in style are the result of errors, misunderstandings, materials, or available time.

Hill (1985) argued that this is not supported by either ethnographic or archaeological evidence. There may be great differences in style between communities even where they are very closely and regularly linked through marriage, trade, or other relationships (Barth 1969; Braun 1977; Engelbrecht 1974; Hodder 1979; Plog 1980 are cited as examples showing that this approach was not supported by research in Hill 1985: 365).

Social interaction models, however, do not exist in isolation. If this were the only way of looking at style and how it functions then there would not be any ideas, technologies or resources shared when people met regularly through these relationships. The question would arise as to why groups linked through marriage, trade and other affiliations would not have the shared styles. This may be explained by observations that larger groups are formed more readily in times of less perceived risk such as an abundance of resources in a stable environment, compared to people remaining separate in smaller groups when greater risk is perceived (Katz 2015:44). When there is risk and changed circumstances in which resources are precious there is less reason to share information and maintain open borders and engage in social interaction than when there is abundance, and so regional and group identities may become more defined and restricted (e.g. Brady 2008; David & Chant 1995; Smith 1992a).

Thus, in thinking about social interaction we think about exchanging information, whether this is to prevent such interaction to protect precious resources in times of shortages, or to

welcome it during times of plenty. From anthropological observations in the former Yugoslavia, Martin Wobst (1977) developed a theory of information exchange now widely used to investigate Australian rock art. It complements social interaction, in fact the two could not exist without one other.

Information Exchange

Information exchange came to the fore in anthropology and archaeology with the publication of observations of dress and style in the former Yugoslavia (Wobst 1977). The study enabled Wobst (1977) to test the capacity of stylistic elements to communicate identity and affiliation in an ethnically diverse community.

Wobst (1977) suggested that a conscious decision was made to display the most distinctive and visible item of dress (hats) when in public to denote ethnicity. He developed a model showing the relative power of the information encoded in visibility and form, dependent on the complexity of the information and the degree of intimacy between the emitter and receiver of information. In his model, the hat is a distinct and visible identity/affiliation signal. Those close to the wearer would easily recognise the hat's style because it is part of their specific group identity; its primary function is to share this information with other ethnic groups with whom they would interact in public spaces. The information is only exchangeable if the viewer has access to the correct coded information (Wobst 1977:334-335). This infers that there is social interaction to share information, but not to the extent that the same styles will be adopted.

Figure 4.1 adapts the model to show how intimacy, affiliations and style codes may work for information exchange in rock art. The most distant group are not likely to be the target for information embedded in a rock art style and would not have sufficient information exchanged through social interaction to decode a style, perhaps only to know they are different from their own. Groups with some affiliation, but socially distant (allies/neighbours) may be aware of the style codes and able to read the information embedded in the rock art.

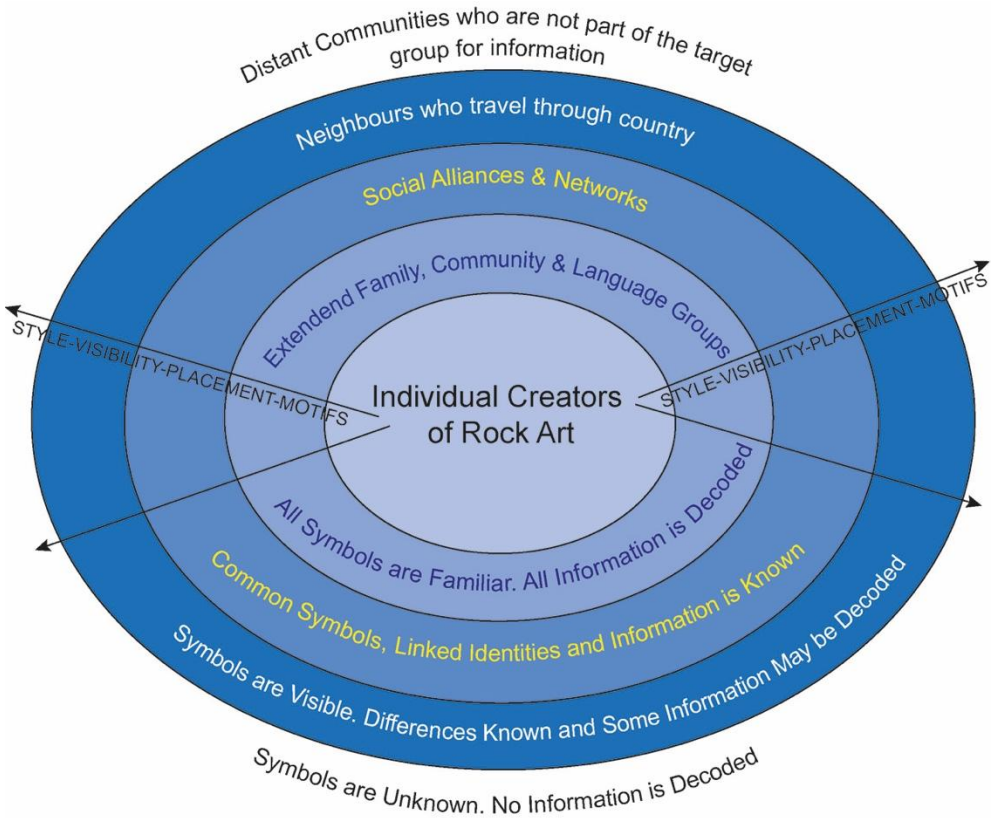


FIGURE 4.1 A MODEL FOR INFORMATION EXCHANGE (ADAPTED FROM WOBST 1977:334, FIGURE 1).

Information exchange was linked to a wider range of applications in archaeology as more researchers published their work linking style, social behaviours and object/artefact visibility (Conkey 1978; Conkey & Hastorf 1990; DeBoer 2009; Wade et al. 2011; Wiessner 1989).

Wiessner (1983; 1984) tested the theory in the manufacture of arrow heads by the Kalahari San !Kung people (now known as Ju|'hoansi Bushmen, Sam Challis 2024, pers. comm. 29 November). Both Wiessner (1983; 1985) and Wobst (1977) used mobile artefacts to test their theories, and Sackett (1985) contended that they made assumptions about the behaviours of people that were not supported by the evidence. Sackett (1985) disagreed that all choices were conscious or intentional, drawing clear distinctions between isochrestic and iconological (see above) behaviours applied to the information communicated through the artefacts. These differences in individual choices versus following habitual or societal norms are the foundations of defining and describing style in Chapter 7, and sorting out which, if any, rock art displays isochrestic behaviours and which aims to exchange information with the viewers embedded in stylistic variations.

There is less disagreement that artefacts have the capacity to exchange information between individuals and groups, no matter the intent of the creator. Discussion is more concerned with whether inclusion of stylistic elements is conscious or if they are embedded

in traditional practices and techniques, and subject to societal norms for creation of functional objects (Lorblanchet 1977; Sackett 1977; 1982).

Wiessner's (1983; 1984; 1985; 1989) anthropological research reinforced the idea that artefacts have stylistic features which exchange information within and between groups. This defined two different aspects of style, emblemic and assertive, each expressing different types of identity (Wiessner 1983:257-258). Wiessner (1983; 1984; 1985; 1989).

- Emblemic Style reflects societal or group norms and relates to the idea that identity is gained by belonging to a group. Thus, it would be expected that homogeneity of stylistic markers, and therefore, behaviours, are practiced within a group (see also David & Chant 1995; Smith 1992b; 1996; Smith 2008). Research with the San !Kung (now known as Ju|'hoansi Bushmen, Sam Challis 2024, pers. comm. 29 November) people showed that their arrow points were sufficiently homogenous and different enough from their neighbours for the !Kung to identify them with relative ease (Wiessner 1983), an emblemic style for the !Kung people.
- Assertive Style is described as that through which an individual makes stylistic choices to differentiate themselves from others. Wiessner (1983) did not see individuality in the arrow heads but did see it in her observations of dress and personal adornment, suggesting that there may be a wide variety of other reasons for stylistic variability within and between groups.

Wiessner (1983) concluded that both emblemic and assertive styles communicate different types of information. Emblemic style choices communicate a group identity and, to an extent, define territory because the referents of the display of the style markers were both within and outside the groups she observed. Since there was no referent but individual choice making, assertive styles would be less easily be interpreted as sharing information, even if the intent was to do so.

Wobst (2000:47) later suggested that the placement of rock art in caves may limit sharing information and indicate degrees of control, dominance or resistance in the use of space. This may be a factor in the volume of motifs, repetition of motifs, visibility and placement in the landscape, particularly in relation to control of territory, and border delineation.

David and Wilson (2002b:58) suggested that increased visibility of images in Wardaman Country, NT, was a restatement of ownership of territory. It acted to reinforce social bonding, and as a form of resistance to European incursions on traditional lands. O'Connor (et al. 2013) shows that placement of traditional motifs at new and existing sites in the southern

Kimberley following pastoral incursion is likely to be a similar expression of resistance and maintenance of connection to Country for Bunuba people.

Though not explicitly stated, a combination of social interaction and information exchange has been used in Australia. Researchers (David & Chant 1995; Gould 1980; Smith 1992b, Veth et al. 2021) have used Information Exchange Theory to illustrate the homogeneity of stylistic markers in open social networks. Homogeneity is suggested to reduce the need for negotiation (intense social interaction) to access to scarce resources in poor environments or during times of economic stress. Conversely, greater heterogeneity is needed for groups to maintain their borders, especially when they are richer in resources. Rock art styles will then be embedded with information that they are different from the neighbours, suggesting 'closed social networks' that seemingly contradictorily indicate an intense social interaction where negotiation may be occurring.

Wobst (1977) described style as a measure of equilibrium, but this limits the differences in articulation of style over the use-life of rock art. Rock art is fixed in place over millennia in which cultures, languages and environments change, and cannot always be said to maintain equilibrium over that period.

The idea that a single stable message intended when rock art is created, or that what we see in the present is the final product of the original creator implies a single mindset over time. It denies potential reuse and re-envisioning of an artefact. This is of as much importance in rock art as it is for mobile artefacts such as bowls and stone tools, artefacts of choice for many analyses of style (e.g. Bowdler 1981; Hantman & Plog 1982; Kintigh 1985; Plog 1980; Sackett 1982; 1990; Wiessner 1983; Wiessner 1985). Being fixed in place, rock art has many viewers, many uses, and many relationships to other artefacts, making its use-life increase the layers of complexity. Individual, Indigenous and contemporary perspectives and academic paradigms mean that challenges in reaching consensus regarding the extent to which style communicates the same information over time will continue.

Wobst's (1977) study generated discussion about definitions and applications of style in rock art, style and function, and individual agency in creating style in artefacts (e.g. Conkey 1978; 1987; 1989; 1997; Franklin 1986; Hill 1985; Maynard 1977; McDonald 1999; Plog 1980; Rosenfeld 1982; 1997a; Ross 1999; 2003; Sackett 1985; 1986; 1977; 1982; 1986; 1990; Smith 1992a; Wiessner 1985; Wobst 2000). Narrowly defined, style may limit the consideration of other choices in producing an artefact (e.g. Clegg 2002; Hodder 1982; 1990; Lemonnier 1986).

Australian research continues to investigate the social dimensions of rock art, influenced by the in-depth knowledge and the perspectives of Traditional Owners. Information Exchange Theory is at the heart of much of this work, including Smith's study of the social aspects of contemporary art and the work of other prominent scholars (e.g. David & Chant 1995; David & Cole 1990; McDonald 2000; McDonald & Veth 2008; Rosenfeld 1997b; 2002; Ross 2003; Smith 1992a; Taçon 1999). Smith (1992a) examined the symbolic aspects of rock art, and how its placement on Country reflected current and changing affiliations and territoriality. Other key studies show rock art as an important conduit for the exchange of information on borders and social identity for Aboriginal people in Australia (Brady et al. 2022; David & Chant 1995; McDonald 2000; 2008a; 2008b; McDonald 2021; McDonald & Harper 2016; Smith 1992b; 1996; 2008); an excellent starting point to examine the rock art of the southern Kimberley.

Making sense of such markers and how they are expressed in rock art is at the basis of the following examination of how art models work for rock art, and how they are adaptable within a framework of Information Exchange Theory.

An Art Model for Rock Art and Information Exchange?

Discussion on terminology for rock art in archaeology appears largely resolved since rock art became an integral part of archaeological research, with *Lifeways* one of many projects situating rock art as a recognised line of evidence in the archaeological pantheon (e.g. Aubert et al. 2014; Aubert et al. 2007; Brook et al. 2018; Clarkson et al. 2017; d'Errico et al. 2012; Dorn 1982; Ford et al. 1994; Huntley et al. 2015; Huntley et al. 2014; Lui 2003; McDonald et al. 2014; Pecchioni et al. 2019; Pike et al. 2012; Stuart & Thomas 2017; Taçon et al. 2012; Vázquez et al. 2008). However, its confusion with Eurocentric constructs of 'Art' (Chippindale & Taçon 2006; Soffer & Conkey 1997a) are less so.

Carter and Geczy (2006:26-34) used an art history model to show the potential for understanding rock art. It shows the interplay between creating and viewing art on the basis that art is a means of communication (echoing Wobst's idea that there are emitters and receivers of stylistic information). Figure 4.2 is an adaptation of this model showing how it may be applied to information exchange through art (Figure 4.2a) and rock art (Figure 4.2b), describing how:

- The artist creates a work (object/rock art) which is the vehicle used to *emit* a message (exchange information); and

- The viewer *receives* the message from the artist via the work (rock art) feeds back their understanding or interpretation of the message in their response to both artist and the work.

Carter and Geczy's (2006:26-34) model does not specify how or where art is displayed, or what the viewer receives from it, and is designed around the Eurocentric idea of art mostly portable paintings and sculptures in the modern form.

In rock art, the work is static and in its place of original creation, and the information being exchanged may be explicit or coded, according to the intended targets, location and intimacy of the affiliations/relationships described in Figure 4.1. A viewer may interpret the work according to their own ideas, education, gender and many other factors make up their individual perspective. Context is important in how and what message is received.

Rock art, being in a single physical place with slowly changing geographical and geological characteristics, history, and people and culture means that changes over time, and changing viewers mean differential access to some of the context. Continuity and living culture cuts through some contextual gaps, science cuts through others.

In the rock art application of the model (Figure 4.1b) style is part of the information exchanged between the artist and the viewer. The elements underpinning subject and style in the artefact, suggests layers of complex information being communicated as described in the way style may be defined (see above), suggesting the need for more than the two-dimensional model shown proposed.

In other layers, exchanging stylistic information may be part of rituals (e.g. Boyd & Dering 1996; David 2009; Lewis-Williams 1988; 1997; 2002; Lewis-Williams & Dowson 1989; Whitley 2001a), following traditional practices (see Bowdler 1988; O'Connor et al. 2008b; Vinnicombe 1992), or even as part of a leisure or educational activity (Chaloupka 1984; Mulvaney 1996), making the mechanics of information exchange another dimension which is lightly touched on in this study.

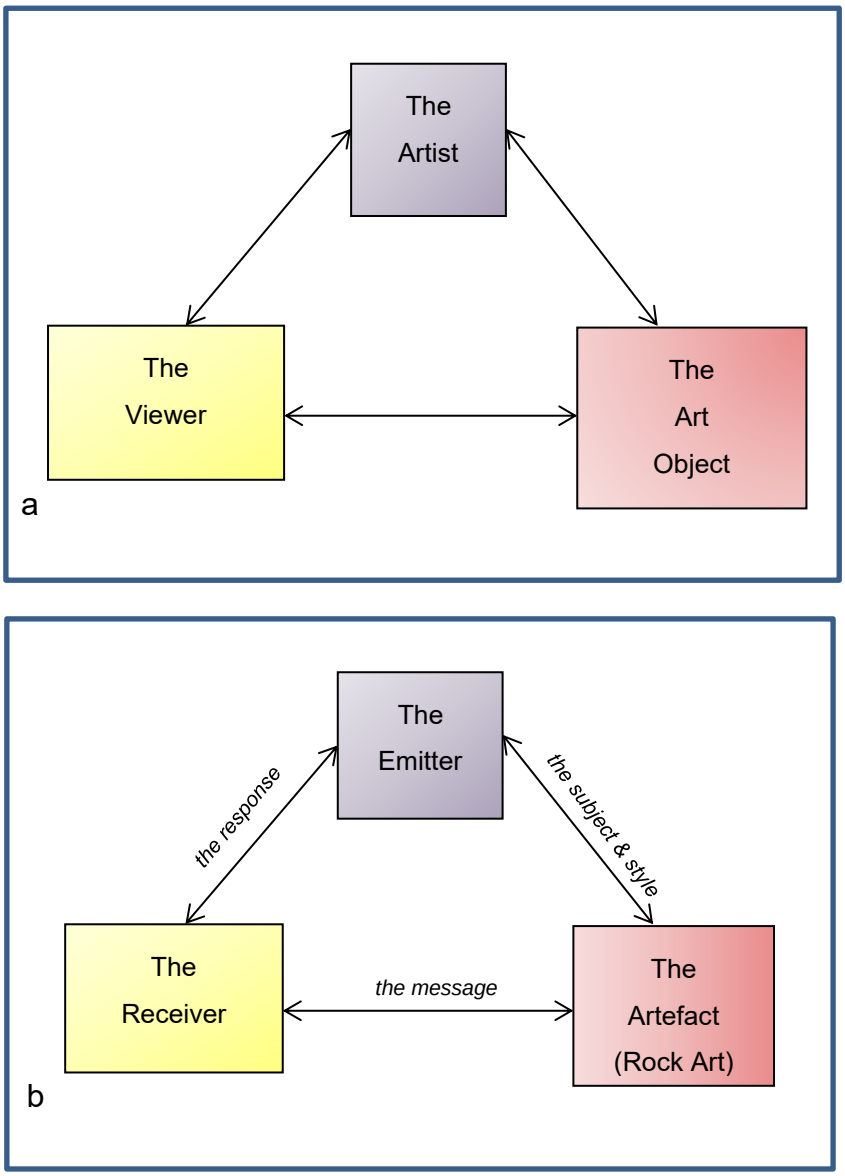


FIGURE 4.2 (A) CARTER AND GECZY'S (2006:26-34) THEORETICAL MODEL FOR THE OPERATION OF ART. (B) THE MODEL EXTRAPOLATED TO WOBST'S (1977) THEORY OF INFORMATION EXCHANGE.

The types of messages communicated will be varied, a discussed above (David & Chant 1995; David & Wilson 2002b; David et al. 1995; Dowson 2000; Frederick 1999; O'Connor et al. 2013; Smith 1989; 1999; 2008; Swartz & Hurlbutt 1994; Taçon 1994; 1999). Rock art may fade or wear away, and the message may change over time, depending on the accessibility, visibility and the knowledge of the viewer.

The message received is the response of the viewer to the rock art, whether they are the intended recipient or not. The response of an Indigenous viewer of rock art may include:

- Connection to the site;
- Recognition of sacred, special, or gender specific rock art/sites;

- Acknowledgement that the land is in the care of a particular people, that it should not be approached, or that special protocols are to be followed to enter Country; and/or
- Recognition of a meeting place, where trade, marriage, ritual or celebration may occur (e.g. Conkey et al. 1980; Wobst 1976, 1977).

If the viewer is not Indigenous or has no cultural or contextual knowledge of the site, rock art, or its creators then the message received may be as simple as that a talented artist created an image on a wall.

There are many layers which could be added to this type of model. They show the complexity of interaction between the creators and the viewers, and place rock art and its stylistic elements in a context where there is a flow of information between the artist and the work (rock art) and between the work and the viewer which may change according to how much the viewer is connected to, intimate with or privy to the information embedded in the style. The viewer changes, the context changes, and a model like this works for rock art because 'the idea of text [rock art] carries within it the idea of a continuous and changing set of encounters … [and while] the physical object may remain the same … the text [message] only emerges with each encounter' (Carter & Geczy 2006:130).

Summary

The considerable research and publication on styles and schematising rock art to tell stories of people across the world provides a strong framework for this research (e.g. Chaloupka 1993; Conkey 1978; 1989; Sackett 1977; 1982; 1990; von Petzinger & Nowell 2011; Wiessner 1983; Wiessner 1985; Wobst 1977). Rock art as information exchange (e.g. McDonald 1999; 2000; Veth et al. 2011; Wiessner 1983; Wobst 1977) underpins this study, using the idea that style in rock art is a way of expressing and communicating information (e.g. Brady & Bradley 2014; Conkey 1978; Rosenfeld 1982), made up of several elements that create a style (e.g. Maynard 1977; Sackett 1977; Schaafsma 1985).

Application of this research approach in Australia has provided understanding of territoriality, exchange of ideas and changes over time (e.g. Brady & Bradley 2014; David & Chant 1995; Franklin 1989; McDonald 1999; 2008a; Ross 2013; Smith 1992b; Veth et al 2021; Wade et al. 2011). This makes it a sound and proven basis from which to tell the story of rock art and identity in the southern Kimberley.

This approach shows that it would be foolish to define style too narrowly, given the scope of choices and application with different types of artefacts. Limiting lines of evidence limits research.

With these ideas in mind, the next chapter focuses on the methodology used to gather the data, identify site types and contexts, and record the rock art in situ. This results in the development of a hierarchical classification system, which includes some of the iconological styles/motifs identified by Traditional Owners in the anthropomorph category.

Gathering the Data

I hear and I forget

I see and I remember

I do and I understand

Confucius

Introduction

The key data for this research was gathered over two field seasons in the south central Kimberley, accompanied by and/or with permission from both Bunuba and Gooniyandi Traditional Owners, and appropriate survey and excavation permits from the Department of Aboriginal Affairs (DAA), Western Australia.[1] Supporting and selected data and/or results arre used in limited, broad comparisons and have been sourced from earlier research in the region, or neighbouring regions (Balme 2000; Blundell 1974, 1975; Blundell & Woolagoodja 2012; Crawford 1964, 1964-1968, 1968, 1972; Harrison 2002b; Jones 2010; O'Connor 1995; O'Connor et al. 2008a; O'Connor et al. 2008b; O'Connor & Fankhauser 2001; Playford 1960, 2007). Supplementary information from the Aboriginal Cultural Heritage Inquiry System (ACHIS) and site-files is also included where available and relevant to the study area. Access to the latter is limited by cultural protocols, permission to view files and/or reports lodged with the Department, and the difficulty in gaining permission for researchers to use the information, partly because of communication problems in remote areas or the demise of the informants noted on file.

[1] The heritage section of this department amalgamated with other agencies to form the Department of Planning, Lands and Heritage on 1 July 2017, it has also been called the Department of Indigenous Affairs.

This chapter describes the methods used to gather, assemble and analyse the data for this research, why the methods were chosen, and how they were used in-field and post-field for recording and analysis.

Selecting Sites

The study area for this research is the contemporary cultural lands of the Bunuba and Gooniyandi peoples to the west and east of Fitzroy Crossing, Western Australia respectively (Figure 1.2). It is an area of close to 18,000km^2 (Federal Court of Australia 2012, 2013), and limited previous research in the region suggested rock art was likely abundant across the area (Akerman 1976, 2009; Balme 2000; Crawford 1964, 1964-1968, 1968, 1972, 1973, 1977; O'Connor et al. 2008a; Playford 1960, 2007; Smith 2006). This is supported by data from the Aboriginal Sites Database[2] in Western Australia (Department of Indigenous Affairs 2011, 2012), which lists 392 sites in the study area; 23.5% have paintings and/or engravings identified as part of the cultural significance of the sites. The proportion of sites with rock art in Gooniyandi Country is lower than in Bunuba Country (Table 5.1). This suggests that while there are documented sites of cultural significance in Gooniyandi Country, those with rock art were not as abundant as those with other heritage significance, including anthropological and spiritual significance.

Rock art sites were identified for recording in this study in three ways. The first was, where possible, to revisit and systematically record the sites in the study area identified or photographed in previous research. This included:

- Sites visited and photographed in the Crawford expeditions (1964, 1964-1968; Smith 2006);
- Sites identified in the ACHIS, files and reports with accurate GPS locations, known to Traditional Owners and/or with no restrictions on access; and
- The sites excavated and visited by Sue O'Connor (1995; O'Connor et al. 2008a) and Jane Balme (2000) known to have painted and engraved rock art that would also be part of the wider *Lifeways* Project (Balme 2011 pers. comm.).

[2] Now known as the Aboriginal Cultural Heritage Inquiry System (ACHIS)

TABLE 5.1 HERITAGE LISTED ABORIGINAL SITES WITH ROCK ART IN THE STUDY AREA BY CONTEMPORARY LANGUAGE AREA.

DAA Sites	Bunuba	Gooniyandi	Total
Total sites	136	256	392
Sites with rock art	65	27	92
Proportion of sites with rock art (%)	*47.8*	*10.50*	*23.5*

Secondly, sites known by Traditional Owners with abundant rock art, which they remembered from work on the pastoral stations, or family connections, were included. Some of those sites' connections had been photographed in the past (e.g. Crawford 1968; Playford 2007:142-143, 147-148, 150; Playford et al. 2009:344), but not systematically recorded, excavated, or registered as sites of significance under the Western Australian *Aboriginal Heritage Act* (Government of Western Australia 1972). This provided greater than expected diversity of site type and location, and a larger assemblage of rock art than had been expected, adding further data to the body of knowledge on rock art, site locations and variation in the region.

Thirdly, during the 2011 field season, vehicle and foot survey were undertaken to attempt to locate sites not otherwise known or identified. The starting points were sites identified by Traditional Owners, registered sites or sites known to members of the team from their previous research (Professors Jane Balme and Sue O'Connor, Chief Investigators on the *Lifeways* Project). We started at known sites, and using 4WD vehicles or on foot, inspected escarpments, hollows and low outcrops as likely locations along roadways, streambeds, creeks and valleys. The road/track survey was particularly important in Bunuba Country, where Fairfield-Leopold Downs Road winds its way between the Oscar Ranges and the eastern part of the Napier Ranges, following the southern escarpment of the Napier Ranges to Bandilngan/Windjana Gorge. Following this unsealed road provided a clear view of the cliff face, and it was possible to identify potential sites from overhangs forming rockshelters and caves, from evidence of water flow on the escarpment indicating past springs or water sources, and disturbances in the rockface that may have created areas for shelter and/or occupation. When potential sites were identified from vehicle survey the team inspected them and surveyed the surrounding area on foot. Many accessible sites, such as three sites within 100m of the road close to Dimalurru/Tunnel Creek, sites in Tarakalu/Dingo Gap, those along the escarpment to the south of Dimalurru/Tunnel Creek, previously unrecorded sites close to Bandilngan/Windjana Gorge, as well as small caves in boulder outcrops were

identified in this way. Locations were recorded on GPS and mud maps[3], and the rock art and site contexts fully recorded in the following field season (Figure 5.1). The same method was used when re-finding sites with Traditional Owners, and additional, sometimes forgotten, sites were recorded and added to the data set. Visiting some of these forgotten sites triggered memories and their Dreaming stories for Traditional Owners who assisted the team in 2011 and 2012.

There were limitations on how, and how many, sites were recorded, and the combination of site selection methods meant that the sample was neither systematic nor random. There were several factors limiting how many sites could be recorded. The first was the time and resources to record rock art at every site known either by the Traditional Owners or listed on the ACHIS (n=92 see Table 5.1); locating and recording every site was simply not viable in the two funded field seasons.

Physical access also posed challenges. Some sites were easily accessible by foot, or on roads and tracks in four-wheel drive vehicles. Others were tougher, but achievable when creeks had dried, and alternate routes found. For example, Elimberrie Springs was not accessible in 2011 because the wet season had been long and the rainfall high (Bureau of Meteorology, www.bom.gov.au). By September 2011, many creeks were still flowing, making tracks inaccessible or dangerous, and flood damage to other tracks made the site impossible to access. In 2012 a shorter and lighter wet season meant that the creeks and ground had dried enough by July to enable the team to locate the site, with detailed directions from Bunuba Traditional Owners. Accessing other sites necessitated days of walking and camping, which was not an option given the limits of time and resources.

Other sites were not accessible because of poor locational information. Some had entry only through pastoral stations which was problematic or time constrained. Others were not visited because individuals or Elders who knew site locations were unable to travel or had cultural or professional commitments during the fieldwork. The result is a concentration of recorded sites spread along the Napier and Oscar Ranges north-west to south-east in Bunuba Country, with a more scattered coverage to the east of Fitzroy Crossing in Gooniyandi Country (Figure 5.1), which was particularly limited by the availability or individuals and/or cultural restrictions in communities related to sorry business[4].

[3] See Glossary for description of mud maps.

[4] Sorry business imposes restrictions on non-community members visiting or conducting business or meeting with people when there has been a death in the community, as well as restrictions on community members' activities and movements during this time. Depending on the community this may be 3-4 weeks, several

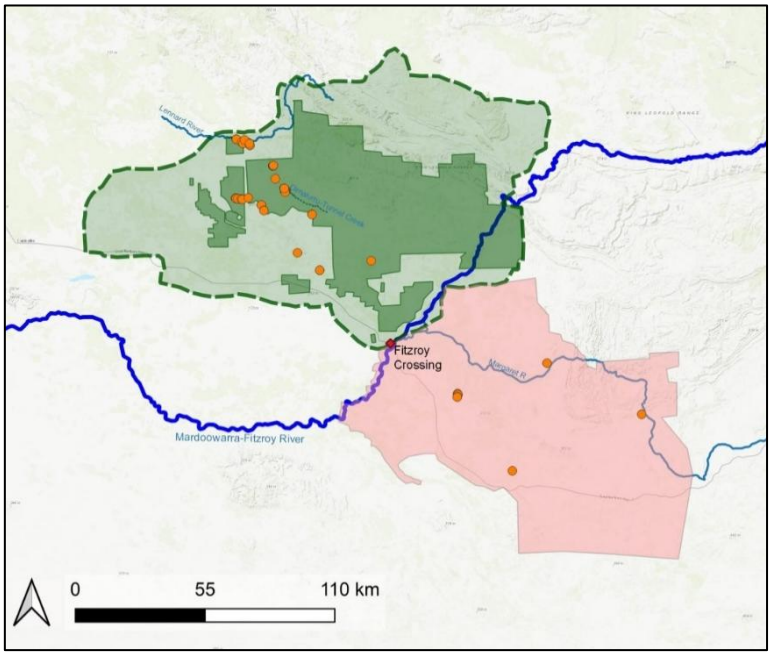


FIGURE 5.1 MAP SHOWING LOCATION OF SITES WITH ROCK ART RECORDED IN BUNUBA AND GOONIYANDI COUNTRY DURING FIELDWORK IN 2011 AND 2012.

Following the two field seasons, other studies and sources were further consulted to provide additional insight into the geographic distribution of important sites. Pannell's (2000) survey of the Upper Fitzroy Valley identified *Ngarranggani* sites in the study area, although only three with rock art. Pannell's (2000) study did not record the rock art, only noted it from the information provided by Traditional Owners, as much of the survey was by air, and the data collected was primarily ethnographic. One of the three sites identified with rock art in Pannell's (2000) survey (Moonggaroonggoo-PR1) was recorded in the fieldwork for this thesis, and this was also one of three sites (Shelter 3) later excavated at the request of the Traditional Owners (Maloney et al. 2017a). The sites all had shallow deposits dating to 2,790 +/- 54cal.BP (Shelter 1) and 2,615 +/- 126cal.BP (Shelter 2) with a single date of 388 +/- 74cal.BP from the 14cm deep excavation at the PR1 site (Maloney et al. 2017a:180). This short report (Maloney et al. 2017a) was limited in terms of rock art, although conversation with the authors indicated that there was rock art present at Shelters 1 and 2 it was not systematically recorded and analysed as part of their work (Dilkes-Hall 2017 pers. comm. 21 November).

months, or even years. This restricted access to Gooniyandi Country and people for the team in the 2011 field season.

The Department of Aboriginal Affairs (DAA)[5] site files and reports were a source of data which had the potential to improve the geographic distribution of sites, and bring the total number of sites recorded closer to the number with rock art listed on the DAA Register following the fieldwork (Table 5.1). A total of 74 sites with rock art were identified that had not been recorded during fieldwork. Information on five of those was not accessible because the DAA could not secure permission from Traditional Owners. Further investigation showed that two DAA sites had been recorded in the fieldwork for this thesis, though known by other names.

The DAA site files and reports have sparse information, with many limited to an observation by a field officer, and/or reports by landowners or surveyors citing the presence of paintings and/or engravings, or short reports for mining or site clearance/avoidance which contained few observations and no details or descriptions. Rock art was systematically recorded in one report (Marwick et al. 2003) with two sites, identified as Feature 4/2 Cra and Ellendale, surveyed. Ellendale is in a closed section of the report for access to men only, so it was not possible to view any of the rock art photographed or descriptions. Feature 4/2 Cra site has rock art described, measured and photographed, and the small assemblage recorded was not used for comparisons with the sites recorded in fieldwork because of the different attributes recorded by the author, and the limits on accessing complete information for both sites. Neither site was visited and re-recorded in this study; GPS information was either restricted or not accurate enough to provide an exact location.

The result of the site selection process and post-field site data gathering was that the sites used in the analysis were all sites recorded during the fieldwork. This meant that all the sites were able to be recorded in the same way, all were recorded with permission and/or assistance from the Traditional Owners and reflected a range of different sites with connections to different family groups in the southern Kimberley. Rock art was systematically recorded at 43 sites over two field seasons, of which three were also excavated, with Riwi and Tangalma subsequently re-excavated in 2013 (Balme et al. 2018c; Maloney et al. 2018b; Whitau et al. 2016b; Whitau et al. 2017; Wood et al. 2016) and Moonggaroonggoo in 2016 (Maloney et al. 2017a). The specific methods and parameters used to record the sites, and the rock art are described in the following sections.

[5] At the time of the research these were held by the Department of Aboriginal Affairs (DAA), in 2024 part of the Department of Planning, Lands and Heritage. This thesis uses the DAA nomenclature as it was current at the time of accessing the information.

Recording Sites

To place the rock art in context locational, geographical and environmental variables were recorded for each site. The placement of sites in the landscape, and the characteristics of that landscape, from the topography to the vegetation and water sources, contributes to the choices made by the creators of rock art in the selection of sites, and their uses over time (McDonald 2006:71). All sites were given a site name according to the information provided by the Traditional Owners, local geographic or locational features such as a creek or river or a pastoral station name, or a pre-existing name in databases; publications or field notes were used for some sites where other names were not known at the time. In this thesis the sites are usually referred to either by the site name or by individual site codes, based on an abbreviation of the site name. Site recording forms were paper-based, and improvements were made over field seasons to reduce the volume of paper and ensure that all required information was recorded on a single sheet. The forms and samples of completed forms are included in Appendix 4, and the recorded sites in this study are listed in Table 5.2.

GPS coordinates were recorded for each site using a handheld Garmin 60. These were recorded as near as possible to the site entrance, where fewer overhanging rocks allowed strong satellite signals. As well as enabling the site to be reliably located in the future, the coordinates are used in the spatial analysis in this study. The coordinates were downloaded to PC using the Garmin Base Camp software and plotted using ArcGIS/ArcMap and QGIS software and Google Earth.

Site plans were drawn in the field on translucent paper with 1mmx1mm graph paper underlay, using a baseline offset with 30m and 8m tapes, a Bosch laser distance measure with spirit level and compass. Site and the profile plans were completed on site and later digitised using CAD with Adobe Photoshop© and Adobe Illustrator© software. Each site plan provides the layout of the rockshelters and caves, with the location of the rock art, excavation (where applicable) and the aspect of the rock art at each site (see Appendix 5).

All sites were photographed with a Canon Digital SLR (EOS 550D), using a range of lenses (10-20mm, 28-80mm and 80-200mm) with image stabilisation (IS), autofocus lenses and UV filters. Each site was photographed facing inwards and outwards, in one metre intervals from along the outer edge of the shelter, or central line in a cave (inwards/interior photographs) and in wide angle from the painted or engraved rockface (outwards). Profile photographs were also taken where physically possible, and with pertinent features in the landscape or the site also photographed.

A Canon PowerShot G12, with DStretch©-enabled SD cards was also used to ensure that no motifs were missed in the recording process. Use of the DStretch© enhancement programming proved helpful at sites where there the rock art was not clearly visible, and revealed several motifs that were very faded, in poorly lit areas, or substantially superimposed that may not have been identified without this technological aid. Additional lighting was provided using Jobi LED portable lights, with magnetic, tripod flexi-legs to provide focussed light when required. All photographs were recorded in the photograph log, and cross referenced to the site records.

TABLE 5.2 SITES RECORDED WITH ROCK ART IN THIS STUDY. SITE NAMES AND CODES.

Site Name	Site Code	Site Name	Site Code
Bunuba Roadside Cave 1	BR1	Marawun 4	M4
Bunuba Roadside Cave 2	BR2	Marawun 7-1	M7-1
Bunuba Roadside Cave 3	BR3	Marawun 7-2	M7-2
Tangalma (Carpenter's Gap 1)	CG1	Marawun 7-3	M7-3
Tangalma A (Carpenter's Gap 1A)	CG1A	Mine Access Site 1	MINE1
Langurmurru (Carpenter's Gap 3)	CG3	Mine Access Site 2	MINE2
Darrananna	DARRA	Mount Behn 1	MB1
Tarakalu 1 (Dingo Gap 1)	DG1	Mount Behn 2	MB2
Tarakalu 2 (Dingo Gap 2)	DG2	Mount Behn 3	MB3
Elimberrie Springs	ELIM	Mount Behn 4	MB4
Emanuel Gap 1	EG1	Moonggaroonggoo (Painted Rock 1)	PR1
Emanuel Gap 2	EG2	Riwi	RIWI
Emanuel Gap 3	EG3	Stumpy's Soak 1	SS1
Emanuel Gap 4	EG4	Tunnel Creek 1	TC1
Emanuel Gap 5	EG5	Tunnel Creek 2	TC2
Fairfield 1	FF1	Tunnel Creek 3	TC3
Fairfield 2	FF2	Tunnel Creek 4	TC4
Fairfield 3	FF3	Tunnel Creek 5	TC5
Lillimooloora 1	LILLI1	Tunnel Creek 6	TC6
Lillimooloora 2	LILLI2	Djuru East (Windjana Gorge 2)	WG2
Louisa Downs 1	LD1	Djuru (Windjana Gorge Water Tank)	WWT
Marawun 1	M1		

Landscape and site condition were recorded for each site to provide a contemporary context. For example, landscape geology is a factor that may influence site access. Site types (rockshelter, cave, open site), available rock art surfaces, the proximity to reliable or ephemeral water, types of vegetation and the presence or absence of other archaeological artefacts may be informative about the ways in which caves and shelters were used and are currently accessed.

As well as the standard locational and site name information the variables recorded for each site, described in the following sections, are:

- Site type;
- Water Source;
- Topography;
- Geology;
- Vegetation;
- Art Surface;
- Site Floor; and
- Other artefacts at site.

Site Type

Site types are described using a range of characteristics observed in the field, particularly those relating to the sites where there is rock art the region. The five site types are rockshelter, cave, outcrop, exposed rockface, and boulders:

Rockshelters are wide horizontal openings in or at the base of an escarpment or cliff face, sheltered by an overhang; they are usually 'wider than they are deep' (Goldberg & Macphail 2006:169). The sizes vary, though all have a defined floor area and, in some cases, a barrier of boulders at the open edge. Rockshelters may be produced in the limestone by weathering, water flow or fracturing (Goldberg & Macphail 2006:173-4).

Caves are an opening in a rockface forming a passage or entrance to an enclosed chamber, or series of chambers. Golderberg and Macphail (2006:174) suggest that most caves are the result of erosion of the sedimentary rock to create large chambers and networks.

Outcrops are a collection of boulders, or isolated large rock formations that resemble hills or ridges in the landscape. Outcrops may also be composed of a conglomeration of large boulders.

Exposed rockfaces are horizontal ledges or vertical rockfaces that are fully exposed to the elements, not protected by a distinct overhang, or part sloped rockface, but forming visibly open surfaces on which rock art may be present.

Boulders are large non-mobile rocks with a paintable or engravable surface that may appear singly or in groups in a landscape without any direct relationship to another site type. Boulders that form an edge, ledge or barrier to another type of site (e.g. a

rockshelter) are included as part of the primary site in this study, because of their relationship to the other characteristics that form the site type.

Water Sources

Water sources provide information on the potential for sites to be used for habitation in the long term, or on a recurrent or sporadic basis. They indicate the extent to which food animals and groups of people may subsist. This is important for sites that may be living, meeting or ceremonial places (e.g. aggregation sites in which ceremonies are performed to appease the creators and increase the resources of the land), and an important factor in comparing the size and diversity of rock art assemblages in relation to the context. The water sources are identified as permanent or ephemeral, and according to five source types well, spring, seepage, creek, and river:

A well is usually a deep hole in the ground or rock from which fresh water is sourced, wells may occur from natural fissures, underground springs or aquifers, or be created by humans.

Seepage is the slow pooling of water that forms a wet area or surface on the rockface. It may be from the sediment above a rockshelter, through the limestone or from below the earth's surface forming a wet spot, or small pools of water.

Springs are formed when water emerges from below the earth and flows to create bodies of water above the surface. Whilst springs may flow steadily, they also form large pools of water in catchments, creating permanent water holes and homes for marine life. Springs occur at many levels in the landscape and may flow down a slope to create a pool or water flow.

Creeks are bodies of flowing water defined by banks and a bed, created by the flowing current. They are distinguished from rivers and streams by size, being a smaller form of flowing water. Creeks are usually, but not always, fresh water, and most in the Kimberley region are ephemeral, flowing during and after high rainfall.

Rivers are the larger natural water courses that are often, but not always, fresh water, and flow from a source such as a spring or mountain, catching rainwater and flowing out into a lake, sea or ocean. In the southern Kimberley the main rivers, the Lennard, Margaret and Fitzroy, flow according to the volume of rainfall during the wet season, though all have permanent pools which can be considered a reliable source of water for humans and animals throughout the year.

Topography

The topography, or shape of the landforms, is an important variable affecting site selection and accessibility. For example, a vertical cliff with a small high cave is not as easy to access as a wide rockshelter on a gentle slope. This influences the choice of sites for different uses; suggesting that less accessible sites may be for restricted or ritual practices, whereas easily accessible sites may be chosen for large family gatherings or meetings with different cultural groups for trade or marriage. Five broad types of topography are identified, each of which provides a different degree of access for people: escarpments, ridges, cliffs, rocky outcrops and valleys. Escarpments and rocky outcrops were the main topographic features in which rock art was recorded in this study.

Escarpments are long, wide, vertical uprisings of rock resulting from faulting in the earth's crust. In the southern Kimberley this is apparent in a series of mostly parallel faults in the Devonian Reef forming the northern arc of the Canning Basin (Playford et al. 2009:2). Escarpments have wide, accessible areas on top, on which vegetation grows, animals feed and humans are able to move about.

A ridge is defined as a 'narrow elevation of land' (Delbridge et al. 1991:1510), distinguished from an escarpment by its width and lack of a broad, relatively flat surface on the upper reaches.

Cliffs are high steep vertical rockfaces, sometimes with a sheer face. Cliffs are distinguished by their sharp edge and may be formed because of a sharp fracture of an escarpment, or a sharper, less graduated faulting of the earth's surface.

Rocky Outcrops are large discontinuous rock formations that stand out from the surrounding plains. These protrusions of rock may be in a large group or large individually, but do not have the length or continuity of escarpments, the slope to form hills, or the characteristics of other rock formations. They have sufficient size and similar fault lines, fractures and fissures to other rock formations that form caves and rockshelters (see Figure 5.2).

A valley is the lowland area between mountains, or parallel escarpments, or a low-lying depression with a river running through it. Parts of the valley may be wide enough to form plains, wide relatively flat areas that may be punctuated by rivers and/or creeks.

FIGURE 5.2 ROCKY OUTCROPS AROUND THE SITE OF RIWI IN GOONIYANDI COUNTRY.

Geology

Geology may be broadly described as the study of the rocks, minerals, land and life forms that both form and change the crust of the earth. In this study it is more specifically used to describe the rock that forms the painting/engraving surfaces in the study area and near vicinity. The rock types observed are limestone, sandstone, quartzite, conglomerate rocks, and a range of other rocks and minerals that are used for lithics, but not directly associated with the production of rock art, as far as is known at present.

Limestone is sedimentary rock formed mostly from calcium carbonate ($CaCO_3$). The Devonian Reefs in the southern Kimberley are formed primarily of several different layers of limestone (Playford et al. 2009:3-9), which have other inclusions giving some colour variation.

Sandstone is also a sedimentary rock, formed from the 'consolidation of sand' (Delbridge et al. 1991:1556), bonded with a variety of components, that may include silica, lime, gypsum, or iron salts. It also has some colour variation due those constituents, and the red/brown colouring in the Kimberley suggests that iron salts are likely to provide the colour.

Quartzite is 'a metamorphosed quartz rich sandstone' (Holdaway & Stern 2004:22). This rock type was included because quartz is prolific in surface scatters in the study area, and it is possible that rock art may be on quartzite, or that it is one of the surfaces in shelters and caves.

Conglomerate rocks are a formation of cemented heterogeneous materials (Delbridge et al. 1991:379), held in a cement that is primarily lime. The heterogeneous materials may include quartz, silica, and mica.

The 'Other' category is included to record the variety of other rocks and minerals found in scatters and excavations that describe the context in which the rock art is placed. This includes basalt, chert, chalcedony and granites from which many of the lithics observed in

the field are made (Tim Maloney 2011, 2012 pers. comm. 16 July). Where known, the name of the rock or mineral is recorded in this category.

Vegetation

The main trees, shrubs and grasses observed in the region from field observations are identified from reference books (e.g. Petherem & Kok 2003) and FloraBase (Western Australian Herbarium 2008), as described in Chapter 2. The main species recorded are largarri (*Adansonia gregorii*/boab), spinifex (*Triodia wiseana*), grasses and sedges (such as *Cyperaceae, Poaceae and Sorghum plumosum*) and water lily (*Nymphaeaceae*). Trees observed included: the Kapok Bush (*Cochlospermum fraseri Planch)* at various sites, notably at *Tarakalu* (DG1 and DG2); paperbark trees (e.g. *Melaleuca viridiflora gaertn* – broad leaf paperbark – and *Melaleuca rhaphlophylla* – swamp paperbark), and a wide range of eucalypts and shrubs. The range of vegetation is recorded to provide environmental context, potential food sources and a record of the plant forms in the immediate vicinity that may also be present in the rock art, a selection of which are shown in Figure 5.3 below, with the example in the rock art of wajarri (boab nuts) in the rock art painted at Fairfield 2 in Figure 5.4.

FIGURE 5.3 SELECTION OF PLANT SPECIES FOUND IN THE SOUTHERN KIMBERLEY, WESTERN AUSTRALIA. PHOTOGRAPHY BY J ENGLISH AND I WALLIS. IMAGES USED WITH THE PERMISSION OF THE WESTERN AUSTRALIAN HERBARIUM, DEPARTMENT OF BIODIVERSITY, CONSERVATION AND ATTRACTIONS HTTPS://FLORABASE.DBCA.WA.GOV.AU/HELP/COPYRIGHT. ACCESSED ON 4 MARCH 2022.

FIGURE 5.4 PAINTED WAJARRI (BOAB NUTS) IN ONE OF THE EXPOSED SURFACES AT FAIRFIELD 2. BRIGHTNESS ADJUSTED +20%. ART SURFACE AND CONDITION.

Two characteristics were recorded for the Art Surface. The first is the type of surface on which the art was painted or engraved. This describes the type of surface available to the rock art creator, be it vertical, horizontal or part of an overhang, and an indication of the accessibility or surfaces within the site, as well as placement choices made by the creators.

Vertical surfaces are those that are at 90°+/-10° from the site floor, either as a wall within a rockshelter or cave, or the art surface of an exposed site.

Horizontal surfaces are largely parallel to the site floor, with some variation on the slope of the surface of ledges or boulders.

Ceilings are defined as the surface directly overhead from the site floor. They may be parallel to the site floor or sloped from the top of a wall (vertical) to another wall or entrance.

Overhangs are the sloped surfaces that extend from the fissure created by the formation of a rockshelter, which will often form both the walls and ceilings of a rockshelter and are distinguished by their acute slope from the site floor (usually less than 60°).

The 'Other' category in this group allows for less common places in which rock art may be placed, and includes areas such as niches within the site, cave entrances or corridors, or site floors.

The second is the condition of the rock art surface, which provides an indication of the conditions which may impact on the visibility and preservation of the rock art, as well as the

choices made by the creators. The characteristics recorded for the condition of the art surfaces are:

Human interference, for example, where there is clear evidence of human modification of the surface, such as attaching other materials such as metal or silicon (Figure 5.5);

Natural climatic and/or geological changes such as flaking, fracturing or fissures in rock surfaces;

Deposits, including calcite deposits from water flow and soot/charcoal from burning woods;

Animal activity and remains includes insect nests and trails, rubbed drawings or paintings at lower levels where animals or their faeces have been observed close to the rockface;

Plant activity that has left observable traces on the rock surface or tendrils, roots and leaves in contact with painted or engraved surfaces; and

Water damage through seepage, dripping or possible water flow and flooding at lower parts of the rockface.

FIGURE 5.5 CLOSE UP OF HUMAN INTERFERENCE AT WWT, WITH THE PLACEMENT OF A LINE OF SILICON TO REDUCE DAMAGE TO THE ROCK ART, BUT WHICH PARTIALLY COVERED ROCK ART AT THE LEFT OF THE IMAGE.

The condition of the rock art itself was also recorded. This provides a record of the current condition, accounting for any damage to the rock art and any observed changes to the art itself, such as erasures There was no indication of vandalism at the sites, and very little graffiti, none of which had been placed over existing rock art, at the sites recorded. The major characteristics recorded were superimposition and water/calcite deposits, with animal

activity around one of the larger sites likely responsible for smudging and removal of painted rock art at the base of the walls. The following characteristics on the condition of the rock art were identified for recording:

- Vandalism;
- Graffiti;
- Foot traffic;
- Smoke;
- Animal traffic/activity;
- Plant/lichen/tree root incursion;
- Superimposition;
- Refreshing/renewal;
- Water/calcite;
- Other; and
- No visible damage.

Site Floor

The condition of site floors was recorded to provide insight into contemporary use, damage and/or changes that may have occurred. The site floor condition is a corollary of the surface and art condition, with the ongoing or sporadic use of the site potentially impacting on the visibility, preservation, type and proliferation of rock art. Observations of the site floor record whether there has been human activity (e.g. surface scatters of stone tools, modification of the site), plant intrusion, animal activity (e.g. faeces or evidence of animal digging and tracks), movement of water, geological disturbance (e.g. fallen rocks and/or boulders), contemporary human activity (e.g. tin cans, cigarettes) or no visible activity on the site floor.

Other Artefacts at the Site

A record of all other visible artefacts, prior to excavation and sampling, was made at each site. This is another part of the context to provide information on site use, particularly where there is not excavation or other archaeological investigation. The artefacts were recorded at the broadest level, by presence or absence to supplement the other site context information. The categories of artefacts identified for recording at sites were lithic; glass (tools); glass (not modified), bone, shell, charcoal, and other contemporary materials (not modified).

Recording Rock Art

The rock art in this study was recorded using a combination of paper based and digital technologies. Paper recording forms were used to classify the rock art and its characteristics. Like the site recording forms, these were improved over the two seasons to provide a compact and quick recording process to accurately record the data. One of the results of this was that the rock art at two sites were rerecorded in the second season (WWT and WG2) and subsequently improved the available data for analysis.

Panels were sketched on graph paper, not to scale, to show the relative placement of figurative and nonfigurative artworks and provide a record through which these could be related to one another, and the initial assessment of superimposition relationships. This was also designed to enable the reconciliation of motif and figure numbers with digital photographs, and the post-field electronic data entry.

Within each site, panels were identified using the primary criteria of physical separation on vertical and sloped surfaces forming overhangs in rockshelters. The separation criteria used for vertical panels were:

- A distinct gap between groups of motifs of three or more metres;
- A distinct difference in aspect such as an assemblage may be around a corner from another;
- A clearly defined niche or cave-like niche that separated one group of motifs from another by a vertical ridge, protrusion or sharp angle;
- An area outside of a rockshelter or cave where rock art was also present; and
- A separate chamber within a cave.

Similarly, where the ceiling of a rockshelter or a cave is distinct from the mostly vertical or sloped surface on which a panel was identified, it is identified as a separate panel where there is rock art that does not continue across both surfaces. The latter was not observed in the field, but the distinction of motifs and figures placed on ceiling or vertical/sloped wall areas has been recorded, though because of lack of separation they are coded as single continuous panels in this study. This has not affected the analyses presented in the thesis.

Identifying separate panels was chosen to group images together so that they could be considered as potential compositions. Whilst this seemed possible and had been used in other analyses to some effect (e.g. Welch 1996a, 2016), the rock art in the southern Kimberley did not display any characteristics that suggested that different images may have

been composed as a story or scene. In addition, the division of rock art into individual scenes is entirely at the discretion of the researcher, and, while it may be informed by Bunuba and Gooniyandi descendants, such decisions may be little more than personal interpretation. It should be noted that this is not always the case, as there are Indigenous people who have had continuous connection with particular rock art panels and are in a well informed position to identify panels which depict a particular scene or story, this was not the case in the southern Kimberley, and this was not pursued in post field analysis.

Digital photography was employed as the primary visual method of recording the rock art and site context. Wherever physically possible each panel was photographed at one metre intervals along a base line, using the 10-20mm wide angle lens, with three levels, low, medium and high. Along with drawings this provides an accurate record of the relationships of the motifs and/or figures to one another, and their placement within the site.

Digital photographs were taken of the individual figures at each site. The 10-20mm wide angle and 28-80mm IS lenses were used to record the rock art in most instances. Photographs were taken using handheld and tripod shots, at 18.1 megapixels, the finest resolution available on the Canon EOS 550D camera.

All figurative and non-figurative rock art were photographed both with and without scale, using the IFRAO Standard Scale. Close up photographs were taken of some attributes that were noted in the records, and where light was an issue in rockshelters, or on exposed rockfaces different settings and angles were used in the photography for later reference in further attribute identification. Jobi Gorilla Grip lights provided additional lighting where necessary to enhance visibility in darker rockshelters or caves.

In addition, in the 2012 field season a Canon PowerShot, loaded with DStretch© software was also used. DStretch© was not available for SLR cameras at the time, but in the PowerShot it provided an additional tool to survey the panels and identify rock art in the field that may have been excluded because of faded pigment, light limitations, and human vision. This tool was used on many occasions to identify uncertain motifs and details, or layers of superimposition, or rock art obscured by calcite deposits. Whenever this was used and images or superimposition identified, these was also photographed on the Canon EOS 550D for high resolution photographs for later analysis.

Photographs were downloaded directly onto a laptop computer in the field, with backup up to an external hard drive. These were later manipulated in RAW format using Adobe Bridge© with the Camera RAW plugin where necessary, which has the capacity to manipulate and correct lighting, exposure, colour histograms, vibrancy and clarity in images more than other

formats allow. Some photographs were also adjusted in Adobe PhotoShop© or in Image J© with a DStretch© plug-in, which uses intense colour saturation, an extremely useful tool in reviewing superimposition and clarifying hard to see rock art.

To provide the most complete information the widest range of variables for identifying stylistic attributes were identified for recording for each figure. The attributes were only recorded where they were present, which meant that more were recorded for some images than others. This section provides the major headings and brief descriptions of the attributes recorded. The full description of figurative attributes is in table form in Appendix 7.

Figure Recording

Each recorded rock art figure is linked directly to the site and panel on which it is placed. Cross referencing information to link it to the site record includes the site code, date of recording, panel number and recorder. Associated drawings and photographs relating directly to each figure are recorded on the paper form. Each figure has a unique four-digit identifier number, beginning with M, to distinguish it from database generated numbers.

Figure dimensions were recorded both in the field and using the Adobe PhotoShop© measuring tool in photographs with scale (see Appendix 4). The dimensions of figures are used in the analysis to compare the sizes, and therefore, the potential or intended visibility of motifs, attributes, and styles.

The details recorded for all rock art figures are (see also Appendix 4):

- Detailed description of the figure;
- Completeness;
- Single figure or on a panel with other figures;
- Dating potential, and if so what type of potential (e.g. calcite covering, an insect nest, charcoal or other organic matter);
- Surface type (e.g. vertical, horizontal);
- Colour/s used;
- Materials used (e.g. pigment, charcoal, clay);
- Technique (e.g. painted, stencilled, incised);
- Condition of the art (e.g. faded, exfoliated, fresh);
- Superimposition, and superimposition relationships; and
- Determinate i.e. could be recognised as a figurative or non-figurative image by the researchers or Traditional Owners.

Where motifs are identified as determinate, further information is recorded in accordance with the preliminary classification developed for the fieldwork (see below). The identification of colours and the initial classification of the rock art was developed from previously published and unpublished work in the study area (Akerman 2009b; Blundell 1975; Crawford 1964, 1964-1968, 1968; Marwick et al. 2003; O'Connor et al. 2008a; Playford 1960, 2007). The final classification system, and the descriptors, in Table 5.3, Table 5.4 and Table 5.5 resulted from the process of organising the data, identifying the motif types and their characteristics, and observation of overall form, informed by Bunuba and Gooniyandi Traditional Owners.

Classifying the Assemblage

At the broadest level the rock art has been divided into determinate and indeterminate classes of figures. This eliminates markings that do not have sufficient detail to be distinguished as a rock art figure which are described as indeterminate. This was the first classification used in this study, Level 1. Limited data is recorded for indeterminate figures, colour, technique and infill, which is included as part of the broader descriptions of rock art characteristics in the region.

Determinate figures are arranged into classes that describe their broad recognisable types of images, Level 2. This was the initial level at which they were recorded in the field, with the broad descriptors shown in Table 5.3, and further classified post-field into defined subject matter, or sub-classes, shown in Table 5.4 and Table 5.5, Level 3. A range of finer level of depicted subject matter of Level 3 classifications were also identified prior to the field recording through the examination of images from previous research (particularly Crawford 1964-1968), and this was used consistently in field recording (Appendix 4).

More Attributes

For each defined depicted subject matter or sub-classes described in Table 5.4 and Table 5.5, individual attributes were recorded to enable the subclass to be analysed according to a range of characteristics that would, together with the colour, technique, size and classification categories, constitute a style as discussed and defined in Chapter 4. Following Maynard (1977), form would be defined at the wide level of a grouping of marks (infill, pattern, outline), the shape created, and character those additional attributes that make a figure distinctive, such as the shape of the body or limbs, headdress variations or material culture attached to the motifs, etc. This is a useful way to bring together information to enable

defined images to be categorised according to similarities in their attributes and grouped by the presence or overall form of those attributes.

The attributes that have been recorded for the motif subtypes are described in detail in Appendix 4 and summarised in Table 5.6. In total, 157 attributes are recorded. While some of the same attributes are recorded for each figure, such as the outline, colours and infill recorded for many, these are individually recorded and related directly to the subject matter or sub-classes classification and are directly attributed to the individual figure and its classification. These attributes and identified rock art styles will be further defined and explored in ensuing chapters of this thesis.

Additional Informed Information

Traditional Owners and their families accompanied the *Lifeways* team in the field on several occasions, visited the camp at Bandilngan/Windjana Gorge, and/or met with the team in Fitzroy Crossing or Derby to share stories and identify potential sites. Such occasions provided the opportunity to discuss Country, the stories that were important for different places, the correct names of the places and the features in the landscape, from the limestone to the colours of the pigment. Much of this information was recorded in field notebooks. On some occasions I was able to record conversations using a digital voice recorder (UWA Ethics Approval RA/4/1/5159) and later transcribe it to supplement the information about attributes, language, naming and stories associated with rock art figures to the data records. This information was invaluable in classifying some of the figures, for example the rock art shown in Figure 5.6 was identified as a thanggari (water lilies) that were gathered and eaten by the Gooniyandi Traditional Owners as young people (June Davies and Helen Malo 2011 pers. comm., 1 September), which I may have otherwise classified as a geometric motif without that shared informed knowledge. Similarly, the Bunuba Rangers (2012 pers. comm. 16 July) identified the wajarri in Figure 5.4, and described how they roasted them to eat when they were still young and green with the stalks attached. Most of the wajarri seen at sites were without the stalks, and it was with the informed knowledge and assistance of the Bunuba Rangers that I was able to locate and identify the young nuts that were painted at Fairfield 2.

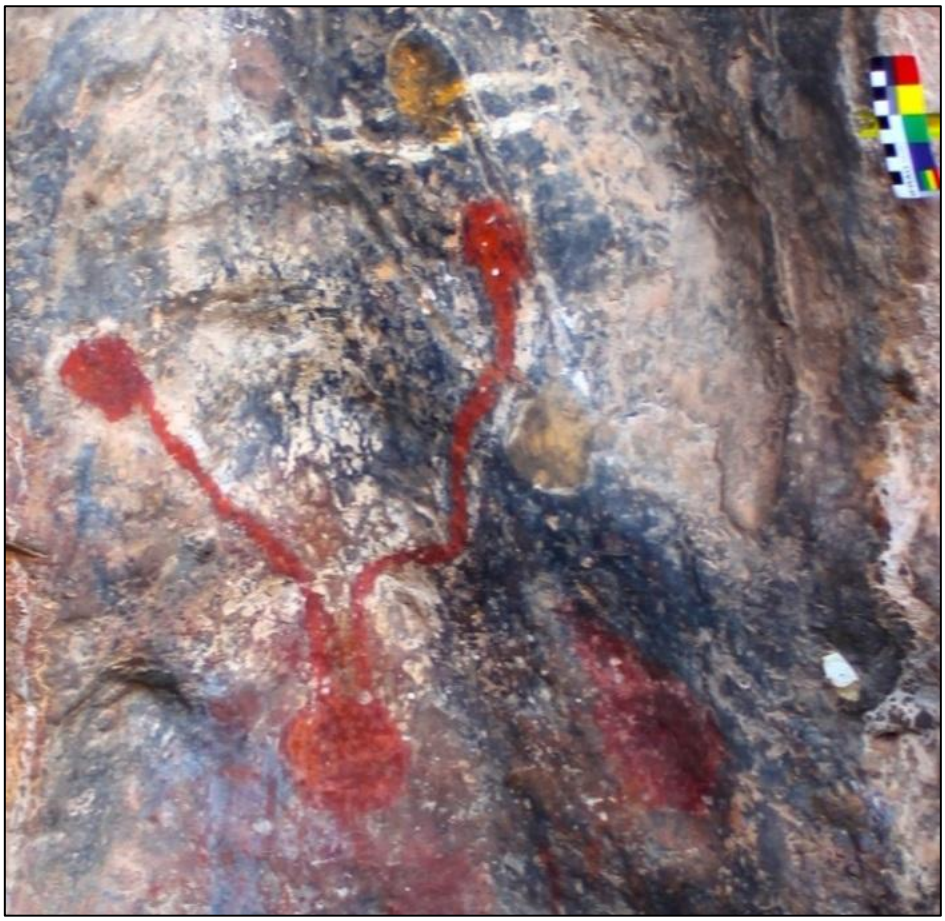


FIGURE 5.6 A THANGGARI (WATER LILY) AT MOONGGAROONGGOO (PR1) IN GOONIYANDI COUNTRY, 1 SEPTEMBER 2011.

TABLE 5.3 DETERMINATE ROCK ART CLASSES OF LEVEL 2 CATEGORIES.

Classes	Descriptor
Anthropomorph	*Figures resembling or with recognisable human attributes. This includes body parts that are definable as human, such as painted, drawn or engraved hands or feet, digits, heads, facial features, bodies, limbs with human musculature, genitalia, hair. This does not include stencilled human hands or feet, which are classified as tracks.*
Zoomorph	*Figures resembling or with recognisable animal attributes, such as feathers, animal head shapes, tails, digits, bodies, limbs, ears. This includes complete and incomplete figures which are recognisable to the researchers or Traditional Owners as representing animals.*
Phytomorph	*Motifs recognisable as realistic or representative of (as identified by Traditional Owners) plants, trees, seeds or other vegetation, with attributes such as seed/ pod shape, stems, roots, foliage, flowers.*
Material Culture	*Recognisable or representations of objects of material culture used or created by humans, such as boomerangs, axes or spears. Objects may appear on their own, in groups, or held by, accompanying other figurative motifs. This category includes stencils of these objects.*
Tracks	*Recognisable symbols that are real or represent prints or tracks observed in rock art, such as animal tracks, foot or hand stencils and prints. Stencils of human hands and feet are included in this category because they denote the presence of actual humans, rather than a representation. Whilst the placement of the stencils may be for cultural, cultural or ceremonial reasons they are interpreted to represent the tracks of human activity at the site, in the same way that depictions of animal tracks are placed to suggest that the birds and other creatures have walked through the site.*
Geometric	*Complete and incomplete recognisable shapes and variants of shapes, lines and groups of lines that cannot be reliably interpreted as representing a figurative motif. For example, a solid infill circle may represent a moon, a lake, a meeting place, but without context or information from Traditional Owners that this is the case, there are too many possible interpretations, and it is only possible to record and classify it as a circle.*
Historical Inscriptions	*Writing, dates and associated punctuation and lines or enclosing shapes that may only have been created by those with written language. Whilst this could include contact with people from Asia with written language there is yet to be any inscription recorded in the Kimberley other than those using English constructs and lettering.*
Other	*Motifs that appear to be figurative, but are not recognisable as specific types of motifs in other figurative categories. These motifs have distinctive form, but what they are meant to be, represent, or interpreted to be is either unknown or moot.*
Other non-figurative	*Cultural, intentional marking of rock surfaces not elsewhere described such as cupules, finger flutings, grinding patches and deeply incised cut marks singly or in groups, or abraded grooves. Too non-specific to be recognisable or known as any specific type, form or style of motif.*

Note: These definitions are an amalgamation of ideas from several sources including Maynard (1977) Brady and the Kaurareg Aboriginal Community (2007), David and Chant (1995), Franklin (2004), Gunn and Mulvaney (2009), and McDonald (2008).

TABLE 5.4 CLASSIFICATION OF ROCK ART CLASSES AND SUB-CLASSES, LEVEL 2 AND LEVEL 3

LEVEL 2	Anthropomorph	Zoomorph	Phytomorph	Material Culture	Tracks	Geometric	Historical Inscription	Other	Other Non-Figurative
LEVEL 3	(a)	(a)							
	Female	Macropod	Wajarri (Boab Nut)	Axe	Human Hands	Circle/Circle Variant	Composite Inscription	Starburst/ Lightning	Grinding Stone
	Male	Quadruped	Grass	Bag	Quadruped	Oval/Oval Variant	Initials	Composite Figure	Grinding Patch
	Non Gendered	Bird	Pods	Boomerang	Bird	Arc/Arc Variant	Numbers	Radiating Lines forming oval shape	Cupules
	Female + Male	Reptile	Thanggari (Water Lily)	Spear/Stick	Human Feet	Parallel Lines	Names		Abraded Grooves
		Fish/Aquatic Creature	Wanggu (Yam)	Club	Macropod	Rectangles	Writing/Letters		
		Amphibian		Shield		Incomplete Geometric			
		Other				Other Linear			
		Insect				Incised Parallel Lines in Groups			

TABLE 5.5 CLASSIFICATION OF ANTHROPOMORPH AND ZOOMORPH CLASSES AND DEFINED DEPICTED SUBJECT MATTER, OR SUB-CLASSES, LEVEL 2 AND LEVEL 3, CONTINUED FROM TABLE 5.

LEVEL	Anthropomorph (Defined)	Zoomorph (Sub classes)	
	(b)	**(b)**	**(b)**
LEVEL 2	Waliarri 1	Bird	Quadruped (other)
LEVEL 3	Waliarri 2	Bush Turkey	Snake
LEVEL 3	Mamo/Djuari	Crab/Crustacean	Thylacine
LEVEL 3	Outline only	Crocodile	Turtle
LEVEL 3	Round bodies	Dingo	
LEVEL 3	Incomplete anthropomorph	Dog (general)	
LEVEL 3	Elongated bodies	Eel	
LEVEL 3	Veganthrop	Fish (general)	
LEVEL 3	Unique anthropomorph	Flying Fox	
LEVEL 3	Therianthrope	Lizard	
LEVEL 3	Muscled limbs	Frog	
LEVEL 3	Contact style	Insect	
LEVEL 3		Macropod	

TABLE 5.6 RECORDED ATTRIBUTES OF ROCK ART FIGURES BY CLASSES (LEVEL 2).

Anthropomorph (42)	Zoomorph (24)	Phytomorph (19)	Material Culture (19)	Tracks (14)	Geometric (16)	Historical Inscriptions (3)	Other Non-Figurative (7)	Other (8)
Outline/ Outline colour All Colours White background Body Divisions/lines Hair belt/ Breast plate Arcs around head Hair/ Headdress Headdress Type Feathers Eyes/ Eyelashes Nose/ Mouth Genitalia Body type With object Object type Infill Type Zoomorphic limbs Number zoomorphic limbs Legs/ Number of legs Feet/ Number of feet Toes Arms/ Number of arms Hands/ Fingers Single/ Multiple/ Joined Images Zoomorph characteristics (body, head, limbs) Phytomorph characteristics Superimposition	All colours Outline Outline colour Infill type Infill colour White background Feathers Eyes Nose Mouth Feet Number of feet Limbs Number of limbs Toes Claws With object Object type With anthropomorph Anthropomorph type Single/ Multiple/ Joined Images Superimposition.	All colours Outline Outline colour Additional lines Additional line colour Additional line type Infill type Infill colour Coloured background With object Object type With anthropomorph Anthropomorph type With zoomorph Zoomorph type Single/ Multiple/ Joined Images Superimposition	All colours Outline Outline colour Infill type Infill colour Axe head direction White background With geometric Geometric type With lines Line type With anthrop. Anthropomorph type With zoomorph Zoomorph type Single/ Multiple/ Joined Images Superimposition.	All colours Outline Outline colour Fill Fill colour Stencil Stencil colour Stencil type Palm Wrist/limb Fist Number of digits Handedness Hand – fingers present Superimposition.	All colours Outline Outline colour Infill type Infill colour White background With object Object type With anthrop. Anthrop. type With zoomorph Zoomorph type Single/ Multiple/ Joined Images Superimposition	Colour/s Technique Transcription Infill type Outline Superimposition	Colour/s Technique Number Single/ Multiple/ Joined Images Super-imposition	Colour/s Technique Infill type Outline Single/ Multiple/ Joined Images Super-imposition.

Drawings

Each rock art recording form has space for a drawing of the motif. Where time allowed, drawings were completed showing the main characteristics of the rock art, relationships to one another, and superimposition observed in the field (e.g. Figure 5.7).

Hundreds of drawings were completed, but time did not allow for detailed drawings to be completed for every rock art motif and figure. The rock art which was not drawn in the field is sketched on panel plans completed for all sites.

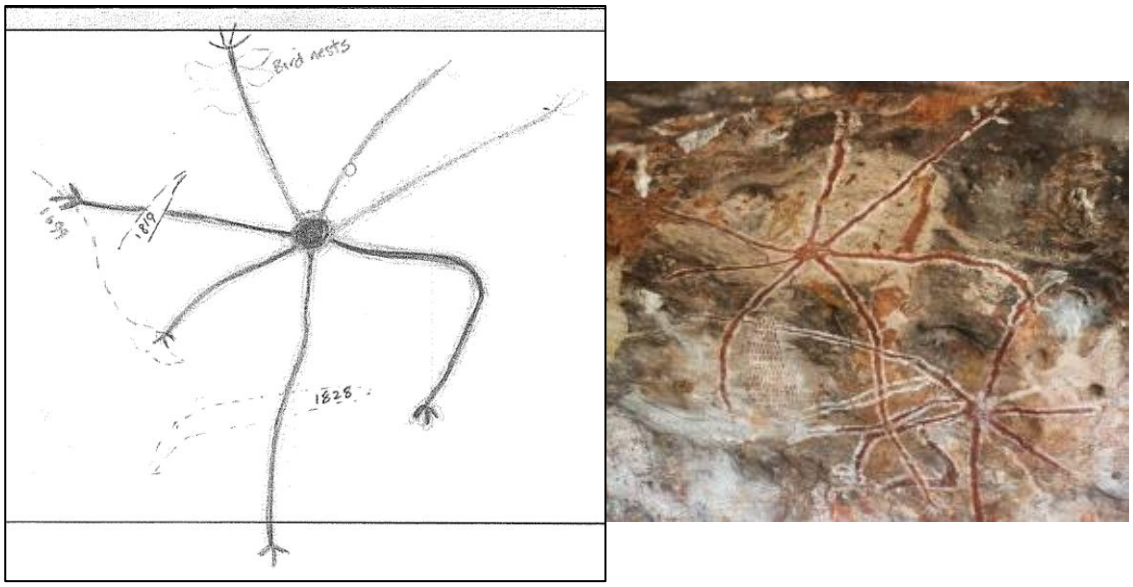


FIGURE 5.7 PENCIL DRAWING OF A 'STARBURST' MOTIF (M1820) AT MOUNT BEHN 1 SHOWING ITS RELATIONSHIP TO THREE OTHER MOTIFS (M1828, M1819 AND M1699) AND BIRD NESTS OVER WHICH IT IS PAINTED. SEE ALSO FIGURE 6.47.

Managing the Data

Managing data for more than 10,000 photographs, 46 sites (43 with rock art) and more than 2,000 rock art markings presented both organisational and data management challenges. The volume, variety and complexity of relationships between the different components meant that it needed to be organised systematically to ensure that data was able to be interrogated, analysed and accessed readily. This section outlines process of organising the different types of information gathered for this study.

Organising the Photographs

All photographs were downloaded to a laptop computer in the field and backed up to an external hard drive. The original photographs are preserved in secure electronic storage at the University of Western Australia (UWA).

Each photograph is sorted by site and electronically labelled by a unique identification number, cross referenced to the photographic log and records of rock art figures (Appendix 4).

Keeping the Records and Organising the Data

The paper records (site plans, panel plans, site and rock art recording forms, photographic and GPS logs) are scanned and stored electronically, on the UWA server and on external hard drive. The scanned documents are arranged, like the photographs, by site.

To store, arrange and analyse the data recorded I created a Microsoft Access relational database. This meant that the data could be interrogated using customised queries, exported to Microsoft Excel and SPSS for statistical analysis and graphs, and exported to ArcGIS/ArcMap and QGIS to create maps showing spatial relationships between the sites and distribution and density of the classified images. The database is structured so that all the fields recorded can be arranged and cross tabulated in any combination required, providing flexibility and long-term electronic data storage.

This program was chosen because of my own familiarity with developing and using it, and its capabilities, as well as the flexibility it offered in data interrogation and export. It does, however, have limits. The program is built with size limits, which meant that photographs cannot be stored in the database without reducing the size of each image, and therefore visibility. The alternative would be to hyperlink the photographs to the records, but this would also be limiting the database; and it would necessitate permanent hosting on a fixed drive, limiting the portability of the database. Embedding photographs in the database was not essential for this research, and cross referencing the images to the electronic records was sufficient for this purpose.

The database structure is shown graphically in Figure 5.8. Note that this graphic does not include all the tables and information fields used in the database, but shows the broad structure, where for each site there are many rock art figures. For each figure there is a classification within the structure shown in Table 5.4, as well as the characteristics of the figure in terms of its classification shown in Table 5.6. There are some figures which may have more than one classification, and therefore have characteristics recorded for those. This is more usual where an anthropomorph has a piece of material culture attached, such as holding boomerangs as shown in Figure 5.8. This is rare in this study, but other datasets in the Kimberley where Gwion Gwion are present, and in the Pilbara are likely to have many more such relationships where anthropomorphic figures with material culture are more

common (e.g. Mulvaney 2015b; Paterson & Wilson 2009; Walsh 1994, 2000). The full detail of the relationships and linked fields in all the tables are shown in the relationships table from the database in Appendix 7.

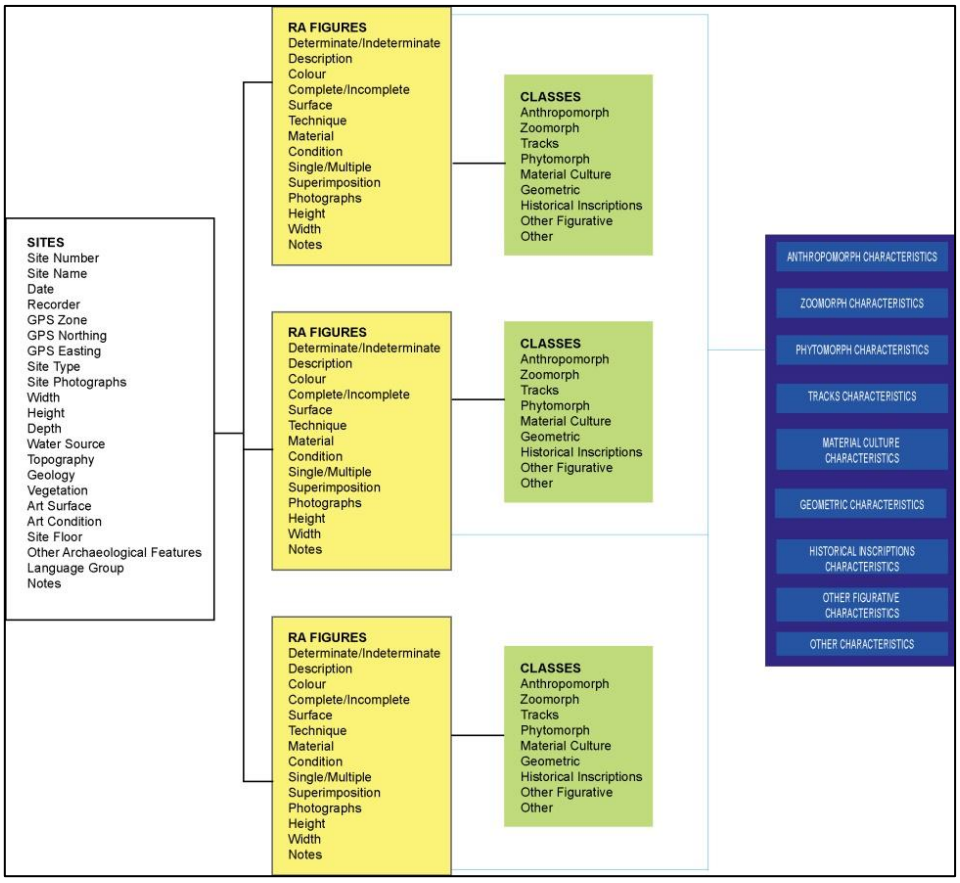


FIGURE 5.8 RELATIONSHIPS BETWEEN INFORMATION IN TABLES IN THE DATABASE DEVELOPED FOR THIS STUDY.

I entered all data myself to maintain data and classification consistency. I also undertook audits of the data to review classifications, site data and image organisation, and to ensure accuracy and consistency in attribute recording.

Superimposition relationships comprise two of the data fields entered in the database, and as those were recorded in the Access Database, I constructed Harris Matrices for the motifs, figures and attributes by site to create a visual record. This was included to provide scope for chronological analysis. ArchEd© software was used to construct the initial Harris Matrices, however this, and other software, was found to be limiting in that they did not provide for the flexibility of multiple layers of information to be embedded in the matrix, as the software is designed primarily for excavation layers and features, and not classification, attributes and stylistic analysis. ArchEd© provided the initial visual representation of the potential layers of rock art at each site, and ultimately, I transferred this to matrices in Microsoft Word to visualise all the information on classification and style needed bring together the chronological and spatial analyses.

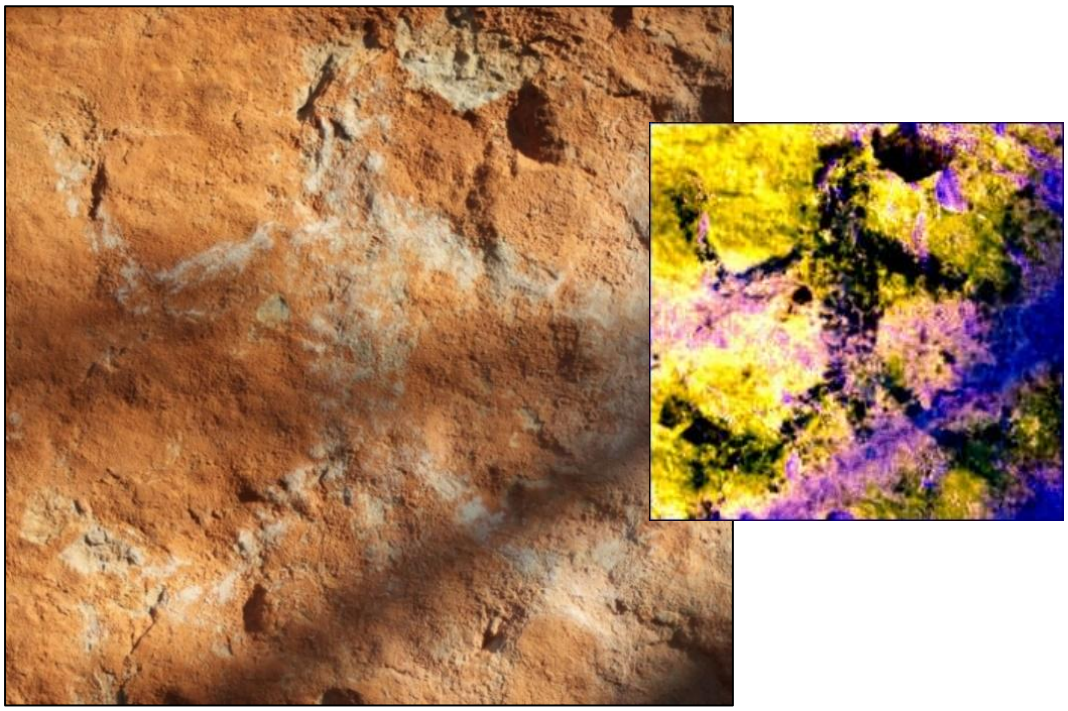


FIGURE 5.9 AN EXAMPLE OF AN ANTHROPOMORPH HOLDING OBJECTS OF MATERIAL CULTURE IN EACH HAND, RESULTING IN THREE CLASSIFICATIONS (M1088). ENHANCED IMAGE WITH DSTRETCH© LABI/SCALE15.

GPS data was downloaded daily in the field to a laptop with Garmin compatible software. The data required auditing and minor edits to remove duplication, improve organisation and ensure correct labelling. The data was then incorporated in the main database and exported to ArcGIS or QGIS for use in maps and spatial analysis.

Analysing the data

The data gathered in this research is analysed in three ways, using descriptive statistics, chronological relationships, and spatial analysis. The analyses are intertwined, with the spatial and chronological analyses building on the statistical reporting, and both building upon one another.

Statistical

Descriptive statistics are the basis for reports and analyses in this thesis, including frequencies and statistical relationships. Data validity and reliability was tested using cross tabulation, simple linear regression and Chi Square tests, generated from the results of database queries in Microsoft Access, imported into statistical software package SPSS and Microsoft Excel Analysis Tool Pack.

Frequencies were analysed for each level of the classification and by the attributes, and style. The database allowed all combinations of all attributes, locations, figures which are

essential to determine the relationships of figures to sites and one another, as well as to generate densities for spatial analysis. For example, colours identified in preliminary research (e.g. identification of a range of colours from Crawford 1964-1968) and observed in the field, and colour and colour combinations are cross tabulated with classifications and selected attributes from those described above to contribute to identification of styles, chronologies and distribution profiles for the study area. Appendix 11 shows the colours defined in this study, matched to Munsel© colours.

This is a structured way to determine whether sites with large numbers of motifs and figures, which may represent meeting places, show the same types and/or diversity of motifs and/or styles as sites with smaller numbers of figures at varying distances from them, and to test the likelihood of interconnectedness, shared symbolic behaviours and potential exchange between family groups, and the degree of conformity in motif and stylistic choices.

Two-step cluster analysis was used to produce initial stylistic groupings of figures because it has the capacity to identify groups of data with common attributes in large datasets, which Drennan (2010:309) described as mimicking the mind's capacity to arrange complex information into groups. However, when broken down to classes (Level 2, as in Table 5.4) and characteristics (Table 5.6) there was insufficient data to make this meaningful or produce consistent or statistically valid identifiable correlations for this dataset. The cluster analysis, scatter plots, and correlations are included for completeness of methods attempted in Appendix 7 but are not used in the statistical descriptions in this study.

Chronological

Relative chronologies are created and analysed using a combination of observations in the field, photographic analysis, statistical analysis, information from Traditional Owners and other unpublished sources (e.g. Jones 2010: see Appendix 2).

The results are shown in a Harris Matrix for each site, showing the placement of all figures in superimposition relationships (Appendix 10). This means that the charts for some sites are highly complex, particularly where a figure is large and may be superimposed by, and on, many other figures. Each Harris Matrix also includes the classification of each figure to class and sub-class, its unique figure number (e.g. M1234) and a code for the initial style grouping to which it was allocated. Figure 5.9 shows how this process works as a Harris Matrix, and Figure 5.10 shows how it may appear as a figure on the rockface. At the base directly on the rockface, is a Waliarri[6] type anthropomorph (dark blue – M2011A-Style2),

[6] As named by Traditional Owners.

superimposed by three figures; a phytomorph (green – a pair of wajarri-M1667-Style1), a material culture figure (– an axe-M1668-Style1) and a track (orange – a handprint-M2011B-Style6). In addition, the phytomorph is also superimposed by the track. The track and the material culture motif (axe) are at the top level, the most completely visible, and the most recent, while the anthropomorph is the oldest in this sequence.

It was hoped that associated research to date the calcite covering of figures at two of the rock art sites in this study area, using uranium series dating would lead to the addition of absolute dates for specific rock art images, motifs, figures and styles. This would make it possible to specify reliable anchor points for layers within superimposition relationships, and provide a clearer indication of relative ages for motifs and styles; for example if the anthropomorph in Figure 5. was dated in the Holocene then all of the other motifs superimposed on the anthropomorph would be post-dated from the Holocene to the contemporary, i.e. a *post terminus quem* date. However, the contamination of many of the calcite flows, and the lack of identifiable determinate rock art associated with calcite meant that this did not eventuate.

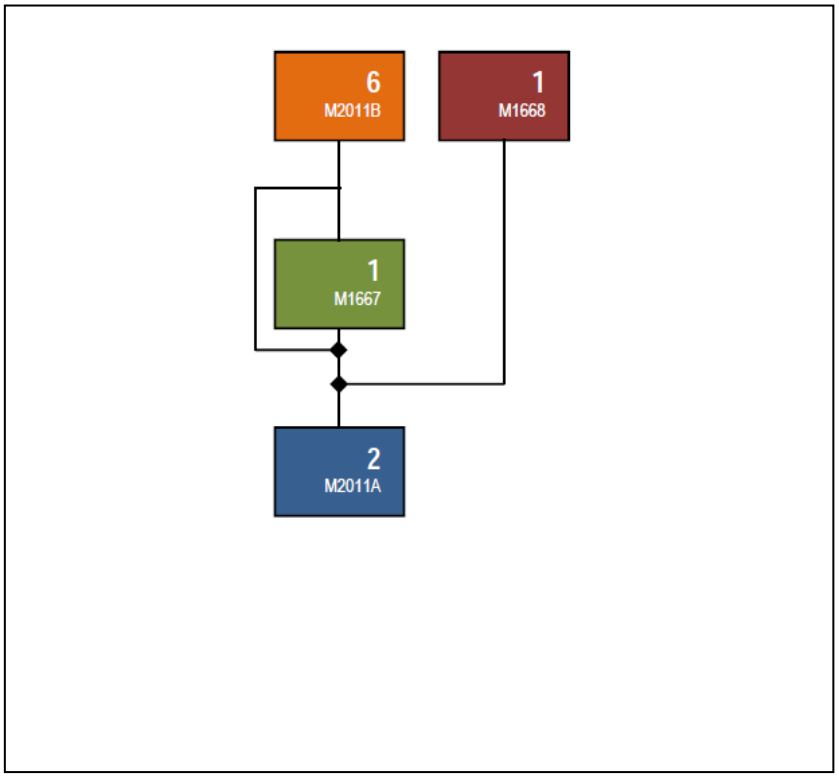


FIGURE 5.10 EXTRACT FROM HARRIS MATRIX FOR MOUNT BEHN 1.

Radiocarbon dating of charcoal and shell in excavated deposits where limestone with applied pigment, or ochre pieces were recovered provides some insight into the potential for occupation and pigment use. In some instances, this may be related chronologically to the presence of rock art, but not to specific images or style in the assemblage. In addition,

optically stimulated luminescence dating from the excavated sites with pigment recovered in some excavation units also had the capacity to provide insight into the chronology of the rock art in the southern Kimberley, although, similarly, not to specific images or layers in the superimposition relationships.

Whilst it may be possible to date rock art at some sites using these methodologies their specific application at the sites in this study was not possible, partly because of degradation and contamination, and partly because of lack of direct association with the rock art in situ. This meant the primary method used for any type of chronological analysis had to be the superimposition relationships as described.

FIGURE 5.11 A REPRESENTATION OF HOW THE RELATIONSHIPS DESCRIBED IN FIGURE 5.10 WOULD APPEAR ON THE ROCKFACE (NOTE: NOT AN ACTUAL SUPERIMPOSITION RELATIONSHIP, THIS IS AN ILLUSTRATION ONLY).

Spatial

ArcGIS/ArcMap 10 and QGIS 3.22 software were used to map site locations and generate layered density maps. In this analysis homogenous motifs and styles may suggest open social networks with associated spiritual or economic interactions, or somewhat open networks without those social connections and interactions, demonstrated through shared

symbolic representations in the rock art. This approach is based on Wobst's (1977) Information Exchange Theory and Claire Smith's (1992b) idea that heterogeneity in art styles occurred in times of increased population density, reflecting closed social networks as competition for resources became more intense; whilst more homogenous assemblages indicate open networks and sharing of resources (see Chapter 4).

The layers also incorporate the relative chronologies and build on the information from the Harris Matrices of each site, and the descriptive statistics for the rock art images and their recorded attributes. This shows the extent to which heterogeneity or homogeneity in the assemblages was consistent over time and space.

Summary

The methods used in this research provided a highly detailed dataset from which to undertake statistical, chronological and spatial analysis of rock art over a region of approximately 18,000km^2.

The selection of sites, the gathering of data and the discussion of rock art images and myths associated with sites meant the Traditional Owners in Bunuba and Gooniyandi Country were engaged in an ongoing and productive relationship throughout the project. Whilst the selection of sites was not as systematic as desired due to limits of time, funding and access to Country, it was not random, and resulted in representation of a range of sites across the region, some with both prolific assemblages and unusual or unexpected motifs, with distinct stylistic attributes.

The data was recorded and organised systematically to enable the detailed analysis described above and provide scope for future use of the information in research or cultural heritage management.

In the following four chapters this data will be used to:

1. Statistically describe the sites and each of the classes of rock art images;
2. Drill down to the attributes of the classes and subclasses to identify and refine styles of rock art in Bunuba and Gooniyandi Country;
3. Map the distribution of classes and styles across the study area, discuss areas of density and their links to movement or shared styles; and
4. Use superimposition relationships identified to determine if there are identifiable chronologies of styles or defined motif types either across the study area, in specific cultural areas, or in localised pockets.

These analyses will lead to discussion of the primary research questions in the final chapters centred around whether Bunuba and Gooniyandi people have distinct identities which distinguish them from one another and their western neighbours, and whether this has always been so.

Sites and Rock Art

The San spirit world is never vague or blurred: it was precisely constituted and stabilised on the walls of rock shelters.
(Lewis-Williams 2002)

Introduction

Painted and engraved rock art included in this study are arranged by language/cultural group and site, by the broad characteristic of determinate/non-determinate, and by motif type in this chapter. The statistics and examples include details of the colours, techniques and variations recorded for the motifs at Level 2 and at Level 3 for the nine rock art classes in accordance with the classification system presented in the previous chapter (Tables 5.3, 5.4 and 5.5).

To provide locational and environmental context for the rock art, data sources and the broad characteristics of the sites are described briefly. Detailed descriptions and site plans are in Appendix 5.

Data Sources

Sources of information on rock art in the southern Kimberley include government agencies, previous archaeological investigation and rock art recording, and opportunistic or commercial photography. Many are accessible, and some published (Crawford 1968). Their use and suitability as data in this study is limited. Published (Crawford 1968; 1973; Walsh 1994; 2000), publicly available data (Crawford 1964; 1964-1968; Department of Aboriginal Affairs 2013; Smith 2006) restricted or personal archives (Cecilia Myers 2012 pers. comm., 15 November; David Welch 2012 pers. comm., 15 November) were accessible, but none was complete enough to be used in this study.

All sites in this study were recorded during the *Lifeways* Project. They included sites identified by Traditional Owners and previously excavated and analysed sites by Balme (2000) and O'Connor (McConnell & O'Connor 1997; O'Connor 1995; O'Connor et al. 2008; O'Connor & Fankhauser 2001; O'Connor & Veth 2008). This data is the result of the rock art and site recording I completed with Bunuba and Gooniyandi Traditional Owners in 2011 and 2012. Three sites (FF3, LD1 and Elimberrie Springs) were photographed by members of the *Lifeways* team and motifs analysed by the author; however, only photographs of motifs and minimal site data was recorded, and time limited my capacity to revisit those sites to fill this gap.

Site Names

Sites in this study have different names. This is a historic anomaly which has arisen for several reasons. Some names of sites in the local language were supressed at the request of Traditional Owners and have come to be known by the English language names in publications. Carpenter's Gap is one such site. Sue O'Connor was requested not to use the traditional name (Tangalma) in publications in the 1990s (Sue O'Connor, June Oscar 2012 pers. comm., 12 August) and the results from the site were published using the name Carpenter's[1] Gap (e.g. Frawley & O'Connor 2010; O'Connor et al. 2014; Wallis 2000). New generations, attitudes, knowledge and relationships with Traditional Owners changed this. At the request of the Bunuba Traditional Owners I use Tangalma in this thesis, with inclusion of the previous name where relevant to provide consistency in referencing.

Other sites have not used traditional names in the past because there has been debate about the most appropriate name, or the traditional names were not known to researchers or surveyors. This is partly the result of limited interactions with Traditional Owners, consultation with Traditional Owners from neighbouring Country in surveys, rather than Bunuba or Gooniyandi people with appropriate knowledge (see Chapter 2), or a choice by Traditional Owners not to share names in their own language for cultural or other reasons.

Where possible, and known, Bunuba and/or Gooniyandi names are used in this thesis, with cross referencing to other names by which they are also known, both in English and Bunuba or Gooniyandi.

[1] Or Carpenters.

Types of Data

Site plans and panel sketches were completed for most sites (Appendix 5). Site plans show the placement of the rock art in the context of the whole site, and panel plans show the motifs in relation to one another, including superimposition. Placement and image size affect the visibility of the rock art, suggesting the extent to which rock art may be created to communicate within a group, to close associates or to strangers (Figure 4.1), and how this may change over time with superimposition.

Contextual data was recorded to enable each site to be categorised by site type. This provides context for creation of rock art, capacity of the site to accommodate people and the factors which impact on the creation and preservation of rock art.

A core set of data (Table 6.1, Appendix 4 and 7) was recorded for each motif at each site, and specific attributes for each class and subclass of motifs. For example, for anthropomorphs and zoomorphs the number of limbs visible is recorded, whereas handedness is recorded for hand stencils and prints (classified as tracks). The specific attributes recorded for anthropomorphs are shown in Table 6.2. Core and specific data are combined to determine the heterogeneity and/or homogeneity in the rock art, and to identify styles that coexist, or have changed over time across the region. Each motif is linked to its site, and each set of attributes is linked to the specific motif (Chapter 5, Appendix 4 and 7).

TABLE 6.1 CORE DATA RECORDED FOR EACH ROCK ART FIGURE IN THE STUDY.

Data Heading: Core Data	
Description	Material
Determinate/Indeterminate	Technique (23 detailed variations)
Single Image/Multiple Images (and count)	Outline (colour, technique, and colour in relation to infill)
Complete/Incomplete	Infill (14 detailed variations)
Condition	Dimensions (size- height/width)
Surface (7 types)	Motif Classification (Level 2 and Level 3)
Colour (8 individual colours + colour combinations)	Superimposition (11 layers + 2 additional choices of unclear and no superimposition)

All rock art in this study is digitally photographed and catalogued by site and motif, recorded in the relational database developed for this study and statistics generated in Microsoft Excel and SPSS software. Database structure, tables and additional statistics are presented in Appendix 7.

TABLE 6.2 SPECIFIC ATTRIBUTES RECORDED FOR ANTHROPOMORPHIC FIGURES.

Data Heading: Anthropomorphs (specific attributes)	
Headdress (14 types)	With Material Culture (7 types)
Feathers (2 types)	Legs (presence, number)
Eyes (1 or 2)	Arms (presence, number)
Eyelashes	Feet (1 or 2)
Nose	Hands (1 or 2)
Mouth	Toes (1 or more)
Genitalia (M/F/None)	Fingers (1 or more)
Prepared Background	Divisions in body
Zoomorph Characteristics (body, head, limbs)	Vegetation Characteristics (body, head, limbs)

Sites Recorded

Sites recorded in this study are in the area bounded to the west by two sites within 30m of BandilngaN/Windjana Gorge (henceforth BandilngaN), to the east where Louisa Downs overlooks the Margaret River, and Riwi in the southeast (Figure 5.1). The sites vary in size, shape, access to resources and available art surfaces, and the presence/absence of other occupation evidence.

Site Types

There are three site types recorded in this study: rockshelters, caves, and open sites with exposed rockfaces. Of the 43 sites with rock art, the majority are rockshelters (58%, n=25) (Figure 6.1). Some sites are combinations; such as cave with rockshelters on both sides of the entrance (e.g. Langurmurru where rock art is concentrated on the east wall and ceiling of the rockshelter, see Figure 6.2), or a rockshelter with exposed rockfaces at one or both sides of the shelter (e.g. Mount Behn 1 is a central shelter with rock art on exposed vertical rock faces either side). Combination sites are included in the category which reflects the area in which most, or all, of the rock art is located.

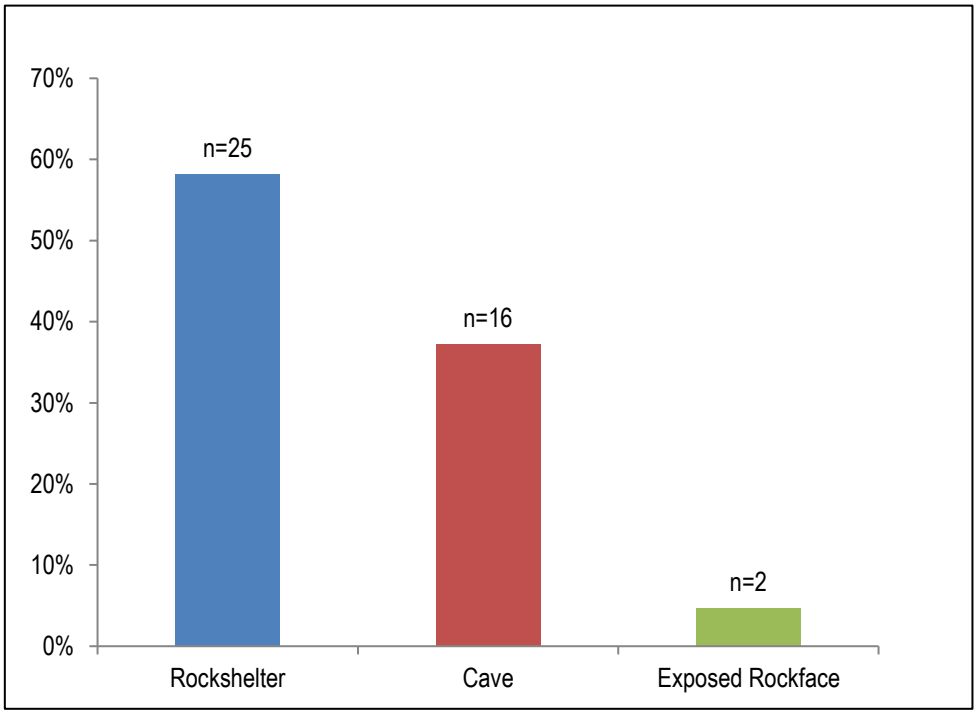


FIGURE 6.1 PERCENTAGE AND NUMBER OF EACH SITE TYPE RECORDED IN THE STUDY AREA.

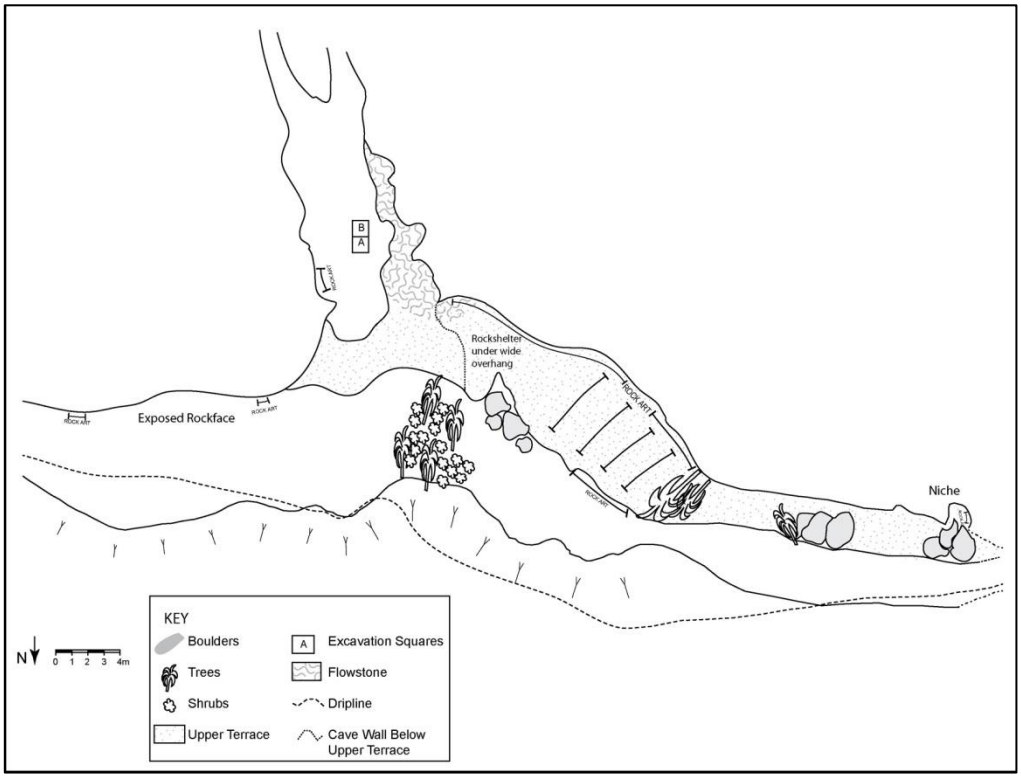


FIGURE 6.2 LANGURMURRU SHOWING THE SITE ELEMENTS, WITH THE ROCKSHELTER TO THE WEST WHERE ROCK ART IS CONCENTRATED (CAD DORCAS VANNIEUWENHUYSE AND JANE FYFE).

Site Locations

The sites are in escarpments and rocky outcrops along the northern edge of the Canning Basin, ranging from wide rockshelters and small caves at ground level to higher, less easily accessible shelters and caves with views over the plains and creeks (Playford et al. 2009).

The study area is across two contemporary cultural areas, both bordered and intersected by the Bandaral ngadu (Fitzroy River) and, more recently, defined by native title. Bunuba people traditionally live in the sub-tropical area along the Oscar and Napier Ranges to the east of Bandilngan, west and north of Bandaral ngadu. Bandaral ngadu, Lennard River and Dimalurru/Tunnel Creek which are major sources of sustenance. The Bunuba area defined under native title in Figure 1.2 (green) is smaller than that identified by the contemporary Bunuba people (the lighter shading with dotted outline shows the full claim area), with some areas expunged where there are national parks, and others due to private ownership of pastoral leases.

Gooniyandi people live in a semi-arid environment punctuated by rocky outcrops and small ranges intersected by the Margaret and Louisa Rivers (lilac in Figure 1.2) mostly south and east of Bandaral ngadu.

Bunuba and Gooniyandi people speak closely related languages, different to those of their neighbours. They share a long border along Bandaral ngadu where it runs northeast to southwest, curving northwest towards King Sound south of the port of Derby.

The southern Kimberley is well provided with water, and all the sites in this study are either on or close to a water source. There are several sites within 20km of Bandilngan (Kimberley Language Resource Centre 2000), at the western side of the Bunuba Country. The Lennard River, which runs through the gorge, is plentiful in shellfish, barramundi and small freshwater crocodiles, as well as eels. The area is also lush with edible fruits and tubers for much of the year, and populated by birds, lizards, snakes and macropods observed (and eaten) during the fieldwork (Figure 6.3).

While within a day's walk (20km) of Bandilngan, the sites at and around Mount Behn are also an easy five-minute walk from a freshwater creek (Figure 6.3). There is access to springs along the escarpment, and evidence of water flow from the calcite deposits in the rockshelter. Evidence of flooding, and/or major rain events at Mount Behn 1 shows the presence of water over the longer term (see Vannieuwenhuyse 2016; Vannieuwenhuyse et al. 2016; Whitau et al. 2018).

In Gooniyandi Country, sites such as Louisa Downs overlook the Margaret River, whilst Moonggaroonggoo and Riwi are within sight of creeks, natural springs, and rock pools. Rock art at Moonggaroonggoo (thanggari – water lilies) and possible flood events, and marine related artefacts recovered in excavations, attest to the presence of accessible, and possibly abundant, water sources in the past (e.g. Balme & O'Connor 2017; 2019; Balme et al. 2018b; Balme et al. 2018b; Maloney et al. 2017b; Vannieuwenhuyse 2016; Wood et al. 2016).

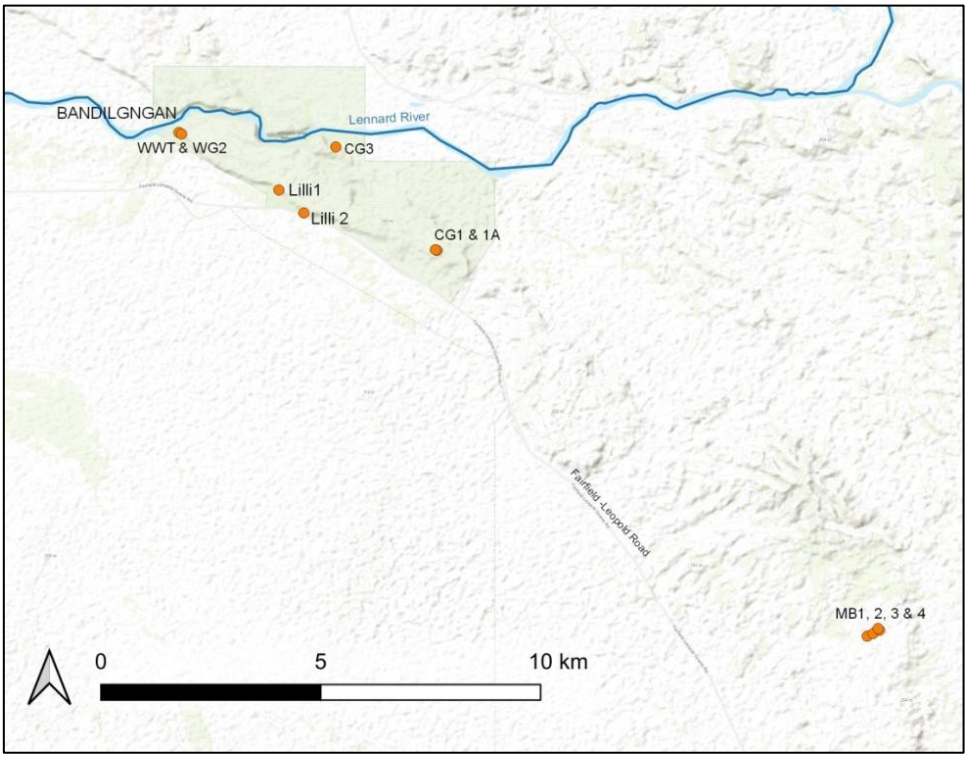


FIGURE 6.3 SITES CLOSE TO THE LENNARD RIVER, WHICH RUNS THROUGH BANDILNGAN IN BUNUBA COUNTRY.

This suggests that sites may have been selected for use or occupation because of their proximity to water and associated food resources, along with the accessibility and shelter they provide. Food sources directly associated with the presence of water (e.g. thanggari, crocodiles, eels, fish) in the rock art indicate that this would have been a major factor in site choice and provides some insight into types of rock art found at sites with close relationships and/or proximity to water sources.

The Rock Art

The rock art in this assemblage is classified at three levels (Tables 5.4 and 5.5). Level 1 is determinate/indeterminate, Level 2 divides it into classes of rock art according to the figure type (e.g. anthropomorph, zoomorph), and Level 3 are variations in depicted subject matter, or sub-classes, within each class of the motifs at Level 2, based on the specific attributes of the figures (Table 5.6). This section describes the frequencies of figures at each level, and

drills down to the frequencies of core attributes recorded for each, including colour, technique and types of infill at broad and specific levels.

The number of figures recorded at each site varies; from a single figure at three sites to 616 at one site (Table 6.3). Sites with large assemblages (>150 motifs) are all close to perennial water sources (Figure 5.1), and are located at either ground level, up gentle slopes or with accessible pathways.

TABLE 6.3 NUMBER OF FIGURES RECORDED IN THE STUDY AREA, BY SITE.

Site Name	Number	Site Name	Number
BUNUBA COUNTRY		**BUNUBA COUNTRY (CONTINUED)**	
Bunuba Roadside Caves 1	17	Mount Behn 1	616
Bunuba Roadside Caves 2	5	Mount Behn 2	13
Bunuba Roadside Caves 3	15	Mount Behn 3	1
Tangalma (CG1)	162	Mount Behn 4	1
Tangalma A (CG1A)	24	Stumpy's Soak 1	42
Langurmurru (CG3)	103	Tunnel Creek 1	19
Darrananna	54	Tunnel Creek 2	2
Tarakalu 1 (DG1)	8	Tunnel Creek 3	17
Tarakalu 2 (DG2)	16	Tunnel Creek 4	55
Elimberrie Springs	272	Tunnel Creek 5	47
Fairfield 1	77	Tunnel Creek 6	21
Fairfield 2	112	Djuru East (WG2)	40
Fairfield 3	48	Djuru (WWT)	46
Lillimooloora 1	21	**GOONIYANDI COUNTRY**	
Lillimooloora 2	27	Emmanuel Gap 1	46
Marawun 1	231	Emmanuel Gap 2	74
Marawun 4	150	Emmanuel Gap 3	22
Marawun 7-1	51	Emmanuel Gap 4	106
Marawun 7-2	1	Emmanuel Gap 5	90
Marawun 7-3	5	Louisa Downs Rockshelter 1	18
Mine Access Site 1	13	Moonggaroonggoo (PR1)	146
Mine Access Site 2	49	Riwi	109
TOTAL			**2992**

This is not exceptional in the study area; most of the sites are located close to springs, creeks or rivers (although not always perennial), and whilst some present challenges to access today (e.g. steep slopes with large boulders and rock falls make it difficult for some of the older people to climb), this may not always have been the case.

Level 1: Determinate-Indeterminate

2,991 images were recorded at 43 sites in this study. The majority are figurative and non-figurative marks and classified as determinate (Table 6.4). The determinate/indeterminate proportions are similar for both cultural areas. Most sites (Table 6.5 and Table 6.6) have greater than 50% determinate figures (n=34). Two sites have exclusively indeterminate rock art and three exclusively determinate (Table 6.6).

TABLE 6.4 DETERMINATE/INDETERMINATE ROCK ART FIGURES BY CULTURAL AREA.

Level 1 classification	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Determinate	1573	66	349	57	1922	64
Indeterminate	808	34	262	43	1070	36
Total	2381	100	611	100	2992	100

TABLE 6.5 DETERMINATE/INDETERMINATE ROCK ART FIGURES BY SITE, GOONIYANDI.

Site Name	Gooniyandi			
	Determinate		Indeterminate	
	Number of figures	Percent of site total	Number of figures	Percent of site total
Emmanuel Gap 1	28	61	18	39
Emmanuel Gap 2	48	65	26	35
Emmanuel Gap 3	10	45	12	55
Emmanuel Gap 4	50	47	56	53
Emmanuel Gap 5	65	72	25	28
Louisa Downs Rockshelter 1	8	44	10	56
Moonggaroonggoo	85	58	61	42
Riwi	55	50	54	50
Total Gooniyandi Sites	**349**	**Av = 55%**	**262**	**Av = 45%**

Colour

Most rock art in the assemblage is painted or drawn. Pigment colours used are black, grey, mulberry, orange, red, white and yellow. Engraved rock art is categorised as 'Other'.

White and red are the most often used colours (Figure 6.4). The majority (76.7%, n=2298) are monochrome, with red and white the most common colours used.

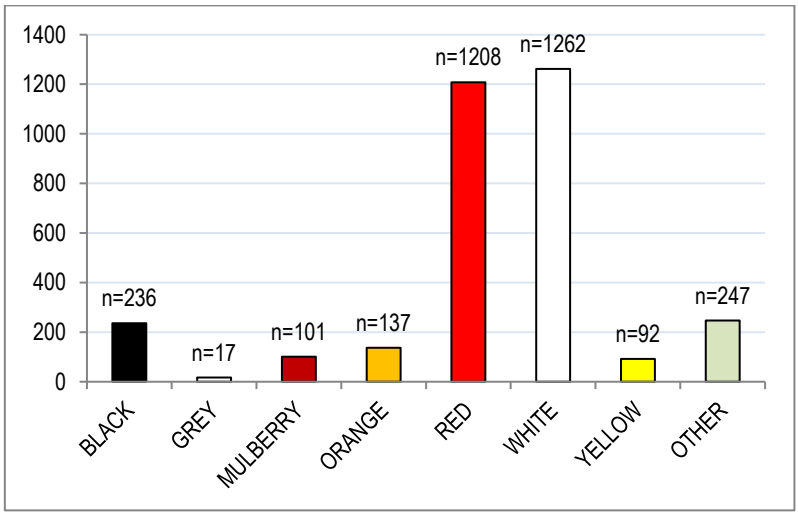


FIGURE 6.4 COLOURS FOR ROCK ART FOR SITES IN THE STUDY AREA, ENGRAVINGS ARE CLASSIFIED AS 'OTHER'.

TABLE 6.6 DETERMINATE/INDETERMINATE ROCK ART FIGURES BY SITE, BUNUBA.

Site Name	Bunuba			
	Determinate		Indeterminate	
	Number of figures	Percent of site total	Number of figures	Percent of site total
Bunuba Roadside Caves 1	9	53	8	47
Bunuba Roadside Caves 2	0	0	5	100
Bunuba Roadside Caves 3	7	47	8	53
Tangalma	145	90	17	10
Tangalma A	14	58	10	42
Langurmurru	78	76	25	24
Darrananna	30	56	24	44
Tarakalu 1	5	63	3	37
Tarakalu 2	13	81	3	19
Elimberrie Springs	168	62	104	38
Fairfield 1	38	49	39	51
Fairfield 2	69	62	43	38
Fairfield 3	27	56	21	44
Lillimooloora 1	7	33	14	67
Lillimooloora 2	23	85	4	15
Marawun 1	153	66	78	34
Marawun 4	94	63	56	37
Marawun 7-1	26	51	25	49
Marawun 7-2	1	100	0	0
Marawun 7-3	3	60	2	40
Mine Access Site 1	10	77	3	23
Mine Access Site 2	28	57	21	43
Mount Behn 1	448	73	168	27
Mount Behn 2	12	92	1	8
Mount Behn 3	1	100	0	0
Mount Behn 4	0	0	1	100
Stumpy's Soak 1	18	43	24	57
Tunnel Creek 1	16	84	3	16
Tunnel Creek 2	2	100	0	0
Tunnel Creek 3	12	71	5	29
Tunnel Creek 4	26	47	29	53
Tunnel Creek 5	26	56	21	44
Tunnel Creek 6	11	52	10	48
Djuru East	28	70	12	30
Djuru	25	54	21	46
Total Bunuba Sites	**1573**	**Av = 62%**	**808**	**Av = 38%**

The proportions of colours used in rock art in Bunuba and Gooniyandi Country are similar. Red and white dominate, followed by black. Less than 10% of figures are in each of the other colours recorded (Figure 6.5).

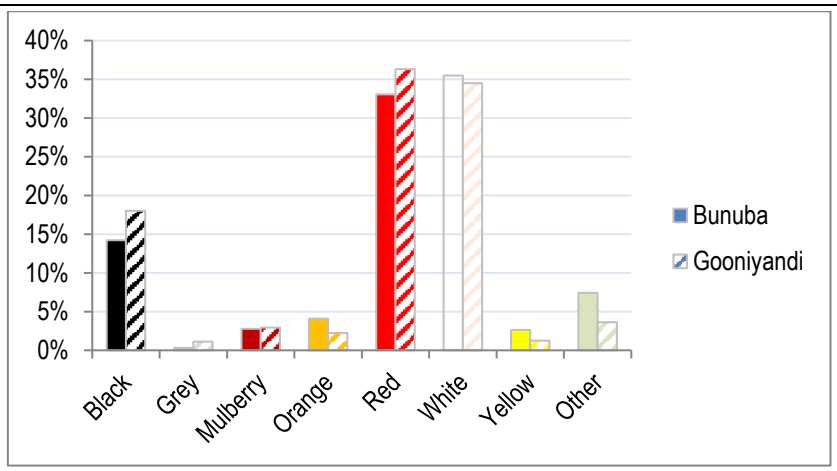


FIGURE 6.5 COLOUR CHOICES IN ROCK ART BY BUNUBA (SOLID) AND GOONIYANDI (STRIPES) SITES, ENGRAVINGS ARE CLASSIFIED AS 'OTHER'.

Technique

Painting is the technique of choice in the southern Kimberley (Table 6.7). Stencilling and drawing are the next most common. Comparatively few figures are created using extractive techniques such as incision or abrasion.

TABLE 6.7 TECHNIQUES RECORDED FOR ROCK ART IN THIS ASSEMBLAGE.

Technique	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Additive	2079	~88	579	~95	2658	89
Painted	1650	69	552	90	2202	74
Drawn	94	4	17	3	111	4
Stencilled	257	11	4	1	261	9
Painted & Stencilled	10	<1	2	<1	12	<1
Painted & Drawn	46	2	3	<1	49	2
Printed	22	1	1	<1	23	
Subtractive	200	8	19	3	219	7
Incised	49	2	3	<1	52	1
Abraded	21	1	2	<1	23	2
Abraded & Incised	85	4	0	0	85	1
Abraded & Pounded	6	<1	0	0	6	3
Abraded & Scratched	6	<1	0	0	6	<1
Incised & Pecked	0	0	1	<1	1	<1
Incised & Scratched	2	<1	1	<0	3	<1
Scratched	31	1	12	2	43	1
Combination Additive/Subtractive	11	<1	1	<1	12	~1
Painted & Scratched	11	<1	1	<1	12	<1
Other	91	4	12	2	103	3
Unclear	91	4	12	2	103	3
Total Figures	2381	100	611	100	2992	100

Where more than one technique is evident, it is not clear if all techniques are part of the original creation. Multiple episodes where enhancement or refreshments occur are possible. For example, a drawn outline may be added to a painted figure a long time after its creation,

or a scratched pattern on a solid infill may have been added soon after the original figure had been created. This is a reminder that where this occurs it is important to acknowledge that the rock art may have had more than one artist, or that it may have special significance to have parts emphasised and/or refreshed over time (Bowdler 1988; Mowaljarlai et. al 1988; O'Connor et.al 2008),

The ratio of additive to subtractive techniques is lower for Bunuba Country than in Gooniyandi Country (Figure 6.6). This may be because fewer sites in Gooniyandi Country were recorded. It is likely that there are sites in Gooniyandi Country with many engraved markings. For example, Minnie Pools was not visited in this study but was photographed as part of a Main Roads survey (DAA 1989). Site slides show an area of incised lines and painted motifs, including at least one anthropomorph with a rayed headdress (DAA 1989). Like other sites in DAA files, and other sources, the slides/photographs of rock art are incomplete, unreferenced for scale or direction, and not systematically recorded to provide site, composition or placement detail.

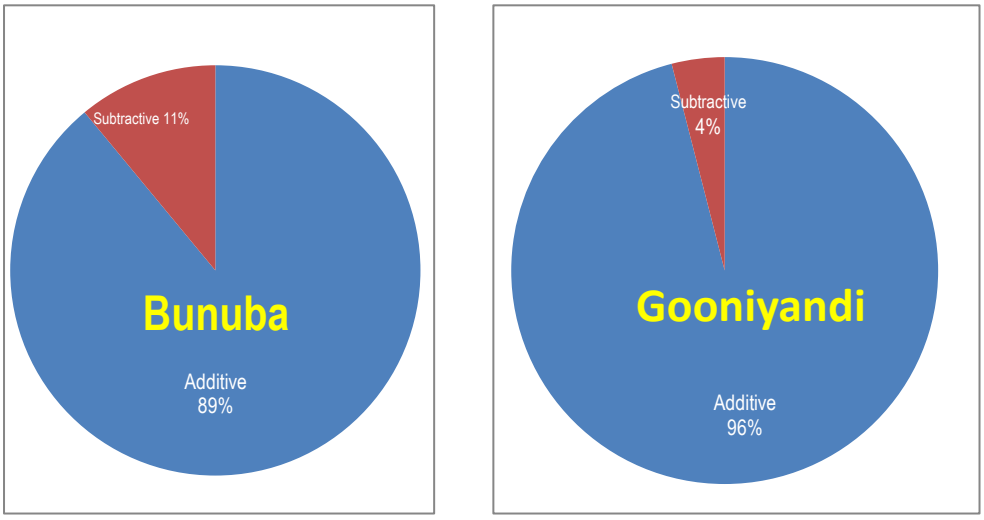


FIGURE 6.6 TECHNIQUES USED FOR ROCK ART IN BUNUBA AND GOONIYANDI COUNTRY.

There are more sites in Gooniyandi Country where it is possible that subtractive techniques are used, but it is just as likely the rock art will be painted. The addition of sites may not affect the ratios between the additive and subtractive rock art in Bunuba and Gooniyandi Country.

Surface (Placement of Rock Art)

Most figures (83%) are on vertical or sloped walls of rockshelters and caves, with 8% recorded on ceilings, a continuation of sloping or vertical walls in most sites (Table 6.8). 4% of figures are on ledges/horizontal surfaces; all of which are engraved with incised lines,

abraded grooves and bird tracks, and a single zoomorph. Most shelters and caves have multiple suitable surfaces, suggesting that walls are a conscious and conventional choice for rock art. This is consistent across the study area. Rock art on vertical sloped surfaces puts it directly in the line of vision and draws viewers in. Ledges may be secondary viewing positions, as they are generally below the eye line, and seen once the viewer is within the shelter. Ceiling rock art is also seen once inside the shelter, most only if the viewer looks upwards, or lies on the floor. Each placement may have a different intended audience (as per Figure 4.1), with the interior viewers more likely within the more intimate ranges of individuals, and family and community.

TABLE 6.8 ROCK ART RECORDED BY CHOICE OF SURFACE.

Surface	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Boulder	13	<1	2	<1	15	1
Ceiling	206	9	40	7	246	8
Ledge/Horizontal	121	5	7	1	128	4
Multiple Surfaces	70	3	8	1	78	3
Overhang	37	2	0	0	37	1
Portable Rocks	12	<1	0	0	12	<1
Wall	1922	81	554	91	2476	83
Total	2381	100	753	100	2991	100

Determinate Figures

1,921 determinate figures were recorded in this study (Table 6.4). It was not possible to clearly identify 1,069 figures because they were badly deteriorated, substantially superimposed, or of a form that was not recognisable by researchers or Traditional Owners. Each determinate figure is categorised in one of nine rock art classes at Level 2 (Table 5.3). Anthropomorphs, zoomorphs and tracks are the most prolific classes in this study (Figure 6.7).

Anthropomorphs and zoomorphs are dominant at most sites in the study area, with different emphasis in each of the cultural areas (Figures 6.8 and 6.9). Anthropomorphs are dominant at 16 sites in Bunuba Country, zoomorphs at 12 sites (Figure 6.9). They are in equal numbers at three sites, and neither are present at two sites. In contrast, zoomorphs are dominant in all but one site in Gooniyandi Country (Figure 6.8).

Tracks are present in large numbers at sites in Bunuba Country, especially human tracks (hand stencils), but less so in Gooniyandi Country. Across all Bunuba sites there are 286 hand stencils, prints or paintings, and only seven recorded at Gooniyandi sites. This

suggests a difference in the importance of this style of personal marking between the two cultural areas.

'Other' and historical inscriptions were recorded at few sites. 'Other' images were recorded at four sites in Bunuba Country, and none in Gooniyandi. This class is dominated by the sub-class level 3 motif defined as 'starburst/lightning' (n=10), painted at two Bunuba sites (Figure 6.10). The motif was not known to Traditional Owners who viewed them in the field. Historical inscriptions are at two sites in Bunuba Country and five in Gooniyandi Country (Figure 6.8). This suggests different colonial interactions or access to sites in the two cultural areas.

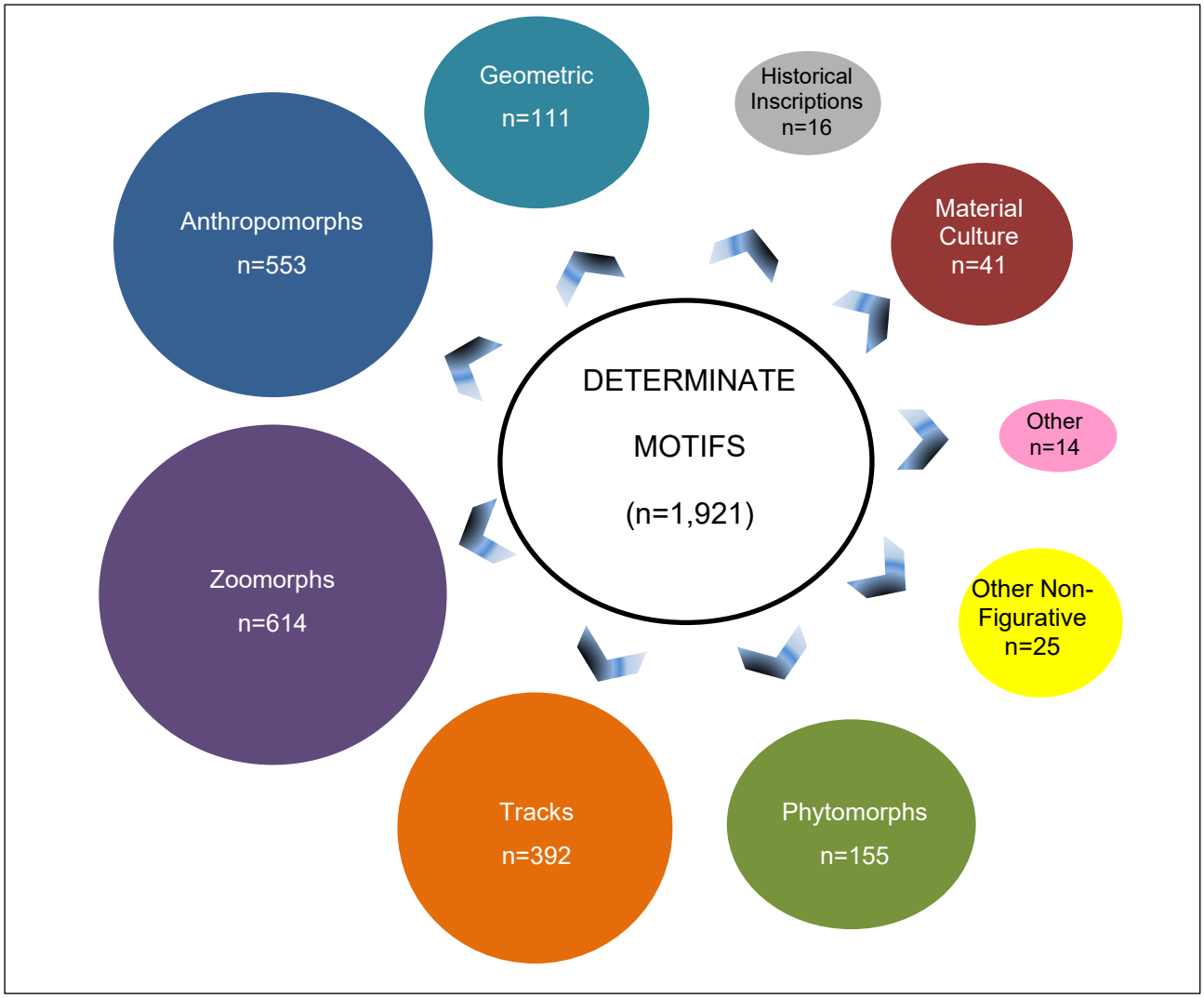


FIGURE 6.7 NUMBER OF DETERMINATE FIGURES BY CLASSES OF ROCK ART (LEVEL 2).

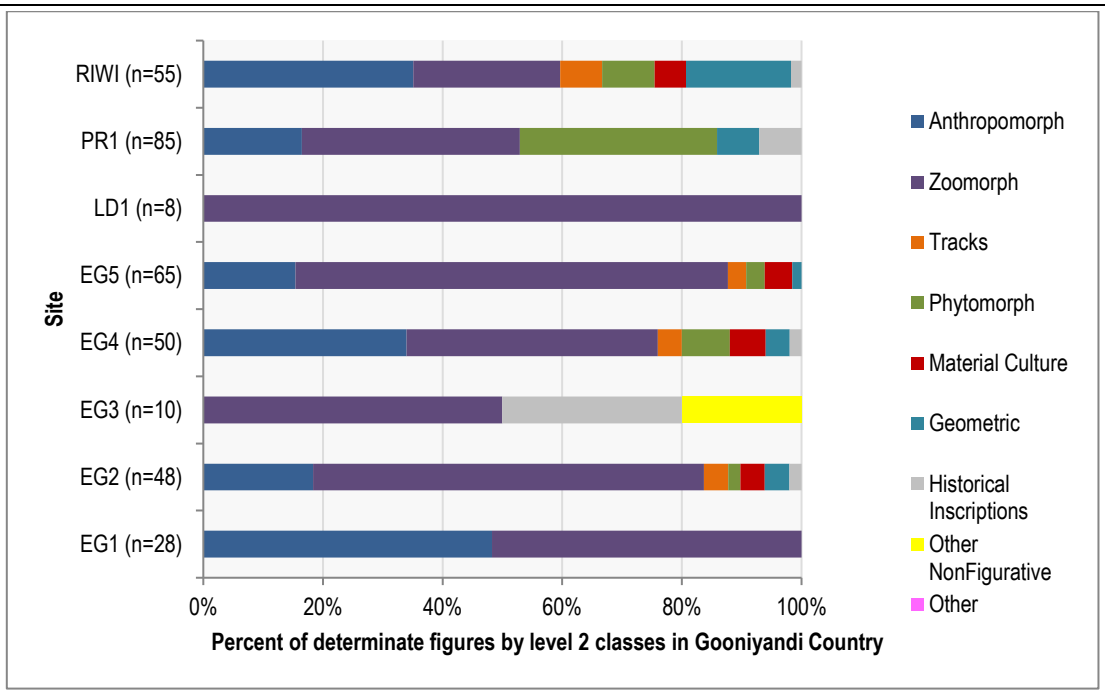


FIGURE 6.8 PROPORTIONS OF DETERMINATE FIGURES IN LEVEL 2 CLASSES AT EACH SITE IN GOONIYANDI COUNTRY. TOTAL NUMBERS OF FIGURES ARE IN BRACKETS NEXT TO SITE ABBREVIATIONS.

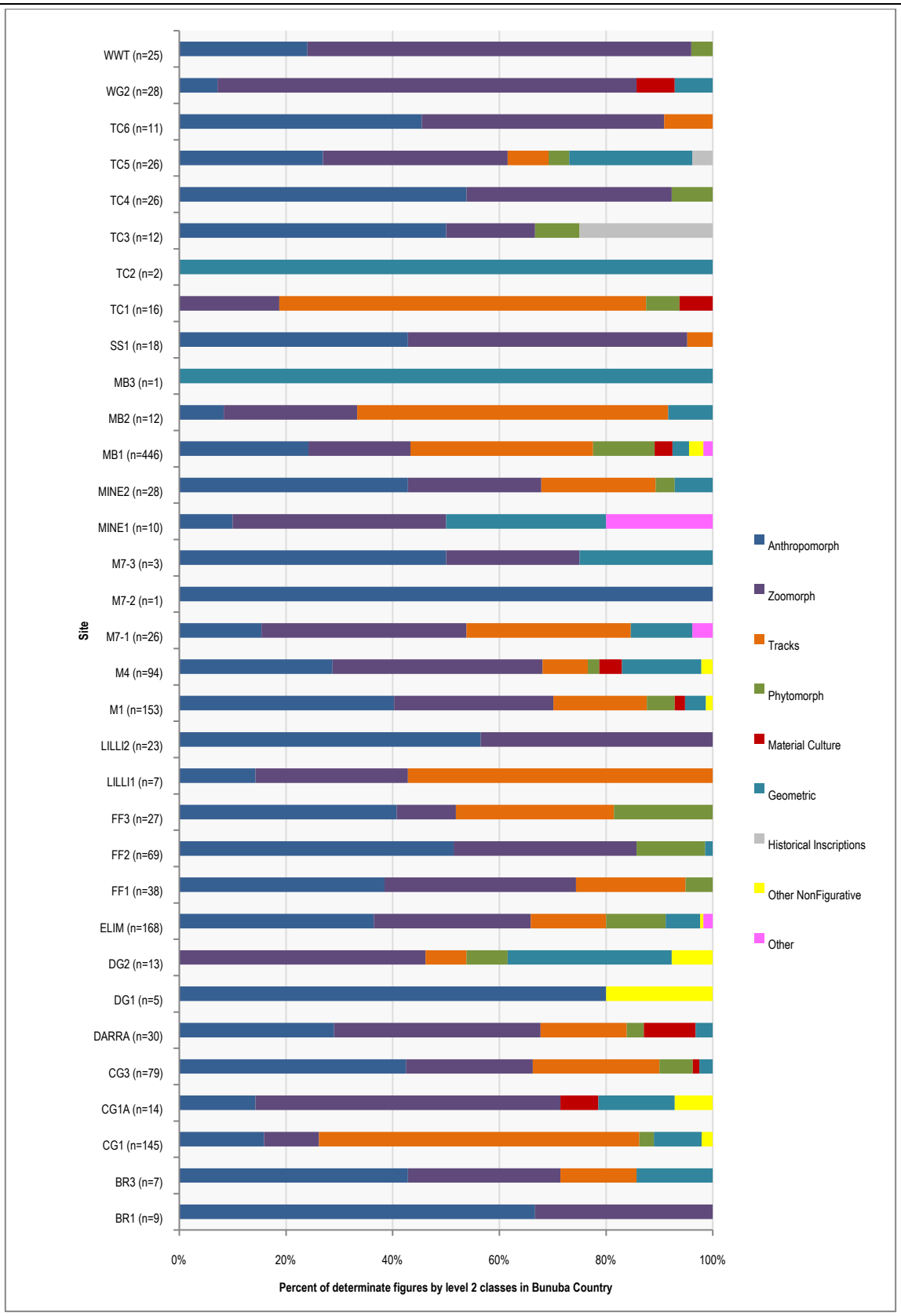


FIGURE 6.9 PROPORTIONS OF DETERMINATE FIGURES IN LEVEL 2 CLASSES AT EACH SITE IN BUNUBA COUNTRY. TOTAL NUMBERS OF FIGURES ARE IN BRACKETS NEXT TO SITE ABBREVIATIONS.

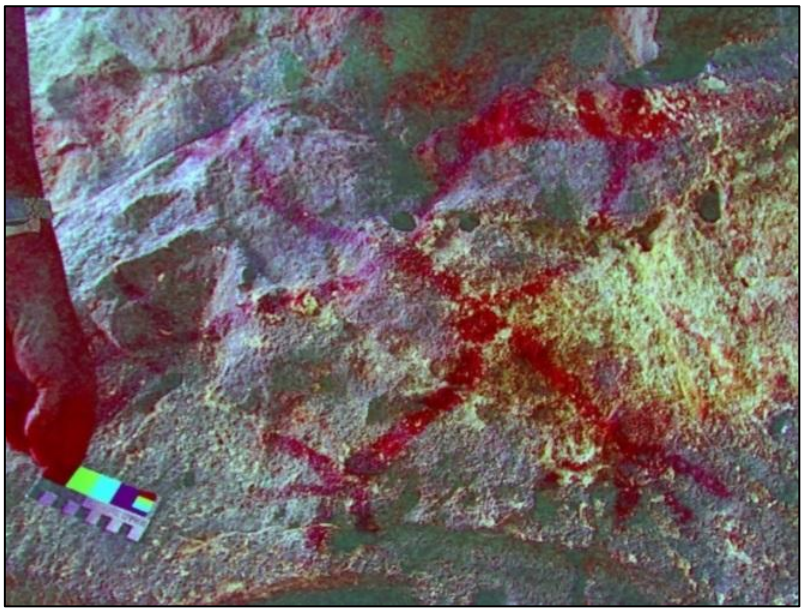


FIGURE 6.10 MONOCHROMATIC 'LIGHTNING/STARBURST' MOTIF AT MINE1 (M5050). IMAGE ADJUSTED WITH DSTRETCH © YRD/SCALE 15.

Colour

There are >30% red figures and >30% white figures in the rock art in both Bunuba and Gooniyandi Country (Figure 6.11). White is used more than red in Bunuba Country. In Gooniyandi Country both are used equally. Black is used more in Gooniyandi (19%) compared to Bunuba (13%) rock art. More use of black and white is reflective of a distinctive group of figures with white outlines and black infill at Gooniyandi sites, which I will later characterise as a unique Gooniyandi style to be discussed in ensuing chapters.

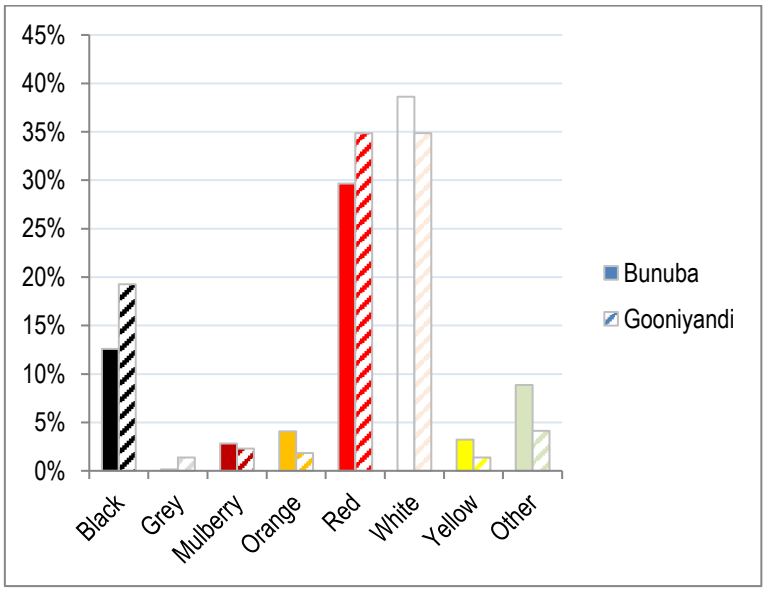


FIGURE 6.11 COLOURS RECORDED FOR DETERMINATE ROCK ART FIGURES AT ALL SITES IN THE STUDY AREA.

Technique

Painting is the dominant technique in both Bunuba and Gooniyandi Country (Table 6.9). Hand stencilling is frequently used in Bunuba Country. Abrasion/incision is more common than incision as a single technique in Bunuba Country, while few figures using subtractive techniques were observed in Gooniyandi Country.

There are 43 scratched images, but many are too lightly scratched or disjointed to be determinate, resulting in only 16 determinate scratched figures. Lightly scratched figures are fragile, and poorly preserved. With so few recognisable figures, it is possible that some may have been unintentional where a tool or wire has dragged on a surface. Some may have been practice markings for more substantive later work, or they could have been a choice between permanence and impermanence, for cultural or personal reasons. Perhaps the choice of the less permanent technique indicates limited tool choice, or that the intended audience was intimate or transient, as opposed to highly visible markings for public view, as suggested by Wobst (1977), in Figure 4.1, if other techniques had been available.

TABLE 6.9 TECHNIQUES RECORDED FOR DETERMINATE ROCK ART FIGURES IN THIS STUDY.

Technique	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Additive						
Painted	1025	65	317	91	1341	70
Drawn	39	2	4	2	45	2
Stencilled	252	16	4	1	256	13
Painted & Stencilled	9	1	2	1	11	1
Painted & Drawn	42	3	1	<1	43	2
Printed	22	1	1	<1	23	1
Subtractive						
Incised	47	3	3	1	50	3
Abraded	17	1	1	<1	18	1
Abraded & Incised	85	5	0	0	85	4
Abraded & Pounded	6	<1	0	0	6	<1
Abraded & Scratched	4	<1	0	0	4	<1
Incised & Pecked	0	0	1	0	0	<1
Incised & Scratched	2	<1	1	0	3	1
Scratched	8	1	8	2	16	<1
Combination of Additive & Subtractive						
Painted & Scratched	7	<1	1	<1	8	<1
Other						
Unclear	14	1	5	1	11	1
Total Figures	1572	100	349	100	1921	100

Surface (Placement of Figures)

Most determinate figures are on vertical or sloped walls (Table 6.10). More determinate figures are on ceilings and fewer on walls than the overall proportion would imply. However,

for determinate figures there is a slightly higher proportion of determinate figures recorded on horizontal surfaces and across multiple surfaces, compared to the proportion of all figures on those surfaces. This is likely a result of the accessibility of low horizontal surfaces for engraved figures, where continuous and deep pressure could be applied for incision and abrasion. These proportions are similar in both Bunuba and Gooniyandi Country.

The lower numbers of determinate figures on walls may relate to environmental conditions, and the subsequent lack of complete images. Vertical surfaces may deteriorate with water flows. Blackened water flow deposits on exposed surfaces, and calcite deposits on interior surfaces were observed to have distorted or obscured many figures recorded in this study. Partially blurred images where the pigment showed water flow, smudges, and drips were observed. Vertical rockfaces were also subject to water/flood events such as at Mount Behn 1 (Vannieuwenhuyse 2016), causing damage to painted rock art at lower levels. In addition, animal activity may also erase or fade parts of the rock art close to the contemporary floor line, and evidence of lizard, kangaroo and smaller marsupial activity was observed at sites with sections of very faded rock art at lower levels. Rock art placed on ceilings, on the other hand, is more protected from such impact, though more difficult to access for the creators.

TABLE 6.10 DETERMINATE MOTIFS RECORDED BY SURFACE.

Surface	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Boulder	11	1	2	1	13	1
Ceiling	161	10	28	8	189	10
Ledge/Horizontal	93	6	4	1	97	5
Multiple Surfaces	66	4	7	2	73	4
Overhang	18	1	0	0	19	1
Portable Rocks	10	1	0	0	10	1
Wall	1213	77	308	88	1521	79
Total	1572	100	349	100	1922	100

The lower proportion of determinate rock art on walls, compared to all recorded figures, may be related to easier accessibility of the wall surfaces. Accessibility provides opportunities to create many layers of images, each superimposing earlier ones to the extent that some can no longer be reliably identified and are therefore, classed as indeterminate. This suggests more rock art creation events at some sites over time, which will lead to more artworks, but also more images covered by layers to such an extent that their overall form is no longer determinate, as little of it is visible.

The differences between all rock art and determinate figures suggest there are broad differences in surface placement (Table 6.10), but few in technique or colour (cf. Figure 6.11

and Table 6.9). Red and white pigment dominates the assemblage whether determinate or not. The consistency and/or variation in this and other factors are further explored at the next level of classification.

Level 2: Nine Classes of General Motif Types

Anthropomorphs

There are 553 anthropomorphs at 35 sites in this study. This group is subdivided into depicted subject matters or sub-classes at Level 3; for instance, 3A gender attributes (Tables 5.4 and 6.11), and 3B anthropomorph sub-classes (Tables 5.5 and 6.12). All the anthropomorphs in the study area are depicted in full frontal view, with feet pointed out from the body where present (Figure 6.12). 86% of anthropomorphs are in Bunuba Country and 14% in Gooniyandi Country, a clear and noticeable difference.

Most anthropomorphs do not have gender markers, and this is consistent across the study area (Table 6.11). The male gender markers are penises, in simple, proportionate and exaggerated forms, with and without representations of testicles (e.g. Figure 6.12). For females, breasts are added, most often drooping at the side of the body under the arms (e.g. Figure 6.13 and Table 2 in Appendix 6).

Many anthropomorphs in this study are visibly distinctive, either by their size, variety of colours or their overall form. Common characteristics and overall form were used to further subdivide anthropomorphs in this study (Tables 5.4 and 5.5).

TABLE 6.11 ANTHROPOMORPHS BY GENDER (LEVEL 3A).

Gender	Bunuba		Gooniyandi		Total	
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
Female	3	1	0	0	3	<1
Male	137	29	25	31	162	29
Non Gendered	332	70	55	69	387	70
Female & Male	1	<1	0	0	1	<1
Total	473	100	80	100	553	100

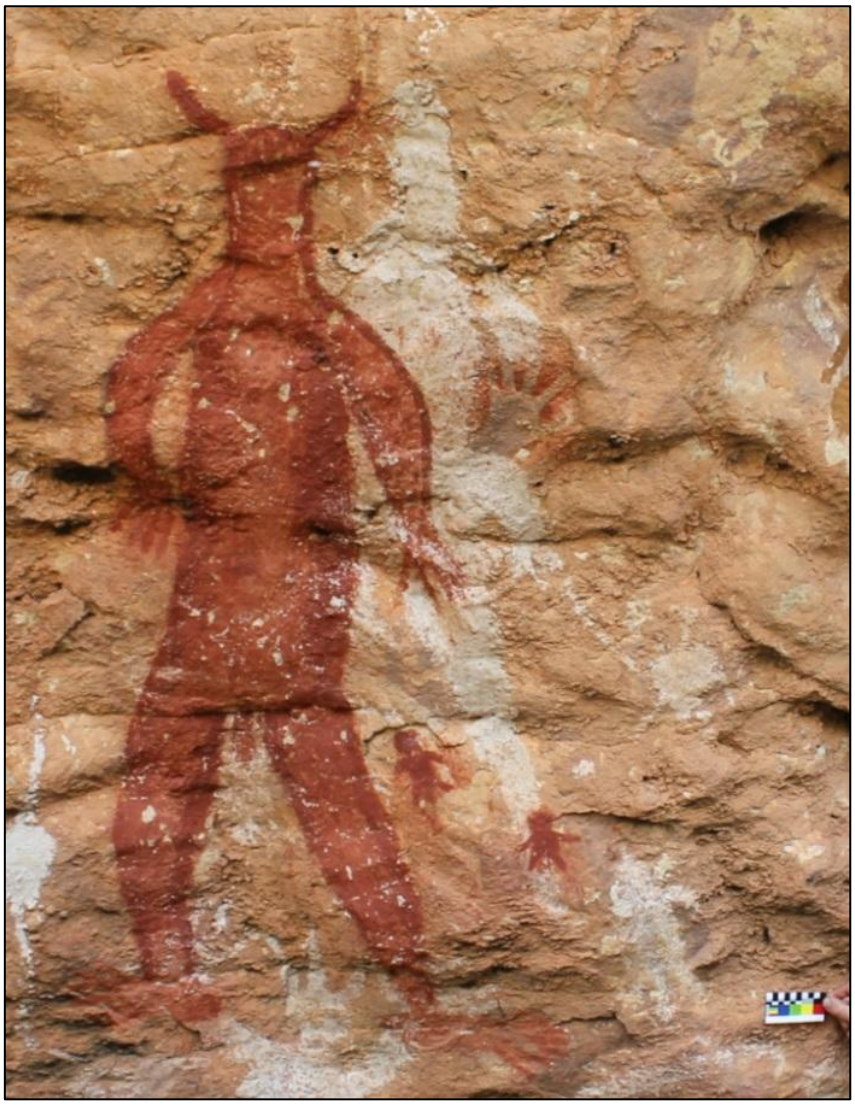


FIGURE 6.12 A FULL FRONTAL MALE ANTHROPOMORPH AT ELIMBERRIE SPRINGS (M1501). PHOTOGRAPH JANE BALME.

The most numerous anthropomorphs in Bunuba sites are those with rounded bodies; they have round/oval shaped bodies and heads without distinguishing characteristics, solid red (n=28) or white (n=61) infill, and simple limbs. Gooniyandi have four of this type of anthropomorph. Overall, 87% (n=82) of the round bodied anthropomorphs in the study are smaller than 30cm from foot to head, and 98% (n=92) are on vertical walls in a vertical/standing position. Gender markers are present in 18% of these figures, all of which are male.

In Gooniyandi Country the most numerous anthropomorphs have elongated bodies, long ovals or oblongs with long, single line limbs. These anthropomorphs are more detailed than the round bodied anthropomorphs, with some displaying hands (n=18) and feet (n=41). A few have monochrome patterned infill (n=4). These anthropomorphs are in red (n=39) and white (n=29), with nine in bichrome and one with three colours. Anthropomorphs with

elongated bodies are in two size categories, 0-30 cm (n=35) and 31-60 cm (n=30). A quarter (n=26) of elongated body anthropomorphs are identified as male.

Differences between the cultural areas include what Traditional Owners call different anthropomorphs (Mona Oscar and June Oscar 2012 pers. comm., 18 August Dorothy Surprise 2011 pers. comm., 2 September; Patsy Bedford 2012 pers. comm., 16 August) (Table 6.12). They range from highly detailed polychromatic figures to monochromatic monochrome figures with fewer specific attributes[2], and are subsequently split into 2 types. These figures are discussed in detail in Chapter 7, and in a case study in Chapter 8. Table 6.12 shows that these two subclasses of anthropomorph are a significant proportion of anthropomorphs in Bunuba Country, whilst less dominant in Gooniyandi Country. In contrast, the so-called Mamo/Djuari anthropomorph (identified by Traditional Owners June, Raylene and Mona Oscar 2012 pers. comm., 18 August and Lorraine Shandly 2012 pers. comm., 23 August) is found at the same frequency in both cultural areas, with close to a 1:1 ratio between Bunuba and Gooniyandi Country. Gender markers for the Waliarri 1, Waliarri 2 and Mamo/Djuari named figures are greater than those for other more prolific anthropomorph types. 35% (n=15) of Waliarri 1 are male and 4% (n=2) female. 40% (n=19) of Waliarri 2 are male and 2% female (n=1). 43% of Mamo/Djuari are male; notably more than proportions for all anthropomorphs.

The second largest group of anthropomorphs (17%) are unique. They do not have characteristics that create an overall form which can be compared to other anthropomorphs, nor do they have any/sufficient attributes that would be consistently associated with another anthropomorph subclass. Most unique anthropomorphs are:

- ≤60cm (n=78);
- On walls (n=90);
- Monochrome (n=87);
- With solid infill (n=94), and
- Red (n=52) or white (n=33).

There are unique anthropomorphs with one or more feet (n=33), some with hands (n=13), and 26 with male gender markers which assisted in defining them as anthropomorphs.

[2] These figures were both named Waliarri in the field by Traditional Owners (Patsy Bedford, June Oscar & Mona Oscar pers. comm., 2011; 2012 pers. comm., 15 August). The attributes for defining this as both a motif and a style will be covered in Chapter 7.

TABLE 6.12 ANTHROPOMORPH BY SUBJECT MATTERS OR SUB-CLASSES BY CULTURAL AREA (LEVEL 3B).

Anthropomorph Subject matters or sub-class	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Waliarri 1	51	11	2	2	53	10
Waliarri 2	88	19	14	18	102	18
Mamo/Djuari	7	1	9	11	18	3
Outline	8	1	6	7	14	2
Rounded bodies	91	19	3	4	94	17
Incomplete	36	8	5	6	41	8
Elongated bodies	60	13	19	24	79	14
Veganthrop	4	1	1	1	5	1
Unique	78	17	18	23	96	17
Therianthrope	30	6	3	4	33	6
Muscled limbs	15	3	0	0	15	3
Contact style	5	1	0	0	5	1
Total	473	100	80	100	553	100

Other anthropomorphs in the study area are the Veganthrop (n=5, see Appendix 6) and contact anthropomorphs (n=5). None are more than 90cm, and two of the Veganthrops are painted on currently difficult to access ceilings. Red, white and black are used in monochrome, bichrome and polychrome combinations for the Veganthrops. Black, white and a single scratched motif are recorded for Contact anthropomorphs (Figure 6.14).

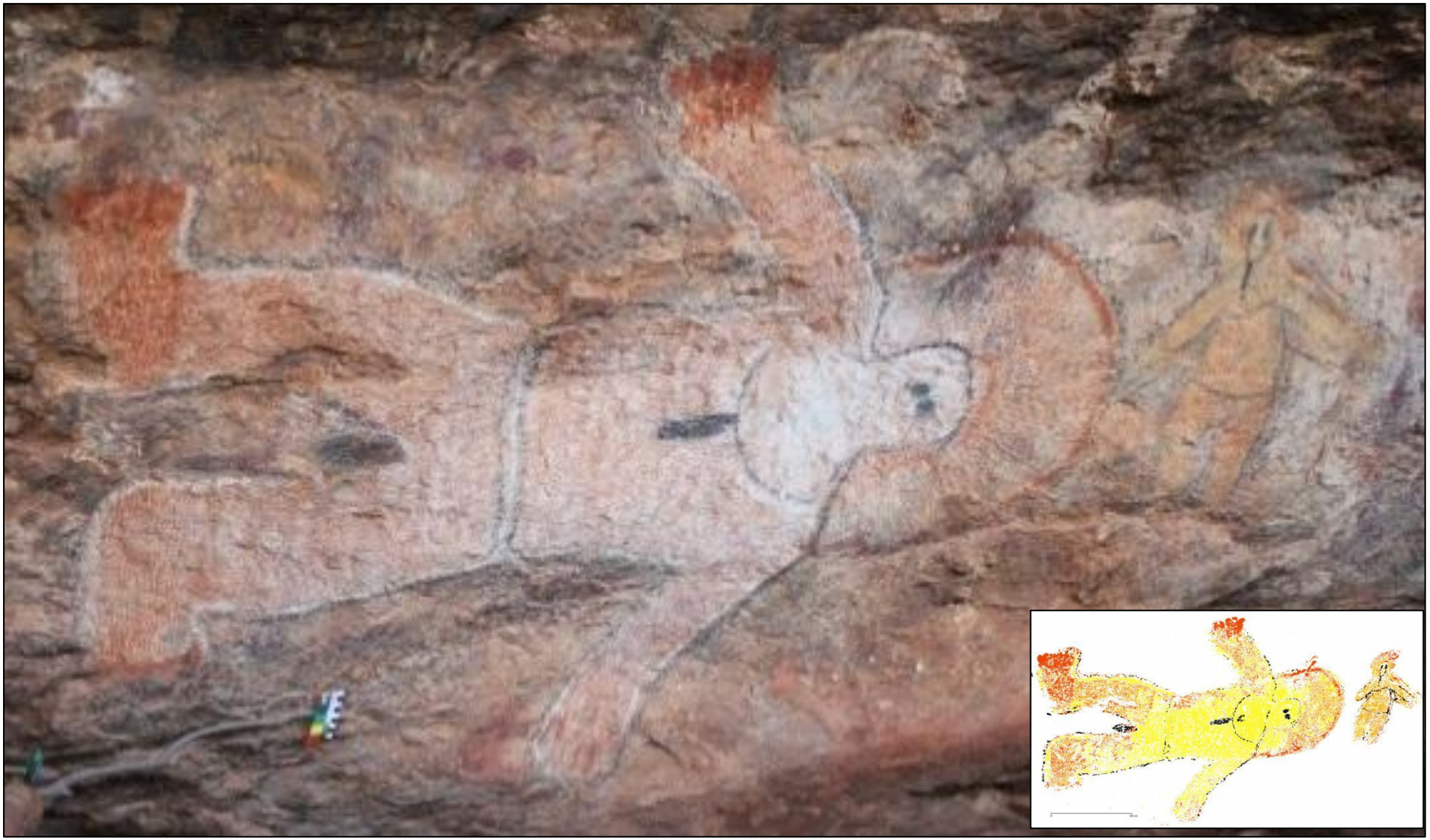


FIGURE 6.13 ANTHROPOMORPHS WITH MALE (HORIZONTAL) AND FEMALE (VERTICAL) GENDER MARKERS AT *TANGALMA*. DIGITAL RENDITION USING ADOBE PHOTOSHOP©.

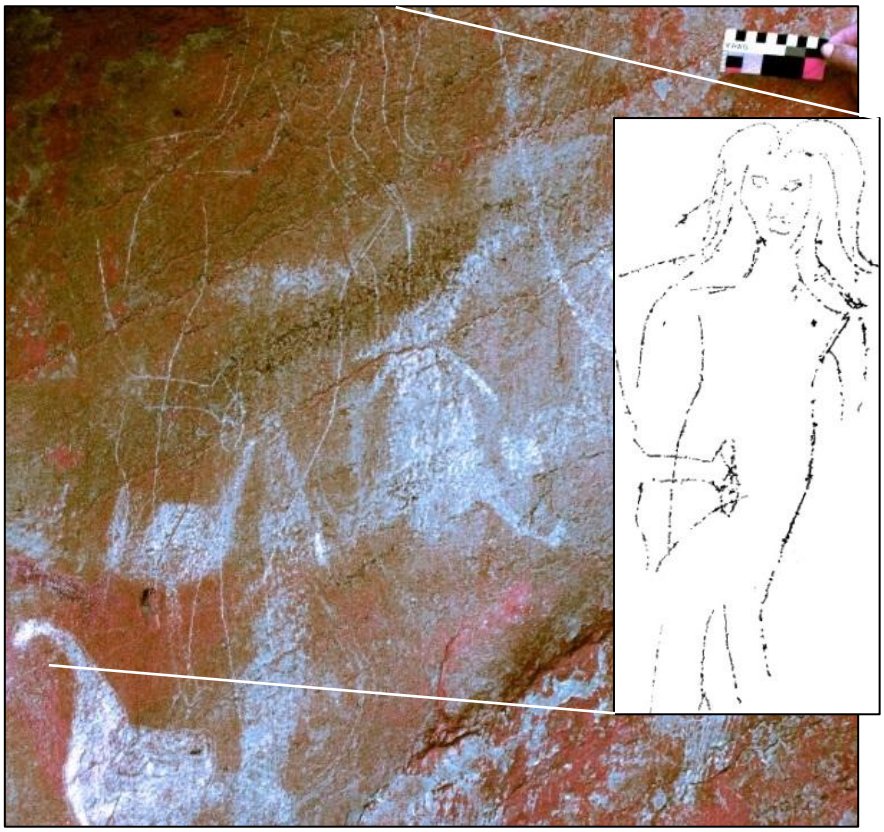


FIGURE 6.14 SCRATCHED CONTACT ANTHROPOMORPH AT STUMPY'S SOAK 1, BUNUBA COUNTRY (M434). DIGITAL DRAWING USING ADOBE PHOTOSHOP©. PHOTOGRAPH ADJUSTED WITH DSTRETCH©, LYE/SCALE 15.

Colour

Most of the anthropomorphs in the study area are monochrome (Table 6.13). Bichrome and polychrome anthropomorphs are a small percentage, but highly visible. There is a small difference in the share of monochrome anthropomorphs in Bunuba and Gooniyandi Country. This may be skewed by fewer sites recorded in Gooniyandi Country. The result is that there are fewer anthropomorphs recorded at Gooniyandi sites; and, similarly, fewer polychrome anthropomorphs in Gooniyandi Country.

TABLE 6.13 ANTHROPOMORPHS BY USE OF COLOUR TECHNIQUES.

Colour Type	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Monochrome	358	76	66	83	424	77
Bichrome	65	14	9	11	74	13
Polychrome	43	9	5	6	48	9
Other	7	1	0	0	7	1
Total	473	100	80	100	553	100

There are more red monochrome anthropomorphs than any single colour or combination of colours (Table 6.14), although white monochrome figures are almost as common. Nine bichrome combinations were identified, with red/white and black/red most common. There are 11 polychrome combinations for anthropomorphs. Black/red/white is the only

combination with ≥10 motifs in the assemblage. Anthropomorphs are also engraved using one or more technique (Figures 6.14 and 6.15).

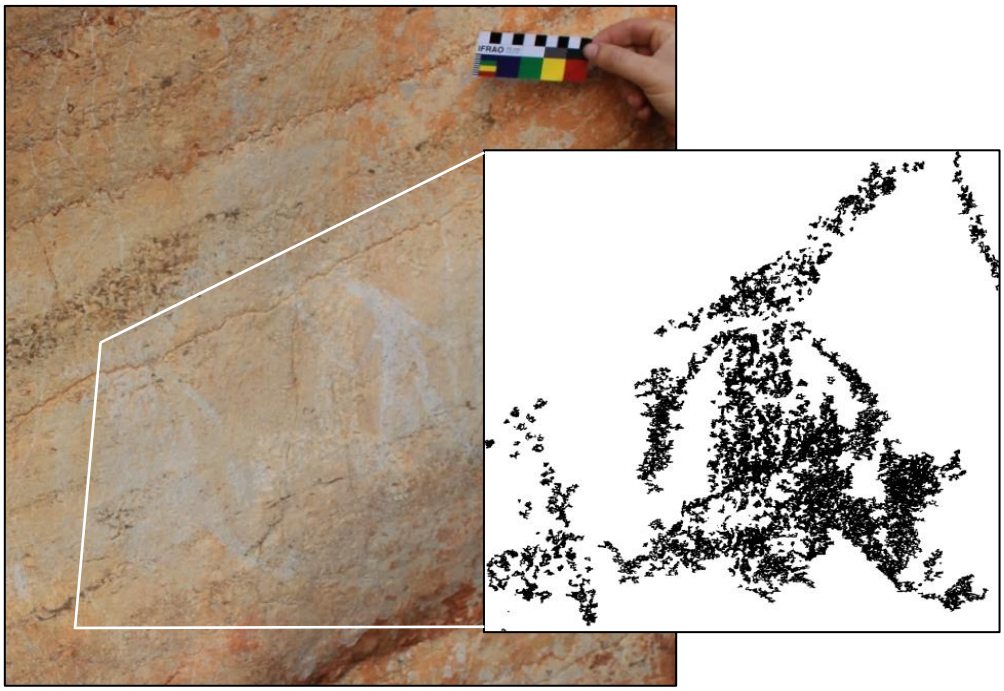


FIGURE 6.15 ENGRAVED ANTHROPOMORPH IN THE 'OTHER' COLOUR CATEGORY, AT STUMPY'S SOAK 1, BUNUBA COUNTRY. DIGITAL RENDITION USING ADOBE PHOTOSHOP©.

There is little difference between cultural areas for monochrome anthropomorphs. There is, however, more variety in the range of bichrome and polychrome colour combinations in Bunuba than Gooniyandi sites, with three bichrome and three polychrome combinations in Gooniyandi sites compared to nine combinations of each in Bunuba sites. There are no 'other' (i.e. engraved) anthropomorphs in Gooniyandi Country (Table 6.14).

Waliarri 1 are mostly bichrome or polychrome (89%), as are 31% of Waliarri 2, 80% of Veganthrops and 24% of Therianthropes. For all other anthropomorph subclasses (Level 3B) 73% are monochrome, with 99% of the round bodied anthropomorphs in a single colour (Appendix 7).

TABLE 6.14 ANTHROPOMORPHS BY COLOUR AND COLOUR COMBINATIONS.

Colour	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Monochrome						
Black	31	7	6	8	37	7
Grey	1	<1	0	0	1	<1
Mulberry	19	4	2	3	21	4
Orange	11	2	1	1	12	2
Red	155	33	37	46	192	35
White	131	28	16	20	147	27
Yellow	10	2	4	5	14	3
Bichrome						
Black/Mulberry	1	<1	0	0	1	<1
Black/Red	19	4	1	1	20	4
Black/White	7	1	3	8	13	2
Mulberry/Red	2	<1	0	0	2	<1
Mulberry/White	2	<1	0	0	2	<1
Orange/White	1	,1	0	<1	1	<1
Red/White	24	5	2	3	26	5
Red/Yellow	1	<1	0	0	1	<1
White/Yellow	2	<1	0	0	2	<1
Polychrome						
Black/Mulberry/ Red	0	0	1	<1	1	<1
Black/Orange/ White	1	<1	0	0	1	<1
Black/Orange/Red	1	<1	0	0	1	<1
Black/Orange/Red /White	1	<1	0	0	1	<1
Black/Other/White	1	<1	0	0	1	<1
Black/Red/White	31	7	3	4	34	6
Black/Red/White/ Yellow	1	<1	0	<1	1	<1
Black/White/ Yellow	3	1	0	0	3	<1
Mulberry/Red/ White	1	<1	0	0	1	<1
Orange/Red/White	0	0	1	0	1	<1
Red/White/Yellow	2	<1	0	0	2	<1
Other	7	1	0	0	7	1
Total	473	100	80	100	553	100

Technique

Painting is the dominant technique for anthropomorphs (Table 6.15), with other single techniques and combinations of techniques seldom used. For example, the next most often used techniques are painting/drawing, followed by drawing. There is little difference in technique between Bunuba and Gooniyandi Country.

Of the 12 anthropomorph subclasses at Level 3B only two have figures that are solely painted (Veganthrop and Therianthrope). All the other anthropomorph subclasses have examples using at least one other technique. For example, six Waliarri 1, and eight Waliarri 2 anthropomorphs have a combination of painting and drawing. Contact anthropomorphs, have a single painted example, three drawn and one scratched (Figure 6.14).

TABLE 6.15 TECHNIQUES USED IN THE PRODUCTION OF ANTHROPOMORPHS IN THE STUDY AREA.

Technique	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Painted	425	90	74	93	499	90
Drawn	14	3	3	4	17	3
Incised	1	<1	0	0	1	<1
Abraded	3	1	0	0	3	1
Unclear	1	<1	1	1	2	<1
Painted & Stencilled	2	<1	0	0	2	<1
Painted & Drawn	25	5	1	1	26	5
Abraded & Scratched	1	<1	0	0	1	<1
Painted & Scratched	0	0	1	1	1	<1
Scratched	1	<1	0	0	1	<1
Total	473	100	80	100	553	100

Size

Anthropomorphs range from very small (0–30cm) to life-sized (150–180cm) and ultra large (>210cm). This is important because as a dominant figurative motif in the assemblage its visibility and placement within the site, and the type of surface on which it is placed determine who sees them and when, and therefore, the amount of coding (style) embedded to convey information (Wobst 1977).

Anthropomorphs are allocated to size categories in Table 6.16 using the head to toe measurement, including headdresses where present. This is more consistent than measuring arm span, given the range of arms poses in anthropomorphs (e.g. widespread, hanging at side, bent, akimbo, angled out, upraised). Placement of anthropomorphs on ceilings and overhangs meant they were not all in positions where measurement was possible. Despite this limitation, 93% of anthropomorphs were measured in this study.

Most anthropomorphs (78%, n=399) were in the two smallest categories, ≤60cm (Table 6.16), with 49% of those less than 30cm. Four anthropomorphs were measured at more than 210cm, with one each in Outline, Elongated Bodies, Unique, and Therianthrope subclasses. 15 Waliarri 1 anthropomorphs are 91–210cm, 12 Mamo/Djuari, and four each of Waliarri 2 and Therianthrope (see Appendix 7).

TABLE 6.16 ANTHROPOMORPHS SIZE RANGES IN THE STUDY AREA.

Anthropomorph size groups	Bunuba		Gooniyandi		Total		
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total	Percent of total
0-30 cm	212	45	38	48	251	45	49
31-60 cm	124	26	24	30	148	27	29
61-90 cm	60	13	2	3	62	11	12
91-120 cm	20	4	3	4	23	4	4
121-150 cm	8	2	3	4	11	2	2
151-180 cm	9	2	1	1	10	2	2
181-210 cm	3	1	1	1	4	1	1
>210 cm	4	1	0	0	4	1	1
Subtotal (measured)	443	93	72	90	513	93	100
No Scale	33	7	8	10	40	7	n/a
Total	473	100	80	100	553	100	n/a

Infill

Most anthropomorphs (Table 6.17) have monochrome solid infill. This is similar for both Bunuba and Gooniyandi Country. Pattern infill on solid infill is a small proportion of infill for anthropomorphs; 11% in Bunuba and 3% in Gooniyandi Country. Solid+pattern infill anthropomorphs are either bichrome (Bunuba n=14, Gooniyandi n=0) or polychrome (Bunuba n=39, Gooniyandi n=2). The solid+pattern infill is a characteristic of Waliarri 1 (n=28), with few examples in other anthropomorph types, the closest being Therianthrope (n=7), and Unique and Incomplete anthropomorphs (n=5 for each).

A small proportion of anthropomorphs have pattern only infill. All of which are monochrome. 29 anthropomorphs were also recorded without infill.

TABLE 6.17 TYPES OF INFILL FOR ANTHROPOMORPHS.

Infill type	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
None	21	4	8	10	29	5
Solid	381	81	69	86	450	82
Solid + Pattern	54	11	2	3	56	10
Pattern only	17	4	1	1	18	3
Total	473	100	80	100	553	100

Other Anthropomorph Attributes

Other attributes were recorded for anthropomorphs (Table 5.6) to describe their character (after Maynard 1977). Many of these attributes are defining characteristics of anthropomorphs at Level 3B on advice and information from Traditional Owners (see Chapter 5 and Appendix 6).

Not all attributes are present in all anthropomorphs. For some this is the result of deterioration or superimposition, for others it may be deliberate choice.

Headdresses are an attribute with great variation. 14 types of headdresses were recorded for 201 anthropomorphs (Table 6.18). The most frequently observed was a 'multiple feather-type' angled upward from the head. Figure 6.16 is one of only two examples where more than one red and black cockatoo feather is present.

Conical headdresses are at a single site, which Traditional Owner Johnny Bell (2011 pers. comm., 6 September) told me was used mainly for shelter on hot days during pastoral work. The figures are scratched and abraded; most likely using fencing wire and other tools workers had at the time (Figure 6.15). Although created following the initial contact period in the area, these anthropomorphs reflect more traditional attributes of rock art images and are likely to be part of traditional dress and dances which may be celebrations of community, marriage, abundance and ancestors, as well as exchange and passing on of knowledge (see O'Connor et al. 2013). The examples shown in Figures 6.17 and 6.18 show that such cultural practices have continuity through colonial times to the present and for likely much longer.

TABLE 6.18 HEADDRESSES ON ANTHROPOMORPHS BY HEADDRESS ATTRIBUTES, ALL SITES.

Headdress Type	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Rays	47	10	4	5	51	9
Arc	3	1	1	1	4	1
Rays + Arc	31	7	1	1	32	6
Feather	12	3	4	5	16	3
>1 Feather	48	10	20	25	68	12
>1 Cockatoo Feather	2	<1	0	0	2	<1
Hair Like	1	<1	0	0	1	<1
Feather + Hair Like	2	<1	0	0	2	<1
Rays + Feathers	4	1	1	1	5	1
Rays + Feathers + Arc	2	<1	0	0	2	<1
Other Head Adornment	12	3	2	3	14	3
Arc + Feathers	1	<1	0	0	1	<1
Conical	3	<1	0	0	3	1
Hat	1	64	0	0	1	<1
Subtotal Total-Headdresses	168	36	47	41	201	36
No Headdress	304	64	47	59	351	64
Total	473	100	80	100	553	100

FIGURE 6.16 BLACK AND WHITE RAYED HEADDRESS WITH COCKATOO FEATHERS AT MOONGGAROONGGOO (M232).

FIGURE 6.17 CONICAL HEADDRESSES WORN IN CEREMONY IN THE 'SOUTHERN KIMBERLEY'. PHOTOGRAPH TAKEN BETWEEN 1920 AND 1936. SOURCED FROM THE STATE LIBRARY OF WESTERN AUSTRALIA FROM THE CHARLES EDWARD FLINDERS COLLECTION HELD IN THE BATTYE LIBRARY (ALBUM BA1459/145).[3]

FIGURE 6.18 CONICAL HEADDRESSES WORN DURING CEREMONIAL DANCES IN THE KIMBERLEY IN THE 1990S (KALACC 1994:20) INCLUDED WITH KIND PERMISSION OF KALACC 2021.

[3] Please note that the State Library of Western Australia advised that use of this photograph in the thesis has received Cultural Clearance (pers. comm. 4 April 2025).

Cross tabulating headdresses with anthropomorph size suggests that there are similar numbers of anthropomorphs >60cm with and without headdresses in Bunuba Country (Figure 6.19). Smaller anthropomorphs are less likely to have headdresses. This is less consistent in Gooniyandi Country (Figure 6.20) where there are fewer anthropomorphs in each size category (Table 6.19).

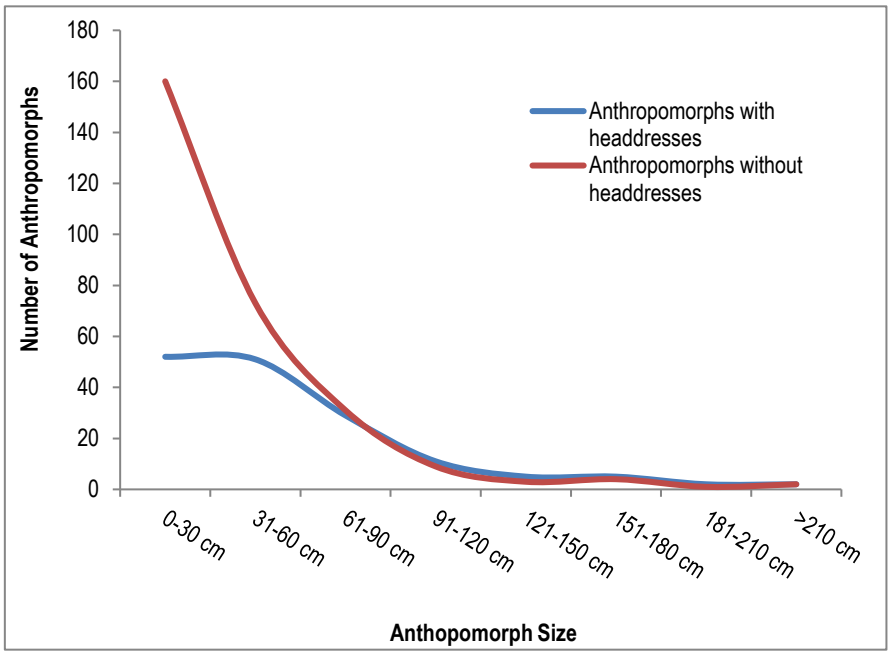


FIGURE 6.19 ANTHROPOMORPHS WITH AND WITHOUT HEADDRESSES CROSS TABULATED WITH ANTHROPOMORPH SIZE IN BUNUBA COUNTRY.

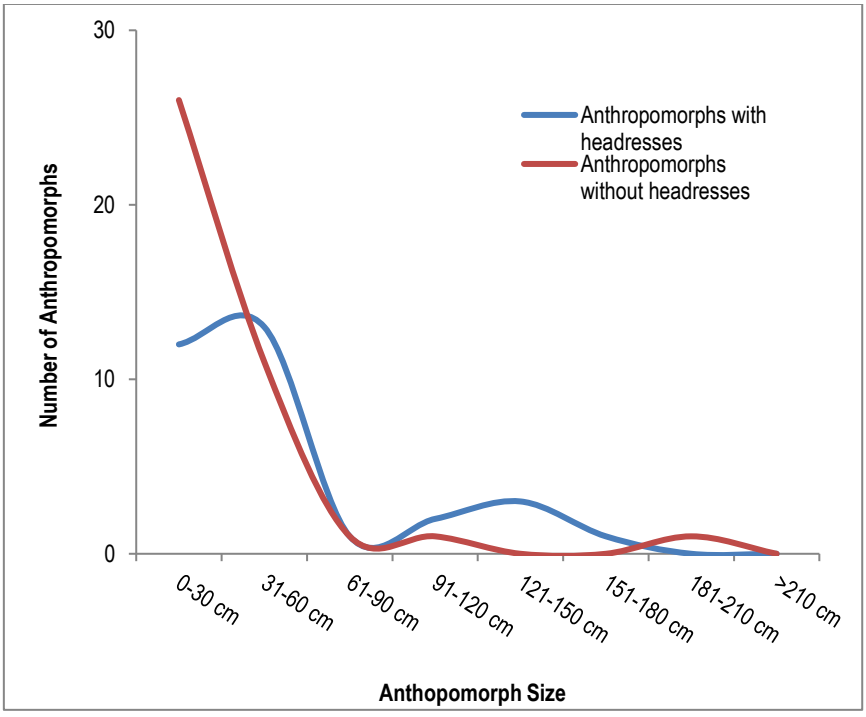


FIGURE 6.20 ANTHROPOMORPHS WITH AND WITHOUT HEADDRESSES CROSS TABULATED WITH ANTHROPOMORPH SIZE IN GOONIYANDI COUNTRY.

This correlation between the presence/absence of headdresses and size is confirmed using Pearson's correlation for Bunuba anthropomorphs, showing that as anthropomorph size increases the number of anthropomorphs, with or without headdress, declines at a similar rate (Table 6.19).

Correlation tests for Gooniyandi anthropomorphs produced similar results, with a strong negative correlation between the number of anthropomorphs and size for those with headdresses and those without (Table 6.20). Therefore, the number of anthropomorphs falls at a similar rate as the size increases, whether they have headdresses or not. Thus, size is not directly related to the presence of headdresses in anthropomorph motifs.

TABLE 6.19 PEARSON CORRELATION TEST RESULTS FOR THE PRESENCE/ABSENCE OF HEADDRESSES AND THE SIZE OF ANTHROPOMORPHS IN BUNUBA COUNTRY.

	Size	Headdress	No Headdress
Size	1		
Headdress	-0.91	1	
No Headdress	-0.81	0.89	1

TABLE 6.20 PEARSON CORRELATION TEST RESULTS FOR THE PRESENCE/ABSENCE OF HEADDRESSES AND THE SIZE OF ANTHROPOMORPHS IN GOONIYANDI COUNTRY.

	Size	Headdress	No Headdress
Size	1		
Headdress	-0.81	1	
No Headdress	-0.74	0.86	1

The most prolific additional attribute recorded for anthropomorphs are feet (Table 6.21). One or more visible foot is recorded for 32% of anthropomorphs, though this is slightly greater in Bunuba (35%) than Gooniyandi Country (30%). Of the anthropomorphs with one or more feet, 53% have toes.

Not all legs are fully visible because of deterioration or superimposition, accounting for the absence of feet on some anthropomorphs. On others the absence of feet appears to be a choice in the motif form. Further detail on limbs is in Appendix 7.

Hands are also prolific for anthropomorphs. 20% of anthropomorphs have hands (most of which have fingers), and an additional 4% have fingers attached directly to arms.

Eyes are recorded on fewer anthropomorphs than hands or feet. 14% of anthropomorphs have eyes in Bunuba Country and 8% in Gooniyandi Country (Figure 6.21). Eyes with eyelashes, a feature in some Waliarri anthropomorphs, were only observed in Bunuba sites.

TABLE 6.21 ADDITIONAL ATTRIBUTES RECORDED FOR ANTHROPOMORPHS.

Specific attributes for anthropomorphs	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total*	Number of figures	Percent of total	Number of figures	Percent of total
Feet						
1 foot	76	16	8	10	84	15
2 feet	93	20	9	11	102	18
Foot/feet with toes	87	19	5	6	92	17
Toes only	8	2	0	0	8	1
Hands						
Hands	93	20	11	14	104	19
Hands with fingers	87	18	7	9	94	17
Fingers only	20	4	3	4	23	4
Eyes						
Eyes only	56	12	6	8	62	11
Eyes with eyelashes	10	2	0	0	10	2
Other attributes						
Nose	25	5	3	4	28	5
Mouth	15	3	1	1	16	3
Breast Plate	10	2	0	0	10	2
Internal divisions	18	4	0	0	18	3
Prepared background	6	1	0	0	7	1
Veganthrop attributes						
Yam Body	4	1	1	1	5	1
Therianthrope attributes						
Snake body	7	1	0	0	7	1
Lizard body	3	1	1	1	4	<1
Insect Body	2	<1	0	0	2	1
Body not clear	4	1	0	0	4	<1
Bird head	1	<1	0	0	1	<1
Lizard head	2	<1	0	0	2	<1
Eel head	0	0	1	1	1	<1
Bird limbs	8	2	0	0	8	1
Insect limbs	2	<1	0	0	2	<1
Lizard limbs	0	0	1	1	1	<1
With Material Culture						
Bag	2	<1	0	0	2	<1
Boomerang	5	1	3	4	8	1
Spear/stick	8	2	1	1	9	2
Shield	1	0	0	0	1	<1

*Percentage of total anthropomorphs

Other facial features are comparatively few, as are breast plates and internal divisions, the latter two primarily on Waliarri 1 anthropomorphs.

Material Culture attached to anthropomorphs was also recorded. There are 20 anthropomorphs holding items of materials culture, including bags, stick/s or boomerangs. Of those nine (Bunuba n=6, Gooniyandi n=3) have headdresses, and most (n=18, 90%) are 31-60cm, with a single measured anthropomorph holding a boomerang in the 61-90cm range.

The Veganthrops in this assemblage all have long wanggu (yam) bodies with humanlike heads and arms. Three have headdresses and they range from 12–75cm (Figure 6.22).

Therianthropes have more varied body types. Snakes are the most common (n=7) animal body (Figure 6.23) and wings the most frequent animal limb (n=8). Headdresses are on 12 (38%) therianthropes, most of which (n=11) were recorded in Bunuba Country. Therianthrope sizes range from the smallest category (0-30 cm) to the largest (>210cm) with most ≤90cm (n=25).

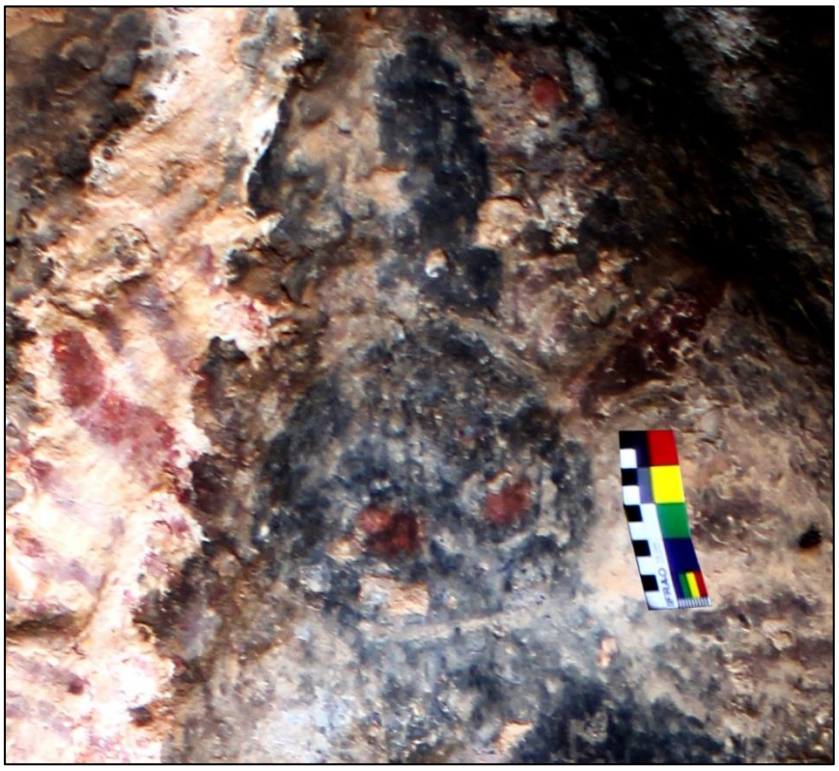


FIGURE 6.21 ROUND RED EYES WITHOUT ADDITIONS (I.E. EYELASHES) ON THIS DJUARI FIGURE AT MOONGGAROONGGOO (PR1, M235) IN GOONIYANDI COUNTRY.

Additional attributes assist in defining figures as anthropomorphs and distinguish them from one another to allow finer level classification. A combination of human and non-human attributes defines Veganthrop and Therianthropes, and the presence of human like limbs, feet, hands and digits or the combination of infill patterns, colours and headdresses characterise the Waliarri 1 and Waliarri 2 anthropomorphs. This information contributes to an understanding of what constitutes an anthropomorph, and how each subclass is distinguishable from the other.

FIGURE 6.22 VEGANTHROP ON THE CEILING OF THE LOWER OVERHANG AT TANGALMA (M037A).

FIGURE 6.23 THERIANTHROPE WITH A SNAKE BODY AND DETAILED HUMAN-LIKE FACIAL FEATURES AND HEADDRESS AT MOUNT BEHN 1 (M1673).

Zoomorphs

There are 614 zoomorphs at 37 sites in the study area. Zoomorphs are depicted in two ways. Quadrupeds and macropods have their bodies and heads in profile but show two ears and all legs in a three-quarter profile (Figure 6.24). Except for the bush turkey, birds are depicted in the same combination of profile/three quarter view. The bush turkey is painted as if running away from the viewer, showing the tail feathers fluffed out either side of the legs (Figure 2.15); very much the perspective observed during fieldwork in 2012 when hunting turkeys for dinner with Traditional Owners. Other zoomorphs are painted as if viewed from

above (aerial view), showing the body shape with limbs and heads defined, and occasionally eyes, tongue and/or cloaca. This class is divided into 8 subject matters or sub-classes at Level 3, with 17 animals at 3B (Table 5.5). 72% (n=441) of zoomorphs are in Bunuba Country and 28% (n=173) in Gooniyandi Country (Table 6.22).

TABLE 6.22 ZOOMORPH SUBJECT MATTERS/SUB-CLASSES BY CULTURAL AREA (LEVEL 3A).

Zoomorph subject matters	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Macropod	3	1	11	6	14	2
Quadruped	10	2	4	2	14	2
Bird	21	5	29	17	50	8
Reptile	362	82	109	63	471	77
Fish/Aquatic Creature	36	8	15	9	51	8
Amphibian	6	1	0	1	6	1
Insect	1	<1	4	2	5	1
Other	2	<1	1	1	3	<1
Total	441	100	173	100	614	100

The most prolific zoomorphs in the study area are reptiles, within which snakes comprise 50% in Bunuba, and 27% in Gooniyandi Country. Lizards and turtles are also present across the study area (Table 6.23). In Bunuba Country eels and crocodiles are also well represented, whilst in Gooniyandi Country emu motifs are the third most prolific zoomorphic figure.

FIGURE 6.24 A DINGO (QUADRUPED) WITH BODY AND HEAD IN PROFILE AND BOTH EARS AND ALL LEGS SHOWN IN A THREE QUARTER PROFILE AT LILLIMOOLOORA 1 (M1762).

TABLE 6.23 ZOOMORPH SUBJECT MATTERS BY CULTURAL AREA (LEVEL 3B).

Zoomorph subject matters	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Australian Stork	0	0	2	1	2	0
Bird	11	2	6	3	17	3
Bush Turkey	5	1	1	1	6	1
Crab	1	0	2	1	3	0
Crocodile	30	7	6	3	36	6
Crustacean	4	1	0	0	4	1
Dingo	7	2	1	1	8	1
Eel	28	6	3	2	31	5
Emu	5	1	20	12	25	4
Fish	3	1	10	6	13	2
Flying Fox	2	0	1	1	3	0
Frill–Necked Lizard	0	0	4	2	4	1
Frog	6	1	0	0	6	1
Goanna	5	1	0	0	5	1
Insect	1	0	4	2	5	1
Kangaroo	0	0	4	2	4	1
Lizard	80	18	35	20	115	19
Macropod	3	1	7	4	10	2
Quadruped	2	0	3	2	5	1
Snake	180	41	50	29	230	37
Thylacine	1	0	0	0	1	0
Turtle	67	15	13	8	80	13
Water Lizard	0	0	1	1	1	0
Total	441	100	173	100	614	100

Colour

Most zoomorphs are monochrome (Table 6.24), bichrome occurring less frequently. Bichrome zoomorphs are a greater proportion of Gooniyandi zoomorphs than those in Bunuba Country. Polychrome zoomorphs (Figure 6.25) are only recorded in Bunuba Country at large sites, with large assemblages, such as Elimberrie Springs and Mount Behn 1.

TABLE 6.24 ZOOMORPHS BY COLOUR TECHNIQUE.

Colour Technique	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Monochrome	345	78	118	68	464	75
Bichrome	50	11	53	30	103	17
Polychrome	35	8	0	0	35	6
Other	11	2	2	1	13	2
Total	441	100	173	100	614	100

FIGURE 6.25 POLYCHROME SNAKE AT ELIMBERRIE SPRINGS (M1542).

The difference between the two cultural areas is stark when colours and colour combinations for zoomorphs are examined (Table 6.25). Monochrome colours follow similar patterns in both cultural areas, red and white are dominant. Bichrome colour combinations are markedly different, red and white is the dominant combination for Bunuba, and black and white for Gooniyandi. This is further discussed in subsequent chapters (Chapters, 7, 8 and 9). Polychrome zoomorphs in Bunuba Country are dominated by the black/red/white combination (Figure 6.25), which is also seen in Gooniyandi Country.

Infill

Most zoomorphs have solid, monochrome infill (Tables 6.26 and 6.27). The majority of zoomorphs with solid infill are also monochrome, but all colour types are found in this grouping (Table 6.28). Bunuba zoomorphs are overwhelmingly monochrome. Most Gooniyandi zoomorphs have monochrome/solid infill. Most of the bichrome zoomorphs in Gooniyandi Country are distinctive white outlined motifs with black solid infill (Figure 6.26), in the style discussed in detail in Chapter 7.

TABLE 6.25 ZOOMORPHS BY COLOUR AND COLOUR COMBINATIONS.0

Colour	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Monochrome						
Black	29	7	1	11	48	8
Grey	1	<1	1	1	2	<1
Mulberry	12	3	3	2	15	2
Orange	20	5	2	1	22	4
Red	151	34	50	29	201	33
White	120	27	42	24	162	26
Yellow	12	3	2	1	14	2
Bichrome						
Black/red	4	1	1	1	5	1
Black/white	5	1	37	21	42	7
Black/yellow	1	<1	0	0	1	<1
Grey/white	1	<1	3	2	4	1
Mulberry/white	2	<1	0	0	2	<1
Orange/red	2	<1	0	0	2	<1
Orange/white	5	1	1	1	6	1
Red/white	26	6	10	10	36	6
Red/yellow	1	<1	0	0	1	<1
White/yellow	3	1	0	<1	3	<1
Polychrome						
Black/orange/white	1	<1	0	0	1	<1
Black/red/white	18	4	0	0	18	3
Black/red/yellow	2	<1	0	0	2	<1
Black/white/yellow	8	2	0	0	8	1
Orange/red/white	1	<1	0	0	1	<1
Black/mulberry/red/ white	1	<1	0	0	1	<1
Black/orange/red/white	2	<1	0	0	2	<1
Black/orange/red/ yellow	1	<1	0	0	1	<1
Black/red/white/yellow	1	<1	0	0	1	<1
Other	11	2	2	1	13	2
Total	441	100	173	100	614	100

TABLE 6.26 TECHNIQUES USED IN THE PRODUCTION OF ZOOMORPH FIGURES.

Technique	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Painted	408	93	170	98	578	94
Drawn	8	3	3	2	11	2
Incised	1	<1	0	0	1	<1
Abraded	3	1	0	0	3	<1
Abraded & Incised	1	<1	0	0	1	<1
Unclear	2	<1	0	0	2	<1
Painted & Drawn	11	2	0	0	11	2
Abraded & Scratched	3	1	0	0	3	<1
Painted & Scratched	3	1	0	0	3	<1
Scratched	1	0	0	0	1	<1
Total	441	100	173	100	614	100

TABLE 6.27 TYPES OF INFILL FOR ZOOMORPHS.

Infill type	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
None	21	5	9	5	30	5
Solid	325	74	158	91	483	79
Solid + Pattern	59	14	1	1	61	10
Pattern only	36	8	5	3	41	7
Total	441	100	173	100	614	100

TABLE 6.28 COLOUR TYPES FOR SOLID INFILL FOR ZOOMORPHS.

Colour type	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Monochrome	293	90	105	66	398	82
Bichrome	23	7	51	32	74	15
Polychrome	1	<1	0	0	1	<1
Other	8	2	2	2	10	2
Total	325	100	158	100	483	100

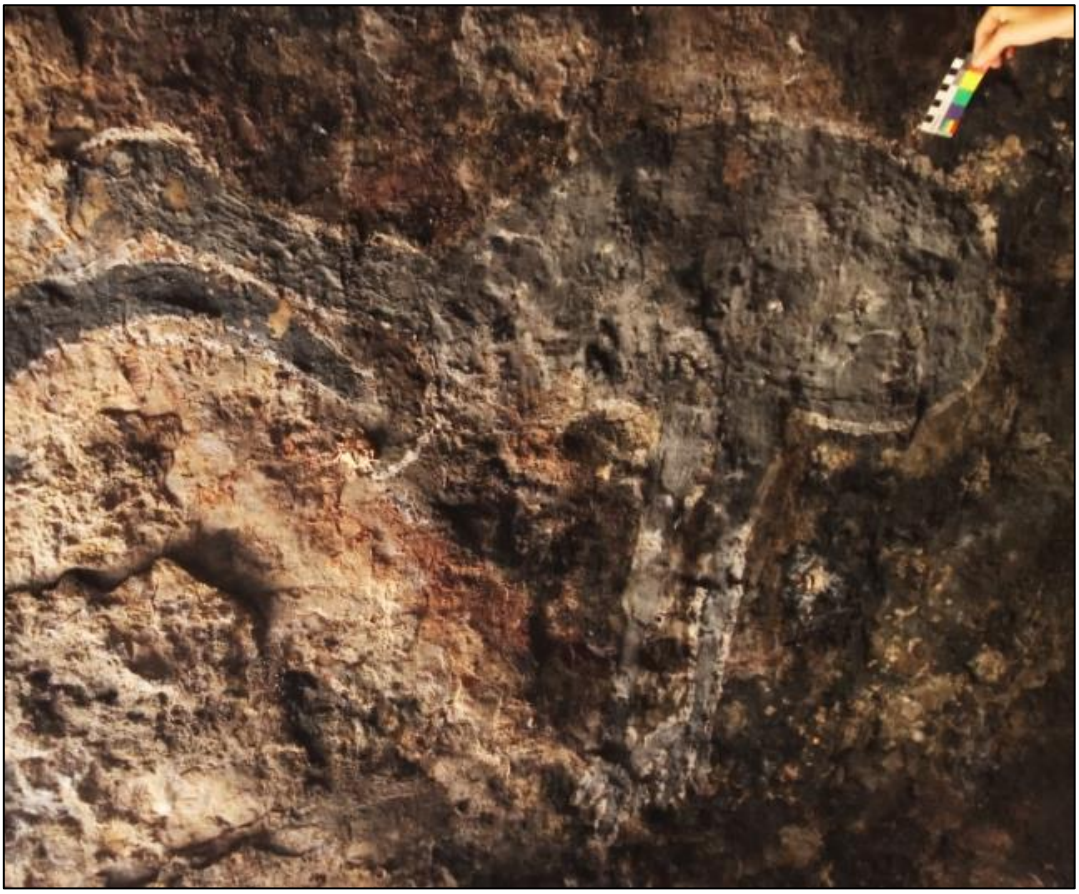


FIGURE 6.26 BICHROME EMU AT EMANUEL GAP 5 (M4458).

Other Zoomorph Attributes

There are few other zoomorph attributes in this assemblage (Table 6.29). Limbs and feet, with/without digits are the most common, and are helpful in identifying species. The proportion of zoomorphs without limbs also reflects the large number of snakes (n=290).

Other attributes are eyes on eels, macropods, snakes, emus, lizards and crocodiles, mostly in Bunuba Country. Few noses/snouts are present on the zoomorphs, mostly on crocodiles (n=7) with shaped snouts (Figure 6.27). Zoomorphs, most in Bunuba Country, have internal divisions such as on the snake in Figure 6.25. A small number are on prepared backgrounds, which may cover previous rock art, or provide a contrasting background for the motif for other reasons, such as instituting a new style or introducing a new idea.

TABLE 6.29 ADDITIONAL ATTRIBUTES RECORDED FOR ZOOMORPHS.

Other attributes	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Visible limbs						
1 Limb	16	4	10	6	26	4
2 Limbs	48	11	44	25	92	15
3 Limbs	46	10	6	3	52	9
4 limbs	104	24	46	27	150	24
≥ 6 limbs	3	<1	1	<1	4	<1
No limbs	224	51	66	38	290	47
Total Limbs	441	100	173	100	614	100
Feet						
1 foot	6	1	6	3	9	1
2 feet	16	4	26	15	42	7
3 feet	1	<1	0	0	1	<1
4 feet	15	3	3	2	18	3
No feet	403	91	138	80	541	88
Feet with digits	*47*	*11*	*33*	*19*	*80*	*13*
Other attributes						
Eyes	18	4	3	2	21	3
Nose	8	2	0	0	8	1
Mouth	0	0	0	0	0	0
Internal divisions	12	3	1	1	13	2
Prepared background	5	1	1	1	6	1
Genitalia	0	0	1	1	1	<1

*Percentage of total zoomorphs.

FIGURE 6.27 CROCODILE AT MOUNT BEHN 1 WITH A SHAPED SNOUT, EYES AND SOLID+PATTERN INFILL (M1818). IMAGE ENHANCED WITH DSTRETCH© LAB/SCALE 15.

Phytomorphs

Phytomorph (plant/vegetation) figures are present across the study area. 155 phytomorphs were recorded at 21 sites. Phytomorphs are divided into five subject matters or sub-classes at Level 3 in the classification system (Table 5.4). The majority of phytomorphs (74%) were recorded in Bunuba Country (Table 6.30).

There are three well represented phytomorphs in this assemblage; wanggu (yam), thanggari (water lilies) and wajarri (boab nuts). The majority of wanggu and wajarri are in Bunuba Country, whereas the majority of thanggari are in Gooniyandi Country, likely reflecting the abundance of, or access to, each of those food sources in each cultural area. For example, Traditional Owners in Gooniyandi Country remembered harvesting and eating thanggari from the pools around the rocky outcrops at Moonggaroonggoo (June Davis, Mervyn Street, Helen Malo 2011 pers. comm., 1 September), whereas the Bunuba Rangers and Traditional Owners were more focussed on food from freshwater crocodiles, turtles and fish from waterways, but also described how they gathered and cooked the wajarri in season (Bunuba Rangers 2012 pers. comm., 19-20 July). The availability of wajarri is also different because of the different environments of the two areas, the Bunuba west is semi-tropical and the largarri (boab trees) are abundant whereas when we moved southeast of the Bandaral

ngadu into semi-arid Gooniyandi Country they became sparse, thus less likely to be important in the diet. It is possible that each had a totemic function in marking identity of which contemporary Traditional Owners are not aware, which will be discussed in relation to style in Chapter 7, and in Chapter 10.

TABLE 6.30 PHYTOMORPH SUBJECT MATTERS BY CULTURAL AREA.

Phytomorph subject matters	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Wajarri (Boab Nuts)	25	22	1	3	26	17
Grass	3	3	0	0	3	2
Pods	0	0	1	3	1	17
Thanggari (Water Lily)	1	1	26	65	27	63
Wanggu (Yam)	86	75	12	30	98	16
Total	115	100	40	100	155	100

Colour

Most phytomorphs are monochrome (Table 6.31), particularly in Gooniyandi Country, where red thanggari are the most prolific single phytomorph (Figure 6.28). In Bunuba Country there is variation in the colour types, including bichrome and polychrome phytomorphs, as well as a single scratched wanggu (Figure 6.29).

In Gooniyandi Country red is the dominant phytomorph colour (Table 6.32). White and black are also used in monochrome figures, and a single polychrome phytomorph is four colours. In Bunuba Country black/red/white is the most common combination, followed by white, and red/white. This reveals a difference in colour choices between the two cultural areas, as other motifs demonstrate that the same range of colours are available and used in both cultural areas.

TABLE 6.31 PHYTOMORPHS BY COLOUR TECHNIQUE.

Colour	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Monochrome	53	46	39	98	92	59
Bichrome	30	26	0	0	30	19
Polychrome	31	27	1	3	32	21
Other	1	1	0	0	1	<1
Total	115	100	40	100	155	100

FIGURE 6.28 THANGGARI AT MOONGGAROONGGOO, GOONIYANDI COUNTRY (M239).

FIGURE 6.29 A SCRATCHED WANGGU, AT FAIRFIELD 1, BUNUBA COUNTRY (M1219).

TABLE 6.32 PHYTOMORPHS BY COLOUR AND COLOUR COMBINATIONS.

Colour	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Monochrome						
Black	8	7	2	5	10	6
Mulberry	3	3	1	0	4	0
Orange	7	6	0	3	7	3
Red	12	10	28	70	40	26
White	19	17	8	20	27	26
Yellow	4	3	0	0	4	17
Bichrome						
Black/Orange	1	1	0	0	1	1
Black/Red	1	3	0	0	1	2
Black/White	2	2	0	0	2	1
Mulberry/White	4	3	0	0	4	3
Mulberry/Yellow	1	1	0	0	1	1
Orange/White	1	1	0	0	1	1
Red/White	14	12	0	0	14	9
Red/Yellow	2	2	0	0	2	1
White/Yellow	1	1	0	0	1	1
Polychrome						
Black/Orange/Red/ White	1	1	1	3	2	1
Black/Red/White	24	21	0	0	24	15
Black/Red/White/ Yellow	3	3	0	0	3	2
Orange/Red/White	1	1	0	0	1	1
Other	1	1	0	0	1	1
Total	115	100	40	100	155	100

Technique

Painting is the dominant technique for phytomorphs in this study (Table 6.33). It is the only technique used for phytomorphs at Gooniyandi sites. Two other techniques (drawn and scratched), and two combinations are used in Bunuba Country. While the numbers of phytomorphs using techniques other than painting are low, the presence of other techniques is a difference between Bunuba and Gooniyandi rock art sites.

TABLE 6.33 TECHNIQUES USED IN THE PRODUCTION OF PHYTOMORPHS.

Technique	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Painted	103	90	40	100	143	92
Drawn	4	3	0	0	4	3
Painted & Drawn	4	3	0	0	4	3
Painted & Scratched	3	3	0	0	3	2
Scratched	1	1	0	0	1	1
Total	115	100	40	100	155	100

Infill

Phytomorphs are recorded with all the major infill types across the study area (Table 6.34). Half have solid colour infill, followed by solid+pattern, with few with pattern only, or without

infill. Solid+pattern is favoured in Bunuba Country, while solid infill is dominant in Gooniyandi Country. This is also apparent in the different phytomorph types; the most prolific phytomorph in Gooniyandi Country, thanggari has solid infill in monochrome colours (Figure 6.28), whereas the wanggu in Bunuba Country are in a variety of colours, and solid+pattern infill (Figure 6.30). Perhaps each is created to realistically represent the shape and texture of the vegetation, though not the colour.

TABLE 6.34 TYPES OF INFILL USED IN PHYTOMORPHS.

Infill type	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
None	3	3	5	13	8	5
Solid	47	41	32	80	79	51
Solid + Pattern	52	45	1	3	53	34
Pattern only	13	11	2	5	15	10
Total	115	100	40	100	155	100

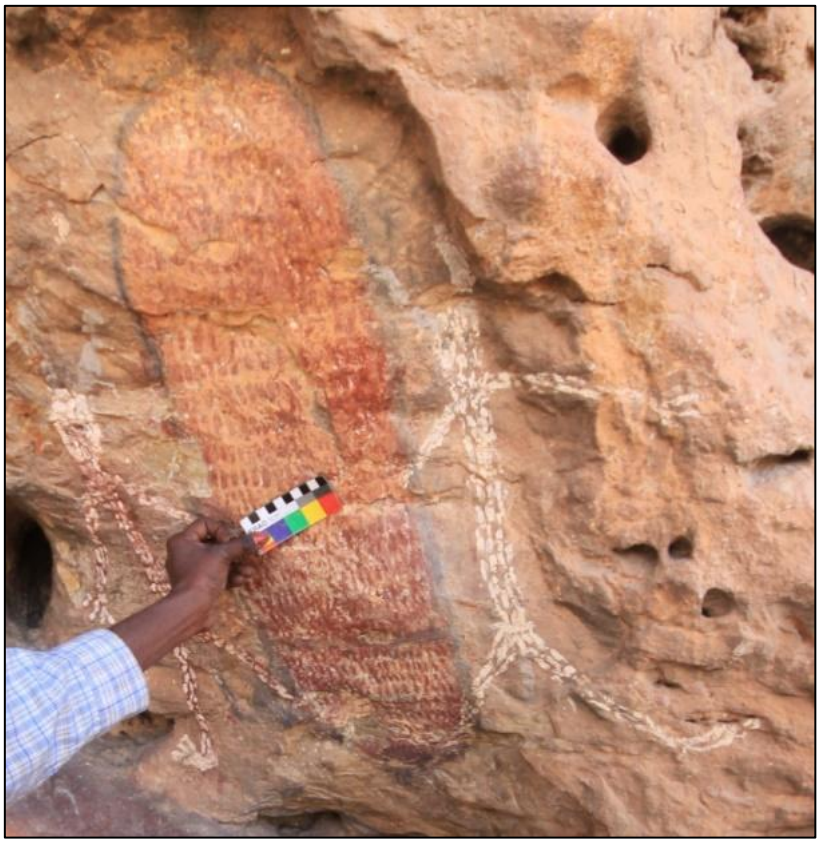


FIGURE 6.30 A POLYCHROME WANGGU AT MARAWUN 1, BUNUBA COUNTRY (M2517, M2518, M2519).

Other Phytomorph Attributes

Phytomorph forms offer a limited range of additional attributes, without changing them to another motif type such as Veganthrops (Table 6.35). The attributes recorded in this assemblage are the stalks, added to both ends of wajarri and the narrower end of wanggu,

fronds (small root like straggling lines) at the base of wanggu, and the internal divisions and prepared backgrounds also recorded for all other rock art figures (Table 6.35).

All but one of the wajarri has stalks (Figure 6.31). There are fewer wajarri than wanggu with stalks, and all are in Bunuba Country. Wanggu are the only phytomorph with fronds, with this attribute present across the study area, again reflecting realism for this root vegetable.

One wajarri, which is also polychrome with solid+pattern infill, has an internal division, which appears to have been added after the infill was completed (Figure 6.32). A greater number of wanggu have internal divisions (Figure 6.30); all of which are in Bunuba Country, suggesting some doubt in the classification of the wajarri in Figure 6.32 which was identified as such by Traditional Owners. Few phytomorphs have prepared backgrounds.

TABLE 6.35 OTHER ATTRIBUTES RECORDED FOR PHYTOMORPHS.

Other attributes for phytomorphs	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total*	Number of figures	Percent of total	Number of figures	Percent of total
Stalks						
Wajarri (Boab Nuts)	24	21	1	3	25	16
Wanggu (Yams)	33	29	0	0	33	21
Fronds						
Wanggu (Yams)	9	8	2	5	11	7
Internal Divisions						
Wajarri (Boab Nuts)	1	1	0	0	1	1
Wanggu (Yams)	29	25	0	0	29	19
Prepared Background						
Wajarri (Boab Nuts)	2	2	0	0	2	1

*Percentage of total phytomorphs.

Some phytomorphs appear to be part of compositions, where they are grouped as shown in Figure 6.31, or separate but in close proximity on a single panel with other figures in similar styles, and likely contemporary composition including solid infill white round bodied anthropomorphs in Figure 6.33.

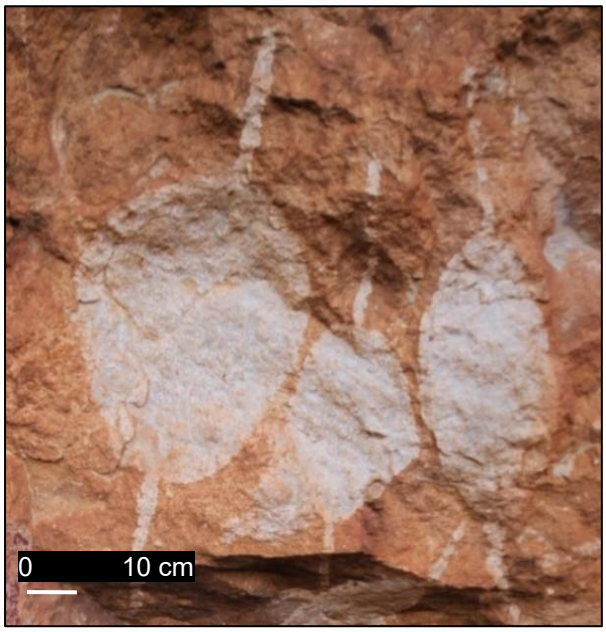


FIGURE 6.31 WAJARRI AT FAIRFIELD 2, BUNUBA COUNTRY (M1345A, M1345B, M1345C).

FIGURE 6.32 WAJARRI WITH AN INTERNAL LINE AND STALK IN RED PIGMENT ACROSS ITS PATTERNED INFILL ON A BACKGROUND OF WHITE AT MOUNT BEHN 1, BUNUBA COUNTRY (M1886).

FIGURE 6.33 PANEL AT FAIRFIELD 2 WITH PHYTOMORPHS (WAJARRI) AND ANTHROPOMORPHS IN POSSIBLE COMPOSITION.

Material Culture

41 Material Culture figures were recorded at 12 sites in this study (Table 6.36). This does not include the 20 items of Material Culture attached to anthropomorphs. There are six types of Material Culture recorded (Table 5.4), two of which are only recorded attached to anthropomorphs, i.e. bag and shield. The most prolific separate Material Culture motifs are boomerangs and axes; both present across the study area (Table 6.36).

TABLE 6.36 DEPICTED MATERIAL CULTURE BY CULTURAL AREA.

Material Culture	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Axe	12	40	1	9	13	32
Boomerang	14	47	7	64	21	51
Spear/Stick	1	3	1	9	2	5
Club	3	10	1	18	5	12
Total	30	100	11	100	41	100

Colour

Material Culture rock art is mostly monochrome or bichrome (Table 6.38). Most boomerangs (n=14, 67%) are monochrome, and axes bichrome (n=8, 62%). The most common monochrome colours are red and white (Table 6.39), and red/white and black/white are the most common combination. Five monochrome colours and seven bichrome combinations, along with a single polychrome combination, shows diversity in colour choices for a small class of rock art. There are no notable differences between the two cultural areas.

TABLE 6.37 MATERIAL CULTURE BY COLOUR TECHNIQUE.

Colour technique	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Monochrome	17	57	6	55	23	56
Bichrome	12	40	5	45	17	41
Polychrome	1	3	0	0	1	2
Other	0	0	0	0	0	0
Total	30	100	11	100	41	100

TABLE 6.38 DEPICTED MATERIAL CULTURE BY COLOUR AND COLOUR COMBINATIONS.

Colour	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Monochrome						
Black	1	3	1	9	2	5
Mulberry	0	0	1	9	1	2
Orange	2	7	0	0	2	5
Red	5	17	2	18	7	17
White	9	30	2	18	11	27
Bichrome						
Black/Orange	1	3	0	0	1	2
Black/Red	2	7	0	0	2	5
Black/White	3	10	2	18	5	12
Grey/White	0	0	2	18	2	5
Mulberry/White	1	3	0	0	1	2
Orange/White	1	3	0	0	1	2
Red/White	4	13	1	9	5	12
Polychrome						
Black/Orange/ White	1	3	0	0	1	2
Other	0	0	0	0	0	0
Total	30	100	11	100	41	100

Technique

Painting and stencilling are the only techniques used for Material Culture in this study (Table 6.39). Boomerangs (Figure 6.34) are more stencilled, and the only figure recorded using a combination of painting and stencilling. There is one stencilled axe in Bunuba Country and a single stencilled stick in Gooniyandi Country, so the technique is not exclusive to one area or another.

TABLE 6.39 TECHNIQUES USED IN THE DEPICTIONS OF MATERIAL CULTURE IN THE STUDY AREA.

Technique	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Painted	23	77	10	91	33	80
Stencilled	6	20	1	9	7	17
Painted & Stencilled	1	3	0	0	1	2
Total	30	100	11	100	41	100

Infill

Most Material Culture figures have solid infill (Table 6.40). Seven of the 11 figures with no infill are stencils, making the technique used the main factor in the numbers of this infill type. Boomerangs and axes both appear with all listed infill types across the study area. Most of the Material Culture motifs with any type of patterns as part of the infill are axes (n=6) in Bunuba Country (Figure 6.35).

FIGURE 6.34 BOOMERANG STENCIL AT MARAWUN 4 (M2837).

TABLE 6.40 TYPES OF INFILL USED IN MATERIAL CULTURE FIGURES.

Infill type	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
None	9	30	2	18	11	27
Solid	12	40	9	82	21	51
Solid + Pattern	4	13	0	0	4	10
Pattern only	5	17	0	0	5	12
Total	30	100	11	100	41	100

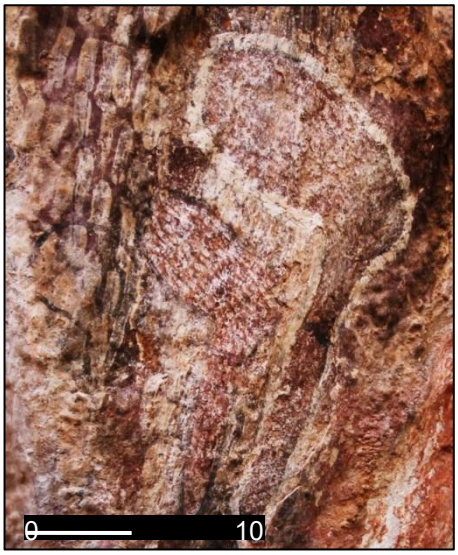


FIGURE 6.35 AXES AT MOUNT BEHN 1, BUNUBA COUNTRY (M2078, M2079 & M2085).

Other Attributes

There are few additional attributes recorded for Material Culture in this study (Table 6.41). The spears/sticks are single unadorned lines, with the only differences observed where one is stencilled, and one in the body of a crocodile (Figure 6.36).

For axes, the direction of the head in relation to the handle is recorded, with little difference in the direction observed. Most axes are in Bunuba Country (n=12, 92%).

TABLE 6.41 OTHER ATTRIBUTES RECORDED FOR MATERIAL CULTURE.

Other attributes for Material Culture	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total*	Number of figures	Percent of total	Number of figures	Percent of total
Axe head direction						
Left	7	23	0	0	7	17
Right	5	17	1	1	6	15
Sets						
Set of 2	0	0	2	2	2	5
Set of 3	1	3	0	0	1	2
With zoomorph						
Spear with crocodile	1	3	0	0	1	2

*Percentage of total Material Culture motifs.

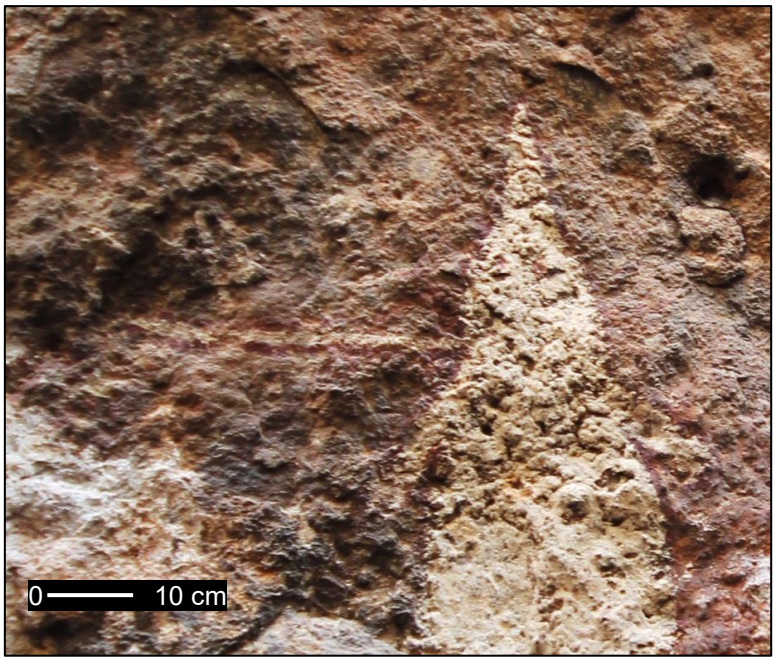


FIGURE 6.36 A SPEAR STICKING INTO A CROCODILE AT LANGURMURRU, BUNUBA COUNTRY (M1053B).

Some Material Culture figures are recorded in groups. For example, the three axes in Figure 6.35 appear to be a set composition, as each is painted close to the others to form a stepped arrangement. This may have been a pair of axes to which the third, the smaller black outline axe, was later added; since the position in relation to the other axes is closer to the blade of the proximal axe, rather than below it like the other two axes. The other two sets are one pair of boomerangs and one pair of clubs, described as pairs because of their proximity to one another, and separation from other motifs.

The Material Culture attached to anthropomorphs show less variation than those depicted independently or in groups. All are monochrome in a range of colours, 16 in Bunuba and four in Gooniyandi Country.

Tracks

There are 392 tracks at 23 sites in this study. Tracks are both the realistic and symbolic depictions of marks left by humans, birds and other animals. Human hand and foot stencils are the more intimate marks of human presence. Tracks created using other techniques are symbolic representations of human and animal tracks. This category is subdivided into five subject matters of tracks at Level 3, relating to the type of creature and/or limb (in the case of humans) represented.

Human hands are the dominant track in the study area (Table 6.43), at 19 sites: 16 in Bunuba and three in Gooniyandi Country. The majority (97%) of all types of tracks are in Bunuba Country, with no bird tracks or human feet recorded at Gooniyandi sites.

TABLE 6.42 TRACK TYPES BY CULTURAL AREA.

Track types	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Human hands	286	75	7	70	293	75
Quadruped	5	1	1	10	6	2
Birds	71	19	0	0	71	18
Human Feet	1	0	0	0	1	<1
Macropod	19	5	2	20	21	5
Total	382	100	10	100	392	100

Colour

Most tracks are monochrome, and the pigment most used is white (Table 6.43 and Table 6.44). The 'Other' colour for tracks relates to engraved figures. A small number of figures are bichrome, although no colour combination appears to dominate, with only red/white recorded for more than one motif.

TABLE 6.43 TRACKS BY COLOUR TECHNIQUE.

Colour	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Monochrome	289	75	8	70	297	76
Bichrome	5	1	2	20	7	2
Polychrome	0	0	0	0	0	0
Other	88	23	0	0	88	22
Total	382	100	10	100	392	100

TABLE 6.44 TRACK COLOURS AND COLOUR COMBINATIONS BY CULTURAL AREA.

Colour	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Monochrome						
Black	12	3	0	0	12	3
Mulberry	6	2	0	2	6	2
Orange	1	0	1	10	2	1
Red	32	8	3	30	35	9
White	237	62	4	40	241	61
Yellow	1	0	0	0	1	<1
Bichrome						
Black/Red	1	0	0	0	1	0
Black/White	0	0	1	10	1	<1
Mulberry/White		1	0	0	1	<1
Orange/White	1	0	0	0	1	<1
Red/White	2	1	1	10	3	1
Other	88	23	0	0	88	22
Total	115	100	40	100	155	100

Technique

As suggested by colour type 'Other', engraving is used to create tracks (Table 6.45). This is not the case in Gooniyandi Country where painting and stencilling are the main techniques used. Individual and combined additive techniques are also used, dominated by stencilling at 64% across the study area, followed by abraded and incised tracks 20%, and printed tracks 6%. All the printed tracks are human hands, and the stencilled tracks are human hands (Figure 6.37), and a single small human foot.

FIGURE 6.37 SOME OF THE MANY STENCILLED HUMAN HANDS (N=143) AT MOUNT BEHN 1, BUNUBA COUNTRY.

TABLE 6.45 TECHNIQUES USED IN THE PRODUCTIONS OF TRACKS.

Technique	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Painted	9	2	4	40	13	3
Drawn	10	3	0	0	10	3
Stencilled	246	64	3	30	249	64
Incised	7	2	0	0	7	2
Abraded & Incised	80	21	0	0	80	20
Painted & Stencilled	6	2	2	20	8	2
Painted & Drawn	1	0	0	0	1	<1
Printed	22	6	1	10	23	6
Scratched	1	0	0	0	1	<1
Total	382	100	10	100	392	100

Infill

89% of stencilled and engraved tracks (Figure 6.38) do not have infill; they are outlined in blown or spattered pigment, or made up of a series of joined lines, (Table 6.46). Tracks with infill are painted or printed with solid infill.

TABLE 6.46 TYPES OF INFILL USED IN TRACKS.

Infill type	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
None	345	90	4	40	349	89
Solid	37	10	6	60	43	11
Solid + Pattern	0	0	0	0	0	0
Pattern only	0	0	0	0	0	0
Total	382	100	10	100	392	100

FIGURE 6.38 CLOSE UP OF INCISED BIRD TRACKS AT TANGLAMA, BUNUBA COUNTRY.

Other Attributes

Other attributes such as prepared backgrounds, dividing lines, additions or variations are recorded for all motifs, but none were present for tracks in this study. Handedness was recorded for human hands (left or right), and number of toes for bird tracks.

Human hands are predominantly left hands, with many unclear from deterioration or superimposition (Table 6.47). This suggests right handedness, with the dominant hand used to mix and apply the pigment to the non-dominant hand (Gunn 2007). Contemporary accounts (Crawford 1968:21-22; Gunn 2007:199; Mulvaney 1996:17) and the patterns produced in experimental archaeology (Vicky Winton 2010 pers. comm., July 12) suggest that the pigment in hand stencils was most likely blown onto the surface, rather than spattered by another hand. It has been suggested that the use of a particular hand in stencil may be more reflective of stochastic choice by an individual, or emblemic choice indicating conformity as a member of a cultural group (Franklin 1986; Sackett 1990). It is also possible that the dominant hand is used for mixing and holding spraying implements or transferring the ochre to the mouth whilst placing the non-dominant hand for the stencil. It may also be that cultural norms are followed to ensure that the stencils are of left hands (e.g. Conkey 1990; McDonald 1999; Sackett 1985; 1990; Wiessner 1984; 1985) and in white in the southern Kimberley.

TABLE 6.47 OTHER ATTRIBUTES RECORDED FOR TRACKS.

Other attributes for tracks	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total*	Number of figures	Percent of total*	Number of figures	Percent of total*
Hands						
Left Hand	161	42	5	66	166	46
Right Hand	49	13	0	0	49	13
Not Clear	76	20	2	20	78	21
Bird Tracks						
3 Toe	58	15	0	0	58	16
4 Toe	13	3	0	0	13	4

*Percentage of total track motifs

The number of toes on a bird track may indicate species (e.g. Gunn et al. 2011b; Mulvaney 2010:181, 287; Ouzman et al. 2002), with three toes suggesting a generic bird and four suggesting an emu, particularly if one of the toes is in the opposite direction (Figure 6.39). In this assemblage there are four times more three-toed bird tracks than the four-toed variety.

There are instances in which tracks are grouped together, such as hand stencils around an opening at Mount Behn 1 (Figure 6.37), or incised bird and macropod tracks at Tangalma (Figure 6.39). It might be suggested that such groups form compositions, relating a story or

lesson. However, groups of hands are more likely to be affirmation of group membership and connection to Country (Crawford 1968; Colin Hamlin 2011 pers. comm., 18 July). It is likely that the placement of the bird tracks follows a cultural norm (e.g. Franklin 1986), as there are few instances of bird tracks in association with other figures, painted, or on other surfaces.

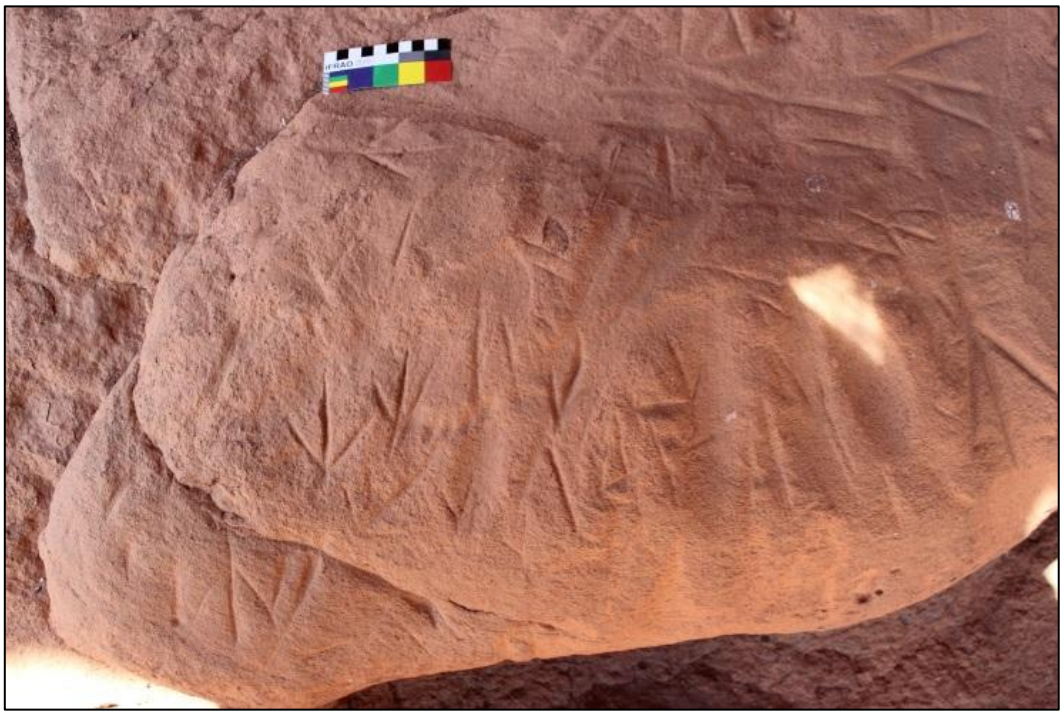


FIGURE 6.39 INCISED BIRD TRACKS ON THE LEDGE AT THE WEST OF TANGALMA ROCKSHELTER.

Geometric

There are 111 geometric figures at 25 sites in this study. This class is divided at Level 3 into eight subject matters or sub-classes (Table 5.4 and Table 6.48). Most of the geometric rock art is in Bunuba Country, where the most numerous are groups of incised parallel lines (Figure 6.40), arc/arc variants and circle/circle variants (Figure 6.41). It should be noted that some geometric rock art such as circles and circle variants may have been intended as something other such as wajarri (boab nuts) or wanggu (yam), but without further information from Traditional Owners it was not possible to classify them otherwise. All geometric subject matters other than the single rectangle recorded are present across the study area.

TABLE 6.48 GEOMETRIC MOTIFS BY CULTURAL AREA.

Geometric subject matters	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Circle/circle variant	19	20	3	14	22	19
Oval/oval variant	8	9	6	29	14	13
Arc/arc variant	18	20	4	19	22	20
Parallel lines	2	2	2	10	4	4
Rectangle	0	0	1	5	1	1
Other linear	2	2	1	5	3	3
Incomplete geometric	4	4	1	5	5	5
Incised parallel lines in groups	37	42	3	14	40	37
Total	91	100	21	100	111	100

FIGURE 6.40 GROUPS OF INCISED PARALLEL LINES ON THE LEDGE AT MARAWUN 4, BUNUBA COUNTRY.

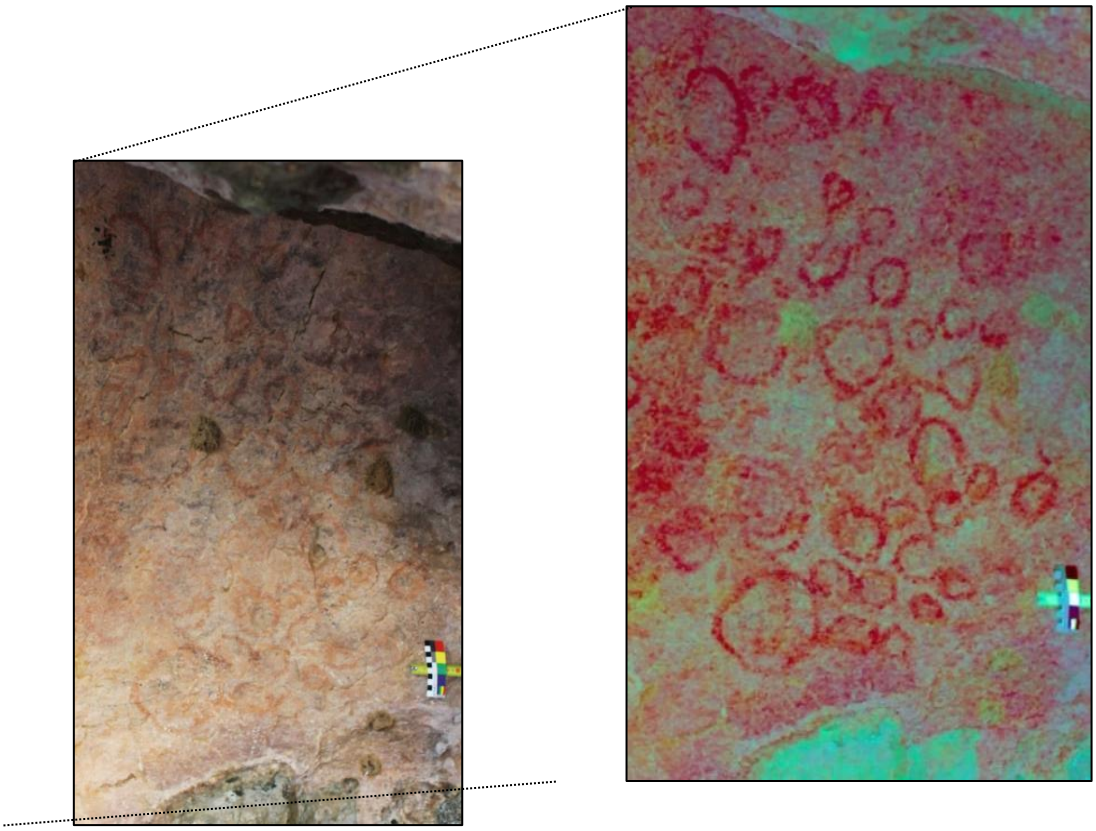


FIGURE 6.41 RED CIRCLES AT TUNNEL CREEK 5, BUNUBA COUNTRY. IMAGE ADJUSTED ON DSTRETCH© LRE/SCALE 15.

Colour

Many geometric figures are incised and do not have colour (Table 6.48). Where pigment is used, in most cases it is monochrome and mostly red (Figure 6.41). It is possible that pigment has been used in the past to colour incised lines or other engraved motifs, but, like the now white marble statues of ancient Greece and Rome (e.g. Kiilerich 2016), if colour was present it has deteriorated to such an extent it is no longer visible.

TABLE 6.49 COLOUR USED FOR GEOMETRIC FIGURES.

Colour	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Monochrome	39	43	13	62	52	47
Bichrome	7	8	4	19	11	10
Polychrome	0	0	0	0	0	0
Other	44	49	4	19	43	43
Total	90	100	21	100	111	100

TABLE 6.50 GEOMETRIC COLOURS AND COLOUR COMBINATIONS.

Colour	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Monochrome						
Black	5	6	1	5	6	5
Mulberry	0	0	2	10	2	2
Orange	4	4	0	0	4	4
Red	17	19	8	38	25	23
White	13	14	2	10	15	14
Bichrome						
Black/White	3	3	2	10	5	5
Black/Yellow	1	1	0	0	1	1
Orange/Red	1	1	1	5	2	2
Other	44	49	4	19	48	43
Total	90	100	21	100	111	100

Technique

Painting is used more often for geometric rock art in this study (53%). In Gooniyandi Country 81% is painted, compared to Bunuba Country where incision and painting are close to equal (Table 6.51). As described above much of the rock art in this category are groups of parallel incisions, and this is reflected in the techniques used. However, incisions are not always unenhanced, and there are geometric figures created with incision and abrasion.

TABLE 6.51 TECHNIQUES USED IN THE PRODUCTION OF GEOMETRIC ROCK ART.

Technique	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Painted	42	47	17	81	59	53
Drawn	2	2	0	0	2	2
Incised	38	42	2	10	40	36
Abraded & Incised	3	3	0	0	3	3
Painted & Drawn	1	1	0	0	1	1
Incised & Scratched	2	2	0	0	2	2
Painted & Scratched	1	1	0	0	1	1
Scratched	1	1	1	5	2	2
Unclear	0	0	1	5	1	1
Total	90	100	21	100	111	100

Infill

Engraved figures in this category do not have pigment visible, which means that most geometric rock art does not have infill (Table 6.52) Painted figures have infill, mostly solid. There is geometric rock art with pattern infill, such as a bichrome arc with scratched lines forming a pattern, and a small number of painted or drawn motifs with pattern infill.

TABLE 6.52 TYPES OF INFILL USED IN GEOMETRIC ROCK ART.

Infill type	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
None	56	62	5	24	61	55
Solid	30	33	16	76	46	41
Solid + Pattern	1	1	0	0	1	1
Pattern only	3	3	0	0	3	3
Total	90	100	21	100	111	100

Other Attributes

There are two additional attributes identified for geometric rock art, both for the groups of incisions. The first is group size (Table 6.53), which varies across both cultural areas. Defining the lines as belonging to a group is determined by the proximity of lines to one another and the group's separateness from other groups or figures on the same surface. Parallel lines are most often in groups of three or four. There are four groups with seven lines, and 10 groups with ≥20 parallel lines. This is a substantial and highly visible motif in the geometric assemblage, amounting to a total of 540 lines, in both Bunuba (87%) and Gooniyandi Country (13%).

The second is the surface on which the incisions are made, which was recorded to assess whether they are made on the same surfaces as other rock art (Table 6.54). Most are on horizontal surfaces, either ledges attached to a shelter wall, or on separate boulders. All incisions are at easily accessible heights between 0.2m and 1.3m from floor level, suggesting that physical comfort or accessibility may have been a factor in spending the time required to make deep incisions. There are some groups of incisions on ceilings and vertical walls, and a single group of incisions was recorded on a rock small enough to be moved around a site, but larger and heavier than might be carried between sites.

TABLE 6.53 NUMBERS OF INCISED PARALLEL LINES IN GROUPS.

Number of Incised parallel lines in a group	Bunuba		Gooniyandi		Total	
	Number of groups	Percent of total Geometric	Number of groups	Percent of total Geometric	Number of groups	Percent of total Geometric
2	4	4	0	0	4	4
3	6	7	1	5	7	6
4	5	6	0	0	5	5
6	2	2	0	0	2	2
7	4	4	0	0	4	4
9	1	1	0	0	1	1
10	1	1	0	0	1	1
11	2	2	0	0	2	2
12	2	2	0	0	2	2
17	1	1	0	0	1	1
20	2	2	0	0	2	2
22	0	0	1	5	1	1
24	1	1	0	0	1	1
26	1	1	0	0	1	1
27	1	1	0	0	1	1
30	1	1	0	0	1	1
42	1	1	0	0	1	1
46	1	1	1	5	2	2
66	1	1	0	0	1	1
Total	37	42	3	14	41	37
Total Incised lines	469		71		540	

TABLE 6.54 INCISED PARALLEL LINES IN GROUPS BY SURFACE PLACEMENT.

Surface	Bunuba		Gooniyandi		Total	
	Number of groups	Percent of total*	Number of groups	Percent of total*	Number of groups	Percent of total
Ledge						
Horizontal	20	54	2	67	22	54
Vertical	4	11	1	33	5	12
Boulder						
Horizontal	1	3	0	0	1	2
Vertical	2	5	0	0	2	5
Other surface						
Wall (vertical)	5	13	0	0	5	12
Ceiling	4	4	0	0	4	10
Portable rock	1	3	0	0	1	2
Total	37	100	3	100	41	100

Historical Inscriptions

There were 16 Historical Inscriptions recorded at seven sites in this study (Table 6.55). Most Historical Inscriptions are in Gooniyandi Country at five sites. The two sites with historical inscriptions in Bunuba Country are both within 20m of the southern exit to Dimalurru/Tunnel Creek, a busy tourist destination during the dry season.

Historical Inscriptions are divided into five subject matters or sub-classes (Table 5.4), with the two most often recorded probable initials and remnant letters/writing with parts obscured (Table 6.56).

TABLE 6.55 HISTORICAL INSCRIPTIONS BY CULTURAL AREA.

Historical Inscription type	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Composite	0	0	2	17	3	19
Initials	0	0	6	50	6	38
Numbers	0	0	1	8	1	6
Names	1	25	1	8	2	12
Writing/Letters	3	75	2	17	5	31
Total	4	100	12	100	16	100

TABLE 6.56 SELECTED TRANSCRIPTIONS.

Bunuba	Gooniyandi
ALLAN P??	TLW xX
.HSIS	c E
LI??A	C. NELSON 20/12/77

Note 1: ? = letters present that have too little detail to identify.
Note 2: The lines and dots included are part of the inscriptions.

Colour, Technique and Infill

Most of the Historical Inscriptions in this study do not have colour or infill, because they are mostly scratched or otherwise engraved (Table 6.57). The few inscriptions with colour are painted in white.

Most inscriptions are in upper case. Punctuation is present in one inscription, with a full stop after an initial, and lines between numbers forming a date (Table 6.55). One historical inscription is the name of a known person, the son of a Traditional Owner (Dorothy Surprise 2011 pers. comm., 30 August) who assisted in recording the site and identified his inscription (Figure 6.42). Archival research may be able to identify other inscriptions, such as the name and date in Table 6.56, but this is outside the scope of this study at present.

FIGURE 6.42 BEVAN COX' SCRATCHED AT THE ENTRANCE TO RIWI, GOONIYANDI COUNTRY (M188).

TABLE 6.57 COLOURS, TECHNIQUES AND INFILL USED FOR HISTORICAL INSCRIPTIONS.

Attributes for historical Inscriptions	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total*	Number of figures	Percent of total	Number of figures	Percent of total
Colour						
Monochrome	1	25	2	17	3	19
Other	3	75	10	83	13	81
Individual Colours						
White	1	25	2	17	3	19
Other	3	75	10	83	13	81
Technique						
Painted	1	25	2	17	2	13
Incised	0	0	1	8	1	6
Incised & Pecked	0	0	1	8	1	6
Incised & Scratched	0	0	1	8	1	6
Scratched	3	75	7	58	10	63
Infill						
None	4	100	10	83	14	88
Solid	0	0	2	17	2	13

Other

There are 14 figures in the 'Other' category recorded at four sites in the study area, all in Bunuba Country (Table 6.58). This category has three subject matters or sub-classes described as figurative because they appear to have form, but do not fit under any other classification heading, or appear to bear any close relationships to one another.

Discussion with Bunuba Rangers and senior Traditional Owners suggested many possibilities for the starburst/lightning motif, including a star map of the night sky, tracks between water holes and the remnants of lightning in the night sky (Bunuba Rangers 2012 pers. comm., 25 July). Another suggestion was that it might be *Jula* maps: maps to large important women's sites, places where powerful women's spells were created. The long curving lines emanating from the centre would be snakes representing women's power reaching out across the land (Patsy Bedford, Kaylene Marr, Selina Middleton, June Oscar and Mona Oscar 2012 pers. comm. 18 August). No one is certain what the figures are, or

what they represent (Figure 6.43). Those who visited the sites during the research had no personal or cultural knowledge of the figures though they shared other knowledge about the sites. The older Traditional Owners, who could not access the site and were shown the images later, did not know about these motifs either (Mona Oscar 2012 pers. comm., 17 August, C Dann 2012 pers. comm. 28 August). The starburst/lightning motifs occur at two sites in Bunuba Country.

The three composite figures in this category are close together at one site (Figure 6.44), and the radiating lines which almost form an oval shape (Figure 6.45) are at another.

TABLE 6.58 OTHER ROCK ART FIGURES BY CULTURAL AREA.

Other figures	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Starburst/Lightning	10	71	0	0	10	71
Composite Figure	3	21	0	0	3	21
Radiating lines forming an oval	1	7	0	0	1	7
Total	14	100	0	100	14	100

FIGURE 6.43 STARBURST/LIGHTNING FIGURES AT MOUNT BEHN 1, BUNUBA COUNTRY.

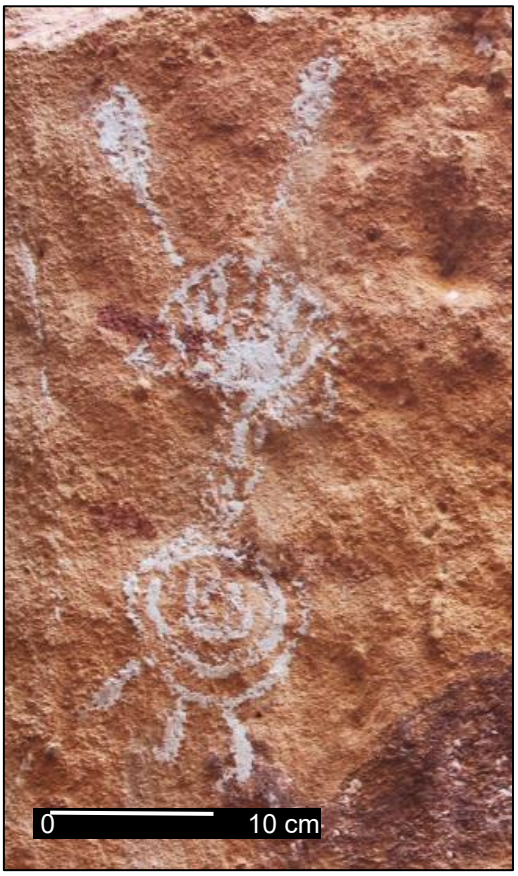


FIGURE 6.44 COMPOSITE FIGURE AT ELIMBERRIE SPRINGS, BUNUBA COUNTRY (M3139).

FIGURE 6.45 RADIATING LINES FORMING AN OVAL AT MARAWUN 7-1, BUNUBA COUNTRY (M2951).

Colour, Technique & Infill

The starburst/lighting motifs are in both monochrome and bichrome (Table 6.59, Figures 6.8 and 6.43). All the other figures are monochrome. The composite figures are white (Figure 6.44), and the radiating lines are red (Figure 6.45). All the rock art in this category is painted.

TABLE 6.59 COLOURS, TECHNIQUES AND INFILL USED FOR OTHER MOTIFS.

Attributes for Other figures	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total*	Number of figures	Percent of total	Number of figures	Percent of total
Colour						
Monochrome	8	57	0	0	8	57
Bichrome	6	43	0	0	6	43
Individual Colours						
Orange	2	14	0	0	2	14
Red	3	21	0	0	3	21
White	3	21	0	0	3	21
Orange/White	1	7	0	0	1	7
Red/White	5	36	0	0	5	36
Technique						
Painted	14	100	0	0	14	100
Infill						
None	3	21	0	0	3	21
Solid	11	79	0	0	11	79

Other Non-Figurative Markings

The non-figurative category is included to record other evidence or remnants of cultural marking in the study area. This may not be rock art in the sense that it may or may not be art, but it is identifiable as created by human, and appears to be intentional and consistent in form.

A subclass within this category is cupules, about which there has been debate regarding their role as rock art or cultural markers (e.g. Bednarik 2008; Mulvaney 2013; Taçon et al. 1997), and it may be suggested that in context they are both (see below). The other subclasses have less evidence that they are used as cultural markers and are included in the classification to note their presence.

Acknowledging cupules is important in classification. Similar to other discussions that cupules may have been used for mixing pigment, other markings may be the artefacts of functional activities reflecting a human presence. For example, abraded grooves may be the result of shaping tools or the result of an artistic, social or symbolic activity. Harrison (2002b:235) suggested that cupules may have had several different purposes in Jaru Country (south of Gooniyandi Country). They may have been used as a guide to places, boundary marking, a means to humanise the landscape, or even to represent a being from the Dreaming.

Grinding patches and stones may have functions related to rock art production, food preparation and/or the creation or shaping of tools from wood, stone or bone. The presence of these markings opens discussion in other areas from which research may be pursued

using this data. There are 25 non-figurative markings in this category, recorded at nine sites (Table 6.60).

Most cupules in the study area appear either singly or in groups of three or four. The exception is a group of 32 cupules on one boulder at Tangalma (Figure 6.46). This suggests that cupules may have been created as rock art at one site at least. Sites with fewer cupules do not have any appearance of patterning (Figure 6.47), though this does not discount them as a form of artistic or cultural expression.

TABLE 6.60 OTHER NON-FIGURATIVE MARKINGS BY CULTURAL AREA.

Other Non-figurative markings	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Abraded grooves	4	17	0	0	4	16
Cupules	8	35	2	100	10	40
Grinding Patch	8	35	0	0	8	32
Grinding Stone	3	13	0	0	3	12
Total	23	100	2	100	25	100

Cupules are not widespread in highly visible groupings such as the group at Tangalma (Figure 6.46). They more often appear to beincidental and in small numbers such as those at Tarakalu (Figure 6.47).

FIGURE 6.46 AN ARRANGEMENT OF 32 CUPULES AT TANGALMA, BUNUBA COUNTRY (M089R).

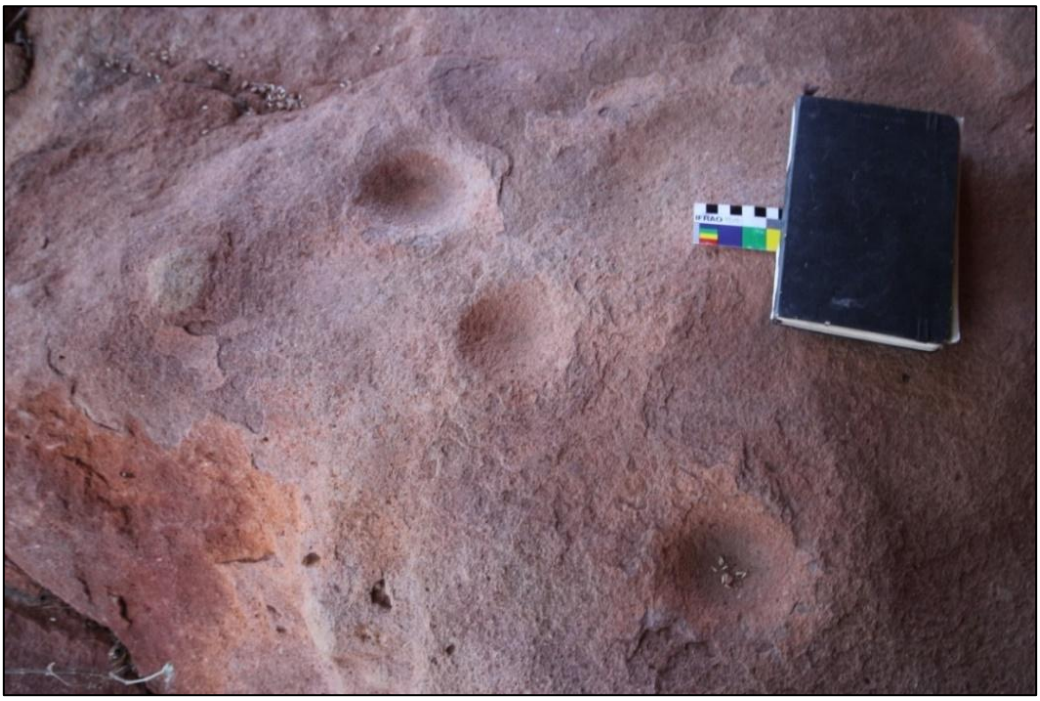


FIGURE 6.47 THREE CUPULES ON A BOULDER AT TARAKALU 1, BUNUBA COUNTRY (M2301).

Colour, Technique & Infill

Cupules, grinding patches and grinding stones all have the potential to retain remnants of colour; few (n=8) in this study did (Table 6.61).

The techniques recorded for the other non-figurative markings reflect only those identifiable from visual examination and may not be representative of all techniques used. The most frequently observed technique is abrasion, or a combination of abrasion and another subtractive technique. Pigments are not painted or drawn; they are ground into the surface, suggesting a functional purpose (e.g. grinding or mixing pigment).

All cupules and abraded grooves are on horizontal surfaces, either a ledge (n=5) or a large boulder within, or at the edge of, sites (n=8).

Grinding patches are all on horizontal surfaces of boulders or ledges. The surface area is not identifiable either way on portable grinding stones, as multiple surfaces show striations of grinding on the stone observed in the field.

TABLE 6.61 COLOUR, TECHNIQUE AND INFILL USED FOR OTHER NON-FIGURATIVE CULTURAL MARKINGS.

Attributes for other non-figurative markings	Bunuba		Gooniyandi		Total	
	Numbers	Percent of total*	Numbers	Percent of total	Numbers	Percent of total
Colour						
Monochrome	4	17	2	100	6	24
Bichrome	1	4	0	0	1	4
Polychrome	1	4	0	0	1	4
Other	17	74	0	0	17	68
Individual Colours						
Red	2	9	1	1	3	12
White	2	9	1	50	3	12
Other	17	74	0	0	17	68
White/Yellow	1	4	0	0	1	4
Red/White/Yellow	1	4	0	0	1	4
Technique						
Abraded	11	48	1	50	12	48
Abraded & Incised	1	4	0	0	1	4
Abraded & Pounded	6	26	0	0	6	24
Unclear	5	22	1	50	6	24
Infill						
None	22	96	1	50	23	92
Solid	1	4	1	50	2	8

Summary

This chapter details rock art in Bunuba and Gooniyandi Country in the southern Kimberley during two seasons of fieldwork. It provides descriptions and statistics on variations across the range of attributes for the rock art for each of the nine classes, depicted subject matter and its attributes.

Most of the recorded rock art is determinate. Figures at individual sites range from one to more than 600. Painted rock art dominates the caves, exposed walls and rockshelters in this region. The figures are predominantly monochrome, and the most prolific colours are red and white.

Differences between the two cultural areas include the white outlined motifs with black infill, mostly in Gooniyandi Country and engraved bird tracks, only recorded in Bunuba Country.

The statistics suggest that while the two cultural areas have much in common regarding the dominance of anthropomorphs and zoomorphs, there are differences in the extent to which one or another is present in the rock art.

Table 6.62 summarises the nine rock art classes in each cultural area's assemblage and reveals that while most classes are dominated by Bunuba rock art, the nine classes of rock art have different relative proportions in each cultural area.

A major difference is the proportion of anthropomorphs and zoomorphs in the two cultural areas. They each make up close to 30% of the Bunuba assemblage, whereas zoomorphs are 50% of the Gooniyandi assemblage, and anthropomorphs 23%.

Another distinction is that tracks account for 24% of figures at Bunuba sites, but only 3% in Gooniyandi Country, and those are mostly engraved.

Historical inscriptions are another point of difference. Most classes of rock art are numerically greater in Bunuba Country, but this is reversed for Historical Inscriptions. This type of rock art indicates colonial/post-colonial activity at sites, and it may have been expected that where one type of colonial/post-colonial markings (historical inscriptions) are present others would also be present such as anthropomorphs, introduced animals or ships (Fyfe 2010b; Paterson & Van Duivenvoorde 2013; Paterson & Wilson 2009; Paterson & Wilson 2010; Strano 2009; Taçon et al. 2012).

A single instance of contact type anthropomorph was recorded in Bunuba Country (Table 6.12), and none in Gooniyandi Country during two seasons of fieldwork. One site was later noted by *Lifeways* CIs in Gooniyandi Country containing both historical inscriptions and colonial images, but not visited or recorded in this study (Balme & O'Connor 2015), adding further to the imbalance in colonial/post-colonial rock art between Bunuba and Gooniyandi Country. This suggests differences in the choice of marking, or cultural responses in the two cultural areas following the uptake of pastoral leases, and subsequent colonisation of the southern Kimberley. It is notable that in an area settled by Europeans for close to 130 years historical inscriptions and contact style anthropomorphs form a very small proportion of the assemblage, 21 figures or <1% of the assemblage in this study.

The statistics in this chapter describe at a raw level the similarities and differences between rock art in Bunuba and Gooniyandi Country and inferentially the people who have lived and continue to live there. This forms the basis for identifying patterns of attributes, particularly in the anthropomorphs and zoomorphs, the most represented figures in the rock art, which may be used in conjunction with the information provided by Traditional Owners to define styles.

TABLE 6.62 SUMMARY OF ROCK ART FIGURE CLASSES BY CULTURAL AREA.

Rock art Figure Classes	Bunuba		Gooniyandi		Total	
	Number of figures	Percent of total	Number of figures	Percent of total	Number of figures	Percent of total
Anthropomorph	473	30	80	23	553	29
Zoomorph	441	28	173	50	614	32
Phytomorph	115	7	40	11	155	8
Material Culture	30	2	11	3	41	2
Tracks	382	24	10	3	392	20
Geometric	90	6	21	6	111	6
Historical Inscriptions	4	<1	12	3	16	<1
Other	14	<1	0	0	14	<1
Other non-figurative	23	1	2	<1	25	1
Total	1572	100	349	100	1921	100

Chapter 7 begins with identifying the broad patterns of figure attributes, and through a process of elimination narrows these down to identify styles specific to the southern Kimberley, including the subclass of Waliarri identified by Traditional Owners in earlier Chapters (June Oscar and Mona Oscar 2012, pers. comm., 18 August), and the black and white rock art in Gooniyandi Country described above.

The classes of figures and the styles identified in Chapter 7 underpin the analysis of spatial distribution and density in Chapter 8, to address questions of similarity and differences between the cultural groups. Chapter 9 adds a layer of chronological information, gained from mapping superimpositions during and after fieldwork, to explore a potential chronology of styles and address questions of the type or extent of changes over time.

‘You gotta have style’[1]

Style is a way to say who you are without having to speak
(Zoe 2014)

Introduction

Defining style can be problematic given the many different perspectives and experiences that influence rock art researchers. To overcome potential subjectivity, based upon my own culturally formed world views and societal norms I have integrated Bunuba and Gooniyandi knowledge and interpretations with Maynard’s (1977) component approach to defining style. This recognises the importance of clarity and consistency while maintaining shared knowledge and contemporary Indigenous perspectives.

Using this approach to identify styles in the southern Kimberley, I recorded as many attributes of the rock art as possible in the field with the assistance of Bunuba and Gooniyandi Traditional Owners in 2011 and 2012, and in post-field analysis of digital images. This meant that I was able to identify several styles in the field because of their distinctive combinations of attributes and the informed interpretation and knowledge of Traditional Owners.

Rock art was grouped into initial styles during fieldwork according to the dominant colours, fill (or lack thereof), techniques, easily observed details such as a distinctive outline, and/or information shared by Traditional Owners (Tables 7.1 and 7.2). Using this approach the figures were further refined within the initial styles to identify new styles or substyles. For example, more detailed analysis of a polychromatic figure revealed that while some defining

[1] (Chaloupka 1993)

attributes were carried across figures in the same or similar form, they lacked the full array, and those with less detail were a potential substyle, as described later in this chapter.

Styles in which one motif class provides the index case are also present in other classes. Key attributes in common provide the links between classes and styles. For example, zoomorphs and phytomorphs do not have headdresses, but they may be the same colours, outline, infill and patterns as an anthropomorph with a headdress on the same panel to suggest they are created in the same style – a way to say where you belong (equating an infill pattern to clothing, after Wobst 1977) or who you are without having to speak.

TABLE 7.1 INITIAL STYLES DEVELOPED THROUGH CLASSIFICATION IN THE FIELD BEFORE DETAILED ANALYSIS (CF. TABLE 7.12).

Field Identified Styles: Broad Descriptions	Number of Figures
Monochrome Solid Infill	954
Monochrome Outline Only (no infill)	97
Detailed Monochrome with Patterned Infill.	50
Bichrome Solid Infill	122
Bichrome Black Solid Infill with White Outlines.	48
Highly Detailed Polychrome with Patterned and/or Solid Infill.	103
Monochrome Hand Stencils	253
Engraved Tracks	87
Not Allocated	*207*
Total determinate figures	1

Building on this schema, I used observation, detailed photographic and statistical analysis and discussion with Traditional Owners to work out what may constitute styles in the southern Kimberley. This meant that I was able to work from the foundation of figures recognised and named by Traditional Owners through their own cultural knowledge. I combined this with an academic approach comparing form and specified attributes identified through archival research, professional discussions, and fieldwork, and then grouped rock art into styles which may be statistically and/or culturally meaningful.

TABLE 7.2 ATTRIBUTES FOR THE INITIAL STYLES DEFINED IN THE FIELD BEFORE THE ANALYSIS.

Initial Style Name	Style Attributes
Monochrome Solid Infill	Figures which are • a single colour; • infilled in a single colour which is consistently solid, with no patterning, or indications of the earlier presence of other colours; • lacking internal detail (e.g. eyes, cloaca, divisions, facial or body features); and • showing/not showing an outline or remnants of an outline in the same colour.
Monochrome Outline Only	Figures which are • a single colour; • lack any infill, or remnants thereof; • lack, or have minimal (≤2), internal details such eyes, cloaca, divisions, facial or body features; and • have an outline which defines the form of the motif.
Detailed Monochrome with Patterned Infill	Figures which are • a single colour; • infilled fully or partially with a pattern; • with one or more attributes that may be described as internal detail (e.g. eyes, cloaca, divisions, facial or body features); and • with or without an outline in the same colour which defines the form of the motif.
Bichrome Solid Infill	Figures which are • two colours; • infilled in those colours, which may be in the form of solid colour block/s; and • showing/not showing an outline or remnants of an outline.
Bichrome Black Solid Infill with White Outlines	Figures which have • black solid infill; • wide white outlines; and • ≤2 internal features.
Highly Detailed Polychrome with Patterned and/or Solid Infill	Figures which have: • ≥3 colours; • internal details or features such as facial features, dividing lines or anatomic/phytotomic features; • external details in contrasting colours to other parts of the motif, such as a headdress, protruding tongue or stalks; • patterned infill with contrasting colours and/or solid infill in a contrasting colour to an outline, blocks of solid infill in contrasting colours or any combination thereof; and • with/without an outline, or remnant of an outline, in the same contrasting colour as infill.
Monochrome Hand Stencils	A human hand shape defined by a sprayed or splattered stencil of pigment around the shape.
Engraved Tracks	Stylised or realistic animal or bird tracks incised, abraded or scratched into the rock surface.

It was tempting to look for figures which fit established and recognised styles, chronologies or prototypes (McDonald & Veth 2006; Travers & Ross 2016; Walsh 1988; Welch 1993a; 1993b), particularly with the prescience of the Wanjina in the central, northern and coastal Kimberley (Akerman 2014; Blundell 1974; 1975; Crawford 1968; Elkin 1948; Layton 2012; Welch 2016). This would have pre-empted the potential for previously unknown styles to be identified, and ignore (a) the differences between the Wanjina and the southern Kimberley

figures, which I will discuss later in this chapter, (b) the substantially different compositional arrangements in the southern Kimberley, which are part of the Wanjina narrative elsewhere (Akerman 2009b; 2016; Blundell 1974; Crawford 1968; Welch 2016), (c) that these figures are not named Wanjina by the Bunuba people where most were recorded (Patsy Bedford, June Oscar & Mona Oscar pers. comm., 2011; 2012 pers. comm., 15 August), and (d) the plethora of other rock art and its distinctive, and even unique, styles.

For example, Traditional Owners identified three anthropomorphs as Ancestral Beings[2], Waliarri (June Oscar, Mona Oscar 2011 pers. comm., 8 September), Mamo (Patsy Bedford, June Oscar, Mona Oscar, 2012 pers. comm., 15 August) and Djuari (Isaac Cherel, June Davis, Lorraine Shandy, Mervyn Street 2011 pers. comm., 1 September). These beings have attributes which set them apart from other figures, such as headdresses, internal and body fill patterns, and colour schemes. The attributes and stories were recorded in the field which helped with the post field analysis, moving from initial style groupings based on colour, form and technique, to more detailed definitions and/or substyles based on the presence/absence of attributes, such as internal details and patterns.

There are 207 determinate figures which do not have enough common attributes to be reliably allocated to a style. Some may be deteriorated, such as the 26 bichrome figures with pattern infill but no outline, 41 have only outlines, and others are either unique or too few to show a pattern in their form, composition, placement or execution.

Within the unallocated group are 41 sets of incised lines and 13 scratched historical inscriptions. These do not have defining attributes to suggest that they follow a particular stylistic pattern. Historical inscriptions may follow a grammar, which I developed in an earlier study of Pilbara and Torres Strait inscriptions (Fyfe 2010a; 2010b; Fyfe & Brady 2014), but there are too few in this assemblage, or at any site in this study to reliably create a Kimberley grammar. Similarly, the incised lines do not appear in any defined arrangements, groups or pattern of placement within sites.

This approach enabled me to analyse the rock art styles in accordance with field observation, rather than look for established patterns of attributes to conform to preconceived ideas and styles. The result is that broad styles which could be described as generic figure representations, distinct styles, local styles and substyles were identified in the assemblage recorded in the southern Kimberley, with the remaining figures allocated to

[2] See glossary for a definition of this term.

broad groups for possible future analysis when more sites are recorded in the southern Kimberley, and other approaches to stylistic analysis are employed.

Summary Statistics for Initial Field Identified Styles

Figures in the Monochrome Solid Infill style is the most prolific in this assemblage, followed by Monochrome Hand Stencils (Figure 7.1). Highly Detailed Polychrome figures are sparse, but visibility, due to size, colour and the detail of form, make them an important style with the capacity to signal identity, ideas and territorial boundaries. Similarly, there are few in the Bichrome Black Infill with White Outlines style (henceforth Black & White), but it is important because they dominate where they are present and appear to be a geographically local.

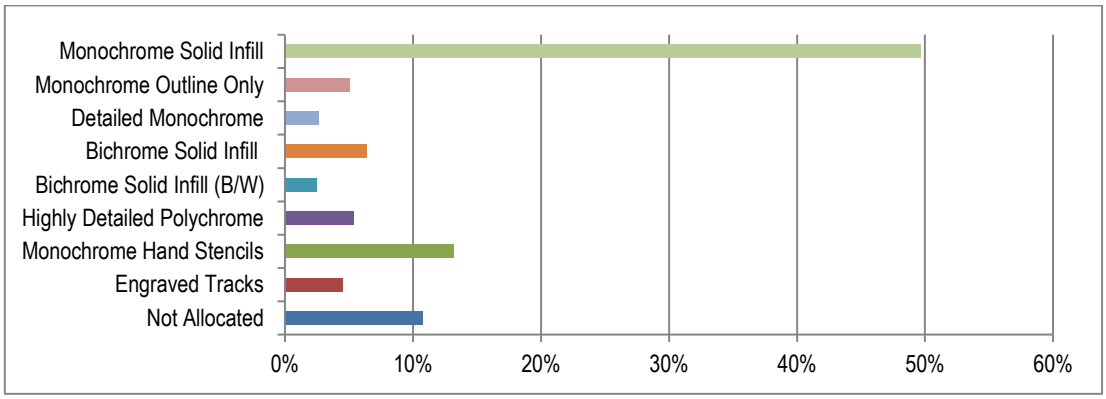


FIGURE 7.1 PROPORTION OF DETERMINATE FIGURES IN THE INITIAL FIELD IDENTIFIED STYLES.

The initial styles are spread across different motif classes. Anthropomorphs and zoomorphs are the only figures which appear in all six initial figure styles. Some styles are dominated by a particular rock art motif class. For example, the Black & White style is dominated by zoomorphs, while the Highly Detailed Polychrome group has similar proportions of anthropomorphs, zoomorphs and phytomorphs (Figure 7.2).

The remainder of this chapter takes the reader through an analysis of the initial styles identified in the field shown in Tables 7.1, 7.2, 7.3 and Figure 7.1, and how analysis of each of those broad, or umbrella ideas of style from the visually obvious attributes leads to a refinement of styles which would otherwise not have been identified.

TABLE 7.3 ROCK ART MOTIF CLASSES BY INITIAL FIELD IDENTIFIED STYLES.

MOTIF CLASS / INITIAL STYLES	Anthropomorph	Zoomorph	Phytomorph	Material Culture	Tracks	Geometric	Historical Inscriptions		Other Non-Figurative	Other	TOTAL Numbers of figures
Monochrome Solid Infill	386	407	72	10	35	37	2		*1*	5	954
Monochrome with Outlines Only	28	30	8	3	10	15	0		0	3	97
Detailed Monochrome with Patterned Infill.	9	29	10	2	0	1	0		0	0	51
Bichrome Solid Infill	51	38	7	10	1	8	0		1	6	122
Bichrome Black Solid Infill with White Outlines.	6	38	0	1	1	2	0		0	0	48
Highly Detailed Polychrome with Patterned and/or Solid Infill.	35	34	32	1	0	0	0		0	0	102
Monochrome and Stencils	0	0	0	0	253	0	0		0	0	253
Engraved Tracks	0	0	0	0	87	0	0		0	0	87
Not Allocated	37	38	26	14	7	48	14		23	0	207
TOTAL	**553**	**614**	**155**	**41**	**392**	**111**	**17**		**25**	**14**	**1**

Monochrome Solid Infill

All motif classes are represented in this initial field identified style (Table 7.3). Figures in this group have a range of common attributes described in Table 7.2.

Rock art is in seven colours (Figure 7.2), uses at least five techniques (Table 7.4) and is in a range of sizes (Figure 7.3). The largest is a 305cm anthropomorph; most are between 10cm and 40cm, and therefore, the details for most are only clearly visible within the cave or rockshelter.

TABLE 7.4 TECHNIQUES USED FOR MONOCHROME SOLID INFILL FIGURES, BY MOTIF CLASS.

MOTIF CLASS / TECHNIQUE	Anthropomorph	Zoomorph	Phytomorph	Material Culture	Tracks	Geometric	Historical Inscriptions	Other Non-Figurative	Other	TOTAL numbers of figures
Painted	365	389	72	10	12	35	2	0	5	890
Drawn	11	4	0	0	0	0	0	0	0	15
Stencilled	0	0	0	0	0	0	0	0	0	0
Engraved	3	3	0	0	0	0	1	0	0	7
Printed	0	0	0	0	23	0	0	0	0	23
Two or more techniques	4	10	0	0	0	1	0	0	0	15
Not clear	2	1	0	0	0	1	0	0	0	4
TOTAL	**385**	**407**	**72**	**10**	**35**	**37**	**3**	**0**	**5**	**954**

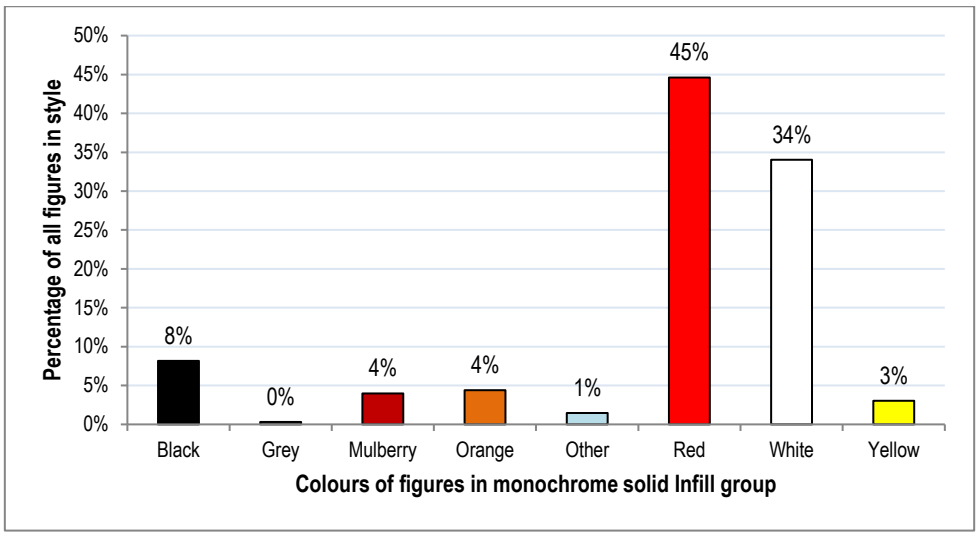


FIGURE 7.2 COLOURS RECORDED FOR FIGURES IN THE MONOCHROME SOLID INFILL STYLE.

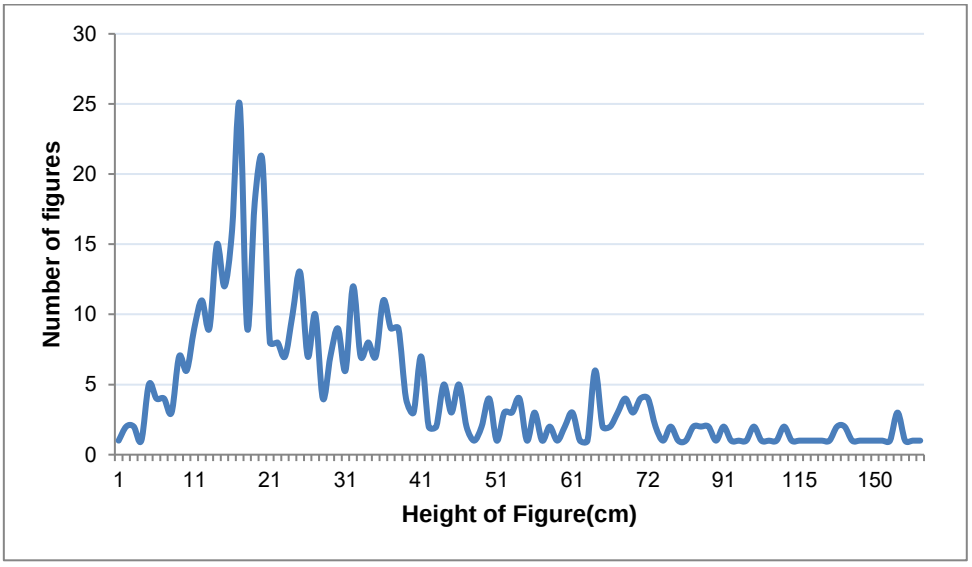


FIGURE 7.3 MONOCHROME SOLID INFILL FIGURES BY HEIGHT.

Anthropomorphs

This initial style description does not include individual attributes which may distinguish one figure from another. However, in post field analysis it was clear that within the initial classification of this style there were attributes which differentiated anthropomorphs from one another, and there was the potential for new or substyles. This section examines five potential new styles of anthropomorph emerging from this style, and identifies attributes which may carry across to other motif classes.

New Style 1: Round Bodied Grouped Anthropomorphs?

Fairfield 2 was the first site where a group of small anthropomorphic figures stood out from others at the site (Figure 7.4) and those observed at other sites. The presence of the same

or very similar figures grouped closely is unusual in this assemblage, and the small, rounded bodies, heads, and simple limbs are consistent in all the figures. This led me to look for similar groups, and I observed the same phenomenon at two other sites.

These anthropomorphs have:

- solid infill;
- a circular or oval body type, with small, rounded heads with no distinguishing facial attributes or additions;
- narrow limbs in a variety of poses (Figures 7.4 and 7.5);
- ≤60cm;
- painted pigment infill, no outlines; and
- appear in close groupings.

In addition, they are never superimposed by more than one other layer, making them relatively recent in rock art sequences.

FIGURE 7.4 SMALL ROUND BODIED GROUPED ANTHROPOMORPHS AT FAIRFIELD 2 (M1351A-M1351O). ADDITIONAL IMAGE ENHANCED WITH DSTRETCH© LAB/SCALE 10.

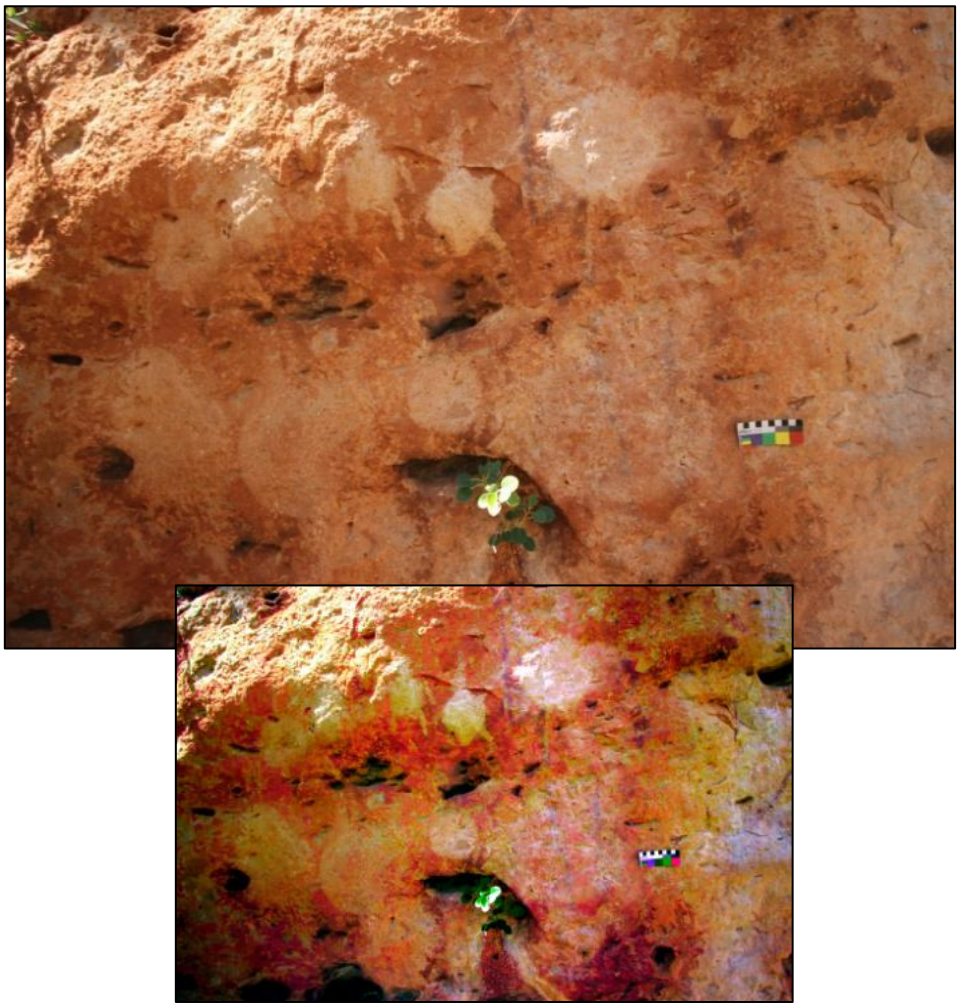


FIGURE 7.5 SMALL ROUND BODIED GROUPED ANTHROPOMORPHS AT MOUNT BEHN 1 (M2173-2180). ADDITIONAL IMAGE ENHANCED WITH DSTRETCH© LAB/SCALE 10.

While there are other anthropomorphs depicted in Monochrome Solid Infill, with rounded bodies and narrow limbs they are not in organised groups (Figures 7.4 and 7.5). This variation is only at three sites in Bunuba Country. At these sites the figures are visible on the exposed rockface part of the shelter. The groups stand out from other figures at the shelters, where other painted rock art images are separate from one another, large, and with other attributes.

While only at three sites it may be considered there is insufficient evidence to identify this as a style, but their visual prominence and variation from other figures at the sites suggests they are there for a purpose, possibly an idea, marking the identity of an artist, or the territory of a family group, or they may be a recent motif created for, or during, a ceremonial gathering. All sites have large floor areas for gatherings, are adjacent to hunting areas, and close to fresh water sources, suggestive of sites where ideas may be exchanged in large groups. This would be described as a local style.

New Style 2: Abraded/Scratched Solid Infill?

The second distinctive anthropomorphs within this initial style are engraved (Figure 6.16). These figures have a solid, abraded infill and with distinctive conical headdresses, and hold spears or sticks. They are distinct within the Monochrome Solid Infill style in overall form, and technique, and are recorded at a single site in the study area, Stumpy's Soak 1 in Bunuba Country.

It is likely that these anthropomorphs are relatively recent. Traditional Owners indicated that Stumpy's Soak 1 was a place where they took shelter from the heat during pastoral work, using fencing wire and other implements available to create rock art while resting (Johnny Bell 2011 pers. comm., 6 September). The conical headdress anthropomorphs are not the most recent figures in the rockshelter; all but one are superimposed by other scratched or painted rock art and indeterminate rock art.

Although the rock art may be within living memory the use of conical headdresses follows an older continuing tradition. Conical headdresses were photographed in the southern Kimberley as early as the 1920s, and as recently as 1994 (Figures 6.16, 6.17, and 6.18). This observation is in keeping with O'Connor et al.'s (2013) conclusion that rock art in the southern Kimberley created in historic times marks resistance to the arrival of Europeans on traditional lands by incorporating traditional motifs and practices, while using introduced tools.

Neither the cave or the rock art is readily visible, and the message may be only available to a small number of people, such as Bunuba people who know its location, which is also consistent with keeping traditions alive, whilst protecting their integrity by limiting access to such a site to a group of people 'in the know'.

Neither the form or the technique used in these figures were seen at any other site, but the rock art is distinctive and consistent within the site to be called a localised style, and it is not limited to anthropomorphs. It may be a style expressed by an individual during times of change, or may be limited to a small group, possibly pastoral workers, who knew about and had access to the site.

New Style 3: Muscle Limbed Anthropomorphs?

Painted anthropomorphs with the single distinct attribute of arms and legs which appear to be naturalistic depictions of heavy musculature were observed at more than one site (Figure 7.6a and b). Initial field discussion suggested that these may be an imitation of Gwion Gwion figures. However, there were clear differences, as the Gwion Gwion mostly have:

- naturalistic limbs, which are usually slim, long, and often in dynamic poses;
- proportionate overall form, appearing in a variety of profiles, including three quarter view; and
- accoutrements including headdresses, sticks and bags (Figure 7.6c).

In contrast, the southern Kimberley figures

- are full frontal depictions with the limbs large and dominant, and lack consistent overall form;
- display a range of different body shapes, arms and hands and feet; and
- lack any accoutrements.

These anthropomorphs only appear as part of a larger group (>1) at two of the five sites (Figure 7.6a), unlike the Gwion Gwion which generally appear with other Gwion Gwion (e.g. Walsh 1994; 2000). They are clearly not related.

These figures are found in a range of superimposition relationships, from no superimposition in one case, to the top layer of superimposition in three cases. The majority are superimposed by other rock art, with one beneath five other layers of other pigment rock art.

There are ten muscled limbed Monochrome Solid Infill anthropomorphs recorded in the study area, all are in Bunuba Country. The low number recorded, the lack of consistency in form (e.g. some have only legs muscled, some have shaped bodies, some have digits while other lack these attributes) and lack of prominence or consistency of group composition at any of the five sites at which they are present does not yet support this being defined as a new style. However, if the figures are discovered at other sites in the vicinity which have not been recorded, then this observation could be reconsidered.

FIGURE 7.6 (A) MUSCLE LIMBED SOLID INFILL ANTHROPOMORPHS PAINTED AT MARAWUN 1, INSERT ENHANCED WITH DSTRETCH©YRD/SCALE 30, (B) STUMPY'S SOAK 1 (M400), (C) YWONA GWION (PHOTO BY GRAHAME WALSH 1994:195).

New Style 4: Monochrome Waliarri?

The Waliarri is a highly detailed polychrome anthropomorph named by Bunuba Traditional Owners (June Oscar, Mona Oscar 2011 pers. comm., 8 September), which will be described in detail later in this chapter (see also Table 7.2). Analysis identified that within the Monochrome Solid Infill style there are 28 anthropomorphs with key attributes in common with the Waliarri, including:

- rayed headdresses;
- rounded heads;
- wide bodies; and/or
- detailed limbs with hands/feet and digits (Figure 7.).

The presence of this variation across 14 sites, 13 in Bunuba and one in Gooniyandi Country, and consistent form makes it distinct and uniform enough to be classified as either a new style or a substyle related to the Highly Detailed Polychrome style, where it will be further analysed to assess it as a potential new style.

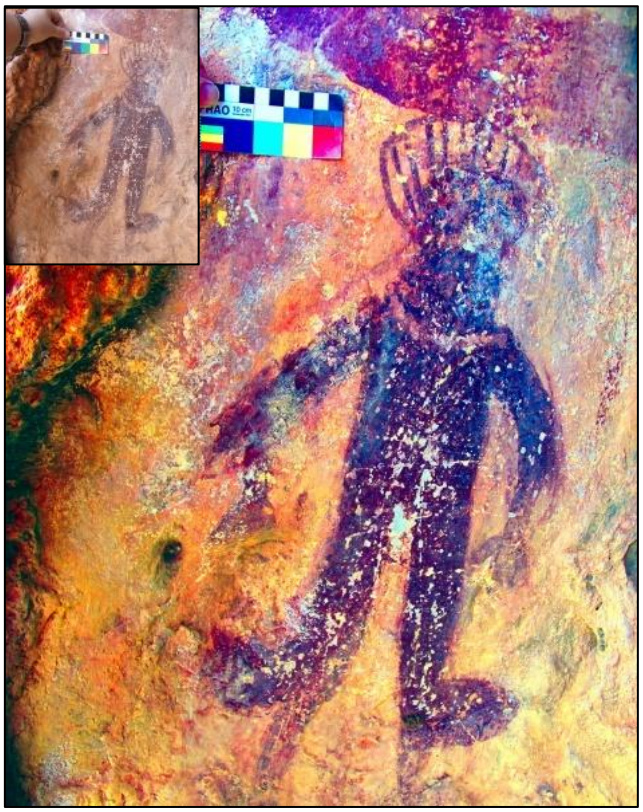


FIGURE 7.7 MONOCHROME ANTHROPOMORPH IN NEW STYLE 4 AT MARAWUN 7-1 (M2903). ADJUSTED WITH DSTRETCH©, AUTOCONTRAST, LAB/SCALE 15.

New Style 5: Monochrome Mamo/Djuari?

Traditional Owners identified several painted Ancestral Beings with a variety of colourings, but with a common overall form as Mamo (Patsy Bedford, June Oscar & Mona Oscar 2012 pers. comm., 15 August), Djuari (June Davies, Helen Malo 2011 pers. comm., 1 September), and Medicine Men (Dorothy Surprise 2011 pers. comm., 30 August). For the purposes of consistency and use in both cultural areas this is abbreviated to Mamo/Djuari[3]. They have:

- feather-like headdresses (1-3 feathers); and
- splayed arms and limbs, with/without digits (Figure 7.8).

Analysis identified 34 anthropomorphs which bear a strong resemblance to those figures. Recorded with consistent form at 17 sites, these anthropomorphs are found in both Bunuba and Gooniyandi Country, suggesting that a new style under this heading, and like Style 4 above which may be further refined as the analysis progresses.

[3] Note: This does not discount Ms Surprise's naming of the Medicine Men. I chose the language names because they were used by multiple informants, rather than a single informant in the case of the Medicine Men.

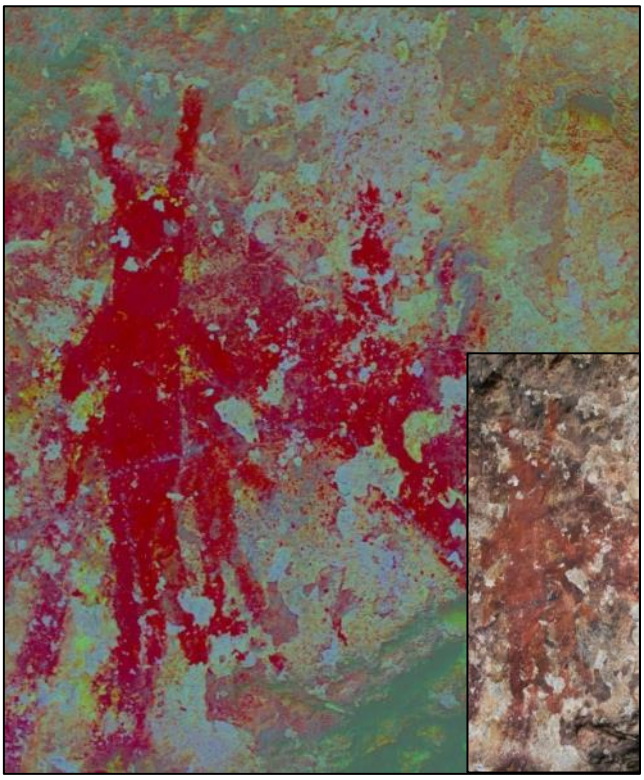


FIGURE 7.8 NEW STYLE 5 ANTHROPOMORPH AT RIWI (M172). IMAGE ADJUSTED IN DSTRETCH© LRE/SCALE 15.

There are four variations with enough consistency in form, size range and site distribution to be called anthropomorph substyles, at this stage of analysis, within the Monochrome Solid Infill style, these are:

- Round Bodied Grouped Anthropomorphs;
- Abraded/Scratched Solid Infill;
- Monochrome Waliarri; and
- Monochrome Mamo/Djuari.

The Muscle Limbed Anthropomorphs (New Style 3) has the potential for a style, but they do not have consistent attributes, and are varied in form. If more examples are found in the southern Kimberley, then it could be reconsidered.

The Abraded/Scratched Solid Infill anthropomorphs are consistent and distinct enough to be identified as a style, but their presence at a single site urges caution in describing it as more than a narrowly local style. The local style descriptor would also apply to the Round Bodied Grouped Anthropomorphs, which are recorded at only three sites in the western part of Bunuba Country, and this is further discussed in Chapter 9.

Zoomorphs

Like anthropomorphs, most of the zoomorphs in this assemblage are painted or drawn in the Monochrome Solid Infill style (Table 7.3) in predominantly red (n=169) and white (n=144).

The dominant technique is painting. There are three Abraded/Scratched Solid Infill zoomorphs at Stumpy's Soak 1 (Figure 7.9), three of the five engraved zoomorphs in the assemblage. The presence of more than one motif class in this variation within the style reinforces that case for describing Abraded/Scratched Solid Infill as a style, and its presence at the same site reinforces it as a highly localised style within the historical period.

There are no other zoomorphs in this style with distinctive attributes or compositions to suggest new styles or substyles for zoomorphs. The main zoomorph attributes allowing them to be identified separately are taxonomic and range from as broad as class (e.g. *reptilia, amphibia*), to family (e.g. *macropodidae*) and in some cases species (e.g. *c. dingo*). Within this style there are 325 *Reptilia* (reptiles), within which are the orders *Crocodilia* (crocodiles), *Squamata* (lizards, snakes), and *Testudinata* (turtles), all of which are depicted as if from an aerial view (Table 7.5).

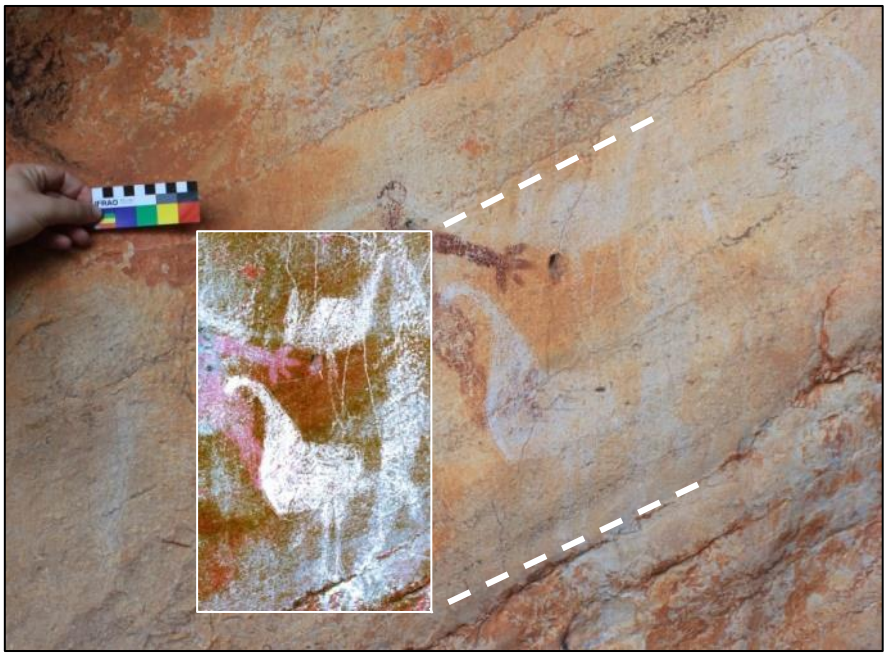


FIGURE 7.9 AN ABRADED/SCRATCHED SOLID INFILL ZOOMORPH AT STUMPY'S SOAK 1. INSERT ADJUSTED USING DSTRETCH© LYE/SCALE 20.

TABLE 7.5 ZOOMORPHS IN THE MONOCHROME SOLID INFILL STYLE BY SPECIFIC ZOOMORPH TYPE.

Zoomorph Type	Number of Figures	Percent of Total (rounded)
Bird (General)	11	3%
Bush Turkey	3	1%
Crustacean	5	1%
Crocodile	18	4%
Dingo	5	1%
Eel	19	5%
Emu	10	2%
Fish (General)	8	1%
Flying Fox	2	1%
Lizard	107	26%
Frog	6	1%
Insect	3	1%
Macropod	7	1%
Quadruped (General)	3	1%
Snake	136	33%
Thylacine	0	0%
Turtle	64	16%
Total	407	100%

Some zoomorphs such as quadrupeds and macropods are in a combination of profile and three-quarter view, with the body and head in profile, but two ears and four legs added to give a partial three quarter profile. The only other depiction of zoomorphs in the Monochrome Solid Infill style is bush turkey which has a rear view, as identified by Traditional Owners (June Oscar 2011 pers. comm., 27 August).

The different profiles of zoomorphs do not suggest a new style, therefore the only additional style for Monochrome Solid Infill zoomorphs is that first identified for anthropomorphs, the Abraded/Scratched Solid Infill local style.

Phytomorphs

Phytomorphs are also sub classified according to taxonomy at family, genus or species level. Wajarri (boab nuts), wanggu (yams) and thanggari (water lilies) were identified by Traditional Owners during fieldwork (Bunuba Rangers 2012, pers. comm. 17-18 July; June Davies and Helen Malo 2011, pers. comm., 1 September; Patsy Bedford 2011 pers. comm., 14 August). Grasses are identified by their form and resemblance to grasses observed in the field, and pods are used to describe circular or oval shapes attached to a line (after Gunn & Mulvaney 2009). There are 72 phytomorphs in this style. All the thanggari (n=27), pods (n=1) and grasses (n=3) are in this style, most of the wajarri (n=19, 73%), and 15% (n=15) of wanggu.

Thanggari have little variation, they are all red, painted, and at Moonggaroonggoo. The only difference observed is that some stems are straight, others curved or twisting (Figure 5.6). Most thanggari (75%, n=20) are either at the top layer of superimposition or have no superimposition and are separate from other figures. The brightness of their pigment, preservation at the site, and their importance in the memories of the Traditional Owners (June Davies and Helen Malo 2011 pers. comm., 1 September) suggests that they may be a relatively recent addition to the assemblage at Moonggaroonggoo, or have been repainted to keep them fresh.

The defining features of Monochrome Solid Infill wajarri (the oval shape and stems at one or both ends) show little variation. Most wajarri are white or red (n=15), and they are in groups or pairs. Wajarri were first identified in this study by Traditional Owners at Fairfield 2 (Bunuba Rangers 2012 pers. comm., 17-18 July), close to the groups of Round Bodied Grouped Anthropomorphs (Figure 7.). It is only at Fairfield 2 that wajarri are found alongside anthropomorphs in the same colour, and the same degree of preservation. It is possible that the wajarri and anthropomorphs were contemporary, but to be categorised in the same style they would need to occur in the same or similar relationship at more than one site, which is not the case.

There are too few grasses and pods to undertake any further analysis. Thus, while there are consistent attributes present in the phytomorphs recorded there were no distinct attributes to suggest any new styles or substyles.

Other Motif Classes

All motif classes other than historical inscriptions have examples in the Monochrome Solid Infill style (Table 7.3). None have as many figures as the anthropomorph, zoomorph and phytomorphs. Nor do other motif classes have variations that might be considered new styles. One is likely printed (Figure 7.10), some are solid lines such as bird or macropod tracks, none are prolific, appear in organised groups or are consistently present across the study area.

FIGURE 7.10 A POSSIBLE HANDPRINT AT MOUNT BEHN 2 (M2289)[4].

The exceptions are 14 painted boomerangs, 14 circles and ovals and three starburst/lightning figures painted in light reds (Figure 6.10). These figures within the Monochrome Solid Infill group do not display any other attributes that might suggest that they are part of a distinct or separate style.

Synopsis

The three most prolifically represented motif classes within the Monochrome Solid Infill style, anthropomorphs, zoomorphs and phytomorphs, have distinctive attributes and arrangements that suggests the broad descriptor does not cover the variation in the ways in which people have created the rock art (Brady et al. 2022; Maynard 1977), including a specific and localised application of technique, which will be discussed in more detail in Chapter 9.

The allocation of all figures with solid infill to this field identified style has been shown to be inadequate, and finer level analysis identified four new styles, distinguished by form, composition, distinctive additional attributes and/or technique.

Technique is one style descriptor useful in defining a new style because of the depiction of traditional subject matter using 20th century tools in a secluded and restricted space. This work is also characterised by the circumstances in which it was created, and the intent to continue tradition in the face of change, which provides insight into the importance of

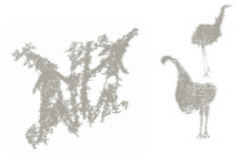
[4] This appears to be a handprint from a person with an extra finger, but it could equally be two hands overprinted on one another, a handprint with an extra finger added, or a painted hand with extra fingers. It could be something else entirely, but my hand fits the shape (minus the extra finger) and it did not resemble anything else seen in the rock art in this area.

maintaining cultural practices, and cultural identity following colonisation (Johnny Bell 2011 pers. comm. 6 September; O'Connor et al. 2013).

Table 7.6 details the attributes of each of the new styles. This is important in the context of how and why style is defined. For example, the Round Bodied Grouped Anthropomorphs are in the smaller size categories (<60cm) and with restricted distribution (discussed in Chapter 9). While this style is only recorded on vertical rockfaces and is easily visible at the sites, their size and placement mean that the viewer must enter the site to see them, suggesting that while not for restricted viewing these figures are placed for viewing by known associates rather than strangers, perhaps indicating a familial link through a distinctive style, rather than one which applies to the wider community (cf. Wobst 1977), within the first two levels of family and social networks in Figure 4.2. This may be indicative of more recent alliances in that restricted area, for marriage affiliations for example (Wobst 1976); within the Bunuba kinship system.

The Monochrome Waliarri and Mamo/Djuari styles are both defined by: their additional attributes, the types of headdresses, their form with similar postures and feet and hands; and by the Traditional Owners who relate their presence to activities in the time of creation (Patsy Bedford, June Oscar & Mona Oscar 2012 pers. comm., 15 August; June Davies, Helen Malo 2011 pers. comm., 1 September; June Oscar, Mona Oscar 2011 pers. comm., 8 September; Dorothy Surprise 2011 pers. comm., 30 August). This links the rock art to Bunuba and Gooniyandi cultural identities, with the spatial distribution and density of the figures and styles discussed in Chapter 9 showing that they are different between the two cultures.

TABLE 7.6 NEW STYLES IDENTIFIED FOR FIGURES THUS FAR FOR MONOCHROME SOLID INFILL.

Substyle	Description
Round Bodied Grouped Anthropomorphs 	• monochrome, solid infill, painted anthropomorphs ≤60cm; • circular or oval body shape with small round heads; • no facial/headdress characteristics; • narrow limbs in a variety of poses; • arranged in groups; and • on exposed rockfaces.
Monochrome Waliarri 	• monochrome, solid infill, painted anthropomorphs; • wide bodies and limbs with arms angled outward from the body, legs with feet (where present) angled away from the body; • rayed headdress atop a rounded head, if feathers are present, they are within the rayed headdress; • no internal features, or evidence of other colours that may have deteriorated; and • may have outlines in the same colour.
Monochrome Mamo/Djuari 	• monochrome, solid infill, painted anthropomorphs; • feathers, offset to the side of the head or on top, 1-3 feathers and there may also be a small hairlike addition between the feathers, where the feathers are the dominant feature; and • splayed arms and legs with digits.
Abraded/Scratched Solid Infill 	• abraded solid infill, no colour evident; • anthropomorphs and zoomorphs; • range from complex posed anthropomorphs with headdresses/accoutrements, to stylised zoomorphs; • characterised by lack of internal detail or outlines; • depicted at a single site in Bunuba Country; and • style is localised, or possibly individual.

Monochrome Outline Only

This field identified style (Table 7.2) has rock art in seven of the nine motif classes (Table 7.3), mostly anthropomorphs, zoomorphs, tracks and geometric. The number recorded for other motif classes in this style is low.

Six colours and five techniques are used; dominated by red and white for painted figures and black for drawn figures (Table 7.7 and Figure 7.11).

The key attributes of this group are:

- a single colour;
- lacking infill, or remnants thereof;
- lacking, or minimal (≤2), internal details; and
- defined as a figure by the outline only.

TABLE 7.7 TECHNIQUES USED IN THE CREATION OF ROCK ART IN THE MONOCHROME OUTLINE ONLY STYLE.

Technique	Number of Figures	Percentage of Total Figures
Painted	69	71%
Drawn	23	24%
Incised	2	2%
Abraded & Incised	2	2%
Scratched	1	1%
Total	97	100%

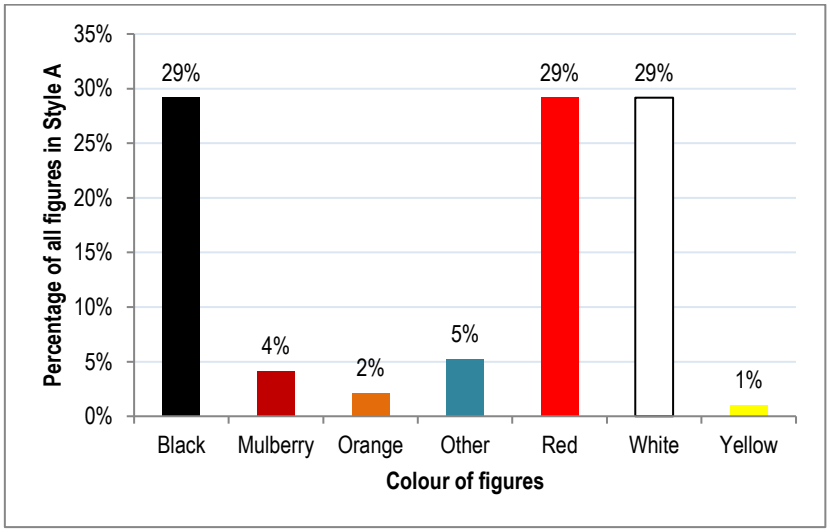


FIGURE 7.11 COLOURS RECORDED FOR FIGURES IN THE MONOCHROME OUTLINE ONLY STYLE.

This section follows the same process as the previous section in analysing each of the major motif classes for attributes which either identify a new style or conclude that figures belong to an already identified style in Table 7.6.

Anthropomorphs

Anthropomorphs are well represented in this field identified initial style (28 of a total of 97 figures). There are few with common attributes that would suggest that they are distinct, prolific, or consistent in form to belong to a new style. However, there are anthropomorphs initially categorised in this style with rayed headdresses enclosed by arcs (Figure 7.12), which is a defining characteristic of the Waliarri described by Traditional Owners (June Oscar, Mona Oscar 2011 pers. comm., 8 September). These figures are not highly detailed, for example, one has eyes but no other features (Figure 12a). A small change in key attributes to New Style 4 described above (do not need to be solid infill) allows such figures to be designated as Monochrome Waliarri.

There are anthropomorphs in this initial style which are unique; they have forms and features not recorded elsewhere. One example is a very large anthropomorph at Langurmurru

(Figure 7.13) painted and superimposed on three other images. This figure is like nothing else seen in the study area, Traditional Owners did not have any information or knowledge of it (June Oscar, Mona Oscar 2012 pers. comm., 16 August; Dillon Andrews 2011 pers. comm., 5 September), and its position as the most recent painting in a sequence at the site suggests that it may be an individualistic creation, rather than one reflecting group identity (McDonald 1999; Sackett 1986; 1985; Wiessner 1989), affiliations with the neighbouring peoples (David & Cole 1990; Wobst 1976), or, indeed, any type of pattern that would indicate a style in the southern Kimberley.

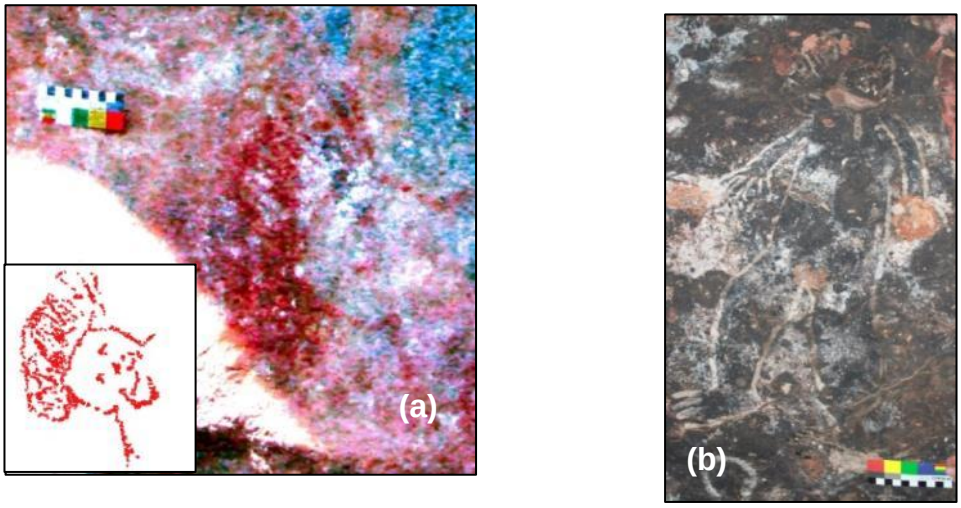


FIGURE 7.12 (A) RECLINING ANTHROPOMORPH WITH HEADDRESS AT FAIRFIELD 2 (M1409). ENHANCED WITH DSTRETCH© LWE/SCALE 15. DRAWING ADOBE PHOTOSHOP©, (B) PAINTED OUTLINE ANTHROPOMORPH (M037) WITH HEADDRESS AT TANGALMA.

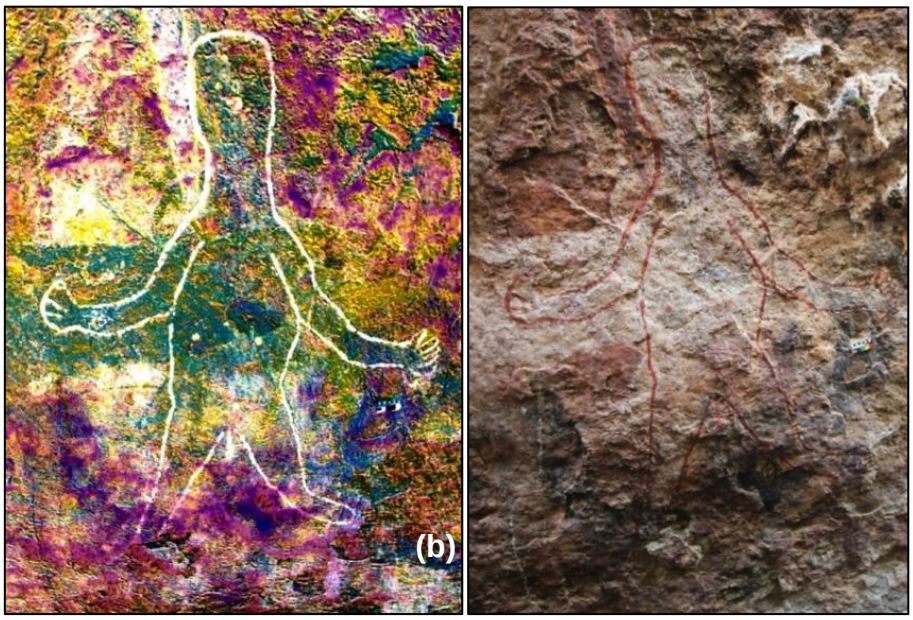


FIGURE 7.13 MONOCHROME OUTLINE ANTHROPOMORPH AT LANGURMURRU (A) ADJUSTED WITH DSTRETCH© LAB/SCALE 15 (B) ORIGINAL (M1061).

There is little variation in technique, as most figures are painted, and of the four drawn figures only one is a complete anthropomorph. One anthropomorph uses fine scratched lines to outline a figure of a female and partial male in probable copulation (Figure 7.14). This figure is at Stumpy's Soak 1, the same location as other scratched and abraded figures. Its form and relation to the other artworks make it likely that it was created recently when the site was a shady refuge during pastoral work (Johnny Bell 2011 pers. comm. 6 September). In addition, while the subject is not uncommon in traditional art, the form of the figures and their positions relative to one another is not shown in the traditional form common in engraved rock art in the Pilbara to the south of the study area (see, for example Mulvaney 2010:Appendix 1, ii).

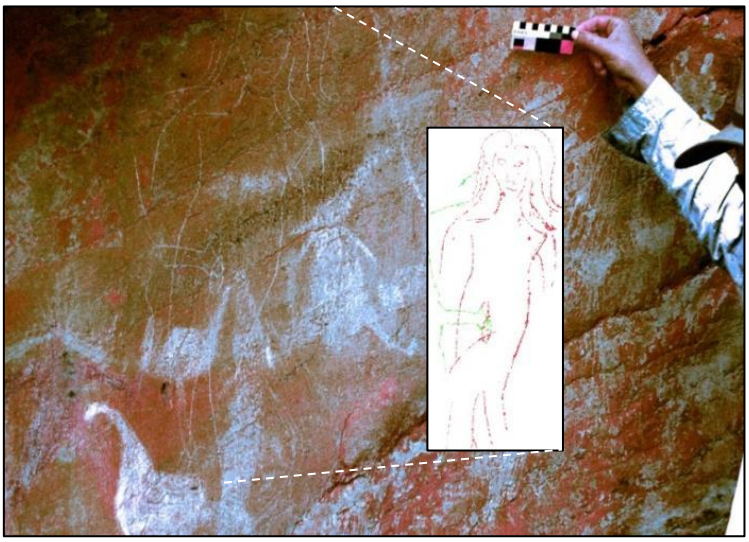


FIGURE 7.14 SCRATCHED OUTLINE ANTHROPOMORPHIC FIGURES OF MALE (PARTIAL) AND FEMALE AT STUMPY'S SOAK 1. IMAGE ADJUSTED WITH DSTRETCH© LYE/SCALE 15. DRAWING IN ADOBE PHOTOSHOP©.

The figures described above stand out from the other rock art in this style, but with only one example of each, and no consistency of form or other attributes, they do not constitute a style, and are more likely to be individual expressions, rather than any consistent marker to indicate identity or belonging as Wobst (1977) describes with clothing, or Wiessner (1982; 1983; 1985) with lithics.

Zoomorphs

There are few variations in zoomorphs in this style. Most are painted (Tables 7.3 and 7.7), four are drawn and two engraved. There are more reptiles than any other type (n=19), with one large crocodile deeply incised and curving around a ledge at Tangalma (Figure 7.15). This is a unique figure in the study area. No other zoomorph has a deeply incised outline, is positioned as if sunbaking on the ledge, or is as large. The crocodile is adjacent to other engravings along the ledge; incised/abraded lines, incised bird tracks and scratched images.

There is a similar ledge at the adjacent rock shelter Tangalma A, with the similar incised lines and tracks, but no crocodile or other zoomorph. Given the proximity and opportunity on like surfaces this crocodile may have some significance; the site is on the southeast side of the escarpment (within a half day's walking distance) through which the Lennard River flows, and in which small freshwater crocodiles are present (personal observation). Like other unique figures one example is not enough from which to draw conclusions about style, especially given the incision technique used to create it is not unique to the site, unlike the use of the abraded/scratched technique described above.

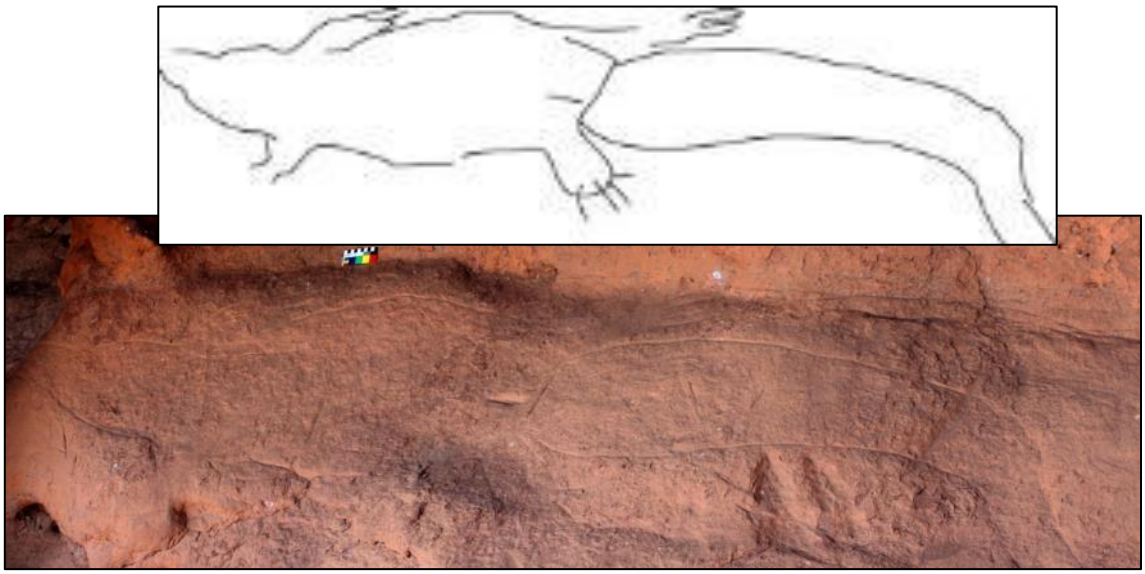


FIGURE 7.15 DEEPLY INCISED CROCODILE AT TANGALMA (M089A). THIS FIGURE IS 174CM LONG AND 55CM WIDE AT THE FRONT LIMBS. NOTE: THE END OF THE SNOUT AND TAIL ARE NOT VISIBLE IN THIS PHOTOGRAPH. DRAWING IN ADOBE ILLUSTRATOR©.

There are no attributes other than those described above that would indicate that the zoomorphs in this style would belong to a new style or substyle or prompt an addition to the new styles identified thus far.

Other Motif Classes

There are few other motif classes in this style; geometric (n=15) and tracks (n=10) are the only classes with ten or more figures. Most of the geometric figures are circles (n=13) and painted (n=12).

Tracks in this style are black drawn outlines of hands in Bunuba Country and are either at the top level of superimposition or separate from other figures suggesting that they are amongst the most recent rock art at the four sites. Two sites are on pastoral stations (MB1 and Elim), and the others are highly accessible by the public (Lilli1 and TC5). This makes it

possible that these are not only recent but may have been made by kartiya[5] visitors rather than Traditional Owners. Whilst the presence of black outline hands at multiple sites suggests a different style, the uncertainty of the authorship leaves doubt about such a conclusion.

It should be noted that some of the circles and circle variants described in Chapter 6 may be wanggu or wajarri, but they lack the definitional characteristics of either, such as fronds, roots and stalks which are clear in other places. Large groups of circles such as those seen in Figure 6.41 may be wanggu or wajarri, or a totemic symbol. However, these were seen on several occasions by Traditional Owners (Kaylene Marr, Sylvia Marr 2011 pers. comm., 3/4 September) when we camped nearby and were referred to as circles, so without other advice from Elders they remain classified as circles.

Synopsis

There are anthropomorphs which show similar attributes to the Monochrome Waliarri (Table 7.6), particularly in their overall form, ray shaped headdresses and body and limb shapes. The description of the Monochrome Waliarri style will be amended to incorporate the no infill variation.

There are unique figures in this initial field identified style. With only lack of infill as the primary determinant, and few other attributes to note. There is nothing to conclude that this is a style; it is without consistent form, pattern of more than one attribute, placement or composition. Nor are there are new styles to be identified in this analysis, only unique figures.

Detailed Monochrome with Patterned Infill

This field identified style (Tables 7.2) has figures in five of the nine motif classes (Table 7.3) and represents <3% (n=51) of determinate figures in the study. It is dominated by zoomorphs, and phytomorphs are the only other class with ≥10 figures in the style.

Rock art in the Detailed Monochrome with Patterned Infill style have the following attributes:

- a single colour;
- fully or partially infilled with a pattern;
- ≥1 internal features (e.g. eyes, cloaca, divisions, facial or body features); and
- with/without an outline in the same colour.

[5] Non Aboriginal, i.e. white people

Figures are in six colours (Figure 7.16), dominated by red and white. Painting and drawing are the main techniques used (Table 7.8).

This section follows the same analytical process as in previous sections.

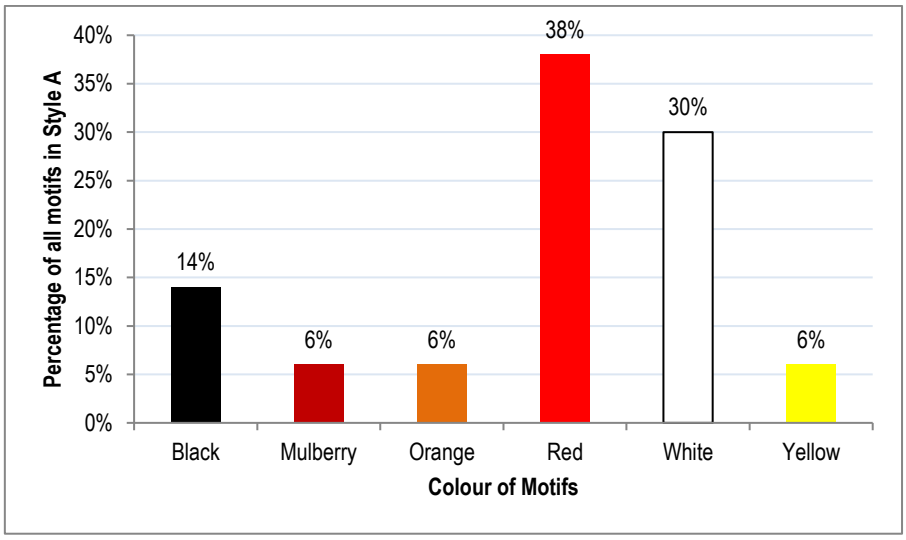


FIGURE 7.16 COLOURS RECORDED FOR FIGURES IN THE DETAILED MONOCHROME WITH PATTERNED INFILL STYLE.

TABLE 7.8 TECHNIQUES USED IN THE CREATION OF ROCK ART IN THE DETAILED MONOCHROME WITH PATTERNED INFILL STYLE.

Technique	Number of Figures	Percentage of Total Figures
Painted	45	88%
Drawn	5	10%
Scratched	1	2%
Total	51	100%

Anthropomorphs

There are nine anthropomorphs in this initial field identified style; eight painted and one drawn. They are in Bunuba (n=8) and Gooniyandi (n=1) Country, and range in superimpositions from the fifth layer (where only parts are visible) to the most recent level, including two figures with no superimposition. Internal features and attributes are varied, with headdresses, eyes and division lines the most common (e.g. Figure 7.17).

A single anthropomorph (Figure 7.17) has the many of the same attributes, particularly the overall form, as the Monochrome Mamo/Djuari style identified earlier (Table 7.6), with the patterned infill and internal features rather than a solid infill. The Mamo/Djuari style will be amended to allow the variation of this fill type.

FIGURE 7.17 ANTHROPOMORPH AT EMANUEL GAP 4 WITH INTERNAL FEATURES AND PATCHY PATTERNED INFILL (M4323). IMAGE ADJUSTED USING DSTRETCH© LYE/SCALE 20.

Zoomorphs

Zoomorphs are the most prolific motifs in this style (n=28). They include reptiles (n=24); snakes (n=16), crocodiles (n=5) and turtles (n=4). All but four are painted; one is scratched and three drawn in charcoal. The patterns vary; most are striped across the body in vertical or diagonal arrangements. There are also dotted infills, small vertical lines arranged in rows, which can be seen in Figure 7.18.

There are four zoomorphs which are not superimposed, seven at the top layer, and the remaining figures in the second to fifth layers. No single figure subclass occurs consistently at a specific layer.

Within this field identified style there is a distinctive and unique (in this assemblage) zoomorph with implications for dating rock art at Langurmurru; a thylacine (*Thylacinus cynocephalus*). This figure is painted in yellow, with distinctive vertical stripes on the thick body, and a squared head in profile. The figure bears a strong resemblance to this marsupial mammal, which had 13-19 dark stripes on the body, beginning towards the rear of the torso and continuing to the tail, which is ‘thick at the base and very stiff, giving the impression that it was a continuation of the body’ (Department of the Environment 2017). This species was extant in Tasmania until the last animal in captivity died in Hobart Zoo in 1936 (Figure 7.20).

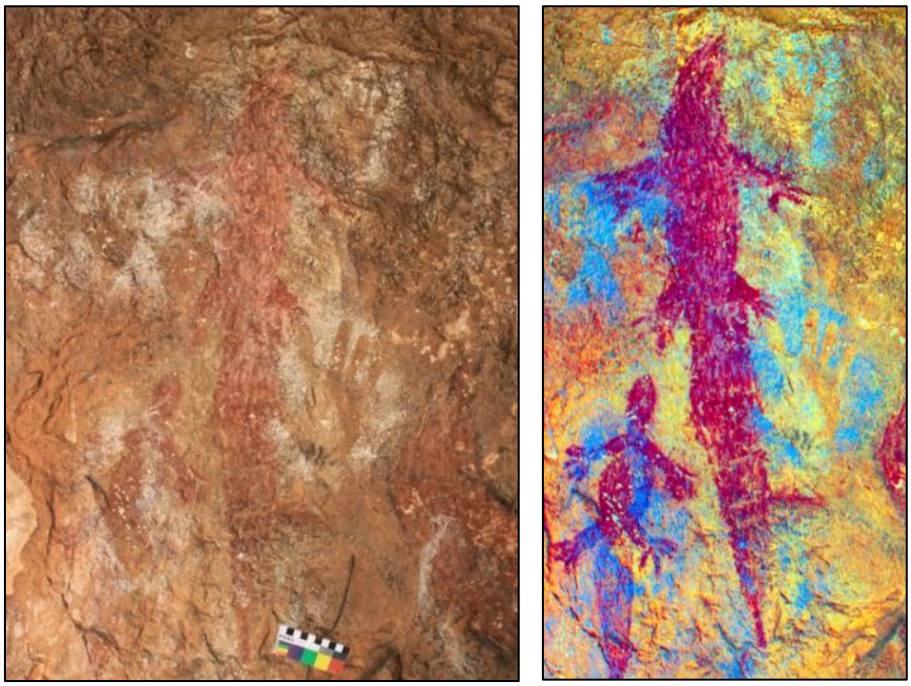


FIGURE 7.18 CROCODILE AT TUNNEL CREEK 1 (M093). IMAGE ENHANCED WITH DSTRETCH© LDS/SCALE 15.

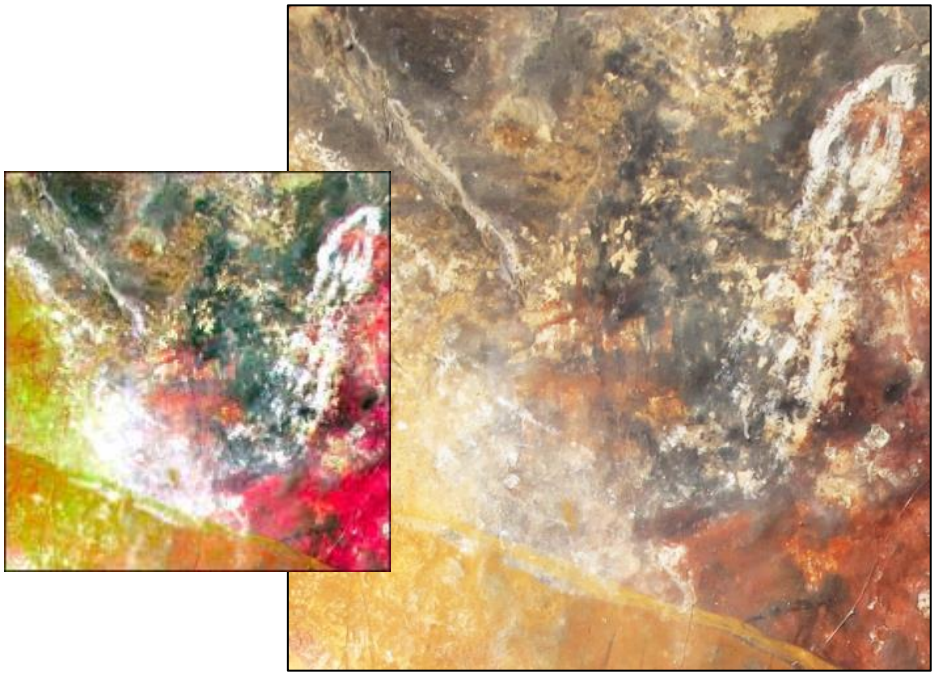


FIGURE 7.19 SNAKE AT MARAWUN 4 (M2805). CONTRAST INCREASED 40%. INSERT ENHANCED WITH DSTRETCH© LAB/SCALE 15.

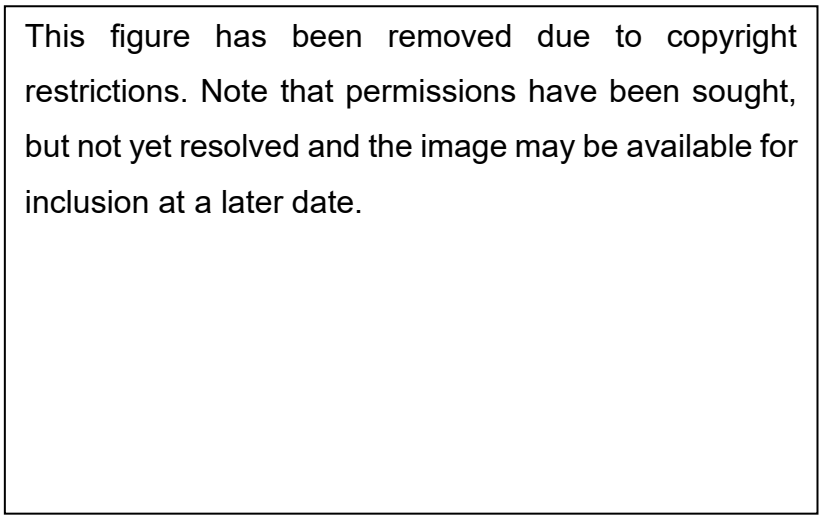


FIGURE 7.20 THYLACINE PHOTOGRAPHED AT THE HOBART ZOO IN 1936 (IMAGE BY HARRY BURELL © AUSTRALIANMUSEUM).

This is the only thylacine rock art recorded in the study area (Figure 7.21). It was probably extinct in Western Australia c.3,200BP (White 2017:9), suggesting that the rock art may be of at least that antiquity.

There are other thylacines in Australian rock art. Mulvaney (2009; 2011) identified more than 20 engraved thylacines at Murujuga, in the Pilbara to the south. Although relatively rare, he suggests there may be many others. In other parts of the Kimberley, David Welch (2015:41) claims to have recorded 23 paintings of thylacine. He distinguishes them from the *Thylacoleo carnifex,* or marsupial lion, which has been suggested for at least two Kimberley figures (Akerman 1998; 2009a; Akerman & Willing 2009) by the shape of the head and paws. The image at Langurmurru does not have detailed shaping of the paws visible, but the head is a similar shape to the painted Thylacine (Figures 7.20 and 7.21).

The rockface on which this figure is painted is not as protected as it may be inside a cave, or a less environmentally exposed rockshelter. The exposed position and potential for deterioration of the painting suggests it is unlikely to be as old as the *Thylacoleo carnifex,* estimated to have become extinct 46,000 years ago (Roberts et al. 2001). The antiquity of the painting may be able to be confirmed at a later stage with advances in U/Th dating using the calcite deposit over the centre of the motif (Figure 7.21b). Dust in the calcite and the thin covering limit this form of dating using current techniques (Max Aubert 2012 pers. comm., 8 July). Contamination will continue to accumulate as the site is regularly exposed to smoke as part of a ritual cleansing process, observed during fieldwork and carried out during the dry season when tours are conducted (Dillon Andrews 2011 pers. comm., 27 August). It may be a unique subject in the assemblage, but this image, no matter how significant in other

aspects, does not constitute a separate style within that of the Detailed Monochrome with Patterned Infill style.

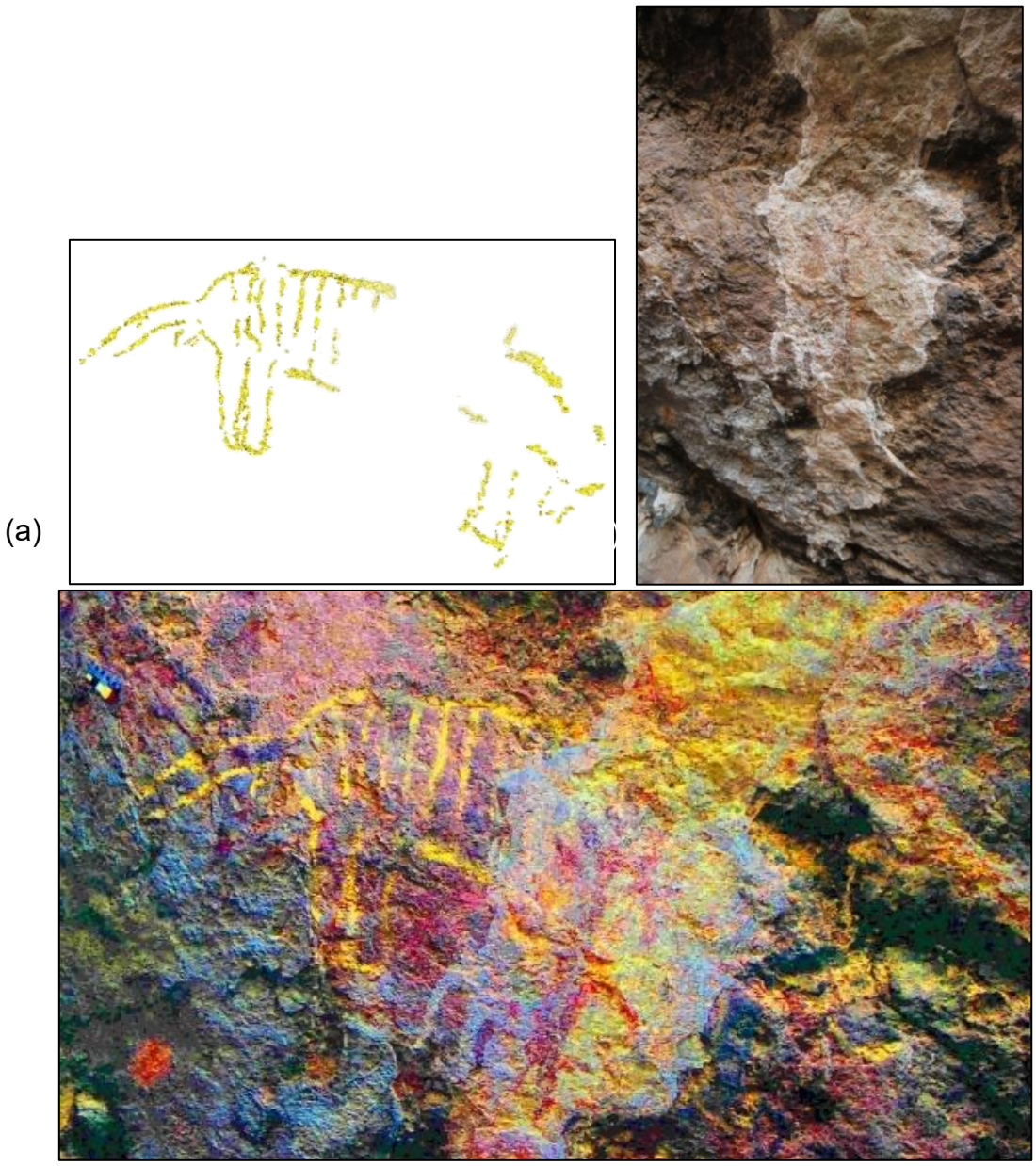


FIGURE 7.21 THYLACINE AT LANGURMURRU (A) DRAWING USING ADOBE PHOTOSHOP© (M1083) (B) PHOTOGRAPH SHOWING THE CALCITE DEPOSIT AND (C) DSTRETCH© ENHANCED IMAGE LYE/SCALE 15.

Phytomorphs

There are few phytomorphs in this field identified style. All are wanggu, with varied infill patterns including dots, rows of vertical lines, horizontal or vertical lines (Figure 7.22). These have outlines (n=10) and/or internal divisions (n=2), as well as the patterned infill. All phytomorphs in this group are either at the top layer of superimposition or without superimposition, suggesting that they may be relatively recent.

FIGURE 7.22 ONE OF THE DETAILED MONOCHROME PHYTOMORPHS (WANGGU), AT TANGALMA (CG1-M038).

Other Motif Classes

Three other figures were recorded in this group, two in material culture (one boomerang and one axe, both with striped infill) and one semi-circle with a vertical stripe infill pattern classified as geometric.

Synopsis

The close similarity of form of an anthropomorph in this style suggests a reallocation and an adjustment to the descriptors for the Monochrome Mamo/Djuari style to include patterned infill and internal features (Table 7.6). No new styles were identified in the analysis.

This style is distinguished by the presence of patterns, internal features, and lines suggesting divisions. The patterned infill in most of the figures has some variation and suggests an additional layer within the style, but not a separate style, as the patterns do not appear consistently in motif classes or in compositions with one another. The consistency of infill patterning does suggest at this stage of the analysis that it is a style in this assemblage.

Bichrome Solid Infill

9% (n=169) of determinate figures in this study are bichrome, and most of those (72%, n=122) are bichrome, with solid infill. Bichrome Solid Infill figures are recorded in five of the motif classes (Table 7.3), including anthropomorphs (n=16 sites), zoomorphs (n=11 sites) and material culture (n=8 sites). The attributes of this style are described in Table 7.2.

Rock art in this style uses six colours, plus a scratched pattern over pigment in one figure. Red (31%) and white (33%) dominate, followed by black (21%), and are most often combined as red/white and black/red.

Painting is the dominant technique for the Bichrome Solid Infill figures (99 of 122 figures); one is a ground cupule with pigment, one technique is not clear due to water damage, and the remainder used two or more techniques (drawing and painting).

Anthropomorphs

There are 51 anthropomorphs in this style, 30 with headdresses, of either rays or feathers, suggesting they may be related to the Monochrome Waliarri or Mamo/Djuari styles described above. Three of the anthropomorphs in this style with headdresses are also identified as Veganthrops: a combination of a wanggu (yam) like body, with fronds at the base resembling wanggu roots, and the addition of arms, head with facial features and headdresses resembling the Monochrome Waliarri style (Figure 6.22). 14 of the anthropomorphs with headdresses also have internal features (Figures 7.23 and 7.24), suggesting they may have been more detailed or polychrome prior to damage from environmental factors observed in the field, and may have belonged to a more detailed polychrome style, such as that identified by Traditional Owners (June and Mona Oscar 2011 pers. comm., 8 September). Discussion with Gooniyandi Traditional Owners later identified Figure 7.24 as a Djuari (June Davis, Helen Malo 2011 pers. comm., 1 September), and it was reclassified following analysis and an extension to the Mamo/Djuari style to make it inclusive of bichrome figures, reflecting that there can be variations within styles.

FIGURE 7.23 BICHROME (BLACK/RED) ANTHROPOMORPH WITH REMNANTS OF A SOLID RED INFILL AND BLACK EYES AND NOSE AT MOUNT BEHN 1 (M2038).

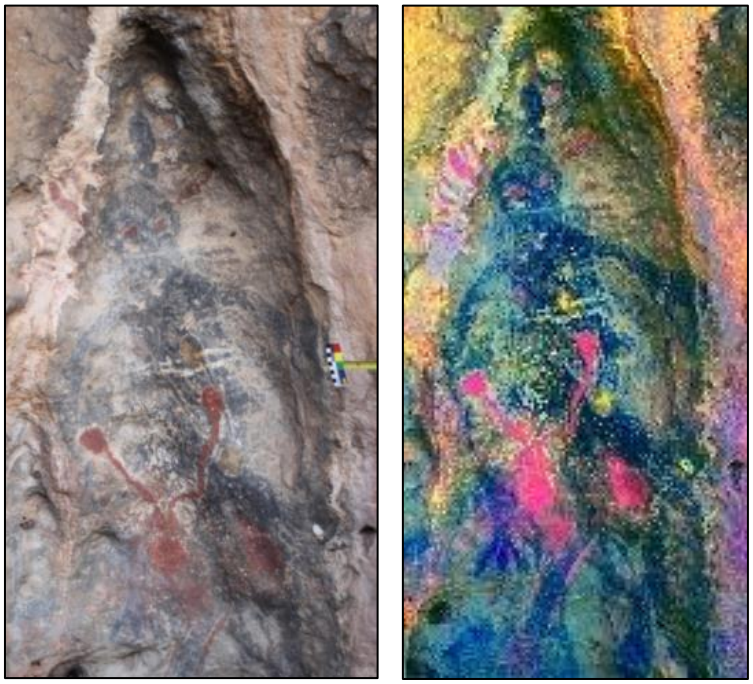


FIGURE 7 24 BICHROME ANTHROPOMORPH, WITH BLACK SOLID INFILL AND RED EYES AND FEATHERS AT MOONGGAROONGGOO (M235). RIGHT IMAGE ADJUSTED ON DSTRETCH© YBK/SCALE 20.

16 of the 51 figures have outlines in a contrasting colour, 13 of which also have the headdresses described above. This suggests that contrasting colour outlines and headdresses are also part of the same set of attributes that Traditional Owners identified for the Waliarri Ancestral Being figure, and more complex than the Monochrome Waliarri identified earlier (Table 7.6), another variation for this motif.

The anthropomorphs in this initial field identified style have varied levels of superimposition, from 25 at the first and second layers, to a single figure at the eighth layer, and 13 without

superimposition. This suggests two possibilities; the first that bichrome figures at more recent layers (first and second) may have been part of an intentional choice, where the features are visible, or that they may have been monochrome figures with features or headdresses added later. The second, that bichrome rock art at less recent layers may have had greater complexity, such as patterns or colours, obscured or destroyed by environmental factors (e.g. Figure 7.23) and/or superimposition.

Zoomorphs

There are 38 zoomorphs recorded in this style; 35 are painted, two painted and drawn, and one with an unclear technique. Most (n=29) are reptiles; snakes, turtles and crocodiles. Nine of the zoomorphs in this style do not have superimposition, and 16 are at the first or second layer. The superimpositions are up to six layers deep, suggesting bichrome zoomorphs have been present over time.

In this study 11 figures have outlines in a contrasting colour to the infill. The outlines prompt three questions.

1. Were they applied at the same time?
2. Were they added later?
3. Were they present as outline figures, and the infill was added later as a ‘colouring-in’ exercise?

Without clear evidence of superimposition within the figure itself (either of the infill or the outline), or dating of the two pigments, the questions remain unresolved, and therefore, the question of the simultaneous creation of contrasting outlines as a stylistic choice is uncertain. What is likely is that a choice has been made at some stage regarding contrasting outlines and infill, resulting in the current form. The example of two crocodiles similar in overall shape and size side by side at Langurmurru with one outlined and one not (Figure 7.25) suggests such a choice. Note that the non-outlined figure has brighter pigment and is superimposed at the lower limbs on the outlined figure.

FIGURE 7.25 144CM WHITE CROCODILE OUTLINED IN RED AT LANGURMURRU SIDE BY SIDE WITH A 180CM NON-OUTLINED CROCODILE (M1053, M1053A).

Phytomorphs

All seven of the phytomorphs in this style are wanggu. All are painted; one is adorned with narrow scratched lines. Five of the seven phytomorphs have contrasting coloured outlines, one a contrasting colour dividing line and the other a criss-cross scratched pattern on white pigment. In one case the white outline of a mulberry solid infill wanggu is likely painted on top of the mulberry pigment, as it has become orange at one part where it has been water damaged and the two colours have mixed. While this may suggest that a style change from Solid Infill Monochrome to Bichrome Solid Infill was made, it is equally likely that the outline was applied as part of the same creation event.

Other Motif Classes

There are ten material culture figures in this style, three axes, five boomerangs, one club and one spear, the latter at the neck of a crocodile in Figure 7.25. The spear is the only material culture object connected with another type of figure in this style, all of which are painted, and none with any additional features that may suggest they belong to a previously identified style or a new style.

None of the other motif classes have more than eight recorded figures (geometric), and there are no historical inscriptions in this style.

Synopsis

This style has examples of figures, such as the Veganthrop in Figure 6.22, with attributes such as headdresses and internal features that suggest they may be related to the style initially called Monochrome Waliarri, but with more complexity.

It is possible that some bichrome figures with solid infill have had patterns over the solid infill, but that pigments such as white clay, which was observed flaking off other images, have deteriorated (Hall et al. 2007; Wesley et al. 2014). Digital enhancement with DStretch© and Adobe PhotoShop© did not reveal any additional colours in these figures. The absence of possible patterns would not result in reallocating figures to another style without scientific analysis to determine the presence of other pigments, such as PXRF, which is not in the remit of this study.

No new styles were identified in this analysis, but some figures will be added to the Monochrome Mamo/Djuari style with appropriate additions to the descriptors, where they meet the overall form and major attributes. Other figures in small numbers, such as the more complex Veganthrops, are also appropriate for addition to the Monochrome Waliarri style (Table 7.6).

The result is two styles identified earlier are renamed, and their descriptors modified:

1. Monochrome Mamo/Djuari becomes Mamo/Djuari style; and
2. Monochrome Waliarri becomes Waliarri.

Bichrome Black Solid Infill with White Outlines

This distinctive style has five of the motif classes (Table 7.3), mostly zoomorphs (n=38) and some anthropomorphs (n=6). The figures are distinct in three ways that suggest it is a style; form, colour combination and location.

All but one figure is in Gooniyandi Country. The figure in Bunuba Country is in a cave easily and often accessed by the public (I was greeted by several tourist groups as I was recording the rock art). It is close to a historic homestead/police station near Bandilngan. The cave was used as a cool room for meat in the colonial period (Figure 7.25) and would have often been visited during that time. This suggests that the figure at that location is more likely contemporary, and, possibly, the work of visitors (Indigenous or non-Indigenous) familiar with the style in other locations, which is similar to representations of other types of visitors, and their material culture recorded in the rock art in shelters and rock formations (e.g. May et al. 2013; May 2020; Paterson & Van Duivenvoorde 2013).

FIGURE 7.26 REMAINS OF MEAT HOOKS IN LILLIMOOLOORA 1, BUNUBA COUNTRY.

Rock art in Gooniyandi Country is not exclusively bichrome, or Bichrome Black Solid Infill with White Outlines (henceforth Black & White), nor in exclusive compositions or locations. The Black & White figures are painted alongside other bichrome, monochrome and patterned infill figures (Figure 7.27), suggesting that whilst they are a conscious stylistic choice, they are not the only choice made in the locality.

FIGURE 7.27 PART OF A PANEL AT EMANUEL GAP 2 SHOWING THE DIVERSITY OF MOTIF TYPES, COLOUR AND STYLE (CONTRAST INCREASED BY 20%).

Anthropomorphs

The six anthropomorphs in this style are at sites in Emanuel Gap, Gooniyandi Country. Not all figures of anthropomorphs at the sites are in this style, but this is the only location where they were recorded in this study. One is at the top layer of superimposition (Figure 7.28), and the remaining anthropomorphs do not have any superimposition relationships. This suggests this is an important and/or recent style because they are not superimposed or in clear compositions with other figures.

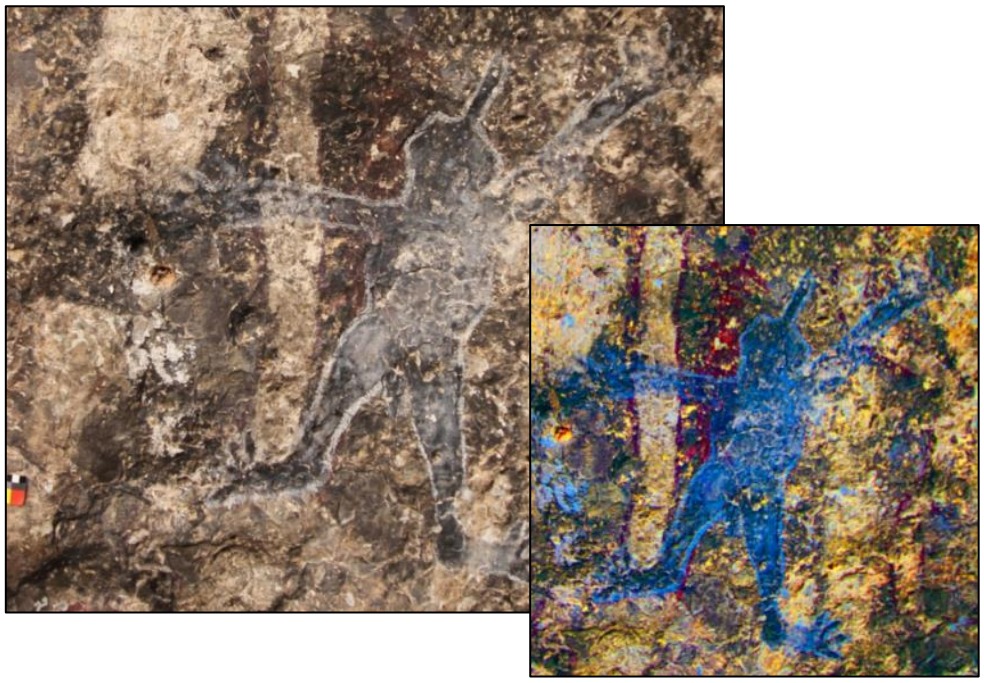


FIGURE 7.28 ANTHROPOMORPH SUPERIMPOSED ON OTHER FIGURES AT EMANUEL GAP 2 (M4021), GOONIYANDI COUNTRY. INSET ADJUSTED WITH DSTRETCH © LDS/SCALE 20.

Zoomorphs

Zoomorphs are the most prolific figures in this style, with mostly birds (n=16) and reptiles (n=12). None have internal features, making the solid black infill and white outline the only attributes setting them apart from other zoomorphs. They follow the same norms as other zoomorphs with most in three quarter profile (Figures 7.29 and 7.30), and reptiles in aerial view (Figure 7.30).

Most zoomorphs in this style are without superimposition (n=15), with the remainder at the 1st (n=11) or 2nd (n=7) layers. Where they are part of a superimposition sequence they are superimposed on or by other figures in the same style. Figure 7.3. shows a large macropod superimposed on a small macropod of the same style, with several superimpositions between the figures. The brightness of the white pigment (Hall et al. 2007; Wesley et al. 2014) in these figures, and the superimposition layers suggests the outlines are recent.

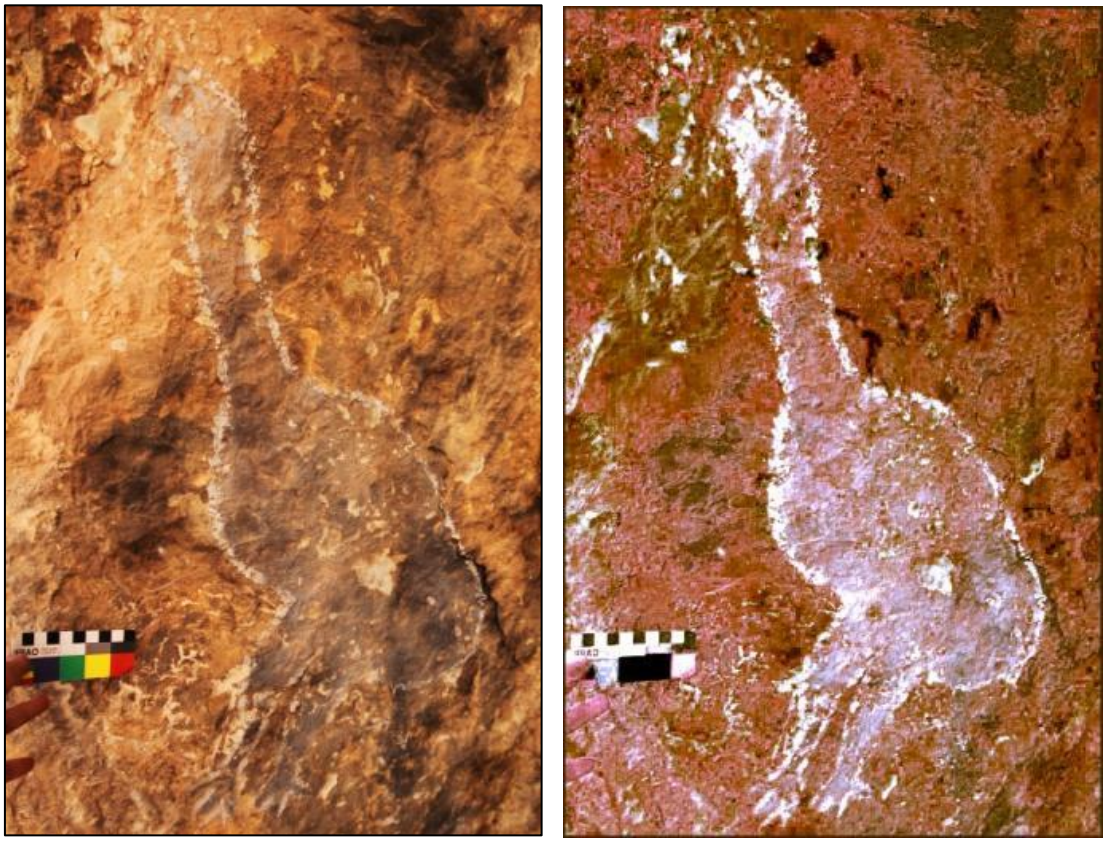


FIGURE 7.29 A BIRD (M4406) AT EMANUEL GAP 5, GOONIYANDI COUNTRY. RIGHT IMAGE ADJUSTED WITH DSTRETCH © LYE/SCALE 15.

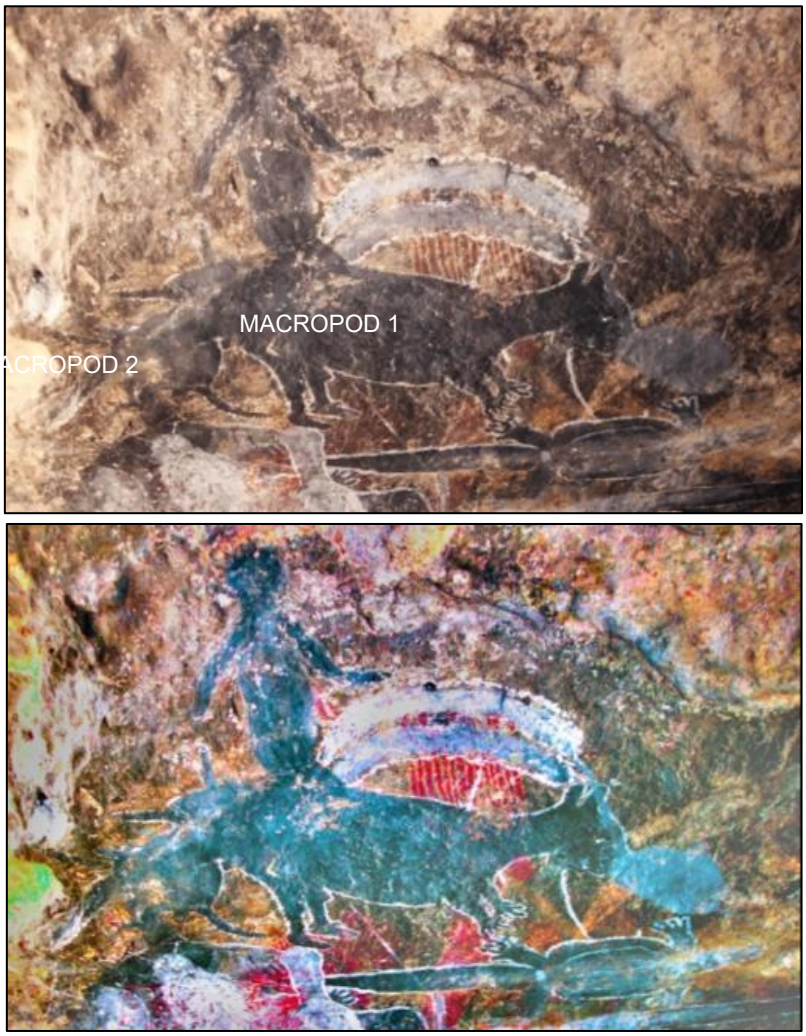


FIGURE 7.20 SEVERAL BICHROME BLACK SOLID INFILL WITH WHITE OUTLINE FIGURES AT EMANUEL GAP 5, GOONIYANDI COUNTRY. LOWER IMAGE ADJUSTED ON DSTRETCH © LAB/SCALE 20.

Other Motif Classes

There are two geometric figures in this style. Both are ovals without any other attributes that might identify them as wajarri or wanggu. Both shapes are at Emanuel Gap 2, in the first and second superimposition layers.

Synopsis

This style is distinguished by the distinctive colour combination, and the relatively wide outlines. The white outlines retain brightness, compared to other white pigment at the sites, which are flaking and fading, and many have discoloured or absorbed other colours at their edges as they have aged and interacted with rock surfaces and other pigments (e.g. Chippindale & Taçon 1998; Ford et al. 1994; Hall et al. 2007), supporting it as a recent style. It is locationally specific (with one exception described above) and displays an identifiable and distinct form for more than one motif class (anthropomorphs, zoomorphs and geometric) establishing it as a style in Gooniyandi Country.

The distance of the sites where these figures are present from the contemporary borders with the Bunuba people (c.35km) suggests that this style may have been an important distinguishing marker of identity. Its presence in sites with good access to fresh water, and the likelihood of the infill being a charcoal base suggests that the sites were well enough used such that enough charcoal was readily accessible to use for large areas of infill, rather than visited infrequently. This suggests that they were important for shelter, subsistence and likely ceremony (ochre marked cupules and surface lithic artefacts were also present at Emanuel Gap). Sampling charcoal on the figures may assist with an anchoring date for the creation of this style, and excavation could be helpful in establishing use over time, especially if hearths and/or charcoal remnants are found.

There were no variations in form or attributes of figures that indicated further refinement or a new style or substyle. For simplicity this style will be abbreviated to Black & White style.

Highly Detailed Polychrome with Patterned and/or Solid Infill

This is the only initial field identified style with more than two colours. There are 102 figures in this style, with three motif classes: anthropomorphs (n=35), zoomorphs (n=34) and phytomorphs (n=32).

These figures are highly detailed. It may be suggested that the variety of pigments available was the reason to create the detail. However, if that was the case monochrome and bichrome figures would not dominate the same spaces. It is more likely to reflect choices related to stylistic traditions, named/Ancestral Beings requiring that detail, and necessitating multiple colours, or reaffirming connections to the Ancestors through ceremonies and gatherings.

All but two of figures in this style are in Bunuba Country, suggesting it is more likely that this style originated in the west of the study area, and that people creating it are likely to have moved between areas, or visited different sites for trade, marriage or ritual purposes, sharing their ideas, or leaving their marks (David & Cole 1990; Wobst 1976; 1977). The dominant colours are black (31%), red (27%) and white (30%). This is reflected in the way colours are combined in figures, with 65% (n=66) of the figures using the black/red/white combination. Black/white/yellow is the only other mix accounting for more than 10% of colour combinations in this style. Most combinations are three colours (Figure 7.31), but there are also four combinations of four colours, and one of four colours plus engraving to either enhance features or create a pattern.

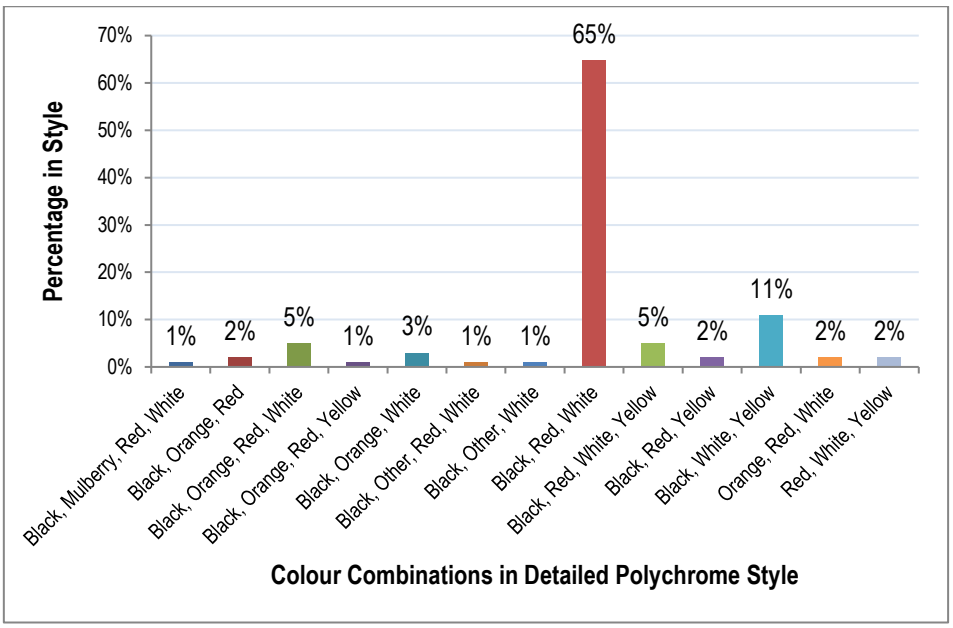


FIGURE 7.31 COLOUR COMBINATIONS IN DETAILED POLYCHROME FIGURES IN THIS STUDY.

Superimposition in this style varies. 15 figures are without superimposition and 50 are at the first and second layers. One figure is at the 10th layer, and there are varying numbers in between. Different reasons may be posited for the variation in superimposition positions for this style:

- continuity over a long period;
- potential contemporaneity, where figures have been part of intensive activity, with figures covering one another but leaving enough of the previous figure exposed to remain visible; and/or
- some figures were less important than others, and therefore partially obscured during later painting.

Anthropomorphs

Of the 35 anthropomorphs in this style 19 are at one site, Mount Behn 1. Other sites also had multiple anthropomorphs recorded in this initial field identified style (Table 7.9).

TABLE 7.9 ANTHROPOMORPHS IN HIGHLY DETAILED POLYCHROME BY SITE.

Site	Number of anthropomorphs	Percentage of Total
Fairfield 3	1	3%
Elimberrie Springs	2	6%
Fairfield 1	2	6%
Langurmurru	2	6%
Marawun 1	2	6%
Marawun 4	2	6%
Tangalma	4	12%
Mount Behn 1	19	55%

All anthropomorphs in this style fit the description and attributes of the Waliarri, as identified by the Bunuba people (June Oscar & Mona Oscar 2011, 2012 pers. comm., 8 September; 15 August), and are in keeping with the overall form identified as such to this point. Therefore, with this in mind the anthropomorphs in this style will be included in the Waliarri style, and the descriptions amended. Waliarri Ancestral Beings have similarities to the Wanjina in neighbouring Worora and Ngaranyin Country (Akerman 2009b; 2014; Blundell 1974; Blundell & Woolagoodja 2012; Crawford 1968; 1973; Jones 2010b; Layton 2012; Welch 2016). There are also similar cultural associations (see Akerman 2014). Some Waliarri anthropomorphs are close to the western borders of Bunuba Country, along the Marawun escarpment and close to Bandilngan (Bandilngan/Windjana Gorge), and they are sometimes referred to as Wanjina by neighbours and younger generations.

Similarities between Waliarri and Wanjina figures include rayed headdresses framing the face, patterned body infill and large, dark solid infill eyes. However, there are also differences. The Waliarri:

- almost always have a complete body and limbs, suggesting they may be more recent than Wanjina (which may be damaged from animal activity erasing bodies lower on rockfaces);
- lack prepared backgrounds, unlike many Wanjina in adjacent areas (Figure 7.32) (2010a: Appendix 2);
- have narrow bands (arcs) around the face, unlike the wide bands or outline solid infill bands of the Wanjina to the north (e.g. Figure 7.32);
- have consistently long rays in the headdresses, similar to those present in Wanjinas further west, particularly the Kaiara at Bigge Island (Crawford 1968:72-80);
- noses are more often two lines joined from the middle of the eye forming a long U or Y shape (Figure 7.23), whereas on the Wanjina they are generally long oval shaped either joined between the eyes or slightly below them;
- feathers incorporated into the rays, compared to Wanjina where there is some mixing of the rays and feathers, but only when the rays are short, so they stand out from them. It is possible that the feathers or the rays were added at different times and the mixing of the two was a stylistic choice for this figure over time;
- wide bodies and limbs in comparison to the heads, in contrast to Wanjina (Figure 7.33); and
- are rarely in compositional groups of near identical figures (Figure 7.32).

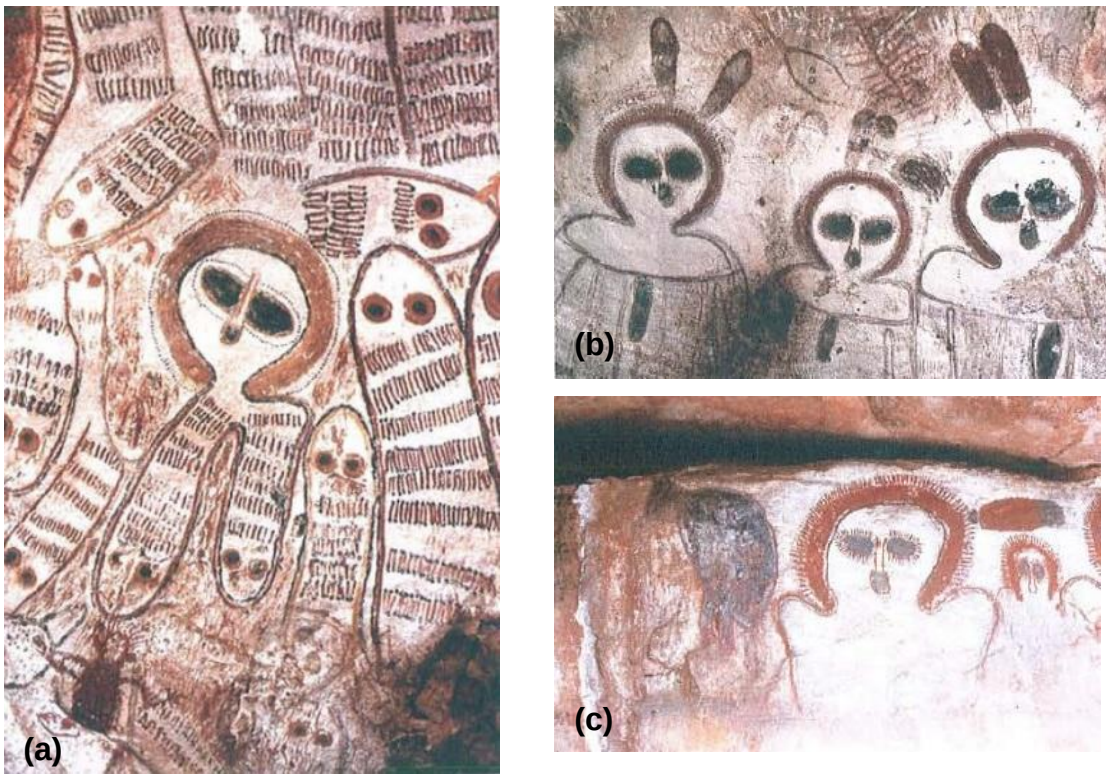


FIGURE 7.32 PHOTOGRAPHS OF WANJINAS BY KIM AKERMAN (2009B:FIG 15A, FIG 10, FIG 11[6]) FROM (A) GIBB RIVER, (B) MOUNT BARNETT, AND (C) MOUNT ELIZABETH SHOWING DIFFERENT TYPES OF WANJINA ON WHITE BACKGROUNDS. IMAGES COURTESY OF KIM AKERMAN 2013.

The level of detail varies in anthropomorphs in this style (Table 7.3), but they consistently have outlines and a mix of a solid+pattern infill. Patterns include rows of small lines on a solid colour, dots or vertical/horizontal lines across the bodies of the figures. Those without the headdresses with the characteristics of rays, feathers and/or arcs have the other detailed attributes such as the distinctive infill and outlines, internal lines for body divisions or features such as eyes, with some obscured as a result of environmental damage (e.g. Figure 7.23).

It may also be noted that the majority of anthropomorphs recorded in this study do not have gender markers. Those which do are more likely male, with contrasting or exaggerated genitalia (Figure 7.33). There are also a small number of anthropomorphs partly obscured through superimposition, no longer clear or fully visible due to animal activity, or water damage, making it impossible to determine if they have, or have had, gender markers.

The most common colour combination for anthropomorphs in this style is black/red/white (n=25), and most are at the first or second layer of superimposition (n=19) or no superimposition (n=4), suggesting that it is a relatively recent style for anthropomorphic

[6] These images were in a document provided to me by the late Kim Akerman when we met at a workshop on Kimberley Rock art in 2013, and he gave verbal permission for their use in my thesis at that time.

figures, which may be part of the information exchange network with visits from neighbours, showing alliance, but adaptation to reflect Bunuba culture (cf. Wobst 1976; 1977).

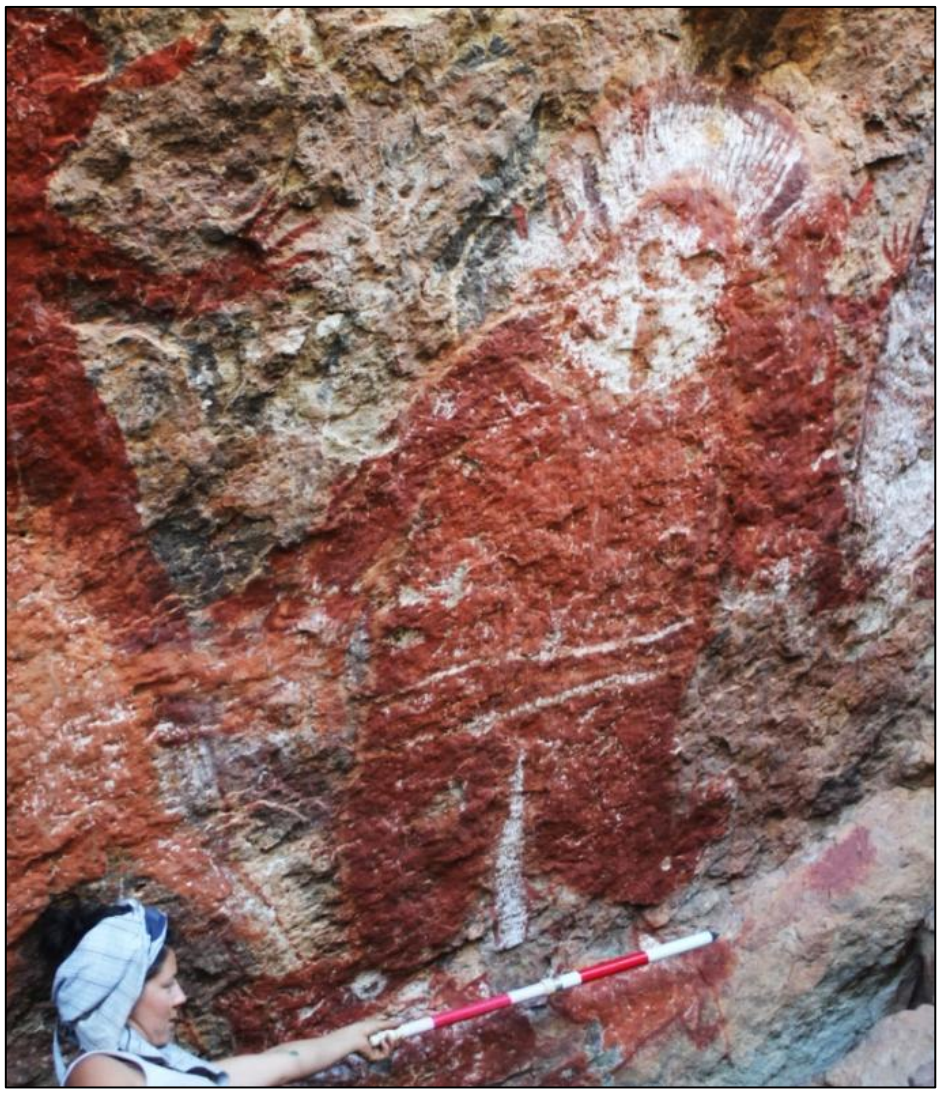


FIGURE 7.33 THIS LARGE, WIDE BODIED WALIARRI WITH A SMALL HEAD OVER ITS SHOULDER DOMINATES THE MAIN GALLERY AT LANGURMURRU (M1016), BUNUBA COUNTRY.

In her analysis of Wanjina at Widgingarri, Worora Country, to the west of Bunuba Country, Jones (2010a) identified monochrome, bichrome and polychrome Wanjina; this variation is also present for Waliarri figures in this study as described in the earlier analysis of field identified styles. Discussion of superimposition of the polychrome Waliarri style anthropomorphs and the monochrome and bichrome figures in Chapter 8 sheds more light on how these figures may have changed over time, and if the complexity has been an evolution of the variations, or if they have a different place in the rock art assemblage.

While the initial analysis suggests these figures belong to a Waliarri Family, there are variations in the level of detail, and the colour combinations that suggest there may be a

division between the simple and more complex figures. For this reason, I have refined the descriptors to classify the figures into Waliarri 1 (Complex) (Table 7.10) and Waliarri 2 (Simple) (cf. Table 7.14). This will assist with the chronological and spatial analysis to determine whether the styles are contemporary, have patterned distribution and/or appear in different densities in different places. They may be regrouped at a later stage for stylistic analysis. The naming is informed by conversations with Traditional Owners (June Oscar, Mona Oscar 2011 pers. comm., 8 September).

Zoomorphs

Zoomorphs in this style are predominantly reptiles (n=28): 23 snakes, three crocodiles and three lizards. They are in a variety of patterns of solid+pattern infill, with some figures showing the pattern along the body, and others with solid blocks of colour (see Figure 6.25). There are five figures with internal division lines and ten with eyes, showing that additional internal detail is important in the zoomorphs in this style. Like anthropomorphs the majority of zoomorphs in this style are black/red/white (n=18). There are more figures at the first and second layers of superimposition than any other levels (n=15), and three without superimposition.

TABLE 7.10 ATTRIBUTES OF ANTHROPOMORPHS IN THE WALIARRI 1 (COMPLEX) ANTHROPOMORPH STYLE.

Detail	Number	% of in style
Solid+Pattern Infill	35	100%
Outline	35	100%
Headdress - Rays	9	26%
Headdress – Ray+Arc	9	26%
Headdress - Arc	2	6%
Headdress – Feather/Feathers	3	9%
Headdress - Rays+Feathers	1	3%
Eyes	29	83%
Eyes with Eyelashes	5	14%
Nose	9	26%
Breast Plate	5	14%
Internal division lines	19	54%
Gender – Male	14	40%
Gender - Female	1	3%
Non Gendered	18	51%
Gender not clear	5	14%

Outlines, solid infill and colouring, and the infill pattern of rows of short lines on a contrasting colour background, are consistent in these figures. The zoomorphs follow the same morés

as the anthropomorphs, resulting in the same style (Figure 7.34), meaning the Waliarri 1 (Complex) anthropomorph style can be applied over different motif classes.

Allocation to this style is also consistent with the relative recency of the zoomorphs in the rock art at the sites in Bunuba Country. No zoomorphs in this style were recorded east of the Bunuba Roadside Caves, more than 100km west of Fitzroy Crossing, reinforcing the likelihood that the style originated in the west of the study area and unlike the anthropomorphs, has not been created by visitors or through information exchange into Gooniyandi Country. This style to the east is limited to anthropomorphs, suggesting that anthropomorphs may be important in information exchange in the southern Kimberley.

Phytomorphs

Phytomorphs in this style are wanggu (yams). The majority (n=24) are black/red/white, and in Bunuba Country (n=31). All the phytomorphs recorded have solid+pattern infill and outlines, and 16 (50%) have one or more dividing lines. 16 phytomorphs also have stalks at one end (Figure 7.34), four have fronds or narrow lines representing roots, and three of those four also have stalks.

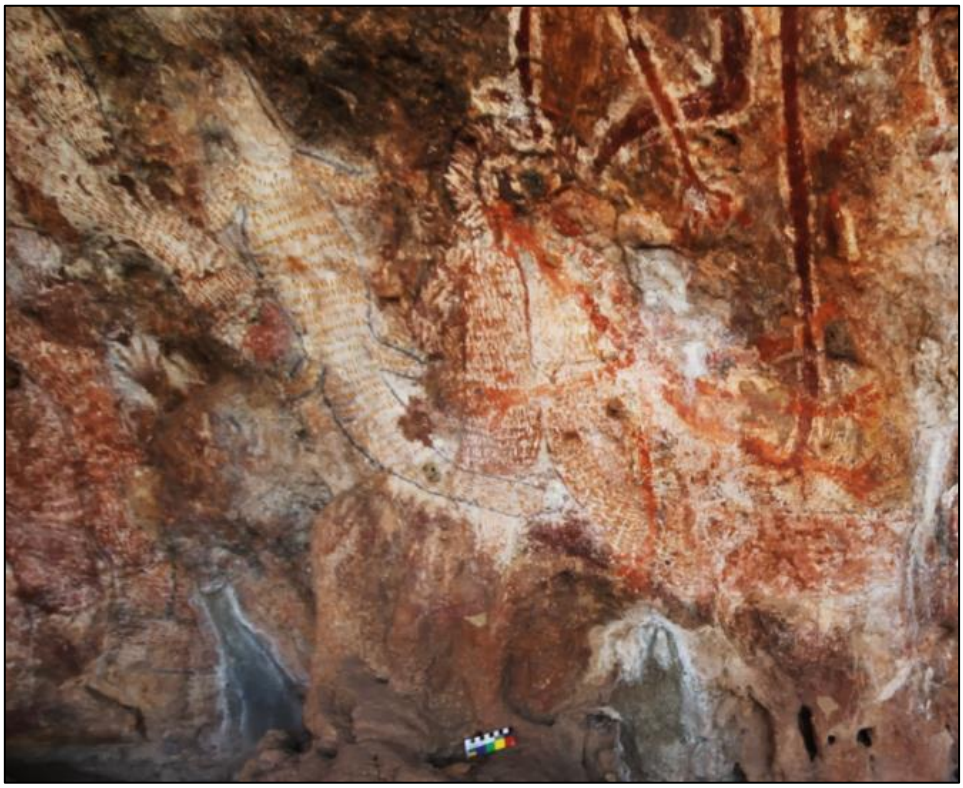


FIGURE 7.34 ANTHROPOMORPHS AND ZOOMORPHS IN THE HIGHLY DETAILED POLYCHROME STYLE AT MOUNT BEHN 1.

FIGURE 7.35 THREE WANGGU AT MOUNT BEHN 1, BUNUBA COUNTRY.

Close to half (47%, n=15) of the phytomorphs are at the first or second layers of superimposition, and eight are without superimposition. The phytomorphs in this style have enough of the same attributes and appear with the same recency in superimposition as the zoomorphs and anthropomorphs at most of the same sites and are added to the Waliarri 1 (Complex) style.

Other Motif Classes

There is only one other figure that may be described as highly detailed polychrome. This may represent a wooden club, with a narrow end, progressing in a straight line and widening to a rounded end. There are other figures of that form which are Monochrome Solid Infill. These do not appear in arrangements or adjacent to other figures and are likely to be recent additions to the rock art corpus. A single figure is insufficient from which to draw any conclusions, either to its certainty as a club or its antiquity and relationship to the other figures in this style.

Synopsis

All the figures in this style have attributes that are too closely related to discount that they belong to a single style. The outlines, infill patterns, dividing lines and internal/external features adding detail to the overall form are common across the three most prolific motif classes, anthropomorphs, zoomorphs and phytomorphs.

As described previously, the Waliarri name comes from the Bunuba people who identified this Ancestral Being and this name will be used for this style of rock art, Waliarri 1 (Complex)

was the first style identified by the Traditional Owners. The Waliarri style was already applied to anthropomorphs in the detailed monochrome group, where many of the same attributes are present. It seems possible from superimpositions that they may be evolutions of the style. For the present the polychrome figures are differentiated as Waliarri 1 (Complex) and the monochrome, less detailed Waliarri 2 (Simple) style.

The Waliarri anthropomorphs have similarities to Wanjina described by Crawford (1968), Akerman (2009b; 2014) and others in areas to the west and north of Bunuba and Gooniyandi Country (e.g. Donaldson 2012a; 2012b; Jones 2010a; Layton 2012; Ross et al. 2016; Welch 2016). There is enough similarity in the overall form to suggest that Waliarri figures are related to the Wanjina to some degree, but enough differences to show that they are not identical. Variation in stories and the form of the figures is likely to have developed through travel, trade, marriage and shared or similar belief systems across the wider region.

Monochrome Hand Stencils

Stencilled hands are a type of track left by humans. Like the fossilised tracks preserved in rock surfaces (e.g. Gierlińskia et al. 2017; Leakey & Harris 1987; Raichlen et al. 2010; Webb et al. 2006) they leave a distinctive, permanent and symbolic sign of human presence. In some ways, they are like a signature, showing that a people were at a site, although they may not have been involved in creating the other figures according to the Ngarranggani/Ngarranggarni stories.

There are 253 Monochrome Hand Stencils recorded in the southern Kimberley, with 248 of those at 13 sites in Bunuba Country, and five at three sites in Gooniyandi Country. Six of the stencils also have painted parts, such as a painted outline (n=1), a painted line surrounding the palm (n=1), and painted infill (n=4). The difference in the number of sites recorded in the two cultural areas (49:1) is far greater than the ratio of sites between the two areas (4:1), or the ratio in other rock art, suggesting that these individual marks may be more important in Bunuba Country than Gooniyandi.

Monochrome Hand Stencils are overwhelmingly in white pigment (Figure 7.36). White pigment is not more available than other colours, as there is widespread use of red pigment (Figures 7.2, 7.11 and 7.16). White is, therefore, a colour choice for hand stencils in the study area, perhaps to clearly distinguish the hand stencils from other figures at sites. Red variations (orange and mulberry) and white hand stencils are recorded in both Bunuba and Gooniyandi Country, so there is no distinction between the two cultural areas in colour choice.

Handedness and gender attribution by relative size of hand stencils and prints has been explored in rock art research (e.g. Galeta et al. 2014; Gunn 2006; Gunn 2007; Walsh 1979), but there are no conclusions on what this says about anything other than the possible left and right handedness of the population making the stencils. This is limited by the lack of direct evidence either archaeologically or ethnographically how people have made these stencils and prints in Bunuba and Gooniyandi country, however in some instances there is evidence of how others have made them (Colin Hamlin 2011, pers. comm 2-3 August; Crawford 1968). Handedness is recorded in this study (Table 7.11), hand measurements are not.

Left hands (57%, n=143) are more numerous than right hands (17%, n=43), suggesting that right-handed people may use their preferred hand to hold and mix ochres and direct the spray for stencilling (with mouth or implement), whilst holding the non-preferred hand on the wall. McManus (2009:37) suggests that around 90% of humans have been right-handed for the last 200,000 years. More than a quarter of Monochrome Hand Stencils were not identifiable as left or right hands because of superimposition (26%, n=67), incomplete stencils or difficulty in distinguishing different finger lengths and angles to determine handedness.

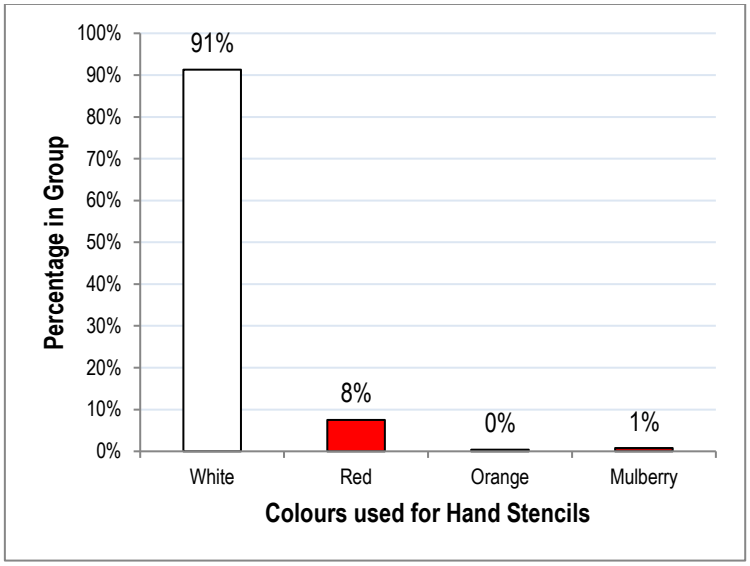


FIGURE 7.36 COLOURS RECORDED FOR HAND STENCILS IN THE STUDY AREA.

TABLE 7.11 HANDEDNESS IN HAND STENCILS IN THE STUDY AREA.

Hand depicted in stencil	Number	Percentage of total
Left hand	143	57%
Right hand	43	17%
Not Clear	67	26%
Total	253	100%

The only other attribute to note for Monochrome Hand Stencils is grouping. Many hand stencils are superimposed on other figures such as anthropomorphs, and others appear in concentrated groups, suggesting sites of either intense activity, which may be aggregation sites, or regular visitation by a family group signalling their connection over time (e.g. Blundell 2003; Conkey et al. 1980; McConvell et al. 2018; McDonald & Veth 2012; Strehlow 1970). The dense group at Mount Behn 1 (Figure 6.40) and the small group of different sized hands at Elimberrie Springs (Figure 7.37) may be examples of the latter.

The small group of hand stencils at Elimberrie Springs more likely represents a single family, with the two larger sized stencils and small stencil possibly representing parents and a child (Figure 7.37). This would be in keeping with introducing people to Country by taking them to important sites and creating hand stencils, a practice described to me in the Weld Ranges, south of the study area, during fieldwork at rock art sites (Carl Hamlett 2011 pers. comm., 17 May), and by Sam Woolagoodja in the west Kimberley (Crawford 1968).

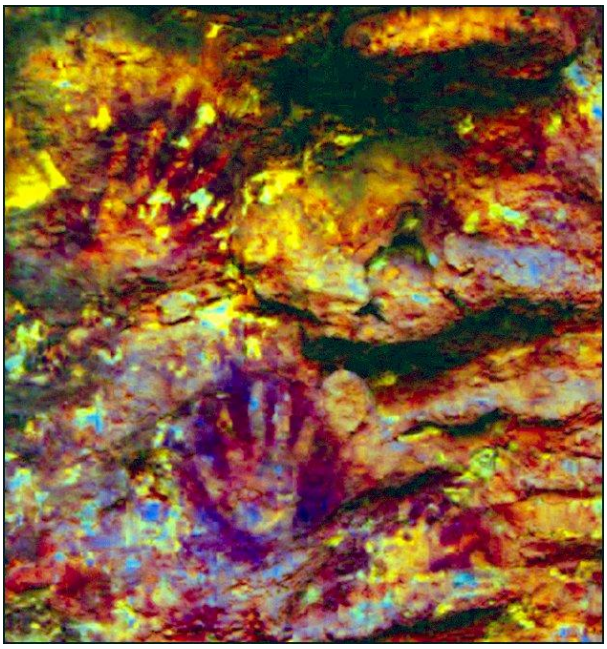


FIGURE 7.37 THREE HAND STENCILS IN RED. LEFT HAND, RIGHT HAND AND SMALL HAND AT ELIMBERRIE SPRINGS, BUNUBA COUNTRY. ENHANCED WITH DSTRETCH © LDS/SCALE 15.

Monochrome Hand Stencils are recorded to a depth of eight layers of superimposition, with most either not superimposed (n=87), or at the top two layers (n=126). Their presence to eight layers suggests that stencilling has been a continuous practice over a considerable time and possible stylistic changes, likely including colonial contact from the 1860s to present. Alternately, stencils like the dense assemblage at Mount Behn 1 may have been created during a single event of intense activity such as during a ceremonial gathering for events such as marriages.

Other stencilled motifs are recorded in the study area, including boomerangs, sticks and axes. The stencilling of items of material culture is consistent with the type of expression that the hands may represent, connecting material objects to Country in the same way as people. There were no variations within this style to indicate that a new style was present, however the presence of items of material culture created the same way, which is clearly observable as designed to achieve the same style outcome, warrants renaming this style to include other figures. As all observed and recorded figures are in a single colour it will be named Monochrome Stencil.

Engraved Tracks

In this study, engraved rock art is always at sites that also have pigment art, suggesting that its presence is a deliberate choice rather than because of available resources or appropriate surfaces.

There are some figures, representations of bird and macropod tracks, that are almost exclusively engraved (see Figure 6.41 and Table 7.12). There are 80 engraved animal tracks using a combination of incision and abrasion, with the remaining seven incised.

The engraved tracks are at two sites in the study area, both in Bunuba Country: Tangalma and Tarakalu 2. At both sites there is pigment rock art, and at both sites the tracks are arranged in dense groups (see Figure 6.38 and Figure 6.39) and as individual figures.

TABLE 7.12 ENGRAVED AND PIGMENT TRACKS BY TRACK TYPE.

Track Type	Engraved Tracks	Painted/drawn/ stencilled/printed Tracks	% engraved
Human Hand/Foot	0	289	0%
Quadruped	5	1	83%
Bird	67	4	94%
Macropod	15	6	71%

Bird tracks are both three and four toed types. Mulvaney (2010:181, 287) suggests they are different birds: three toed may be emus, and four toed may be marine birds and waders (both sites have access to water ways). Engraving is a clear stylistic choice for depicting bird tracks, and communicating information about birds in an area where painting is the overwhelming choice, for other motif types.

There is difficulty in dating engraved rock art (Aubert 2011; Bednarik 2010; Dorn 2001; Taçon et al. 2013; Taçon & Chippindale 1998; Whitley 2012), and the limited animal tracks at two sites in the study area makes this style difficult to place within any chronological

sequence[7]. This limits its contribution to discussion on change and continuity in the rock art and, as the form is ubiquitous across Australia, it is impossible to relate it to information exchange, identity or territoriality.

There were no variations or patterns of composition within the Engraved Tracks style which indicated that a new style or substyle could be identified, but as the tracks are exclusively animals it is renamed Engraved Animal Tracks, to distinguish it from the human tracks in Hand Stencils.

Summary

Analysis of the styles to which figures were initially allocated in the field has revealed distinct attributes which contribute to their overall form. Fine level recording and analysis has identified eight styles within this assemblage (Table 7.13). Rather than ignore remainder of the rock art initially suggested as styles during fieldwork, the figures have been allocated to Broad Groups to capture the range of ways of doing rock art, the use of colours, techniques and forms of figures recorded in the southern Kimberley.

Three styles may be closely related: Waliarri 1 (Complex), Waliarri 2 (Simple), and Mamo/Djuari, and likely related to Wanjina to the east and north of the study area. They remain separate at this stage for the purposes of chronological and spatial analysis in Chapters 8 and 9, including a case study examining their density and distribution.

Three styles are local: either to a single site or geographically close sites (Black & White, Abraded/Scratched Solid Infill and Round Bodied Grouped Anthropomorphs). Two are restricted to motif classes: Monochrome Stencils (Tracks and Material Culture), and Engraved Animal Tracks (Tracks), defined primarily by their techniques which results in distinctive forms.

It is inevitable that in any assemblage of rock art there will be many figures which do not fit into what may be defined as a style. They have too few characteristics in common to be anything more than peripheral to most analyses which will focus on more consistent and interesting styles that contribute to academic inquiry. For this reason, they are often left out of classifications or discussions on style within a region. This is understandable. Analysis of every single figure in an area may not be of interest in academic study or to Traditional Owners, nor may it add to answering any questions posed in research, or ultimately may produce meaningless statistical analyses if not arranged into some type of grouping. This is

[7] This is discussed in Chapter 8.

the reason for establishing the Broad Groups in this chapter. Rather than leaving a gap for all the rock art not allocated to a defined style, I have attempted to overcome this inconsistency by identifying at least one common attribute that will link figures, and which can then be analysed within the same parameters as styles.

Using this approach I identified the following broad groups:

- Monochrome Outline;
- Generic Monochrome; and
- Generic Bichrome.

This was while also grouping the non-figurative markings of Cupules, Incised lines and Historical Inscriptions together, with the remaining incomplete and highly deteriorated images identifiable as figures, but without further detail into a final group in Table 7.13.

Generic Monochrome includes more of all motif classes than any other grouping or style (Tables 7.14 and 7.15). The figures in this Broad Group are diverse, and at many layers of superimposition, suggesting that creating figures in a single colour may be the default rock art choice, but suggesting that what you create in different circumstances may differ.

Generic Monochrome figures may not reflect any cultural or stylistic choices but simply individual expressions during summer heat or rainy days (Johnny Bell 2011 pers. comm., 6 September; Mulvaney 1996). They may be teaching tools for hunting or copies of earlier motifs and figures with varying degrees of artistic competence or execution.

What is painted or engraved also depends on the context in which it is created (e.g. as part of ceremonies, during regular or periodic site use, during refuge from the heat of the day), the time and tools available and the importance/lack of importance associated with the images.

Large numbers of Generic Monochrome zoomorphs may support the idea of a teaching tool for hunting (zoomorphs shown as people may see them when hunting), but the lack of any figures showing anthropomorphs interacting with zoomorphs in hunting scenes such as those recorded in other places (e.g. Alzoubi et al. 2016; Ouzman 2003; Tratebas 1993) makes it difficult to support that conclusion without additional advice or interpretation by Traditional Owners.

The figures may contain different types of information than complex figures such as the Waliarri and Mamo/Djuari, and as teaching tools they may have complex stories attached to their identification, such as the role of the animals in the environment, rather than simply how to catch them.

The zoomorphs may be totemic and added to the rock art for that reason by a family member or visitor to a site (Natalie Davey 2012 pers. comm., 25 July), another part of both intimate and wider information exchange, whereas more complex figures may have restricted stories associated with them, and limited access (Table 4.2 and Wobst 1976; 1977).

Generic Bichrome occurs in all motif classes except Historical Inscriptions. This is understandable as Historical Inscriptions are rare in the southern Kimberley. These figures are diverse, with a strong representation in zoomorphs. Traditional Owners described the bush turkey as seen from the rear as a good representation of the bird in bichrome, as 'how else would you recognise it when you are hunting it?' (June Oscar 2012 pers. comm. 15 August), suggesting that it is a naturalistic image of the bird.

Each site has a different range of styles (Table 7.15), from sites with only one style or broad group, such as Marawun 7-2 where only Generic Monochrome figures were recorded, to sites with a wide range of styles and broad groups of figures, such as Mount Behn 1.

The final styles indicate that three related styles, which may be referred to as the Waliarri Family (Waliarri 1 (Complex), Waliarri 2 (Simple) and Mamo/Djuari) as described above account for 18% (n=353) of determinate figures, with Monochrome Stencils at 14% (n=264). This is skewed by the large proportion in the Generic Monochrome Broad Group, 41% (n=806). Excising the Broad Groups shows the Waliarri Family at 42%, Monochrome Stencil 32%, Engraved Animal Tracks 10%, Round Bodied Grouped Anthropomorphs 8% and the Abraded/Scratched Solid Infill 1% of figures of either local or southern Kimberley-wide styles.

This analysis has given me the opportunity to go through a process that uses the identification of initial styles in the field informed by Traditional Owners. I was able to refine those initial observations and classifications into finer level styles or new styles which give a truer reflection of the variation in rock art in the southern Kimberley. Through this process it became clear that some of the styles have form and attributes in common with styles in other parts of the Kimberley, some are unique to the southern Kimberley, and others do not yet have enough information in their form or attributes to differentiate them outside of generic groupings that may be useful in future finer analyses in a larger data set.

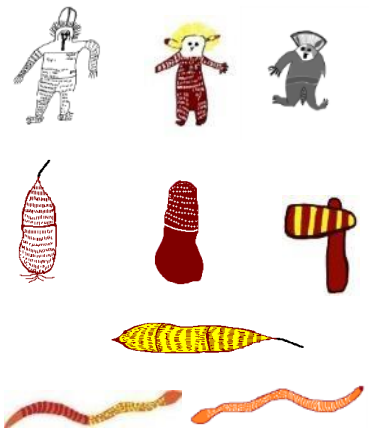
Having identified four southern Kimberley styles, and four local styles[8] within limited areas/sites in the southern Kimberley this sets the foundation for Chapter 8, with style used

[8] Note that one of the four local styles is not truly a local style, as it is ubiquitous in Australian rock art. However, in this study it was not observed or recorded in Gooniyandi Country. The Engraved Tracks are most likely

as the basis of an analysis of chronology to develop an answer to the questions about whether styles which reflect cultural identity and/or territorial boundaries have changed over time.

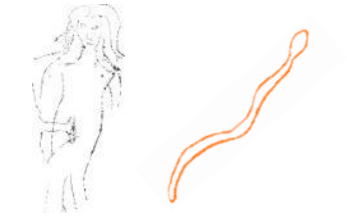
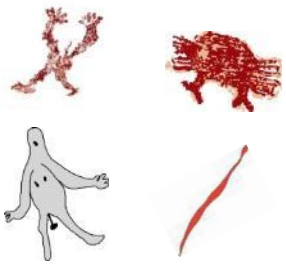
Chapter 9 expands upon this to explore how the styles are distributed, and their density across the southern Kimberley and where styles are concentrated or absent. This continues the discussion of the role of style in sharing of ideas and the importance of certain sites in building and maintaining cross cultural affiliations (McDonald & Veth 2006; 2012; Smith 1999; Wobst 1976; 2000).

TABLE 7.13 ROCK ART STYLES AND BROAD GROUPS IDENTIFIED IN THIS STUDY.

Styles	Description/Attributes
STUDY AREA WIDE STYLES	
Waliarri 1 (Complex) 	• monochrome, bichrome and polychrome; • anthropomorphs have wide bodies and limbs, rayed headdress (with or without enclosing arc), arms angled out from the body, feet (where present) pointing out from body, hands and feet include digits, internal features and dividing internal lines; • detailed internal and external features; • outlines; • patterned infill – may also include blocks of solid infill adjacent to the solid+pattern infill, pattern painted on rock surface or on a solid contrasting coloured infill; • applies to anthropomorphs, zoomorphs; phytomorphs, and material culture. This style is likely related to the Wanjina style mostly recorded to the west and north of the study area, and the Kaiara on the islands of the Kimberley.
Waliarri 2 (Simple) 	• monochrome solid infill; • mostly red, white or black pigment; • defining attribute is the rayed headdress atop a rounded head, wide bodies and limbs. Generally, arms angled out from the body, legs with feet (where present) angled away from the body; • no internal features, or evidence of other colours that may have deteriorated, with and without outlines; • applies only to anthropomorphs. Likely to be part of the same style family as Waliarri 1 (Complex).

present in Gooniyandi Country, and the recording has been limited by the smaller number of sites able to be recorded in Gooniyandi Country in 2011 and 2012.

Styles	Description/Attributes
Mamo/Djuari 	• monochrome or bichrome solid infill; • headdresses in the shape of feathers offset to the side or top of the head, one to three feathers, may also be a small hairlike or rayed addition between the feathers; • splayed arms and legs with digits, and a small number with rounded feet without digits; • applies only to anthropomorphs. This style is specifically identified by Traditional Owners and has a limited number of attributes in common with Waliarri 2 (Simple). They are likely to be part of the same style family.
Monochrome Stencil 	• monochrome stencils; • application of a pigment through blowing or spattering the pigment over a template such as a hand or object of material culture. Technique is not always clear; • associated predominantly with hands, but also recorded with material culture, such as boomerangs. It is likely that the mixture of ochre is blown through the mouth or an implement because of the fine droplets in the outer part of the stencil. Spattering the pigment by hand is unlikely as the droplets would be larger, and less consistent around the template as shown in practice (Vicky Winton 2011 pers. comm., 17 May) and processes described in the Kimberley (Crawford 1968:22).
LOCAL STYLES	
Bichrome Black Solid Infill With White Outlines 	• monochrome black infill and wide white outlines; • associated primarily with Gooniyandi Country; • applies to zoomorphs and anthropomorphs; • prevalent in Gooniyandi Country.
Engraved Animal Tracks 	• scratched, abraded and deeply incised animal tracks; • natural or realistic form suggesting that the animals (mostly birds or macropods) have walked over the surface on which they appear; • mostly appear in groups (birds), but have been recorded singly, or as pairs of bird or macropod tracks and primarily found on horizontal surfaces, or the front of ledges; • prevalent in Bunuba Country.

Styles	Description/Attributes
Abraded/Scratched Solid Infill 	• abraded solid infill, no colour evident; • anthropomorphs and zoomorphs; • different forms, range from complex posed anthropomorphs with headdresses/accoutrements, to stylised zoomorphic figures; • lack internal detail or outlines. This style is at a single site in Bunuba Country. This style is likely to be local, or possibly individual.
Round Bodied Grouped Anthropomorphs 	• monochrome solid infill painted anthropomorphs; • ≤60cm; • circular or oval body type, small, rounded heads, no distinguishing facial/headdress characteristics, narrow limbs in a variety of poses; • arranged in groups; • on exposed rockfaces.
BROAD GROUPS	
Monochrome Outline 	• drawn, painted or scratched outline of a figure or shape; • no evidence of infill; • no detailed features, pigment, pecking or abrasion to form solid infill or patterns; • may incorporate ≤2 simple features such as dot-like eyes in the same colour/technique as the outline; • both engraved and pigment rock art; • applies to mostly anthropomorphs and zoomorphs.
Generic Monochrome 	• single colour; • with/without an outline in the same colour; • no other distinguishing attributes; • may be allocated to a motif class at Level 3 (see Chapter 5) they do not have sufficient common attributes or form to otherwise separate into a style.
Generic Bichrome 	• two colours; • with/without an outline in the same or contrasting colour; • contrasting colours may include a single feature such as an eye or a tongue on a snake, such features are rare and often make the figure unique rather than able to be defined as belonging to a style; • no other distinguishing attributes, and while it can be allocated to a motif class at Level 3 (see Chapter 5) it does not have sufficient common attributes or form with other motifs to otherwise separate it into a style.
Cupules, Incisions and Historical Inscriptions not elsewhere allocated	**Cupules** are ground/abraded circular indents in the rock surface

Styles	Description/Attributes
	• may have been created for decoration[9], ritual or use as ochre repositories; • located on boulders or ledges; • more often in groups of no more than 3 in this study; • may have remnants of ochre. **Incisions** are deeply incised lines • in groups of 2 or more; • may also have been abraded to widen and/or deepen them. **Historical Inscriptions** are letters, numbers and associated markings • may include punctuation, lines and boxed enclosures that have not been recorded elsewhere; • mostly engraved (scratched). A small number (n=2) of Historical Inscriptions are painted.
Insufficient information to allocate to a style or style group 	There is rock art in this study that may be identified as a motif class, but is superimposed, incomplete or damaged to the extent that there is insufficient information to suggest a grouping or a style. Many are body parts of anthropomorphs or zoomorphs.

[9] Note. This was told to me by Gooniyandi elders Tommy Dick and Isaac Cherel when we visited Emanuel Gap in 2012. We were examining the cupules on the ledge at Emanuel Gap 3 and looking at the remnants of ochre in one of the cupules and talking about what else cupules might be used for. They shared stories of their ceremonies around this area (it close to the northern entrance to the gap and a spring) when they were younger and that they used these cupules on the ledge to mix up paint for decorating their bodies for the dancing. They also told me that there were other caves and shelters nearby that had the vertical walls covered in cupules in patterns like rows or circles that were there for decoration because sometimes people liked to decorate the places they came back to often. This is not dissimilar to the stories shared by Aboriginal people from the Keep River region (Northern Territory) with Mulvaney (1996) about creating rock art for pleasure and decoration.

TABLE 7.14 MOTIF CLASS BY STYLE/BROAD GROUP IN THE SOUTHERN KIMBERLEY.

MOTIF CLASS / STYLE	Anthropomorph	Zoomorph	Phytomorph	Material Culture	Tracks	Geometric	Historical Inscriptions	Other Non-Figurative	Other	TOTAL numbers of figures
STUDY AREA WIDE STYLES										
Waliarri 1 (Complex)	69	83	63	8	0	0	0	0	0	223
Waliarri 2 (Simple)	112	7	1	0	0	0	0	0	0	120
Mamo/Djuari	10	0	0	0	0	0	0	0	0	10
Monochrome Stencil	0	0	0	8	256	0	0	0	0	264
LOCAL STYLES										
Black & White	6	38	0	2	1	2	0	0	0	49
Engraved Animal Tracks	0	0	0	0	87	0	0	0	0	87
Abraded/Scratched Solid Infill	4	7	0	0	0	0	0	0	0	11
Round Bodied Grouped Anthropomorphs	64	0	0	0	0	0	0	0	0	64
BROAD GROUPS										
Monochrome Outline	27	30	8	3	11	16	0	3	0	98
Generic Monochrome	240	404	72	10	36	40	1	5	2	810
Generic Bichrome	15	37	7	11	1	9	0	6	0	86
Cupules, Incised lines and Historical Inscriptions not elsewhere allocated	0	0	0	0	0	42	14	0	12	68
Insufficient information to allocate to a style or style group	7	8	4	0	0	3	12	0	0	34
TOTAL	**553**	**614**	**155**	**41**	**392**	**111**	**25**	**14**	**16**	**1921**

TABLE 7.15 FINAL STYLES/BROAD GROUPS IDENTIFIED IN THE STUDY AREA, BY SITES WITH DETERMINATE FIGURES.

SITE	Waliarri 1 (Complex)	Waliarri 2 (Simple)	Mamo/ Djuari	Monochrome Stencil	Black & White	Engraved Animal Tracks	Abraded/Scratched Solid infill	Round Bodied	Monochrome Outline	Generic Monochrome	Generic Bichrome	Cupules et al.	Insufficient information
Bunuba Roadside Caves 1	1	2	0	0	0	0	0	0	0	3	3	0	0
Bunuba Roadside Caves 3	0	2	0	1	0	0	0	0	0	4	0	0	0
Tangalma	7	4	0	0	0	86	0	0	4	25	4	12	3
Tangalma A	3	1	0	1	0	0	0	0	0	4	2	3	0
Langurmurru	9	9	2	12	0	0	0	0	3	30	9	0	3
Darrananna	0	3	0	1	0	0	0	0	1	22	2	0	0
Tarakalu 1	0	0	0	0	0	1	0	0	1	3	0	1	0
Tarakalu 2	0	0	0	0	0	0	0	0	0	7	0	5	0
Elimberrie Springs	15	16	1	19	0	0	0	0	14	94	4	1	4
Emmanuel Gap 1	0	3	1	0	2	0	0	0	4	16	2	0	0
Emmanuel Gap 2	1	1	1	2	12	0	0	0	3	24	4	0	0
Emmanuel Gap 3	0	0	0	0	1	0	0	0	0	4	1	3	1
Emmanuel Gap 4	4	3	1	1	3	0	0	0	6	29	2	0	1
Emmanuel Gap 5	1	0	0	0	27	0	0	0	2	27	7	0	1
Fairfield 1	6	4	1	7	0	0	0	0	2	15	2	0	1
Fairfield 2	4	6	0	0	0	0	0	15	4	35	4	0	1
Fairfield 3	4	2	0	6	0	0	0	0	1	12	0	0	2
Lillimooloora 1	0	0	0	0	1	0	0	0	4	2	0	0	0
Lillimooloora 2	1	2	0	0	0	0	0	0	0	19	1	0	0
Louisa Downs Rockshelter 1	0	0	0	0	1	0	0	0	2	5	0	0	0
Marawun 1	21	9	0	23	0	0	0	16	7	67	6	3	1
Marawun 4	14	9	0	10	0	0	0	0	0	41	4	15	1
Marawun 7-1	1	1	0	8	0	0	0	0	1	12	0	3	0
Marawun 7-2	0	0	0	0	0	0	0	0	0	1	0	0	0
Marawun 7-3	0	0	0	0	0	0	0	0	0	2	0	1	0
Mine Site Access 1	0	0	0	0	0	0	0	0	0	8	0	2	0
Mine Site Access 2	0	3	0	5	0	0	0	0	2	18	0	0	0
Mount Behn 1	115	10	0	149	0	0	0	33	18	88	19	3	13
Mount Behn 2	0	0	0	5	0	0	0	0	1	5	0	0	1
Mount Behn 3	0	0	0	0	0	0	0	0	0	0	1	0	0
Moonggaroonggoo	2	1	1	0	2	0	0	0	2	68	2	7	0
Riwi	1	11	2	3	0	0	0	0	5	29	1	3	0
Stumpy's Soak 1	0	0	0	0	0	0	11	0	1	6	0	0	0
Tunnel Creek 1	2	0	0	11	0	0	0	0	0	2	1	0	0
Tunnel Creek 2	0	0	0	0	0	0	0	0	0	0	0	2	0
Tunnel Creek 3	0	5	0	0	0	0	0	0	0	3	1	3	0
Tunnel Creek 4	3	7	0	0	0	0	0	0	1	13	2	0	0
Tunnel Creek 5	2	5	0	0	0	0	0	0	6	13	0	1	0
Tunnel Creek 6	1	0	0	0	0	0	0	0	2	8	0	0	0
Djuru East	4	1	0	0	0	0	0	0	0	22	0	0	1
Djuru	1	0	0	0	0	0	0	0	0	24	0	0	0
TOTAL	223	120	10	264	49	86	11	64	97	810	84	68	34
% of Total	11.7	6.2	0.5	13.8	2.5	4.5	0.5	3.3	5.0	42.2	4.5	3.5	1.8

Note: some styles are abbreviated in this table due to space requirements.

A question of time

For the times they are a-changin'

(Dylan 1964)

Introduction

In creating chronological sequences for rock art lies the desire to answer questions about time, and how people, ideas and actions change. This study seeks to ascertain how such changes are reflected in Bunuba and Gooniyandi rock art. If figures and styles change, if the location and density changes, if techniques change then what the rock art is communicating may also be changing. Lack of change may signify continuity in identity, affiliations and belief systems; it may signal closed social networks with ready access to the resources to thrive, whereas changing styles and rock art traditions are more likely to indicate open networks resulting from, and in, trade, marriage, movement and sharing of resources in less abundant environments (e.g. David & Chant 1995; McDonald 1994; Smith 1992b; Wobst 1976).

Chronometric, stratigraphic association, and relative dating are the major approaches used to develop chronological sequences and change in rock art and rock art styles (e.g. Conkey & Hastorf 1990; McDonald 1998b, 1999, 2000, 2008; McDonald & Veth 2006, 2012b; Rosenfeld 1997, 2002; Smith 1992b). Many researchers have pursued multi-evidential approaches to provide a ‘reasonably secure knowledge’ (Taçon & Chippindale 1998:93) of dates and sequences in rock art (e.g. Aubert et al. 2019; Bonneau et al. 2011; 2017a; 2017b; Brumm et al. 2021; Chaloupka 1993; Chippindale & Taçon 1998; Faulstich et al. 2003; Finch et al. 2021a; Finch et al. 2021b; Jolly 1998; McDonald & Veth 2012; Pecchioni et al. 2019; Solomon 1998; Steelman et al. 2021; Taçon et al. 2003; Veth 2006; Whitley 2012; Whitley

& Dorn 2010; Wu et al. 2022). The prerequisites of reliable ethnographies, historical documentation, reliable dating techniques and contemporary knowledge from Traditional Owners limit both the potential and the application of the multi-evidential approach in many rock art provinces.

This chapter has three sections which describe the results of chronometric, stratigraphic association, and relative dating for the rock art in this study. The results are summarised in a proposed chronological style sequence for the southern Kimberley.

Chronometric Dating

The use of a new and refined scientific dating techniques in the early 1990s provided new opportunities to compare relative sequences with other dating results, creating greater depth and complexity in the archaeological record (Rosenfeld & Smith 1997). The range of techniques for reliable dating has continued to expand in the 21st century, and more techniques continue to be developed and tested for rock art application (e.g. by Clottes & Geneste 2012; David et al. 2013; Delannoy et al. 2020b; Dorn 2001; Finch et al. 2019; Green et al. 2017a; Green et al. 2021a; Green et al. 2021b; Green et al. 2017b; Pecchioni et al. 2019; Pike et al. 2012; Steelman et al. 2021; Wu et al. 2022).

Dating rock art is a difficult and sometimes controversial exercise (see Whitley 2012), with many scholars choosing single (Green et al. 2017a; Green et al. 2017b; Morwood et al. 2010; O'Connor & Fankhauser 2001; Roberts et al. 1997; Taçon et al. 2012; Taçon et al. 2006; Watchman 1997; Watchman et al. 1997), or specialised techniques (Aubert et al. 2019; Aubert et al. 2007; Huntley et al. 2014; King et al. 2017; Taçon et al. 2004; Wesley et al. 2014 ; Wu et al. 2022). Recent applied research includes:

- radiocarbon dating of organic materials such as charcoal and pollen in mud wasp nests over and underlying rock art (e.g. Boneau et al. 2011; 2017a; 2017b; David et al. 2013; Finch et al. 2019);
- dating calcium oxalate (CaC_2O_4) crusts over/under rock art (Steelman et al. 2021; Steelman & Rowe 2012:575-576; Watchman et al. 2001); and
- Uranium series (U-series) dating for calcite deposits over/under rock art (Aubert et al. 2014; Wu et al. 2022).

Recent dating research has also been investigating the characteristics of mineral depositions in rock art, and the potential for both radiocarbon and U-series dating from

those (Delannoy et al. 2020a; Delannoy et al. 2020b; Finch et al. 2021b; Gleadow et al. 2013-2016; Green et al. 2017a; Green et al. 2017b; Pecchioni et al. 2019).

To enhance the potential for chronometric dating of the rock art in the *Lifeways* Project Maxime Aubert accompanied the team on survey, taking samples of suitable calcite deposits (Figure 8.1). Selection of deposits was based on earlier research (e.g. Aubert et al. 2007) and included detailed examination of thickness, contamination and positioning of the calcite over identifiable determinate figures. Small areas were extracted using a battery-operated rotary tool with diamond saw blade and scraped directly into vials using single use stainless steel scalpel blades (Maxime Aubert 2014, pers. comm., November 22). Traditional Owners also allowed loose flakes to be removed where they showed potential for dating (Table 8.1).

FIGURE 8.1 MAXIME AUBERT REMOVING A FLAKE OF CALCITE DEPOSIT WITH A SURGICAL SCALPEL OVER A MAMO FIGURE AT LANGURMURRU, 2012. PHOTOGRAPH JANE BALME.

TABLE 8.1 SAMPLES TAKEN FOR LASER ABLATION AND URANIUM/THORIUM DATING AT 2 SITES IN THE STUDY AREA (SOURCE: MAXIME AUBERT, 2012 & 2013 PERS. COMM. NOVEMBER 10, MARCH 14). COLOUR CODED FOR THE MOTIF CLASS.

Site	Sample Number	Sample Composition	Relationship to Figure	Associated Figure Number & Classification
Mount Behn 1	MB-01	Calcium carbonate (fragment)	Overlying the paint.	M2202 Zoomorph (snake).
	MB-02	Calcium carbonate (fragment)	Overlying the paint.	M2034A Phytomorph (Wanggu /yam).
	MB-03	Calcium carbonate (fragment)	From the eye of the figure.	M2038 Anthropomorph (Waliarri 1 Complex).
	MB-04	Calcium carbonate (fragment)	Overlying the painted headdress.	
	MB-05	Calcium carbonate (fragment)	Under red paint, and overlying red paint/	M1665 Indeterminate. Possible zoomorph (snake).
	MB-06	Calcium carbonate (fragment)	Under black paint at base of leg.	M1631 Anthropomorph (Waliarri 1 Complex).
	MB-07	Calcium carbonate (fragment)	Under red paint on foot area.	
	MB-08	Calcium carbonate (powder)	Overlying red paint on headdress.	M1615 Anthropomorph (Waliarri 1 Complex).
	MB-09	Calcium carbonate (powder)	Black paint and underlying substrate.	M1886 Phytomorph (wajarri/boab nut).
Langurmurru (Carpenter's Gap 3)	CG3T-01	Calcium carbonate (fragment)	Overlying yellow paint.	M1083 Zoomorph (Thylacine)
	CG3T-02	Calcium carbonate (fragment)	Under yellow paint.	
	CG3F-01	Calcium carbonate (fragment)	Overlying paint.	M1082 Phytomorph (grass). Also associated with M1083.
	CG3BF-01	Calcium carbonate (powder)	Overlying paint.	M1046 Anthropomorph.
	CG3BF-02	Calcium carbonate (fragment)	Overlying and under paint.	
	CG3RF-01	Calcium carbonate (fragment)	Overlying and under red and mulberry paint layers on body.	M1040 Anthropomorph (Mamo).
	CG3RF-02	Calcium carbonate (fragment)	Under red paint at leg edge.	
	CG3RF-03	Calcium carbonate (fragment)	Under red paint at leg edge.	
	CG3RF-04	Calcium carbonate (fragment)	Under red paint at leg edge.	
	CG3RF-05	Calcium carbonate (fragment)	Under red paint at leg edge.	
	CG3RF-06	Calcium carbonate (fragment)	Overlying and under red paint at leg edge.	

20 samples were taken from Mount Behn 1 and Langurmurru, including calcite on which pigment was both under and over the calcite sample. Samples of charcoal from figure outlines were also collected, to complement the calcite samples from figures with charcoal outlines.

Calcite deposits are present in many caves and rockshelters in the southern Kimberley and to the untrained eye these appear to be thick, clean white and ripe for U-series dating. However, expert examination eliminated many because of contamination, thinness of layers or their positioning away from rock art. This limited the number of samples possible in the study area. Post field microscopic analysis further eliminated finely contaminated samples, leaving a single sample for analysis and dating (Maxime Aubert 2013, 2014, pers. comm., November 10, March 14).

Aubert's initial testing, using solution-based U-series dating, produced inconclusive dating results, due to high levels of contamination from detrital materials visible in the variation of the calcite colour, and inclusions in the flake profile (Table 8.1). This was followed by laser ablation U-series dating as described by Eggins et al. (2005), where samples are sufficiently thick. This produced more consistent results (Aubert 2014, pers. comm., November 22). Radiocarbon AMS dating was used for charcoal layers over pigment (Figure 8.2). This was only possible for one sample (MB05), and the results reported here are preliminary (Aubert 2014 pers. comm., November 22).

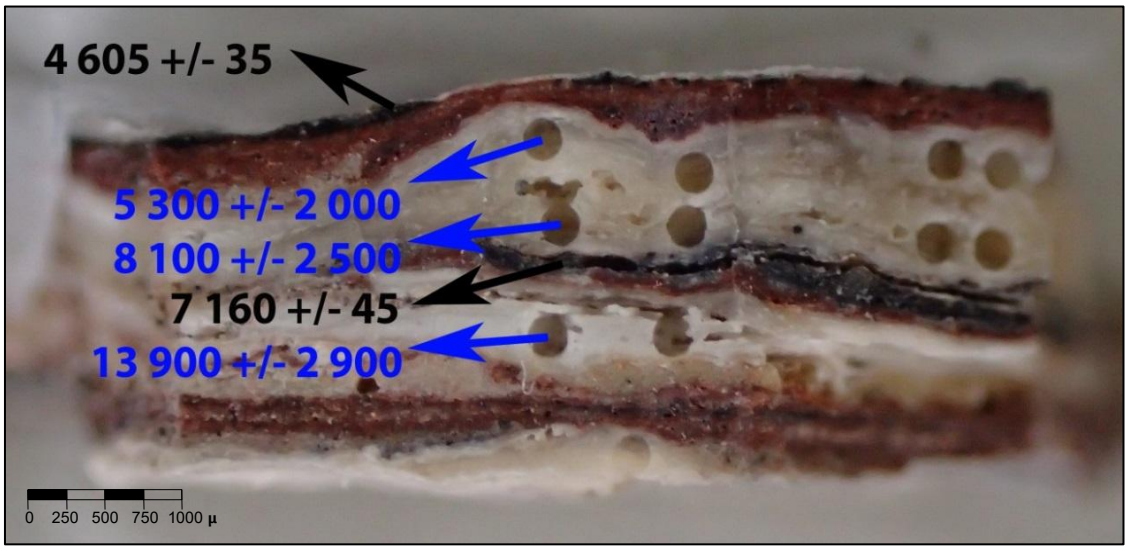


FIGURE 8.2 PROFILE OF SAMPLE MB05 WITH U-SERIES DATES FOR CALCITE (BLUE) AND RADIOCARBON DATES FOR CHARCOAL (BLACK) LAYERS. PHOTOGRAPH AND DATING COURTESY OF MAXIME AUBERT, WOLLONGONG UNIVERSITY, NSW AT THE TIME OF THE WORK.

MB05 has clear sandwiching of pigment and charcoal between layers of calcium carbonate, suggesting the presence of multiple applications of pigment for rock art separated by calcite/water flow events, and possible fires. Although some laser ablation spots in Figure 8.2 show evidence of detrital contamination, others show a clear stratigraphic profile (Fyfe & Aubert 2014a), and this provides well defined demarcation between pigments and calcite deposits. The only visible figure over which this flake was located is not clear, though likely to be a snake, the most common zoomorphic figure in the assemblage, and the upper charcoal layer may be a continuation of the outline on the figure applied after the pigment.

The first pigment layer at the surface of the flake is partly sandwiched between the dated charcoal layer and the calcite deposit, making it older than the charcoal dated at 4,605 +/- 35BP, and more recent than the calcite U-series dates from the calcite deposit (Table 8.2), making it late Holocene.

The second pigment layer is sandwiched between charcoal and calcite (Figure 8.2 and Table 8.2) placing it in the mid to early Holocene. At least two layers of red pigment, and a thin line of charcoal are visible below the calcite deposit (and one within it) most likely also dated in the early Holocene (Figure 8.2). These dates suggest that pigment at this site has been applied to the rockface since at least the terminal Pleistocene.

TABLE 8.2 DATE RANGES FOR CALCITE, PIGMENT AND CHARCOAL FROM FLAKE SAMPLE MB-05

Layer	Earliest Date (BP)	Most Recent Date (BP)
Calcite 1	Not dated	
Charcoal 1	4,605 +/- 35	
Pigment 1	8 100 +/- 2,500	4,605 +/- 35
Calcite 2	8,100 +/- 2,500	5,300 +/-2,000
Charcoal 2	7,160 +/- 45	
Pigment 2	13,900 +/- 2,900	7,160 +/- 45
Calcite 3	13,900 +/- 2,900	
Pigment 3	Not dated	
Calcite 4	Not dated	
Pigment 4/Charcoal 3	Not dated	
Calcite 5	Not dated	
Pigment 5	Not dated	
Charcoal 4	Not dated	
Calcite 6	Not dated	

Note: All dating is courtesy of Maxime Aubert, University of Wollongong, NSW at the time of the work, and currently at Griffith University (2024).

On a cautionary note, it was not possible to date the very thin layers of calcite deposit below, or the charcoal and small deposits between, the two thinner layers of pigment, and not all the laser ablations produced successful results to give consistency for the layer Calcite 3. Without confirmation of an older date the application of the pigment and charcoal at the lowest layers may be contemporary with, or close to, the calcite deposits sandwiching them.

Aubert also collected samples directly from figures where possible. In the case of sample MB06 (Table 8.1) the fragment of calcite deposit is below a black line, the outline of a recognisable Waliarri 1 (Complex) style anthropomorph at Mount Behn 1. The charcoal is radiocarbon dated to 395 +/- 25BP, a maximum of 420BP. The figure is at the fifth layer of superimposition, making the layers of figures above it at least contemporary or more recent. There are some limits to relating the charcoal date to the figure's creation date:

- the figure may have been painted hundreds or thousands of years before the outline was applied (e.g. see Bowdler 1988; Mowaljarlai et al. 1988; O'Connor et al. 2008, Vinnicombe 1992), or at the same painting event; and
- the charcoal used for the outline may have lain at the site for many years before being used, or been freshly burnt.

Minimum and/or maximum dates for pigment and individual figures using radiocarbon, U-series or other dating techniques is possible in the study area, but there are limits to the figures and sites for which these techniques are suitable. Dating a single figure may provide an anchor point, which is helpful to suggest antiquity of a figure type or style at a single site but using it as the basis for a style sequence across sites, or a cultural area would be misleading.

Synopsis

U-series and radiocarbon dating of flakes and charcoal from Mount Behn 1 is evidence that there was pigment applied to the rockface from the terminal Pleistocene to as recently as c.4,00BP. Further samples from different figures would be needed to establish sound chronometric sequences. The dates for the calcite and charcoal at Mount Behn 1 provides evidence that the site was used from an earlier time than suggested by the radiocarbon dates obtained from the excavations at the same site (Vannieuwenhuyse 2014 pers. comm., 15 May; Vannieuwenhuyse 2016), which is described in the following section.

Stratigraphic Dating by Association

Indirect dating, where pigment, or pigment marked artefacts are found in stratigraphic layers able to be radiocarbon dated by association with organic remains (O'Connor & Fankhauser 2001) may provide date ranges for rock art. However, if the artefacts cannot be placed in a rock art context (i.e. within an extant visible figure), or are small enough to have been moved through layers, doubt is cast on their temporal relationship to the rock art. It could be inferred that such artefacts relate to a time at which markings were created in a general sense, but not to extant rock art or styles. Pigment marked flakes in stratigraphic layers may, however, provide a general clue to the maximum age of the rock art at a site. This limits attribution to specific figures, styles, or motifs and therefore sequences, in most contexts.

Four sites with rock art in the study area (Figure 8.3) were excavated as part of the *Lifeways* Project in 2012 and 2013 (Balme et al. 2018b; Balme et al. 2018c; Maloney et al. 2017b; Maloney et al. 2016; O'Connor et al. 2014; Vannieuwenhuyse 2016; Vannieuwenhuyse et

al. 2016b; Whitau et al. 2016a; Whitau et al. 2016b; Whitau et al. 2018; Whitau et al. 2017; Wood et al. 2016); Langurmurru, Mount Behn 1 and Djuru East in the western part of Bunuba Country, and Riwi in Gooniyandi Country.

Langurmurru and Djuru East were excavated in 1993 and 1994 respectively (O'Connor et al. 2008a; O'Connor et al. 2014). In 2012 the excavation area of Langurmurru was expanded to two 1x1m squares and excavated until deposits were consistently sterile below a layer of concretion (O'Connor et al. 2014). At Djuru East a new 1x1m square was opened below the main concentration of rock art, 5m east of the previous excavation (Maloney et al. 2016).

Riwi was excavated in 1999 (Balme 2000). In 2013 the excavation area was reopened and expanded from a single 1x1m square to three additional 1x1m squares around the initial square, and another at the cave entrance (e.g. Balme et al. 2018c).

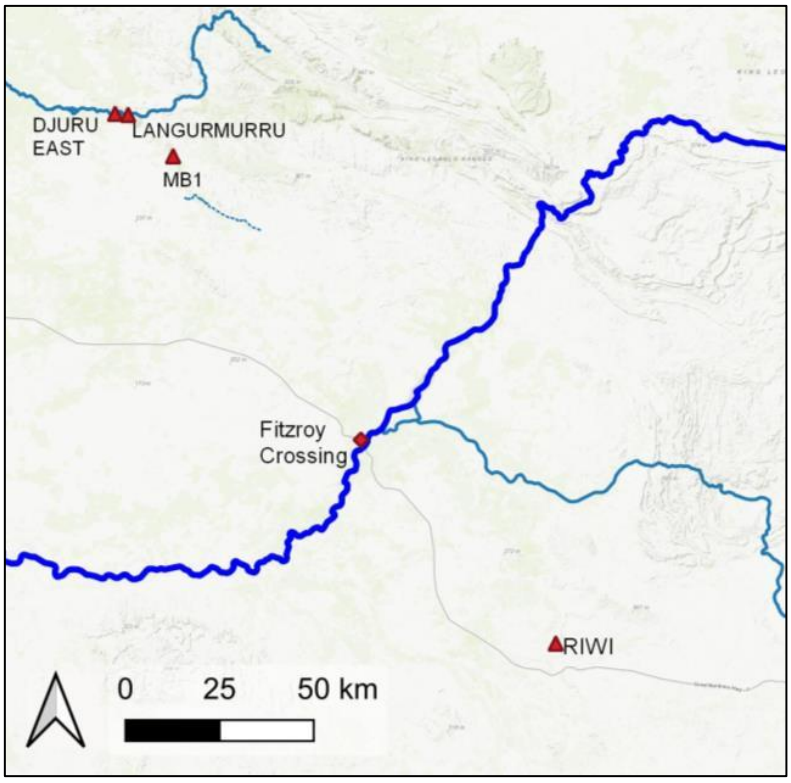


FIGURE 8.3 LOCATION OF SITES EXCAVATED FOR *LIFEWAYS* PROJECT.

Moonggaroonggoo was excavated at the request of the Gooniyandi people from the Muludja community in 2016, and a short report has been published dating occupation (Shelter 3 in the report) to 387 +/- 74BP, noting that one small piece of ochre was identified in the stratigraphic unit above the dated layer, and that it was also the only shelter in the group with rock art of Ancestral Beings/Spiritual Beings (Maloney et al. 2017a:180, 182, 183).

At each of the four sites excavated during the *Lifeways* Project ochre/pigment pieces and flakes with pigment were recovered in situ and in sieve residue (ranging from 1.5mm to 5mm sieves) and sorted by excavation units (XU) and stratigraphic units (SU) for analysis.

244 pieces of pigment and flakes/limestone with applied pigment were recovered in the excavations at Mount Behn 1 (Table 8.3), plus one small piece of animal bone with yellow pigment. The presence of pigment in an excavation suggests that there has been marking activity at the time it was deposited. The pigment recovered in this excavation was too small to identify markings that may indicate use for rock art, and none of the flakes with pigment could be matched with visible figures in the vicinity. This was the case at all sites, making it impossible to date specific figures or superimposition layers by association with XU or SU in the excavations.

TABLE 8.3 SUMMARY OF THE NUMBER OF PIECES OF PIGMENT AND FLAKES/PIECES OF LIMESTONE WITH APPLIED PIGMENT RECOVERED FROM EXCAVATIONS IN THE STUDY AREA, 2012 AND 2013.

Site	Pigment (number of pieces)	Flakes/Limestone with applied pigment (number)
Langurmurru	2	1
Mount Behn 1	227	17
Djuru East	28	6
Riwi	186	13
Total	443	37

The limitations of dating pigment or marked flakes by association, however, does not preclude the likelihood that they may have been used to create rock art, or mark the rock surface (or people) in symbolic or ceremonial ways. Striations on the pigment, grinding marks and associated grinding patches, grooves, cupules or stones, are strong indicators of its use in cultural marking. The presence of pigment without such marks does not preclude its use for those purposes either, as the environmental conditions and deposition processes may obscure any marks that may otherwise have been preserved. Vannieuwenhuyse (2015, pers. comm., 15 May) suggests that at Riwi and Mount Behn 1 there have been water flows which eroded or removed deposits (see also Vannieuwenhuyse 2016), which could partly explain the absence of pigments for some stages of occupation at those sites.

The remainder of this section describes the pigment and marked flakes found at the four sites excavated and relates them to radiocarbon dates from organic materials in the stratigraphic layers.

Langurmurru

At Langurmurru the earliest human occupation is estimated at 29,350 +/-100BP, with intermittent or sparse occupation until 1,00BP (O'Connor et al. 2014:13, 20). The dates cannot be directly linked to the earliest rock art because of the location of the excavation in relation to the rock art(Figure 6.3) and the absence of suitable dating materials covering or underlying the rock art (e.g. calcite, mud wasp nests, beeswax). However, it is likely that people were marking the site from at least that time, as they did at Tangalma, less than 3km to the east. The sites have similar intermittent occupation records, and there is evidence of an ochre marked slab at Tangalma dated to c.40,000BP (O'Connor & Fankhauser 2001) along with longer site use and occupation (Hiscock et al. 2016; Maloney et al. 2018b).

At Langurmurru pigment, and flakes with pigment (Figure 8.4), were found in three XU (Table 8.4). The XUs were not dated, but are sandwiched between dated layers, giving a wide range of possible dates for pigment use, and by extrapolation rock art creation. The artefacts at XU5 and XU7 are between modern and 6,910 +/- 45BP (O'Connor et al. 2014:13), the latter possible c.5,555BP if the dating of *Dentalium sp.* is correct and the flake at XU19 is between 12,650 +/- 190BP and 11,700 +/- 50BP (O'Connor et al. 2014:13).

The excavation at this site is within the cave, well away from the rock art (see Figure 6.3). It is most likely to be an occupation area where a range of activities took place which may have been associated with rock art, such as ceremonial activities associated with trade and marriage (e.g. Wobst 1976). There is a single figure high on the ceiling inside the cave entrance, and three figures on the exposed rockface to the west of the cave entrance.

TABLE 8.4 EXCAVATION UNITS IN SQUARE B, FROM WHICH OCHRE AND EXFOLIATED FLAKES/LIMESTONE PIECES WERE RECOVERED AT LANGURMURRU, CROSS REFERENCED TO RADIOCARBON DATES BY EXCAVATION UNIT.

XU	Flake/ Limestone	Pigment	Radio Carbon Date[1] (BP)	Material Dated[2]	Laboratory Code
1			99.9 +/- 1.8	Charcoal and sand	S-ANU 10606
5		✓	Not dated		
6			600 +/- 30	Celtis	S-ANU 32506
7	✓		5,515 +/- 40	*Dentalium sp.*	S-ANU 33036
10			6,910 +/- 45 4,790 +/- 40 260 +/- 40	*Dentalium* sp. *Celtis* inorganic Charcoal	S-ANU 33037 OZF-325 OZF-033
12			5,625 +/- 40	*Celtis* inorganic	S-ANU 30229
16			7,720 +/- 50	*Dentalium sp.*	S-ANU 33105
18			12,650 +/- 190	Freshwater mussel	OZF-163
19	✓		Not dated		
24			11,250 +/- 50	*Celtis* inorganic	OZF-327
29			13,870 +/- 70 14,100 +/- 300	*Celtis* inorganic Charcoal	OSF-324 OZF-359
30			10,486 +/- 179	Freshwater mussel	S-ANU 10784
61			25,875 +/- 103 27,400 +/- 160	Charcoal Freshwater mussel (nacre)	D-AMS-001665 S-ANU 35003
64			29,280 +/- 190	Freshwater mussel	S-ANU 35007
69			29,450 +/- 200	Freshwater mussel	S-ANU 35006

Note: Several excavation units between 30 and 60 are not included. Those dates show a consistently aging radiocarbon age from 13,300 +/- 30 to 24,900 +/- 570 (see O'Connor et al. 2014: 13)

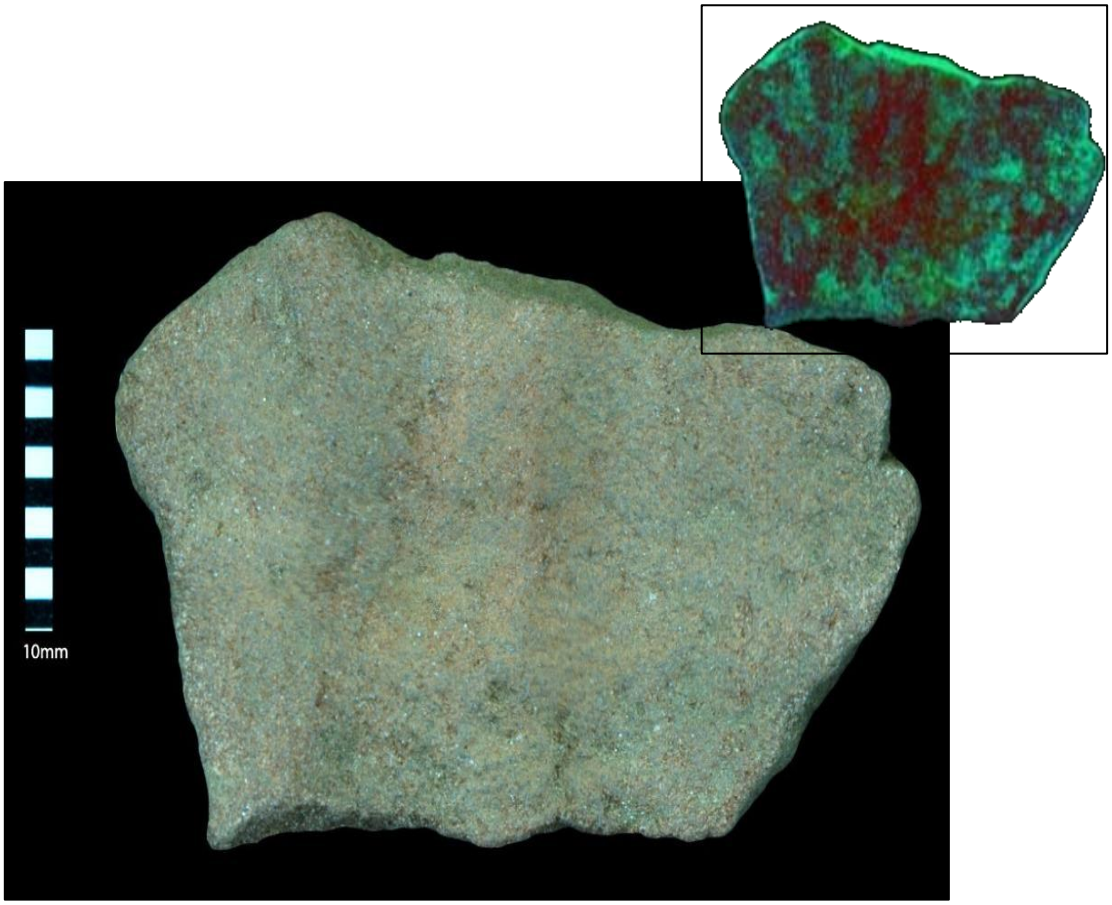


FIGURE 8.4 LIMESTONE WITH PIGMENT FROM LANGURMURRU, SQUARE B, XU7. INSET ENHANCED USING DSTRETCH © LRE/SCALE 20.

Djuru East

At Djuru East pigment and flakes with pigment were recovered from the single square excavation. At this site the excavation square is directly in front of an area of intensively superimposed rock art on an almost vertical rockface (Figure 8.5).

Pigment was recovered from XU4 to XU34, and flakes/limestone pieces from XU2 to XU21. Pigment may be dated from the early Holocene (XU33 and XU34) to dates close to European settlement (Table 8.5). The painted flakes are not in XU which reliably span the same time frame. The deepest flakes/limestone were recovered between layers dated mid to early Holocene (XU21), with the closest to the surface of the deposit dating to modern times (XU2).

Marked limestone (Figure 8.6) from XU19 and XU21 is too large to have been moved through bioturbation, dating its deposition by association with the charcoal deposits to c.1,000BP. The range of dates possible for painted flakes suggests that rock art was present at this site at least 1,000BP, with the possibility that there was cultural marking in the early Holocene closer to 10,000BP (see also Maloney et al. 2016).

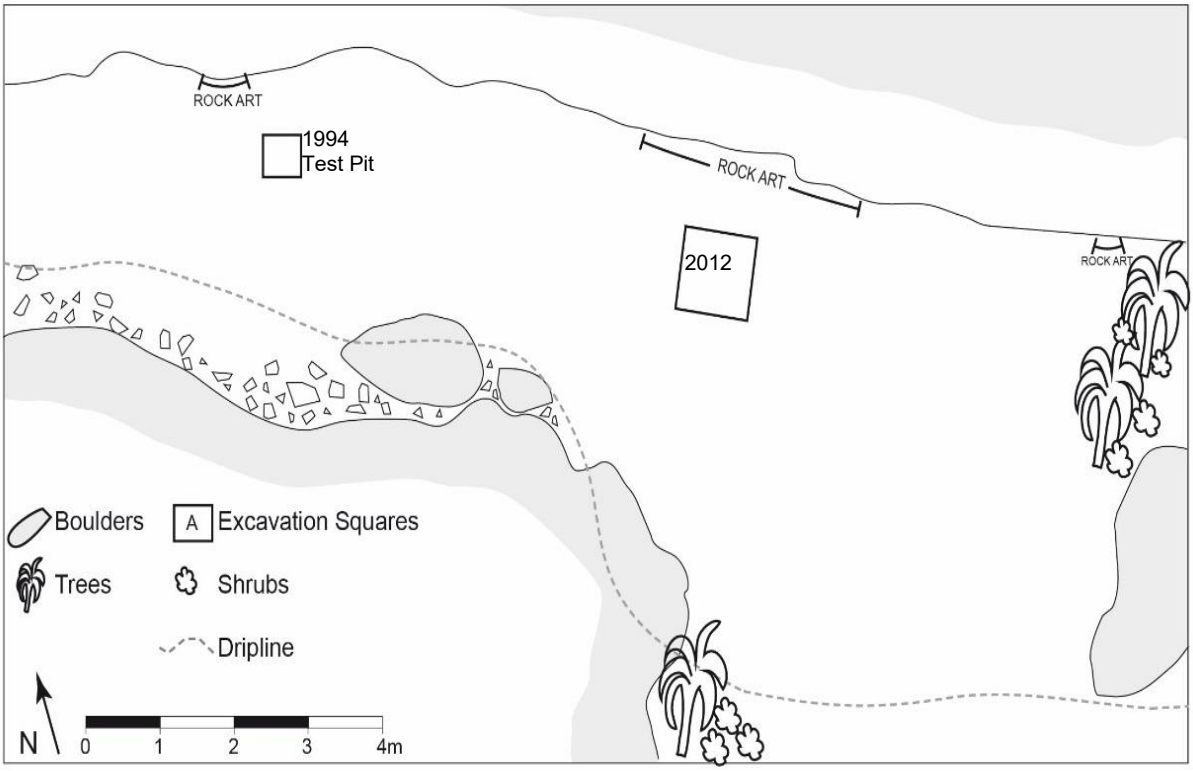


FIGURE 8.5 DJURU EAST SITE PLAN SHOWING LOCATION OF ROCK ART AND EXCAVATIONS. CAD BY DORCAS VANNIEUWENHUYSE/JANE FYFE.

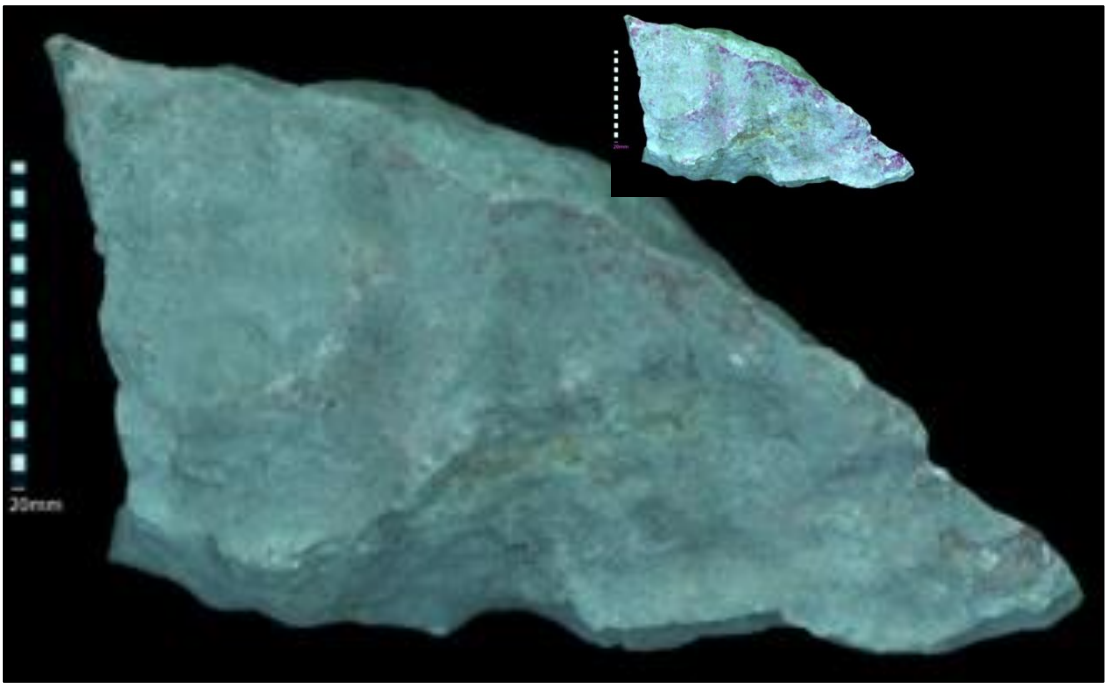


FIGURE 8.6 LIMESTONE WITH REMNANTS OF RED AND WHITE PIGMENT RECOVERED FROM THE EXCAVATION (XU19) AT DJURU EAST IN 2012. INSET ENHANCED WITH DSTRETCH© RGBO/SCALE 15.

TABLE 8.5 EXCAVATION UNITS FROM WHICH PIGMENT AND EXFOLIATED FLAKES/LIMESTONE PIECES WERE RECOVERED AT DJURU EAST, CROSS REFERENCED TO RADIOCARBON BY EXCAVATION UNIT.

XU	Flake/ Limestone	Pigment	Radio Carbon Date[1]	Material Dated	Laboratory Code
1			274 +/- 23	Charcoal	D-AMS 001666
2	✓				
4	✓	✓			
5			827 +/- 25	Charcoal	D-AMS 001667
10			1,248 +/- 24	Charcoal	D-AMS 001668
14		✓			
15			1,364 +/- 29	Charcoal	D-AMS 001669
16	✓	✓			
17	✓	✓			
18			1,067 +/- 25 1,089 +/- 26	Charcoal Charcoal	D-AMS 001670 D-AMS 001671
19	✓	✓			
20			1,459 +/- 25	Charcoal	D-AMS 001672
21	✓				
25		✓	1,009 +/- 31 7,972 +/- 30	Charcoal Charcoal	D-AMS 001673 D-AMS 001674
29			8,678 +/- 38 8,101 +/- 62	Charcoal Charcoal	D-AMS 001675 D-AMS 001676
33		✓			
34		✓			
35			8,807 +/- 50 9,081 +/- 45	Charcoal Charcoal	D-AMS 001677 D-AMS 001678
41			9,188 +/- 50	Charcoal	D-AMS001679
45			9,510 +/- 34	Charcoal	D-AMS-001680
46			11,085 +/- 51	Charcoal	D-AMS-001681

1. Note XU below 35 were also dated at this site but are not included in this table because the lowest XU in which pigment/flakes were recovered is XU34 shown above.
2. As described in O'Connor et al. (2014) in relation to the excavation at Langurmurru, the excavation units at this site were in flat 2cm spits, and some of the XU cut across more than one SU suggesting inconsistency in chronology for the dates obtained. For example, XU25 cuts through at least 2 stratigraphic units and a large disturbance, and the 2 dates obtained for charcoal at that XU may reflect this disturbance which cuts through XU and SU from a depth of approximately 37cm to 75cm.

Mount Behn 1

At Mount Behn 1 a 1x1m square (SQI) was excavated adjacent to, but not adjoining, a wall with densely painted, highly superimposed rock art, within the main shelter (Figure 8.7). Bedrock was reached at 80cm. An additional square was opened to the north (SQ2) and excavated to sterile deposits at 60cm.

In SQ1 pigment was found in many XUs, with concentrations in XU12-XU18 and XU20-XU23 (Table 8.6). Flakes and limestone with applied pigment were also recovered in five XUs in the excavation. This places both pigment and the three painted flakes in XU21 and lower as older than the earliest date of 5,060 +/- 40BP in XU12 in SQ1.

In SQ2 the pattern is similar (Table 8.6). More pigment than painted flakes were recovered. In SQ2 the dates from charcoal recovered from the XUs was more recent, and places the pigment recovered from in XU20/SQ2 in the late Holocene at 2,530 +/- 30BP.

Pigment recovered from both squares is red, white and yellow. Colours on the flakes are red and white. Both the pigment pieces and the flakes reflect the colours used in the rock art in the vicinity of the excavation squares, suggesting that the pigments may be associated with the rock art. Figures on the wall and ceiling above the squares are exfoliated, and there is visible evidence of environmental damage (e.g. water, [animal] rubbing) and chemical interactions on rock surfaces resulting in deterioration of pigments over time (Ford et al. 1994).

Despite close colour matching and attempts to refit flakes to extant figures, the sizes (none was larger than 25mm, see Appendix 11), and the similarity of colour and pattern to the many figures in the vicinity with similar exfoliated parts, it was not possible to match the painted flakes/limestone with specific rock art figures (Figure 8.7).

FIGURE 8.7 FLAKE OF PAINTED ROCK EXCAVATED AT MB1 INSET ON A SECTION OF THE ROCK ART AND DAMAGED ROCK ON THE WALL CLOSE TO EXCAVATION SQUARE 1 (FLAKE CODE: MB1SQ1S1QC. PHOTOGRAPHED WITH LEICA M205C STEREO MICROSCOPE).

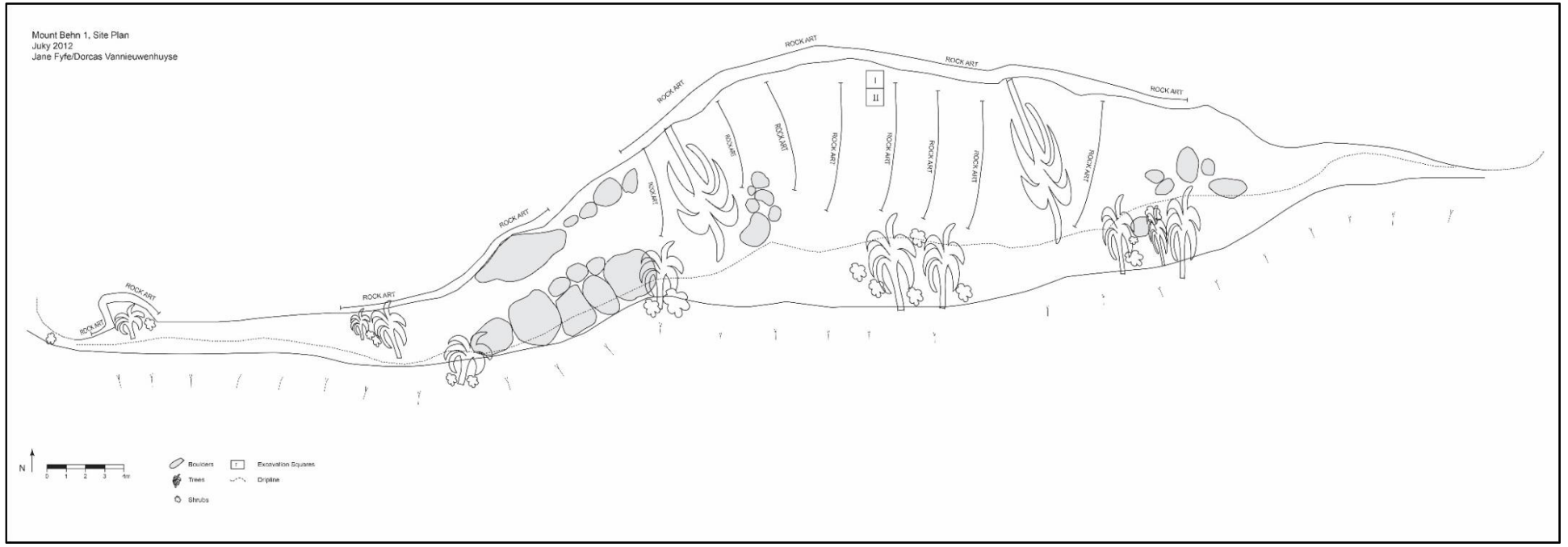


FIGURE 8.8 MOUNT BEHN 1 (MB1) SITE PLAN SHOWING LOCATION OF ROCK ART AND EXCAVATIONS. CAD BY DORCAS VANNIEUWENHUYSE/JANE FYFE.

TABLE 8.6 EXCAVATION UNITS FROM WHICH OCHRE AND FLAKES/LIMESTONE WITH PIGMENT WERE RECOVERED AT MOUNT BEHN 1, CROSS REFERENCED TO RADIOCARBON DATES BY EXCAVATION UNIT.

SQUARE 1						SQUARE 2				
XU	Flake/ Limestone	Pigment	Radio Carbon Date[1](BP)	Material Dated	Laboratory Code	Flake/ Limestone	Pigment	Radio Carbon Date[2](BP)	Material Dated	Laboratory Code
1	✓	✓						3,050 +/- 35	Bailer	S-ANU 32510
2			3,730 +/- 40	*Dentalium sp*	S-ANU 33107	✓	✓			
3	✓	✓						265 +/- 35	Charcoal	S-ANU-32631
4	✓	✓	2,740 +/- 35	*Dentalium* sp	S-ANU-33026	✓	✓	135 +/- 25	Charcoal	S-ANU-32514
5	✓						✓	2,020 +/- 35	Charcoal	S-ANU-32509
6			2,505 +/- 35	*Dentalium* sp	S-ANU-33027		✓			
7			1,955 +/- 30	Celtis	S-ANU-32507					
8			2,225 +/- 40	*Dentalium* sp	S-ANU-33029					
9		✓	3,695 +/- 40	*Dentalium* sp	S-ANU-33030		✓			
10			3,755 +/- 40	*Dentalium* sp	S-ANU-33031			2,460 +/- 35	Charcoal	S-ANU-32513
11			3,310 +/- 40	*Dentalium* sp	S-ANU-33032	✓	✓			
12		✓	5,060 +/- 40	*Dentalium* sp	S-ANU-33033					
13		✓					✓			
14		✓					✓			
15		✓						2,755 +/- 35	Charcoal	
16		✓					✓	2,715 +/- 45	Charcoal	S-ANU-32612
17		✓								
18		✓								
20		✓					✓	2,530 +/- 30	Charcoal	S-ANU-32511
21	✓	✓								
22		✓								
23		✓								

Riwi

From four squares excavated at Riwi in 2013 there are 199 samples of pigment and painted flakes/limestone, recovered from most XUs (Table 8.7). Excavation squares 1, 3 and 4 are in the centre of the main cavern at Riwi (Figure 8.9). Rock art is on the almost vertical walls around the squares, 2m-3m either side. Excavation Square 5 is close to the entrance to the cave, and at the edge of the drip line. There is rock art around the interior walls of the first cavern at either side of Square 5, mostly painted, with some engraved, on ledges and on the vertical wall at the western side of the entrance.

TABLE 8.7 EXCAVATION UNITS FROM WHICH OCHRE AND EXFOLIATED FLAKES/LIMESTONE PIECES WERE RECOVERED AT RIWI, CROSS REFERENCED TO RADIOCARBON DATES BY EXCAVATION UNIT.

XU	Flake/ Limestone	Pigment	Calibrated Radio Carbon Date[1](BP)	Material Dated	Laboratory Code
SQUARE 1					
3-10cm[2]			6,050 +/-450	Scattered charcoal	Wk7605
5-20cm			33,618 +/-580	Charcoal lens	Wk7896
7-25cm			35,751 +/-978	Hearth	Wk7606
13-65cm			47,815 +/-1924	Hearth	ANUA13005
16-95cm			44,747 +/-2320	Isolated charcoal	ANUA13006
100[3]		✓			
102		✓			
105		✓			
107		✓			
108		✓			
SQUARE 3					
1		✓			
2	✓		604 +/- 47	Wood, sieve residue	S-ANU 43337
3		✓	70 +/- 32 22,190 +/-222 20,056 +/- 250	Charcoal sieve residue Charcoal sieve residue, possible top of hearth in feature 1. Hearth Feature 1	D-AMS-004068 S-ANU 38225 S-ANU38226
4		✓			
5		✓			
6	✓	✓	6,050 +/-145 7,048 +/-114	Charcoal Charcoal from wall section	Wk 7605 D-AMS-004069
7		✓			
9		✓			
10		✓			
11		✓			
12		✓			
14		✓			
15		✓			
17		✓			
19			41,185 +/-781	Scattered charcoal in situ	S-ANU 37706
20	✓	✓			
21		✓			
25		✓			
27		✓			
28		✓			

XU	Flake/ Limestone	Pigment	Calibrated Radio Carbon Date[1](BP)	Material Dated	Laboratory Code
29		✓			
41		✓			
42		✓			
48		✓			
SQUARE 4					
1			22,743 +/-217	Charcoal from 5mm sieve residue	S-ANU 38220
3		✓			
4		✓			
5		✓	7,344 +/-75	Scattered charcoal in top of grey layer from 5mm sieve residue	S-ANU 388221
6		✓			
7		✓	7,292 +/-122	Charcoal from wall section	D-AMS 004063
8		✓	6,971 +/-272 7,151 +/-124	Scattered charcoal at base of grey layer from 5mm sieve residue Charcoal from wall section	S-ANU 38223 D-AMS-004062
9	✓				
10		✓			
12			39,034 +/-740	Charcoal, in situ sample	S-ANU 37707
13		✓			
14		✓			
15		✓			
16		✓			
18		✓			
24		✓			
25		✓			
26		✓			
30	✓				
32		✓			
33	✓				
35		✓			
36		✓			
37		✓			
44		✓			
SQUARE 5					
2	✓	✓			
3		✓			
4		✓			
5	✓	✓			
5		✓			
6		✓			
7		✓			

1. 95.4% probability. Calibrated by Tim Maloney (2014 pers. comm. March 27) against SHCal04 (Hogg et al. 2013)) using OxCal v4.2 9 (Bronk Ramsey 2009).
2. Excavation units from 1999 excavation (Square 1 only).
3. Excavation units in 2012, below the base level of excavation in 1999.

Note: cal.BP is used here as this is how it was provided by Tim Maloney, and while non calibrated dates are provided in Dilkes-Hall et al. (2020:69) the calibrated dates are used for consistency in this table-residue from bulk samples is not included.

Following the same excavation methodology as the other sites in the *Lifeways* Project this site was excavated in 2cm and 5cm XUs. Limited dates were obtained from XU residue at this site, with many from samples in the SU identified in the walls of the excavation squares.

The post excavation analysis identified that SU are not readily matched with the in situ defined XU. With the limited data available it is still possible to broadly date the pigment and flakes/limestone recovered. Flakes with applied pigment, and abundant pigment, in XU in Squares 3 and 4 dated 41,185 +/-781BP and 39,034 +/-740BP respectively suggests there has been rock art, or some type of marking, at Riwi for about 40,000 years. It is also likely, from the samples collected in the excavation of Square 1 in 2013, that there has been use of pigment (not present in the cave itself) earlier than 47,067BP.

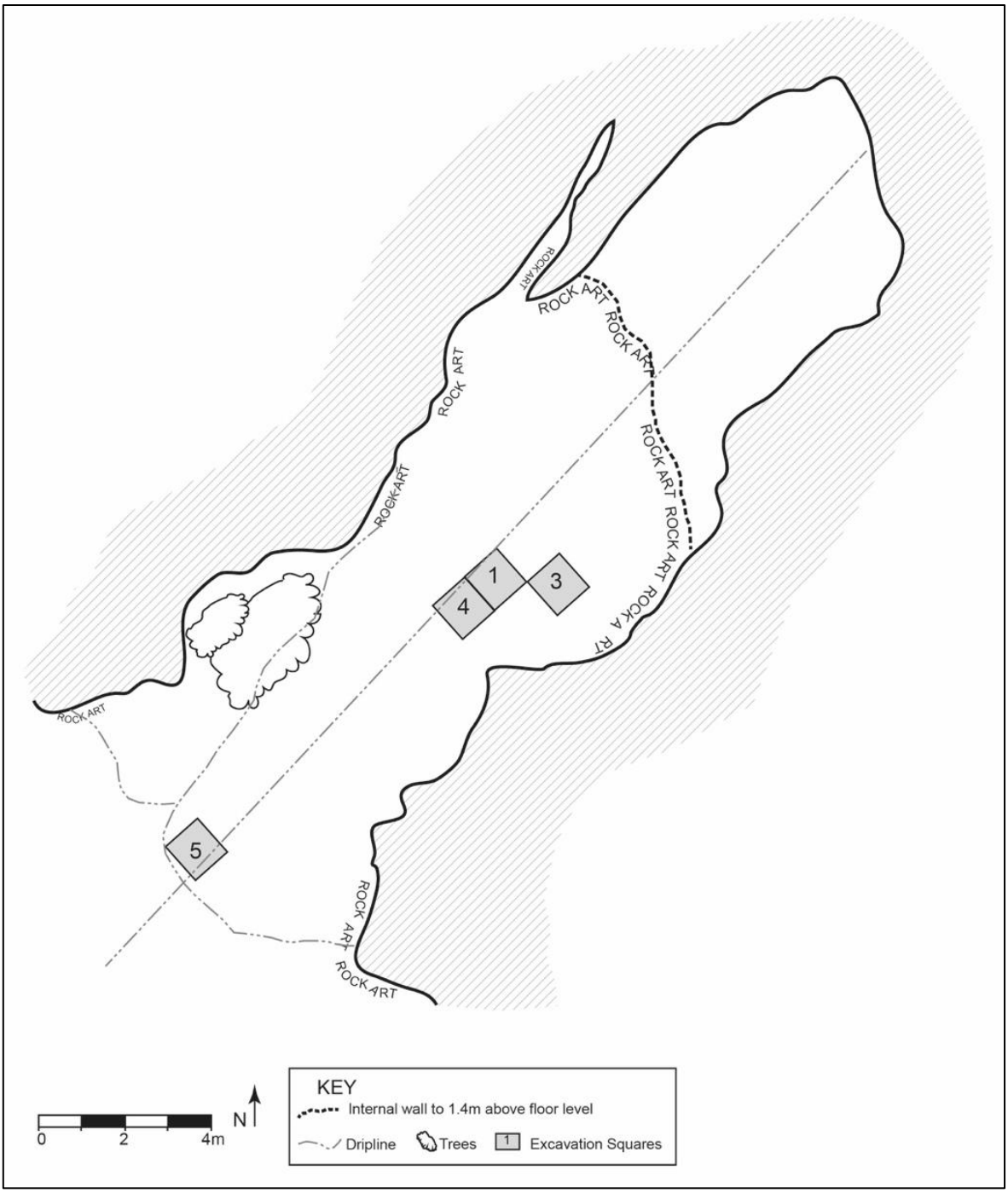


FIGURE 8.9 SITE PLAN OF RIWI, SHOWING THE LOCATION OF EXCAVATION SQUARES AND ROCK ART. CAD DORCAS VANNIEUWENHUYSE/JANE FYFE.

Relative Chronologies

This section examines why superimposition relationships may exit and their role in chronologies, by exploring the relationship of superimposition layers to site size, figure numbers and style, and those superimpositions for sites with large rock art assemblages.

Three hypotheses test possible reasons for superimposition.

1. The greater the physical size of the site (based on floor area) the higher the proportion of figures without superimposition (or the fewer the layers).

If disproven, it will be concluded that site size and superimposition are not related in this study. Therefore, the presence of available space to create rock art is not a determining factor in the creation of multiple layers of superimposition. Other factors will determine the numbers of layers of superimposition in an assemblage.

2. The greater the number of figures at a site, the greater the number of superimposition layers there will be.

If this is true, then multiple layers of superimposition only occur at sites with large numbers of figures. If disproven it shows that choices have been made to change the importance or precedence of figures, and this has no relationship to the density of rock art at a site. This may be extrapolated to suggest that change occurs in rock art in areas where ideas and resources are shared, and/or open social networks are present (McDonald 2000; Smith 1992b, 1999; Wobst 1976, 1977), which informs the question of how this may be manifested for Bunuba and Gooniyandi people.

3. There is a statistical relationship between styles and superimposition layers. This will be tested at the aggregate level for all sites and for sites with ≥100 figures and ≥3 superimposition layers.

Finally, an analysis of the superimposition relationships between styles. Using Harris Matrices to describe superimposition relationships across the study area, and at selected sites, I will propose a relative chronological sequence for the rock art in the southern Kimberley.

Testing the Hypotheses

At one site (Mount Behn 1) there are 11 identifiable superimposition layers and in 31 others three layers (Table 8.8). Superimposition layers are labelled 1-11, with layer 1 the uppermost

(most recent), and layer 11 the lowest (or earliest) in the superimposition sequence, and therefore closest to the rock surface. 13 is the code for figures without superimposition, and 12 where it is unclear. Rock art at seven sites has no superimposition.

1. Superimposition and Site Size

Hypothesis

The greater the physical size of the site (based on floor area) the higher the proportion of figures without superimposition (or the fewer the layers).

It might be expected that more floor space means more wall space, and therefore more rock art. By that reasoning it may be inferred that at larger sites there would be space for many figures on available surfaces without superimposition. However, analysis of site size and the number of figures suggests little association between the two, with a range of <0.2 to 5.4 figures/m^2 (excluding the outliers of <0.1 and 17), and variation within that range (Table 8.8).

Most sites have figures without superimposition, or unclear superimposition relationships. The average of figures without superimposition per site is 37%. When sites without superimpositions are excluded, the average is 38%. The lowest proportion of figures at a site without superimposition is 14% and the highest 85%.

Plotting these variables at all sites does not result in a cohesive pattern (Figure 8.10). Linear regression shows a slight negative slope (r=-0.195) and a small correlation (0.10-0.29) between the variables, suggesting for greater floor area there is likely to be a greater proportion of figures with superimposition relationships. When outliers are excluded (sites with >250 figures, and micro sites with <20 figures) the correlation (r=-0.036) is too low to indicate a statistical relationship (see Drennan 2010).

TABLE 8.8 NUMBER OF SUPERIMPOSITION LAYERS SITES IN THE STUDY AREA (DETERMINATE AND INDETERMINATE).

Site	Number of Layers	Number of Figures	Figures without superimposition[1]	Floor area[2] (m^2)	Figures per m^2
Bunuba Roadside Caves 1	3	17	8	6	2.8
Bunuba Roadside Caves 2	0	5	5	6	0.8
Bunuba Roadside Caves 3	7	15	3	6	2.5
Tangalma	4	162	124	169	1
Tangalma A	3	24	11	27	0.9
Langurmurru	5	103	31	230	0.4
Darrananna	6	54	21	224	0.2
Tarakalu 1 (DG1)	0	8	8	44	0.2
Tarakalu 2 (DG2)	0	16	16	78	0.2
Elimberrie Springs	5	272	113	375[3]	0.7
Emmanuel Gap 1	4	46	13	40[3]	1.1
Emmanuel Gap 2	4	74	18	15[3]	4.9
Emmanuel Gap 3	3	22	7	120[3]	0.2
Emmanuel Gap 4	7	106	30	40[3]	2.6
Emmanuel Gap 5	6	90	22	75	1.2
Fairfield 1	3	77	48	75	1
Fairfield 2	4	112	50	228	0.5
Fairfield 3	4	48	15	10	4.8
Lillimooloora 1	2	21	15	19	1.1
Lillimooloora 2	2	27	14	17	1.6
Louisa Downs Rockshelter 1	3	18	4	Not measured[4]	
Marawun 1	7	231	71	120	1.9
Marawun 4	6	150	40	Not measured[5]	
Marawun 7-1	6	51	8	3[3]	17
Marawun 7-2	0	1	1	2[3]	0.5
Marawun 7-3	3	5	2	5[3]	1
Mine Site Access Site 1	2	13	9	5	2.6
Mine Site Access Site 2	4	49	16	9	5.4
Mount Behn 1	11	616	200	497	1.2
Mount Behn 2	2	13	11	81	0.2
Mount Behn 3	0	1	1	38	0.03
Mount Behn 4	0	1	1	12	0.08
Moonggaroonggoo	5	146	54	62	2.4
Riwi	5	109	37	176	0.6
Stumpy's Soak 1	6	42	6	3	14
Tunnel Creek 1	3	19	6	15	1.3
Tunnel Creek 2	0	2	2	3	0.7
Tunnel Creek 3	5	17	7	78	0.2
Tunnel Creek 4	4	55	22	100	0.6
Tunnel Creek 5	5	47	19	100	0.5
Tunnel Creek 6	4	21	6	Not measured[4]	
Djuru East (WG2)	6	40	10	21	1.9
Djuru (WWT)	5	46	10	180	0.3

1. Includes figures without discernible superimposition relationships,
2. Estimated.
3. Estimated floor area from photographs with scale.
4. Rock art and site was not recorded by author.
5. No clear site definition to measure floor area.

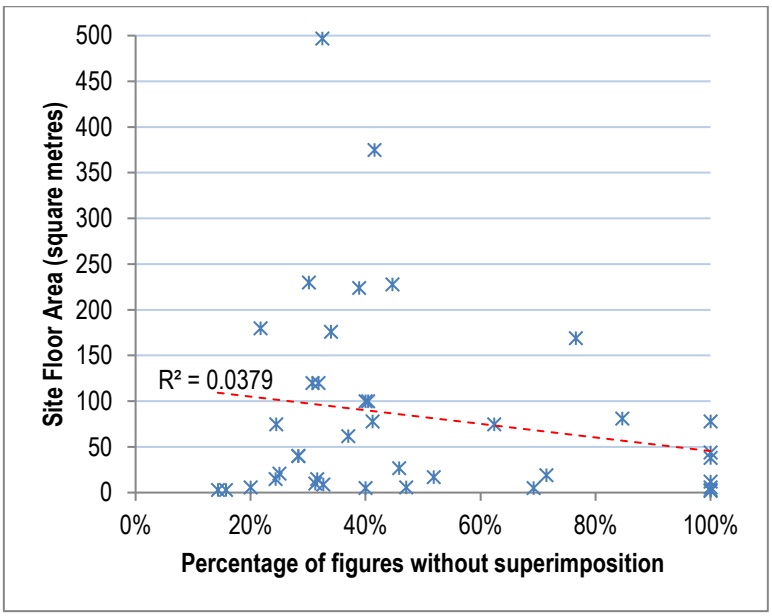


FIGURE 8.10 RELATIONSHIP BETWEEN SITE SIZE AND FIGURES WITHOUT SUPERIMPOSITION, ALL SITES (SCATTER PLOT AND LINEAR REGRESSION).

This is also the case for Bunuba Country, where the correlation (r=-0.23), outliers included, is small (Figure 8.11). With fewer sites in Gooniyandi Country there appears to be a large correlation (r=0.537) between the size of sites and the percentage of figures without superimposition (Figure 8.12).

This may suggest different approaches to the use of space in the two cultural areas, but the sites are not in a cohesive group in either cultural area and the statistical correlation should be viewed with extreme caution, particularly given the small number of sites recorded in Gooniyandi Country. The result is that there is no clear relationship between site size and number of rock art figures.

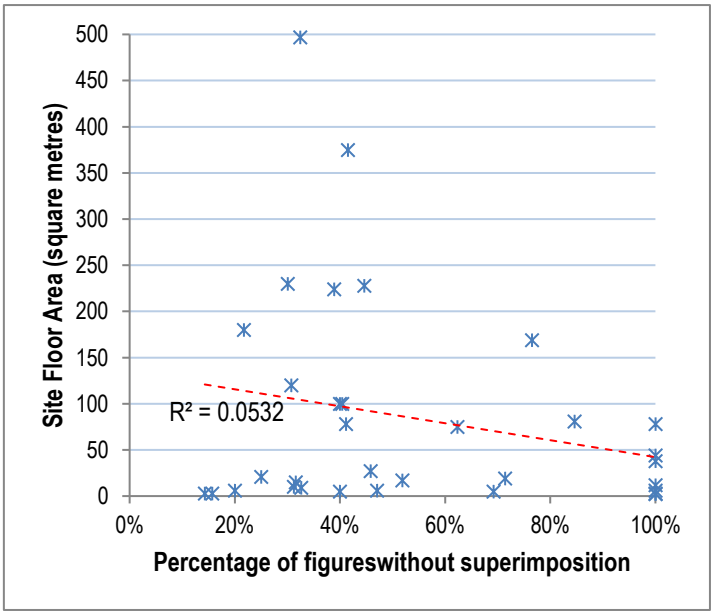


FIGURE 8.11 RELATIONSHIP BETWEEN SITE SIZE AND FIGURES WITHOUT SUPERIMPOSITION, BUNUBA SITES (SCATTER PLOT AND LINEAR REGRESSION).

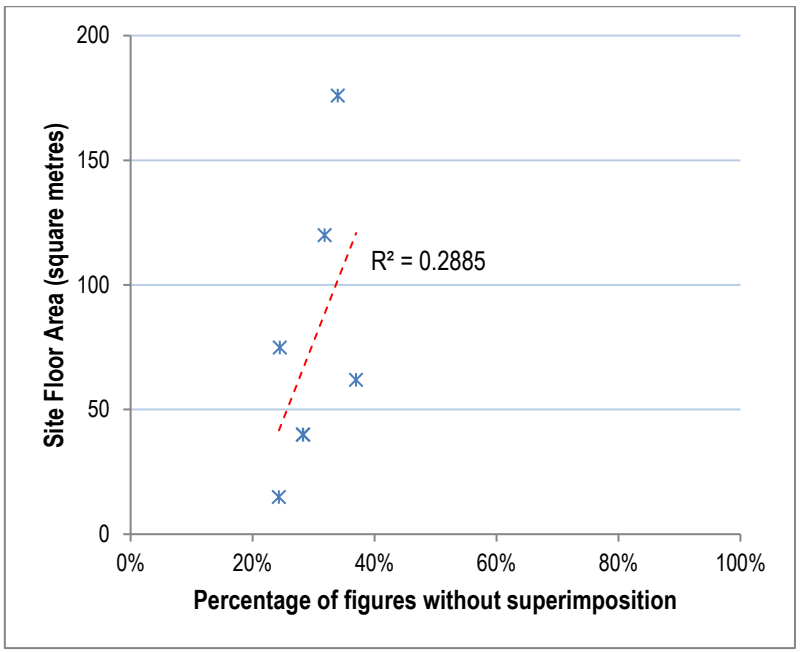


FIGURE 8.12 RELATIONSHIP BETWEEN SITE SIZE AND FIGURES WITHOUT SUPERIMPOSITION, GOONIYANDI SITES (SCATTER PLOT AND LINEAR REGRESSION).

Plotting the relationship between the approximate floor area and the number of layers of superimposition (Figure 8.13) also produces inconclusive results. The regression value r=0.519 indicates a large statistical correlation; however, the scatter of sites around the regression line is not cohesive, suggesting that outliers may be influencing the correlation. When outliers are removed, the correlation is still present (Figure 8.14) but small (r=0.205) and the scatter less cohesive.

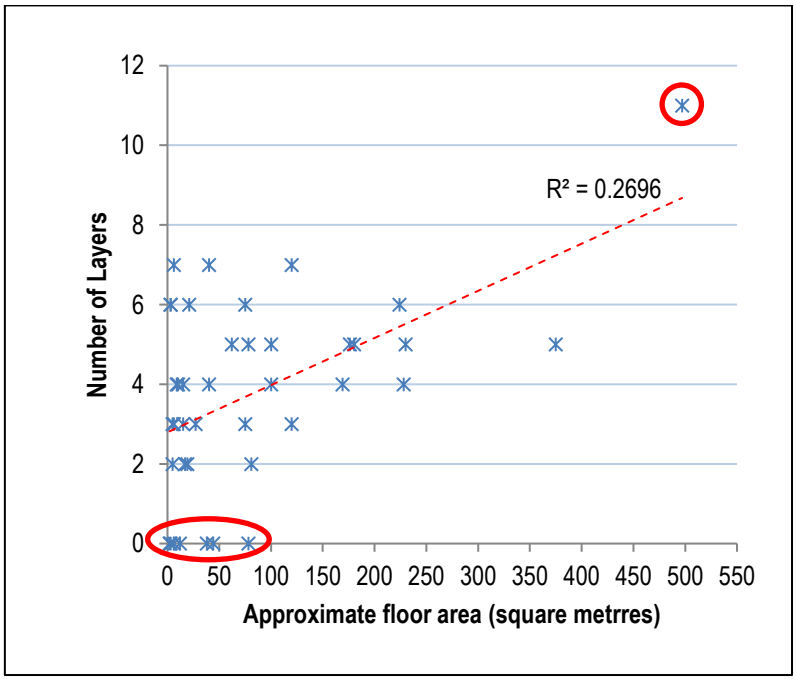


FIGURE 8.13 RELATIONSHIP BETWEEN APPROXIMATE FLOOR AREA AND SUPERIMPOSITION LAYERS, ALL SITES (SCATTER PLOT AND LINEAR REGRESSION). OUTLIERS CIRCLED.

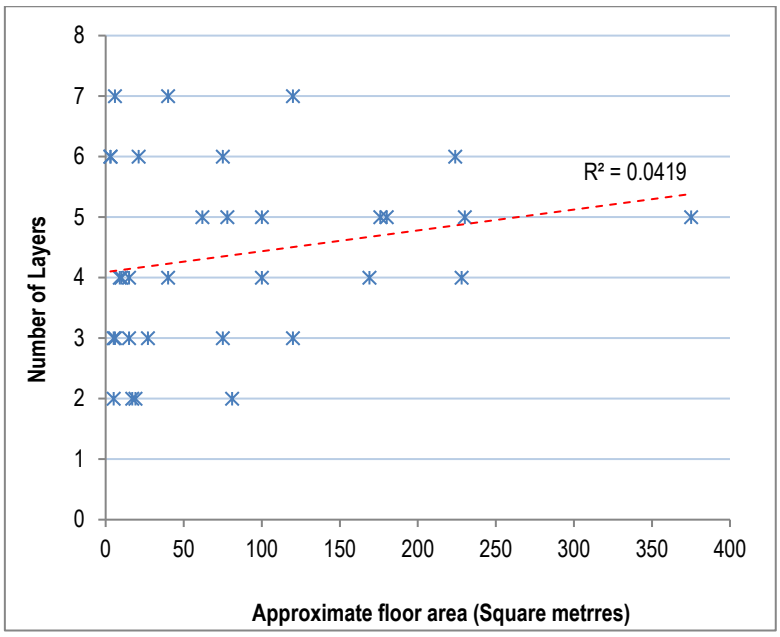


FIGURE 8.14 RELATIONSHIP BETWEEN APPROXIMATE FLOOR AREA AND SUPERIMPOSITION LAYERS, OUTLIERS EXCLUDED, ALL SITES (SCATTER PLOT AND LINEAR REGRESSION).

The pattern is similar when the sites are split between Bunuba and Gooniyandi Country (see Appendix 7). In Bunuba Country, with outliers included r=0.569 (a large positive correlation) with sites scattered widely around the line of regression. In Gooniyandi Country, with fewer sites, there is a small negative correlation (r=-0.144), with sites also widely scattered either side of the regression line.

The inconclusive results of plotting site size and the number of rock art figures, with and without superimposition, and the number of layers of superimposition does not support the hypothesis that the greater the physical size of the site (based on floor area) the higher the proportion of figures without superimposition (or the fewer the layers).

Result

Not Proven.

2. Superimposition and Rock Art Figures

Hypothesis

The greater the number of figures at a site, the greater the number of superimposition layers there will be.

Plotting the number of rock art figures against superimposition layers shows a strong positive correlation (Figure 8.15, r=0.665). This remains positive, but lower (r=0.493) when outliers are removed (Figure 8.16). Although the regression value suggests this may be important, the data is very scattered, so this correlation is not reliable.

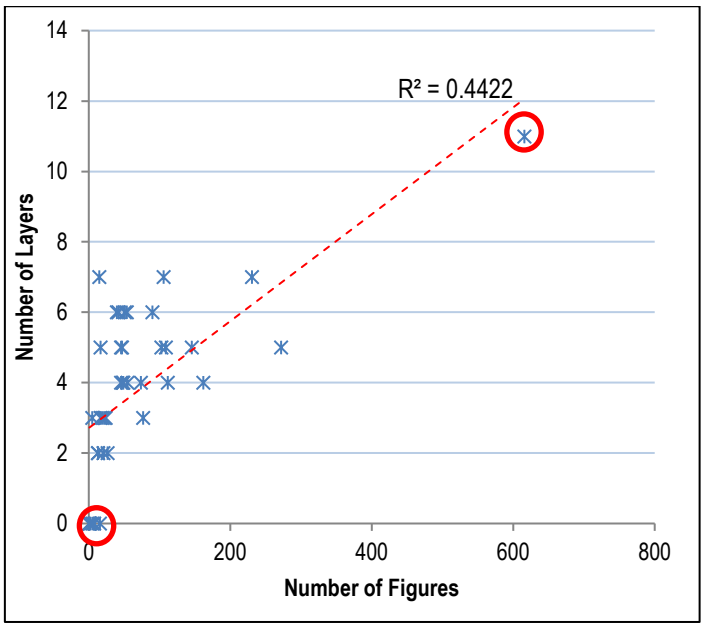


FIGURE 8.15 RELATIONSHIP BETWEEN NUMBER OF FIGURES AND SUPERIMPOSITION LAYERS, ALL SITES (SCATTER PLOT AND LINEAR REGRESSION). OUTLIERS CIRCLED.

When outliers are removed there are small clusters around the 50 figures mark at both four layers and six layers (blue circles in Figure 8.16), either side of the line. There are another 20 figure sites with three layers of superimposition (green circles) with the remaining sites scattered widely.

When the variables for Bunuba sites are plotted the correlation is large (r=0.669), with outliers included. The distribution of sites around the line of regression is scattered with more above the line of regression (<100 figures and between three and seven layers of superimposition), suggesting little cohesion. In Gooniyandi Country a similarly large positive correlation (r=0.663) occurs, with sites scattered around the line of regression, though more balanced and closer to the line than in Bunuba Country (see Appendix 7). As indicated above, with so few sites these results are statistically unreliable.

While the statistical relationship for the above correlations is positive (Figures 8.13–8.16), the lack of cohesion of sites around the line of regression in the overall assemblage, in Bunuba Country in particular, shows that neither the number of figures and the number of layers, nor the site size and the number of layers, have clear relationships. There are likely to be other factors contributing to how often, and to what extent figures are both created and superimposed.

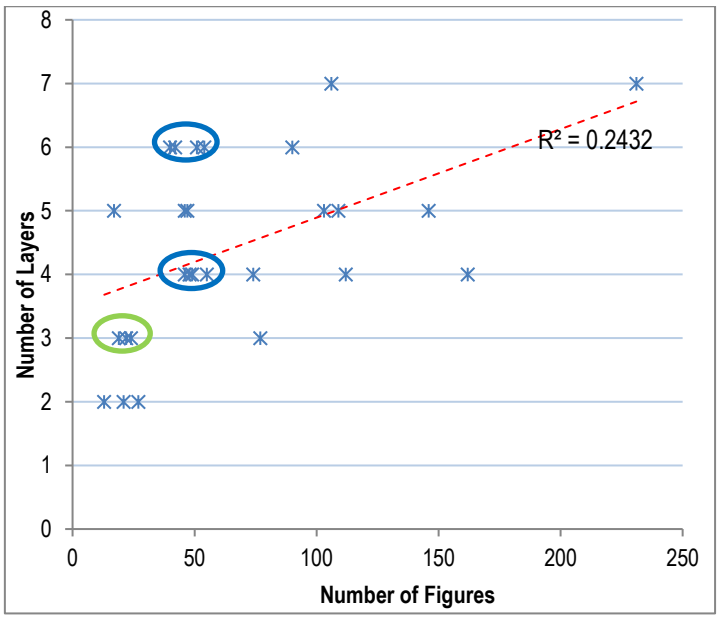


FIGURE 8.16 RELATIONSHIP BETWEEN NUMBER OF FIGURES AND SUPERIMPOSITION LAYERS, OUTLIERS EXCLUDED, ALL SITES (SCATTER PLOT AND LINEAR REGRESSION).

In a broader comparison, the cumulative proportions of figures, sites and layers are plotted against site size groupings (Figure 8.17). This shows the differences between the three variables for most site sizes. For example, the difference between figures and layers is 19% at the closest point (0-10m^2 size group) and 35% at the furthest (21-50 and 51-100m^2 size groups). Each accumulates at a different rate, and none follow the potential normal distribution for site size.

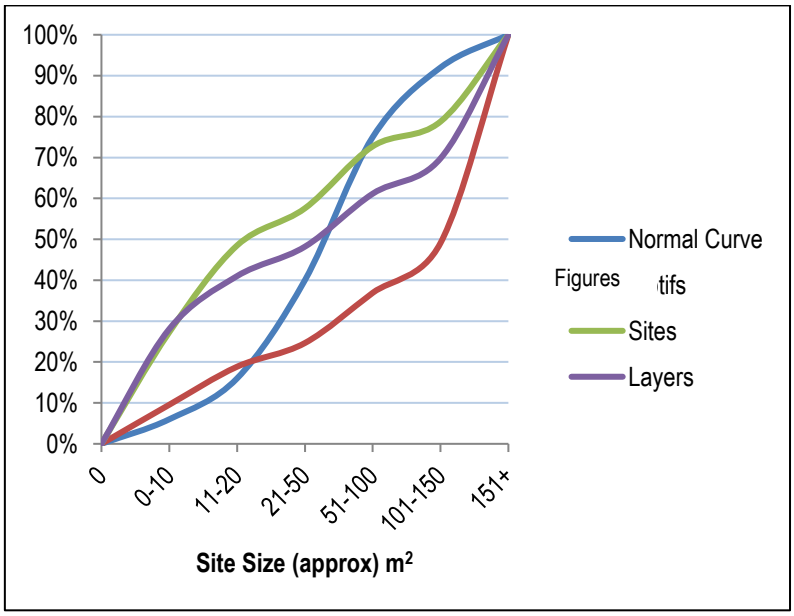


FIGURE 8.17 CUMULATIVE PROPORTIONS OF FIGURES, SITES AND LAYERS TESTED AGAINST SITE SIZE GROUPS (OUTLIERS EXCLUDED). THANKS TO TOM WHITLEY FOR CREATING THIS GRAPH.

This reinforces the lack of clear correlation between site size and the number of figures, site size and the number of layers of superimposition, or site size and the likely number of sites at each defined size group; and that there remains a gap between the variables across different site sizes.

Therefore, neither site size nor the number of figures is a determining factor in the number of layers of superimposition; disproving the hypothesis that the greater the number of figures at a site, the greater the number of superimposition layers there will be, as well as reinforcing that the first hypothesis is not proven.

The choice to superimpose one figure over another has been made for reasons other than available space, or the abundance of rock art at sites in the southern Kimberley. Superimposition is more likely a social or cultural choice than a physical or environmental one, as suggested in research in other areas (Bowdler 1988; Crawford 1968; Domingo-Sanz 2011:16; Morphy 1995; 2012a; Motta 2019; Motta et al. 2020; Mowaljarlai et al. 1988; O'Connor et al. 2008b; Smith 1992b; Veth et al., 2013; 2018; 2021: 197-199; Vinnicombe 1992).

Result

Not Proven.

3. Superimposition and Style

Hypothesis

There is a statistical relationship between styles and superimposition layers.

Scatter plots are also used to identify patterns and test this hypothesis. If each style is related to a specific time, it would be expected that it would appear consistently in the same relative layers to other styles across the assemblage or form clusters at one or more superimposition levels.

Styles are distributed across up to ten superimposition layers (Figure 8.18). There is a very small correlation (r=0.118) between superimposition layers and the styles/broad groups (Table 8.9). Only engraved tracks are exclusively found at one superimposition layer (L1). When the figures without superimposition (L13) or unclear superimposition (L12) are removed the line of regression is negative and negligible (Figure 8.19).

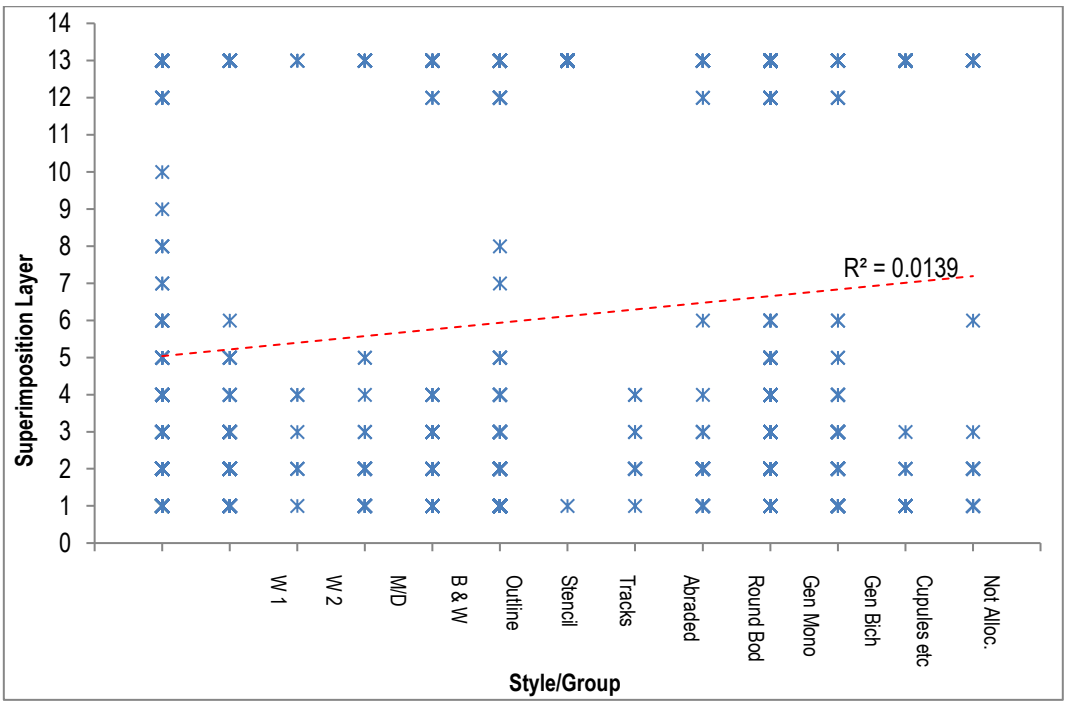


FIGURE 8.18 SUPERIMPOSITION LAYERS AND STYLES/BROAD GROUPS IN THE ASSEMBLAGE. NOTE: LAYER 12 IS THE CODE FOR UNCLEAR, 13 FOR NO SUPERIMPOSITION.[1]

TABLE 8.9 PEARSON CORRELATION (95% CONFIDENCE) FOR SUPERIMPOSITION AND STYLE (ALL DETERMINATE FIGURES).

(a)	Superimposition	Style
Superimposition	1	
Style	0.119	1
(b)	**Superimposition**	**Style**
Superimposition	1	
Style	-0.045	1

(a) with and without superimposition, and (b) with superimposition.

If this pattern occurs in individual sites, then the third hypothesis is disproven.

Sites with more than 100 figures (n=10, see Table 8.8) were used as the test sites for this hypothesis. This assumes that where there are many figures and more than one superimposition (>2 layers), a range of styles and greater likelihood that superimposition shows stylistic change. The ten sites are reported in descending order by number of figures recorded, with scatter plots only for figures with superimposition (additional scatter plots are in Appendix 7). There are seven sites in Bunuba and three in Gooniyandi Country (Figure 8.20).

[1] Note: The following abbreviations are used in these graphs W1: Waliarri 1, W2: Waliarri 2, M/D: Mamo/Djuari, B&W: Black and White, Outline: Monochrome Outline, Stencil: Monochrome Stencil, Tracks: Engraved Animal Tracks, Abraded: Abraded/Scratched Solid Infill, Round Bod: Round Bodied Grouped Anthropomorphs, Gen Mono: Generic Monochrome; Gen Bich: Generic Bichrome; Cupules etc: Cupules, incised lines and historical inscriptions not elsewhere allocated, and Not Alloc: Insufficient information to allocate to a style or style group.

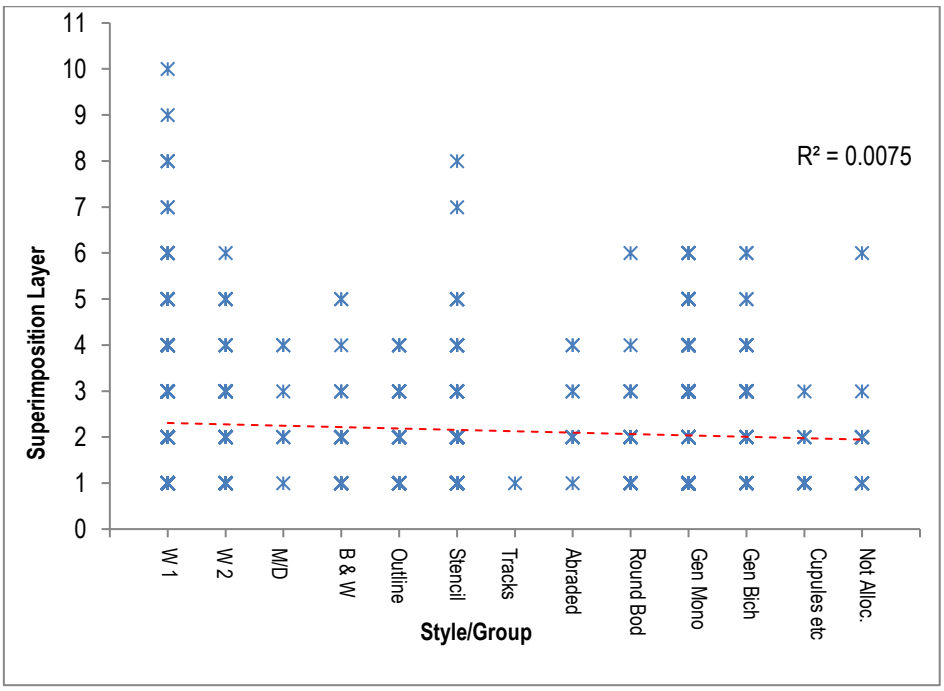


FIGURE 8.19 SCATTER PLOT OF SUPERIMPOSITION LAYERS AND STYLES AND STYLE GROUPS IN THE ASSEMBLAGE, EXCLUDING NO SUPERIMPOSITION AND UNCLEAR SUPERIMPOSITION.

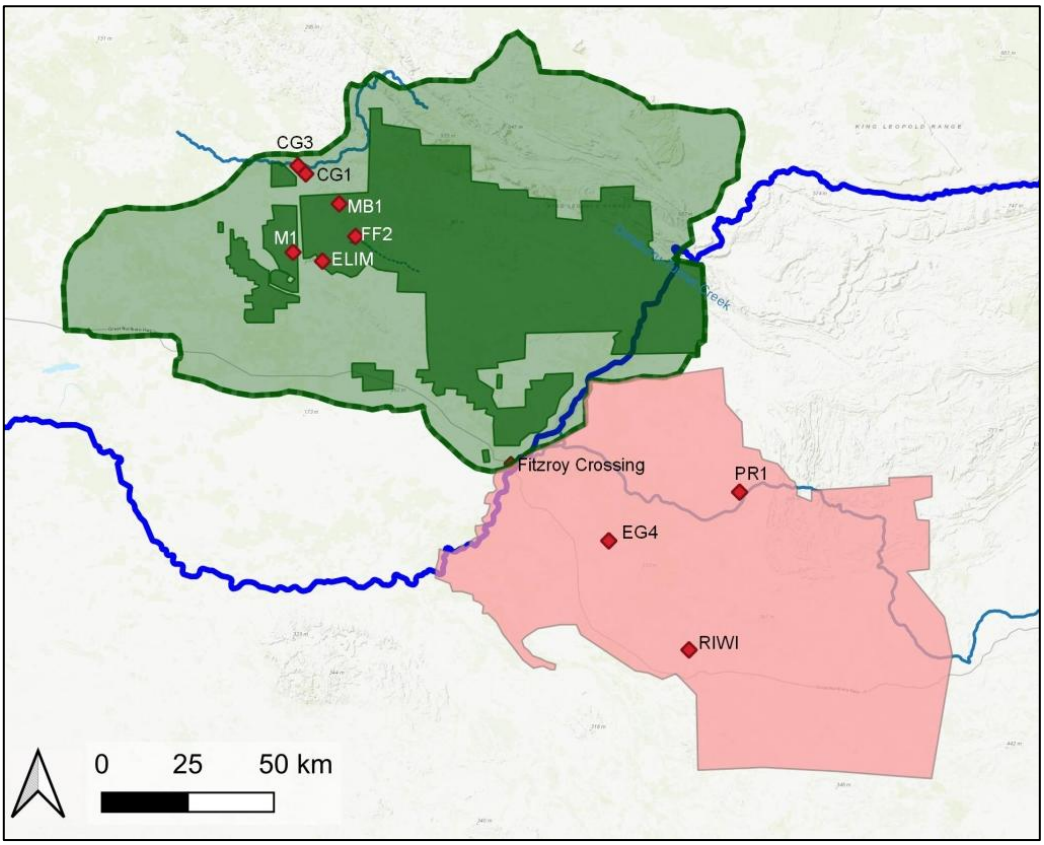


FIGURE 8.20 SITES (♦) IN THE STUDY AREA WITH MORE THAN 100 DETERMINATE FIGURES.

Sites with More Than 100 Figures

Mount Behn 1

Mount Behn 1 is a densely painted site with complex superimposition of ten layers classified to a style for 464 determinate figures (Figure 8.21), a substantial influence on the aggregate patterns for the study area (Figures 8.18 and 8.19). Not all styles are present at this site (Figure 8.22); notably absent are Engraved Animal Tracks and Black and White, both local styles in this study. There are no styles/groups concentrated at one or two adjacent levels of superimposition. All the styles present have some examples close to the surface, while also recorded at greater depth in superimpositions.

The correlation is statistically small despite 32% (n=150) of determinate figures without superimposition (Table 8.10). Lack of strong correlation makes it essential to examine individual sequences of superimposition to determine whether there are chronologies that show change in styles.

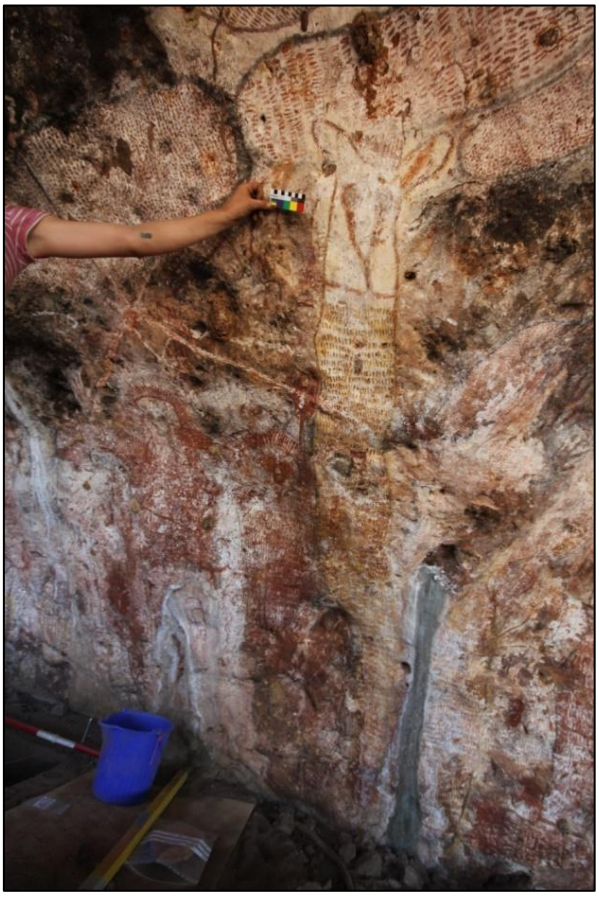


FIGURE 8.21 PART OF THE PAINTED PANEL ABOVE THE SOUTH SQUARE OF THE EXCAVATION AT MOUNT BEHN 1, SHOWING DENSITY, COMPLEXITY AND DEPTH OF LAYERS OF SUPERIMPOSITION AT THE SITE.

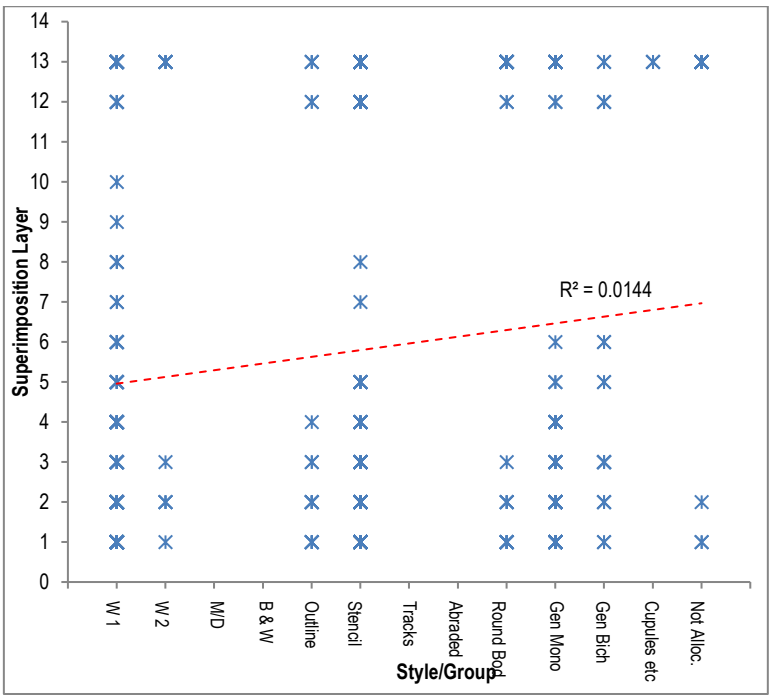


FIGURE 8.22 STYLE/GROUP BY SUPERIMPOSITION LAYER FOR DETERMINATE FIGURES AT MOUNT BEHN1.

TABLE 8.10 PEARSON CORRELATION (95% CONFIDENCE) FOR SUPERIMPOSITION AND STYLE FOR DETERMINATE FIGURES AT MOUNT BEHN 1

(a)	Superimposition	Style
Superimposition	1	
Style	0.119	1
(b)	Superimposition	Style
Superimposition	1	
Style	-0.216	1

(a) all figures, and (b) figures with superimposition relationships.

Elimberrie Springs

Elimberrie Springs has many of the same styles as Mount Behn 1, with superimposition to a depth of five identifiable layers (Figure 8.23). The Generic Monochrome group is recorded to L5.

The distribution of styles is mostly across the first three layers, resulting in a small degree of correlation which becomes negligible when figures without superimposition are excluded (Table 8.11).

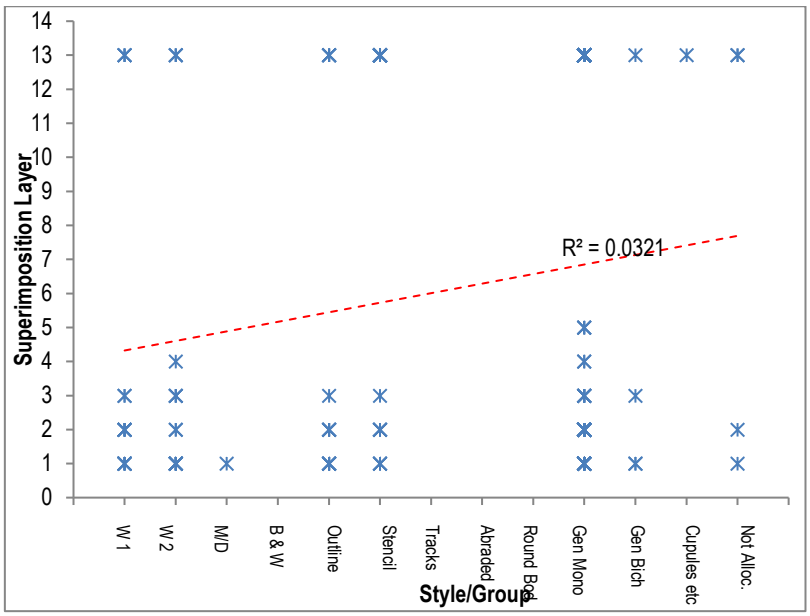


FIGURE 8.23 STYLE/GROUP BY SUPERIMPOSITION LAYER FOR DETERMINATE FIGURES AT ELIMBERRIE SPRINGS.

TABLE 8.11 PEARSON CORRELATION (95% CONFIDENCE) FOR SUPERIMPOSITION AND STYLE FOR DETERMINATE FIGURES AT ELIMBERRIE SPRINGS.

(a)	Superimposition	Style
Superimposition	1	
Style	0.249	1
(b)	Superimposition	Style
Superimposition	1	
Style	0.012	1

(a) all figures, and (b) figures with superimposition relationships.

Marawun 1

At Marawun 1 there are six identifiable superimposition layers (Figure 8.24). Waliarri 1 (Complex) style is recorded through the first five layers, with only Round Bodied Grouped Anthropomorphs and Generic Monochrome figures recorded to similar depths.

Figures without superimposition make up 29% (n=45) of determinate rock art at this site, and their removal changes the statistical correlation of figures and styles to a negligible statistical level (Table 8.12) below the range for a small correlation (r=0.10-0.29).

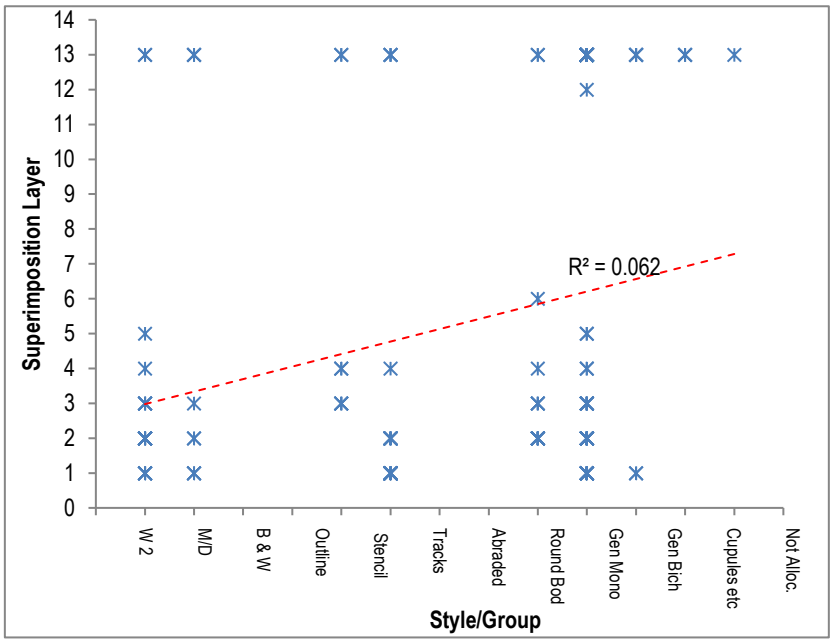


FIGURE 8.24 STYLE/GROUP BY SUPERIMPOSITION LAYER FOR DETERMINATE FIGURES AT MARAWUN 1.

TABLE 8.12 PEARSON CORRELATION (95% CONFIDENCE) FOR SUPERIMPOSITION AND STYLE FOR DETERMINATE FIGURES AT MARAWUN 1.

(a)	Superimposition	Style
Superimposition	1	
Style	0.249	1
(b)	Superimposition	Style
Superimposition	1	
Style	0.012	1

(a) all figures, and (b) figures with superimposition relationships.

Tangalma

The range of styles at Tangalma is not as diverse as at other sites with >100 figures, and nor are the levels of superimposition as deep. Four layers of superimposition were recorded for Generic Monochrome with other styles/groups recorded to two levels (Figure 8.25).

Figures without superimposition comprise 82% (n=133) of determinate rock art at Tangalma. Excluding figures without superimposition substantially changes the correlation, from a small negative to a medium positive (Table 8.13). The very large percentage of figures without superimposition, 68% (n=90) of which are Engraved Animal Tracks, is an important figure class and stylistic choice at this site (Figure 8.26). This makes the positive correlation less reliable coming from a small data set, and 18% of total figures.

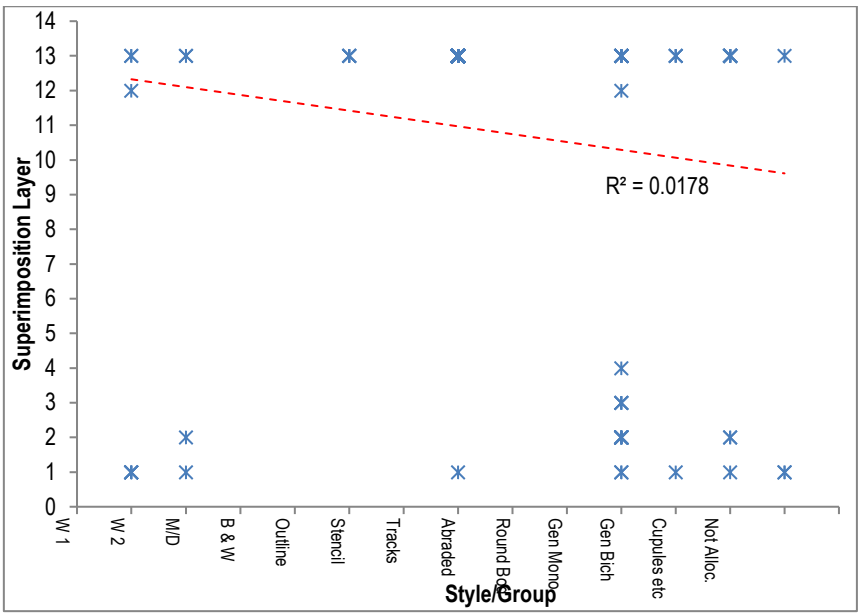


FIGURE 8.25 STYLE/GROUP BY SUPERIMPOSITION LAYER FOR DETERMINATE FIGURE STYLES AT TANGALMA.

TABLE 8.13 PEARSON CORRELATION (95% CONFIDENCE) FOR SUPERIMPOSITION AND STYLE FOR ALL DETERMINATE FIGURES AT TANGALMA

(a)	Superimposition	Style
Superimposition	1	
Style	-0.122	1
(b)	**Superimposition**	**Style**
Superimposition	1	
Style	0.319	1

(a) all figures, and (b) figures with superimposition relationships.

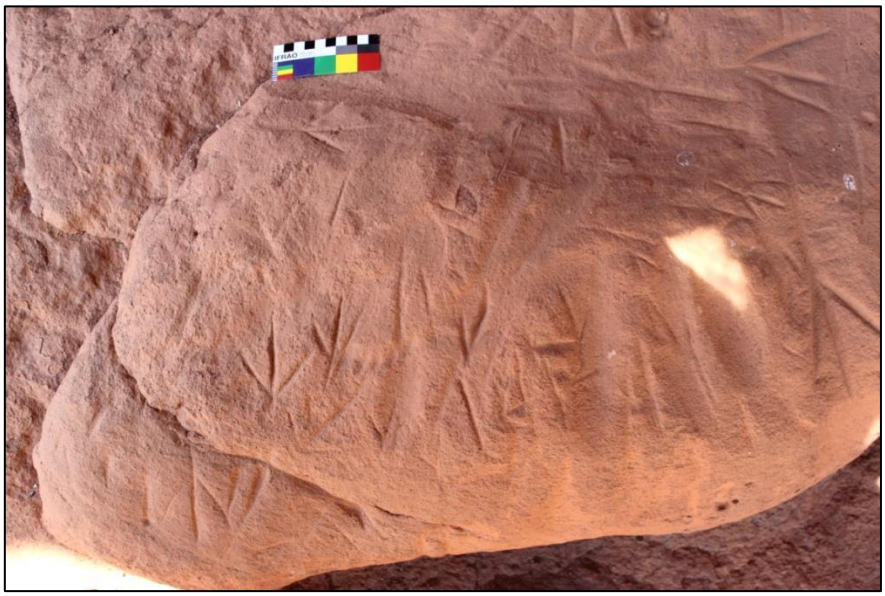


FIGURE 8.26 THE LONG LEDGE AT THE SOUTHERN PART OF TANGALMA HAS ENGRAVED BIRD AND MACROPOD TRACKS AMONGST THE INCISED LINES AND ABRADED GROOVES.

Marawun 4

Determinate figures are identified to six layers of superimposition at Marawun 4 (Figure 8.27), but only five levels for non-local styles. The other style at this site, Monochrome Stencil, is at two levels of superimposition.

The exclusion of the 36% (n=35) of determinate figures without superimposition changed the statistical correlation between figures and superimposition layers from a medium positive correlation to a negligible correlation (Table 8.14).

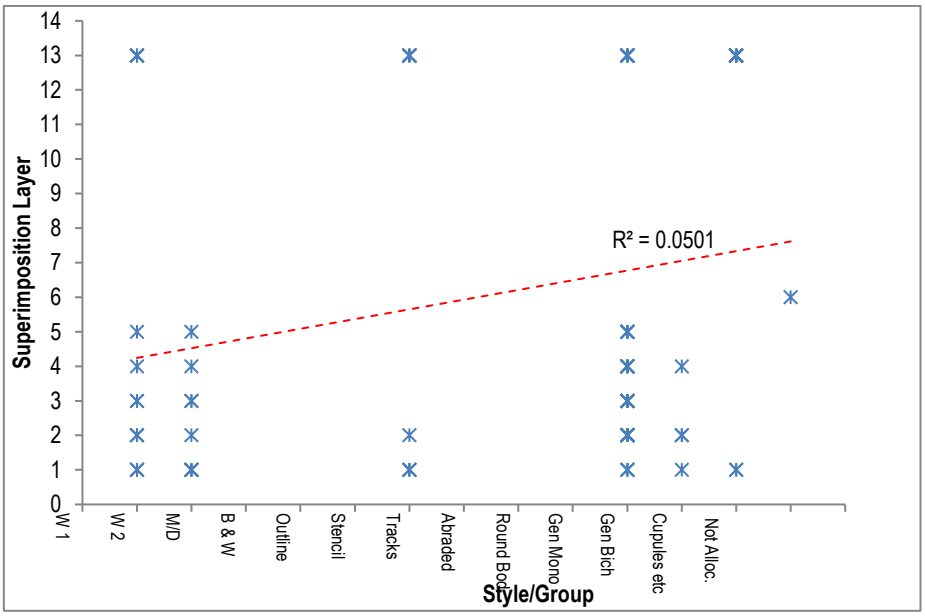


FIGURE 8.27 STYLES/GROUP BY SUPERIMPOSITION LAYER FOR DETERMINATE FIGURE STYLES AT MARAWUN 4.

TABLE 8.14 PEARSON CORRELATION (95% CONFIDENCE) FOR SUPERIMPOSITION AND STYLE FOR ALL DETERMINATE FIGURES AT MARAWUN 4

(a)	Superimposition	Style
Superimposition	1	
Style	0.224	1
(b)	Superimposition	Style
Superimposition	1	
Style	-0.034	1

(a) all figures, and (b) figures with superimposition relationships.

Moonggaroonggoo

The assemblage at Moonggaroonggoo is predominantly figures in the Generic Monochrome group with four superimposition layers. Several zoomorphs and the thanggari (water lilies) are unique to this site. This site also has Waliarri 1 (Complex) and Mamo/Djuari styles present, and Black & White and Monochrome Outline at different levels of superimposition (Figure 8.28).

The assemblage at this site has 32% (n=28) of determinate figures without superimposition. When non superimposed figures are excluded the correlation changes from positive negligible to a negative medium (Table 8.15). This reduces to 0.0189 (small correlation) when General Monochrome is also removed.

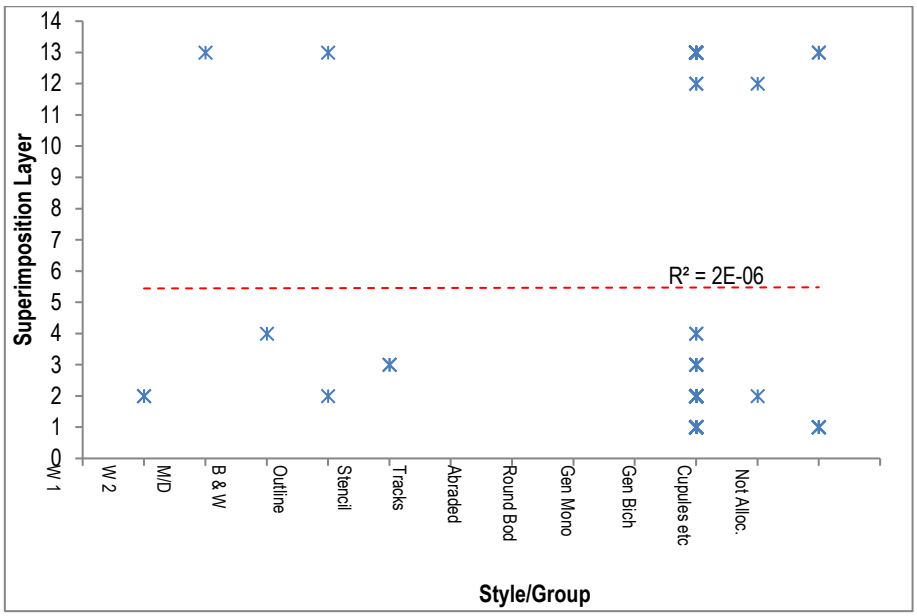


FIGURE 8.28 STYLE/GROUP BY SUPERIMPOSITION LAYER FOR DETERMINATE FIGURES AT MOONGGAROONGGOO.

TABLE 8.15 PEARSON CORRELATION (95% CONFIDENCE) FOR SUPERIMPOSITION AND STYLE FOR ALL DETERMINATE FIGURES AT MOONGGAROONGGOO

(a)	Superimposition	Style
Superimposition	1	
Style	0.001	1
(b)	Superimposition	Style
Superimposition	1	
Style	-0.356	1

(a) all figures, and (b) figures with superimposition relationships.

Fairfield 2

Fairfield 2 has a range of styles, as well as the local Round Bodied Grouped Anthropomorphs style. Styles are superimposed to three layers, whilst the Round Bodied Grouped Anthropomorphs are in two layers. Generic Monochrome is in superimposition relationships up to L4. The figures recorded are scattered across the layers (Figure 8.29), with no clear relationship between superimposition and the style/group to which they are allocated.

39% (n=28) of determinate figures at this site do not have superimposition, with 64% of phytomorphs at the site without superimposition, compared to 31% of anthropomorphs and 42% of zoomorphs. Figures with and without superimpositions both show a small correlation between style and superimposition (Table 8.16).

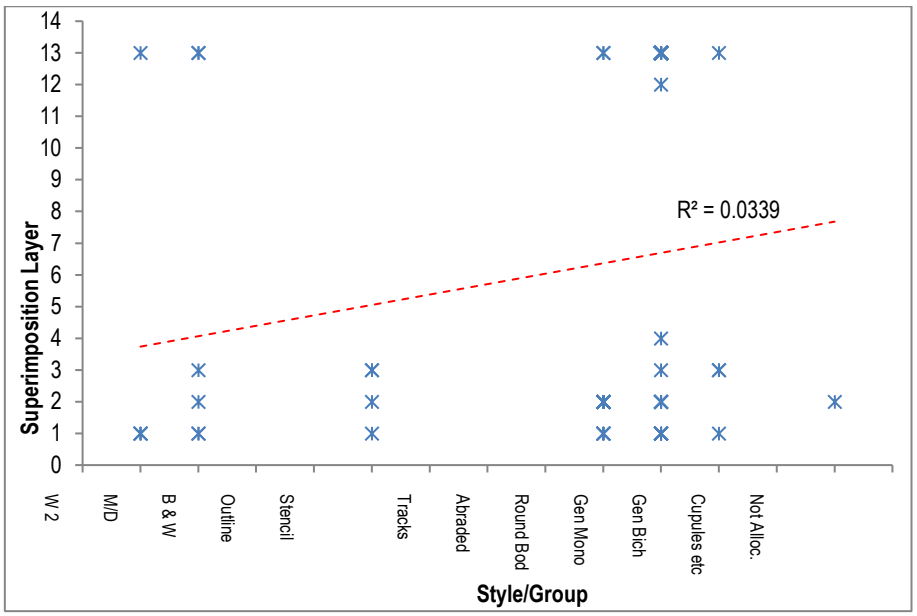


FIGURE 8.29 STYLE/GROUP BY SUPERIMPOSITION LAYER FOR DETERMINATE FIGURES AT FAIRFIELD 2.

TABLE 8.16 PEARSON CORRELATION (95% CONFIDENCE) FOR SUPERIMPOSITION AND STYLE FOR ALL DETERMINATE FIGURES AT FAIRFIELD 2

(a)	Superimposition	Style
Superimposition	1	
Style	0.184	1
(b)	Superimposition	Style
Superimposition	1	
Style	0.156	1

(a) all figures, and (b) figures with superimposition relationships.

Riwi

Riwi has the Mamo/Djuari, Monochrome Stencil and Engraved Animal Tracks styles, as well as Generic Monochrome figures, the latter of which is superimposed to five layers (Figure 8.30).

Black & White style is not at this site, despite being at all other Gooniyandi sites in this study. Other styles at Riwi suggest a degree of similarity with other sites in this geographically large and environmentally diverse area. Riwi is the most southerly of the sites recorded in Gooniyandi Country.

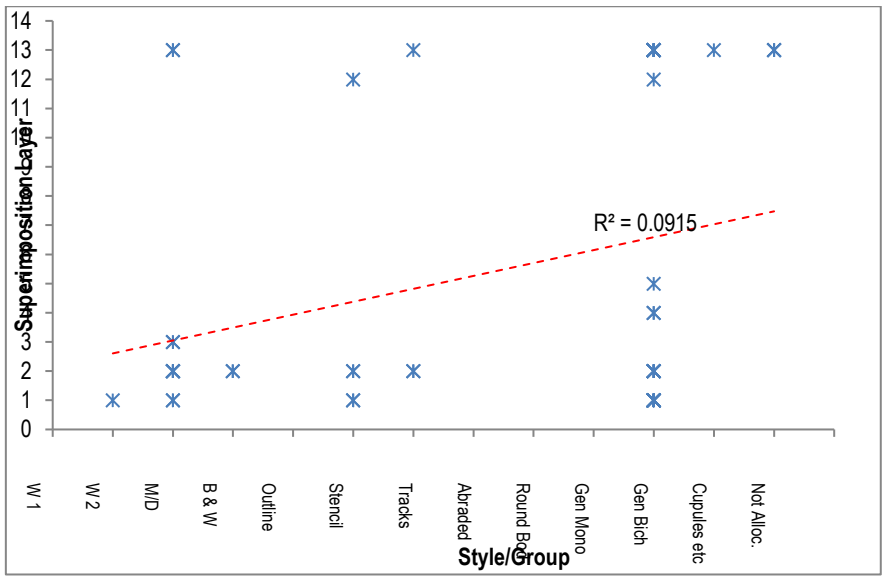


FIGURE 8.30 STYLE/GROUP BY SUPERIMPOSITION LAYER FOR DETERMINATE FIGURES AT RIWI.

There is a medium correlation between style and superimposition layers. This becomes negative and negligible when figures without superimposition are excluded (Table 8.17). The absence of any discernible relationship is further reinforced in the scatter plot by the lack of cohesion around the line of regression (Figure 8.30).

TABLE 8.17 PEARSON CORRELATION (95% CONFIDENCE) FOR SUPERIMPOSITION AND STYLE FOR ALL DETERMINATE FIGURES AT RIWI

(a)	Superimposition	Style
Superimposition	1	
Style	0.302	1
(b)	**Superimposition**	**Style**
Superimposition	1	
Style	-0.007	1

(a) all figures, and (b) figures with superimposition relationships.

Emanuel Gap 4

A range of styles are present at Emanuel Gap 4, with superimposition up to L5 for Waliarri 2 (Simple) style, and L6 for the Generic Monochrome figures. The scatter of figures by superimposition (Figure 8.31) shows little relationship between style and superimposition layers.

The statistical correlation for all determinate figures is at the low end of a small statistical correlation (0.10>r<0.29). Correlation becomes negative medium when the figures without superimposition relationships are excluded (Table 8.18).

Emanuel Gap 4 is in a throughway that has been highly accessed during pastoral expansion. There is damage from fencing encroaching on the rock art (Figure 8.32). The damage has resulted in half of the rock art recorded (n=53) without sufficient remaining detail to identify

forms and therefore is classified as indeterminate or incomplete. Determinate figures to a depth of six layers show the diversity and continuity of rock art at the site, without a large assemblage to show reliable and sound statistical results.

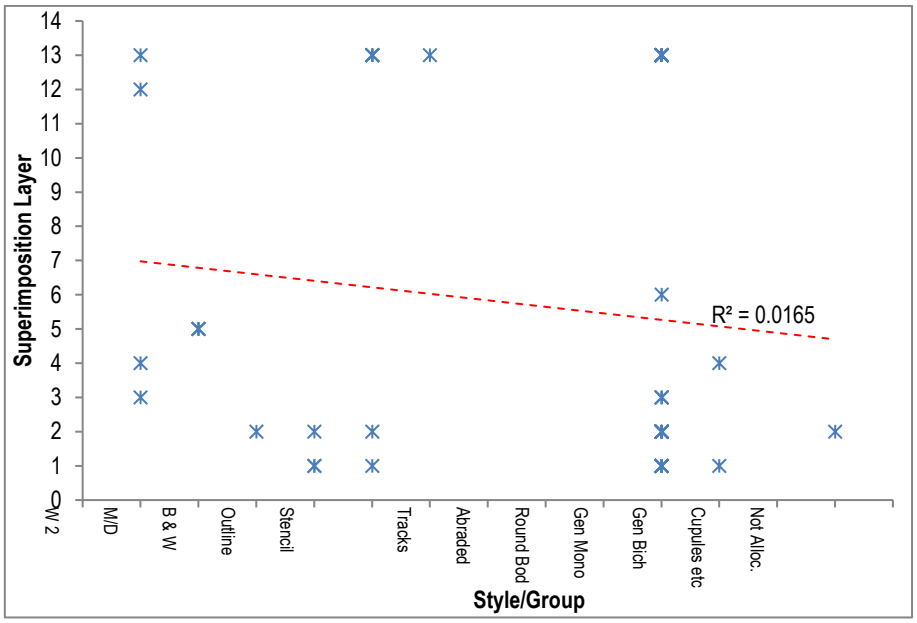


FIGURE 8.31 STYLE/GROUP BY SUPERIMPOSITION LAYER FOR DETERMINATE FIGURES AT EMANUEL GAP 4.

TABLE 8.18 PEARSON CORRELATION (95% CONFIDENCE) FOR SUPERIMPOSITION AND STYLE FOR ALL DETERMINATE FIGURES AT EMANUEL GAP 4

(a)	Superimposition	Style
Superimposition	1	
Style	-0.128	1
(b)	**Superimposition**	**Style**
Superimposition	1	
Style	-0.367	1

(a) all figures, and (b) figures with superimposition relationships.

FIGURE 8.32 FENCING AND WATER FLOW HAS DAMAGED ROCK ART AT EMANUEL GAP 4.

Langurmurru

Langurmurru has just over 100 figures with 77% (n=79) determinate. A greater number of figures in both study area wide styles and local styles are present than at other sites with similar totals such as Riwi and Emanuel Gap 4 (Table 8.19).

TABLE 8.19 PERCENTAGE OF DETERMINATE FIGURES TO TOTAL RECORDED FIGURES AT SITES WITH >100 FIGURES RECORDED.

Site	Total Number of Figures	Percent Determinate	Site	Total Number of Figures	Percent Determinate
Mount Behn 1	616	75%	Moonggaroonggoo	146	58%
Elimberrie Springs	272	63%	Fairfield 2	112	63%
Marawun 1	231	66%	Riwi	109	52%
Tangalma	162	100%	Emanuel Gap 4	106	50%
Marawun 4	150	65%	Langurmurru	103	79%

Langurmurru has a variety of those styles with superimposition up to four layers deep, and up to five layers for Generic Monochrome figures (Figure 8.33). There are ledges and exposed areas like nearby Tangalma (see Figure 8.26), but no Engraved Animal Tracks at this site.

The statistical correlation of layers and styles at Langurmurru is small, for both the inclusion and exclusion of figures without superimposition (Table 8.20). Little change was expected, the share of un-superimposed figures is low at this site (20%, n=16). However, the scatter plot, with most points falling below the line of regression (Figure 8.33), urges caution in interpreting this as a meaningful result.

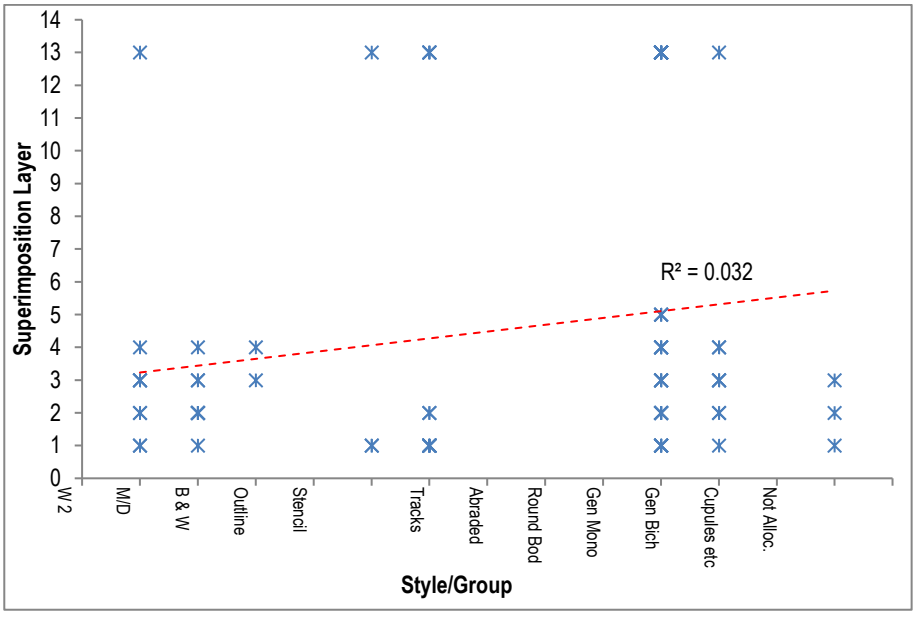


FIGURE 8.33 STYLE/GROUP BY SUPERIMPOSITION LAYER FOR DETERMINATE FIGURES AT LANGURMURRU.

TABLE 8.20 PEARSON CORRELATION (95% CONFIDENCE) FOR SUPERIMPOSITION AND STYLE FOR ALL DETERMINATE FIGURES AT LANGURMURRU

(a)	Superimposition	Style
Superimposition	1	
Style	0.194	1
(b)	Superimposition	Style
Superimposition	1	
Style	0.139	1

(a) all figures, and (b) figures with superimposition relationships.

Synopsis

At an aggregate level there is a statistically small correlation between superimposition layers and style. The correlation became negligible when un-superimposed figures were excluded from the data set (Table 8.9). The widely dispersed scatter plot supports the conclusion that there was no identifiable correlation between the variables (Figure 8.16).

Examination of sites with >100 figures showed variation in the degree to which superimposition layers correlated with styles. The only consistency across the sites is Generic Monochrome, a broad group which is at all layers, no matter how many layers were identified. It is likely that this dominant set of superimposition relationships of a prolific group was a determinant of the aggregate correlation statistics. Generic Monochrome is not a style as such, so the correlation results cannot be used to support a hypothesis of a relationship between style and superimposition, but its consistent presence informs ideas on the continuity of rock art practice through environmental and cultural change.

The influence of figures without superimposition on correlation varied from site to site. Correlations changed from positive to negative, negative to positive, small to medium level, and in some cases barely changed at all. Variation occurred between and within the two cultural areas, with the three Gooniyandi sites showing as much individual variation as the seven Bunuba sites examined.

The result is that each site has a unique distribution of styles across different superimposition layers, different statistical correlations, suggesting a need for finer level analysis of individual sequences within the sites to determine relative chronologies, and the time depth of rock art in the two cultural areas in this assemblage. Thus, the third hypothesis that there is a statistical relationship between styles and superimposition layers is not upheld.

Result

Not Proven.

That the three hypotheses are not proven indicates that there needs to be further refinement, more site focussed analysis of the relationship between styles and superimposition to have a chance of developing relative chronologies.

The next section approaches this using the Harris Matrix as a tool to visually plot the relationships between the figures defined by their allocated styles, and identified layers of superimposition, and then compare the chronological sequences arising to identify whether there has been stylistic change or not.

Developing Chronological Sequences Using the Harris Matrix for Rock Art Stratigraphy

The Harris Matrix is used to describe the stratigraphy of rock art in the same way it is in excavation; the more recent rock art is found closer to the surface than the older rock art (e.g. Harris 1979:112, 1989:7-13; Wheeler 1954). Others have used it for rock art analysis (Brady & Gunn 2012; Chippindale et al. 2000; Chippindale & Taçon 1993; Gunn et al. 2012; Harris & Gunn 2018; Loubser 1997; Pearce 2006; 2010; Russell 2012; Swart 2004). While rarely described in publications it is hard to imagine that similar visual arrangements would not be used to underpin discussion on superimposition and chronological and/or stylistic sequences.

Superimposition may be a simple painting of one figure directly on top of another figure. This is shown in the Harris Matrix as a simple vertical relationship where the most recent layer is shown at the top of the matrix, and that directly on the rockface at the base (Figure 8.34a). Other superimpositions are more complex, with one figure superimposed over part of many others, or many figures superimposed on one or more figures.

There has been some discussion of new terminology of superposition and superimposition being separated to distinguish at the simplest level between figures which cover or replace other figures from figures which partially cover another, with implied intent to suggest that the older figure should still be visible (Gunn et al. 2022). Rather than engage in an argument of semantics and implied intent I prefer to make no imputation regarding the intent of the rock art creator at any layer. I use superimposition in this study to mean all instances where a rock art figure covers another to any extent, where the figures at each layer are identifiable, and therefore extant in an assemblage. The result of this is a collection of matrices showing multiple and complex superimposition layers (Figure 8.34b).

In this study, Harris Matrices have one box for each figure, with the unique identifier for the figure (e.g. M1234) and a code (1) for the allocated style/group. Indeterminate figures are not style coded, and each figure class is colour coded in the same colours used in Chapter 5 and 6. Superimposition relationships are shown with vertical lines connecting figures, and in the more complex relationships a diamond shape at the end join indicates the direction of the superimposition where it is not otherwise clear (Figure 8.34b).

Superimposition was identified in the field and refined in post field photographic analysis. Each site has an individual Harris Matrix (Appendix 10), because, like an excavation, each site has its own set of relationships that may or may not be connected. Superimposition relationships are relative, and figures on the same numbered layer may be created at the same or different times. The matrix represents figure's relationships with one another, not a comparative chronology by layer, which will be done later in this chapter through a process of eliminating reversals firstly within, secondly between sites (with >100 figures) and finally across cultural areas, to identify possible stylistic sequences.

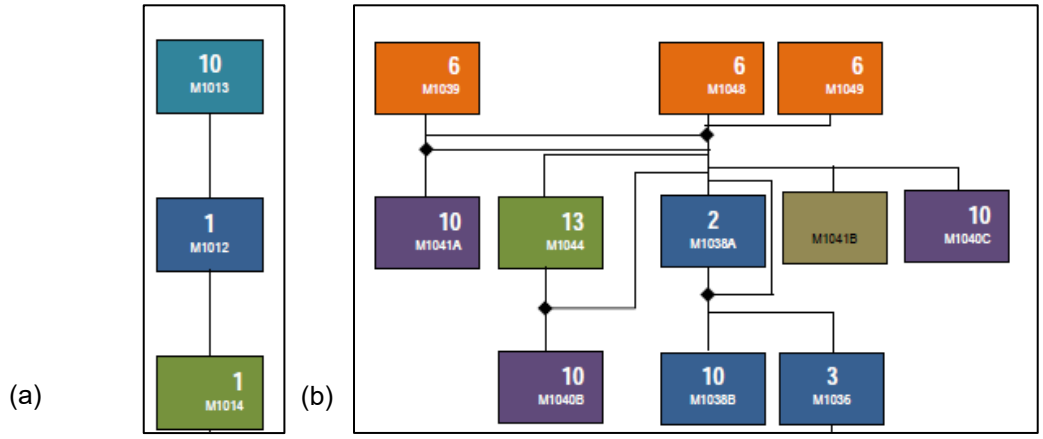


FIGURE 8.34 EXAMPLES OF THE HARRIS MATRIX FOR ROCK ART SUPERIMPOSITION SHOWING (A) SINGLE FIGURE ON FIGURE SUPERIMPOSITION (B) COMPLEX MULTIPLE SUPERIMPOSITION RELATIONSHIPS BETWEEN FIGURES.

Unlike an excavation, there are figures which do not have any type of superimposition; these are included at the end of each site Harris Matrix (Appendix 10). Like surface finds prior to excavation, lack of superimposition in rock art may be as informative as superimposition because it shows choices which may reflect unique, local or regional identity, individual choice, and other factors such as availability of space.

At the other extreme, there are sites with a single figure, or small number of figures, where there is no superimposition. The figures are all under the heading 'No superimposition or unclear/indiscernible superimposition' in this instance. There are six sites in this study in which this occurs, with the number of figures at those sites ranging from one to 17.

Results

The number of figures and superimposition layers vary between sites (Table 8.8), ranging from 11 layers in highly complex relationships at Mount Behn 1 (Figure 8.35), to sites with no superimposition. This means that to identify any relative chronologies for the study area, or the two cultural areas, it is necessary to first identify whether each site has an identifiable sequence, and if there is any consistency across sites. This approach uses the superimpositions from the sites with >100 figures to ensure there is enough diversity of figures and superimposition relationships to identify stylistic sequences.

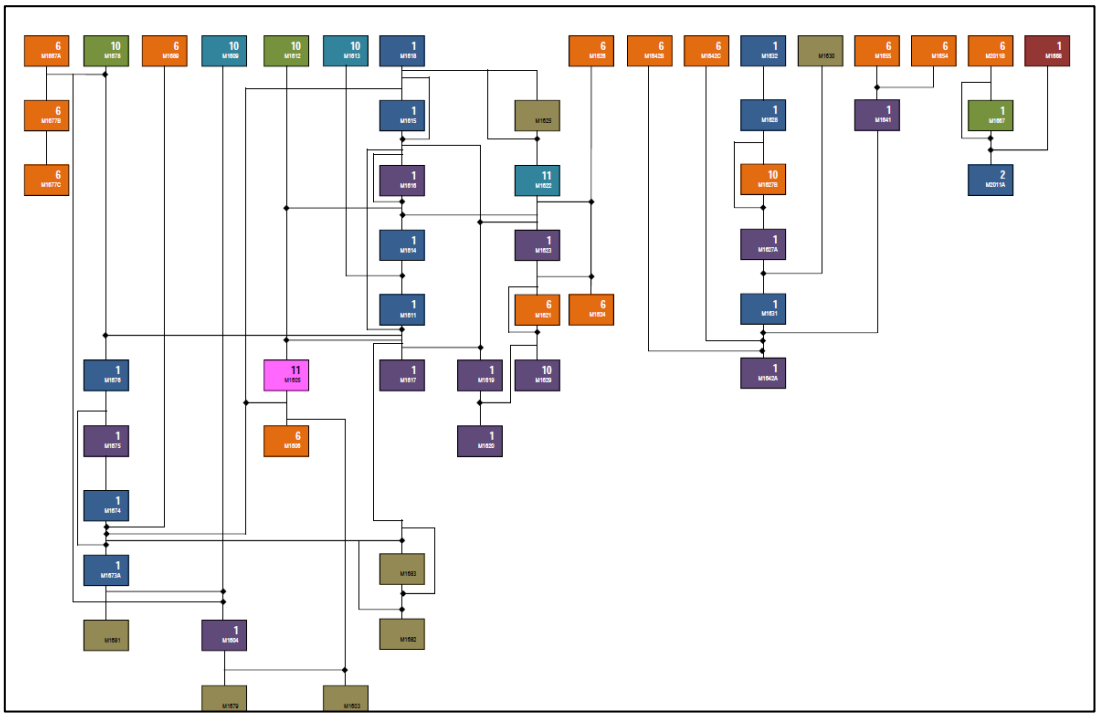


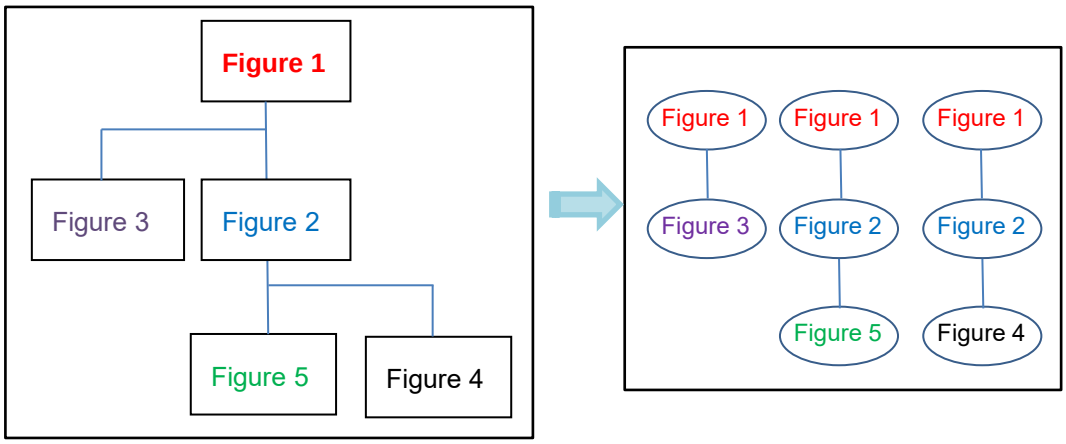
FIGURE 8.35 EXCERPT FROM THE HARRIS MATRIX FOR MOUNT BEHN 1 SHOWING COMPLEX SUPERIMPOSITIONS (APPENDIX 10 PROVIDES FULL DETAILS).

To identify sequences at each site the superimpositions are broken down into individual superimposition sequences. If a figure at the first level is superimposed on two other figures, there are two individual sequences and so on (Figure 8.36). All individual sequences have been identified for the selected sites (Table 8.21). These have been further refined into sequences for each site, resulting in 422 individual sequences from the superimposition relationships of all figures, which were then compared across the study area to determine sequences for each cultural area and then the full study area.

TABLE 8.21 NUMBERS OF FIGURES, LAYERS OF SUPERIMPOSITION AND INDIVIDUAL SUPERIMPOSITION SEQUENCES FOR SITES WITH MORE THAN 100 FIGURES IN THE STUDY AREA.

Site	All Figures	Layers of Superimposition	Individual Superimposition sequences
Mount Behn 1	616	11	166
Elimberrie Springs	272	5	49
Marawun 1	231	7	54
Tangalma	162	4	12
Marawun 4	150	6	29
Moonggaroonggoo	146	5	29
Fairfield 2	112	4	21
Riwi	109	5	16
Emanuel Gap 4	106	7	8
Langurmurru	103	6	38
Total	2007	n/a	422

*Sequences for relationships between determinate figures only.



Harris Matrix for Superimposition

Individual superimposition sequences

FIGURE 8.36 IDENTIFYING INDIVIDUAL SUPERIMPOSITION SEQUENCES FROM A MORE COMPLEX HARRIS MATRIX, READING FROM THE MOST RECENT LAYER AT THE TOP TO OLDEST AT THE BOTTOM.

Mount Behn 1

The relative chronology of figures at Mount Behn 1 is highly complex, with many different superimposition relationships. At all sites I have considered the sequence of the identified styles in this study, excluding the broad groups of Generic Monochrome, Generic Bichrome, Cupules, Incisions and Historical Inscriptions and the Non-Allocated figures as part of the sequences of styles for this purpose, as groups like Generic Monochrome and Generic Bichrome are at all levels of superimposition (Appendix 7 includes all styles and broad groups). While Monochrome Outline is also identified as a broad group and, on that criterion, would be excluded, it remains part of this analysis as the numbers are low and it is may have been part of another style that has lost internal detail through deterioration.

The process of culling also removes reversals, where one style is both superimposed on and superimposed by another, and self-superimposition where a figure may have been

refreshed (O'Connor et al. 2008b). This left six consistent and recurrent superimpositions at Mount Behn 1 (Figure 8.37) and five clear sequences (Figure 8.38)[2].

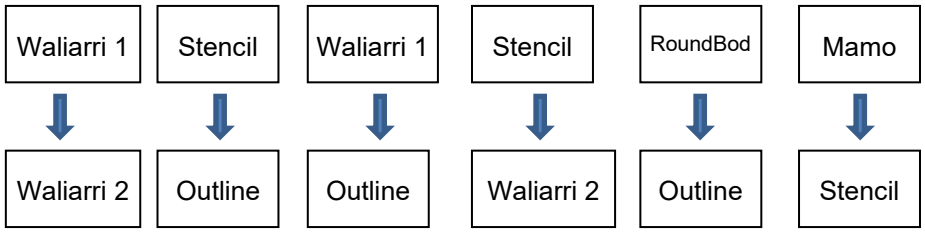


FIGURE 8.37 INDIVIDUAL SUPERIMPOSITIONS OF STYLES AT MOUNT BEHN 1.

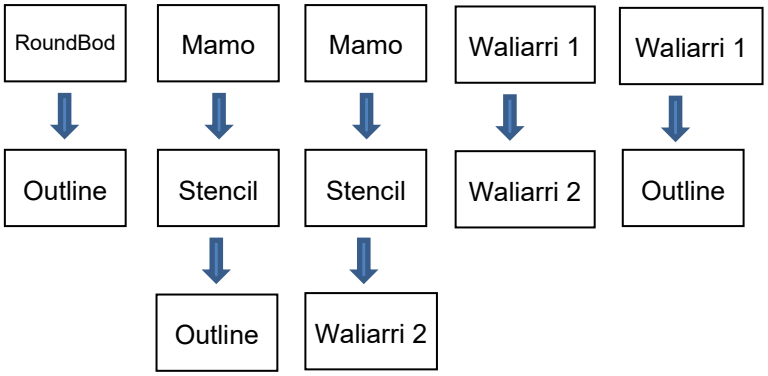


FIGURE 8.38 STYLES SEQUENCES AT MOUNT BEHN 1.

At Mount Behn 1 there are 43 (26%) individual sequences where Waliarri 1 (Complex) figures are directly superimposed on one another. This suggests periods of intense activity, recurrent themes, or continuity of the style over a long period. Continuity over time is possible; there are eight sequences where there are four or more layers of Waliarri 1 (Complex) superimposed directly on one another, and one discernible to six layers. This is helpful in determining the extent to which style choices have changed over time, or not, and continuity of cultural interactions and alliances.

Elimberrie Springs

Removing reversals there are six recurrent superimpositions at Elimberrie Springs (Figure 8.39). This results in three sequences (Figure 8.40), where Mamo/Djuari is the most recent and Waliarri 2 (Simple) the oldest style. This is visibly clear particularly with the large anthropomorph which dominates a panel at this site (Figure 8.41).

[2] Note: for abbreviation purposes Mamo/Djuari is Mamo for sites in Bunuba Country and Djuari for sites in Gooniyandi Country, as those are the names used for the same form/style in each.

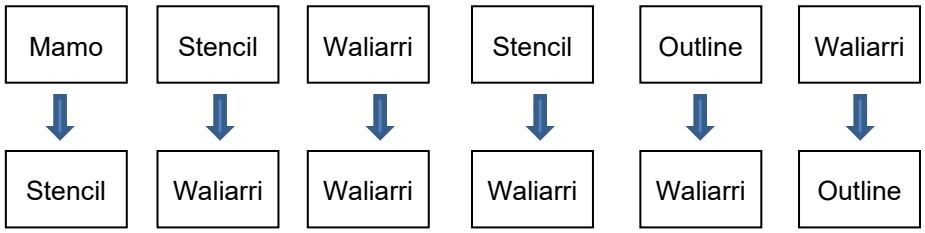


FIGURE 8.39 INDIVIDUAL SUPERIMPOSITIONS OF STYLES AT ELIMBERRIE SPRINGS.

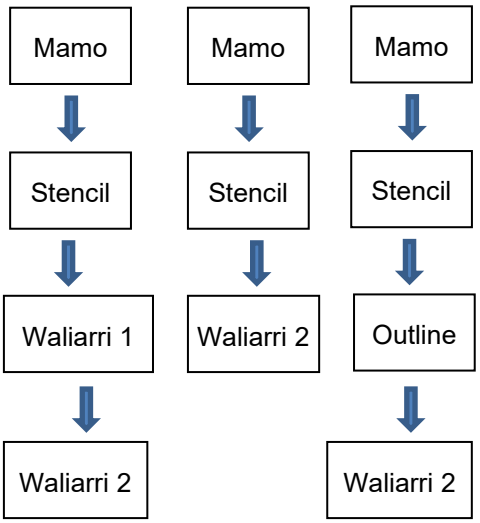


FIGURE 8.40 STYLE SEQUENCE AT ELIMBERRIE SPRINGS.

FIGURE 8.41 THE MOST RECENT STYLE PAINTED AT ELIMBERRIE SPRINGS IS THE RED MAMO ANTHROPOMORPH (M1501) DOMINATING THE PANEL. PHOTOGRAPH BY JANE BALME.

Marawun 1

There are four recurrent superimpositions at Marawun 1 (Figure 8.42). The result is three sequences (Figure 8.43), where Monochrome Stencil is the most recent, with Monochrome Outline and Round Bodied Grouped Anthropomorphs the older styles.

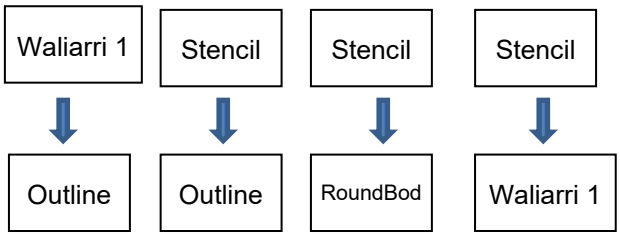


FIGURE 8.42 INDIVIDUAL SUPERIMPOSITION RELATIONSHIPS OF STYLES AT MARAWUN 1.

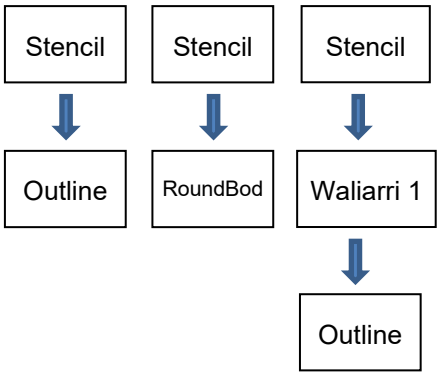


FIGURE 8.43 STYLES SEQUENCES AT MARAWUN 1.

Tangalma

There is one recurrent superimposition at Tangalma (Figure 8.44); a single style sequence.

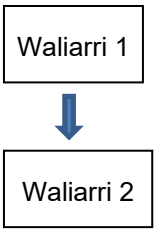


FIGURE 8.44 INDIVIDUAL SUPERIMPOSITIONS OF STYLES/STYLE SEQUENCE AT TANGALMA.

The large number of engraved figures, mostly tracks and incised parallel lines at Tangalma without superimposition, suggests two different periods of use at the site: a relatively short one where pigment art was prevalent, and a period where engraving, characterised by deep incision dominated or may have continued in parallel.

Mineral crusts from this site dated at least one cross section from a large boulder with red pigment between a basal layer of 16,300 +/- 300BP and present (Watchman et al. 2001:813-816). Samples were also taken from the densely engraved ledge, but the results for these were not published. Coupled with dating of an ochre marked slab to c.40,000BP (O'Connor & Fankhauser 2001) pigment art is likely to have been present with comparatively little change over a long period.

That there are only two stages in the sequence identified from the superimposition at this site suggests it is possible that the site was used for painted rock art sporadically or selectively over time.

Marawun 4

There is one recurrent superimposition at Marawun 4 (Figure 8.45), and therefore a single sequence.

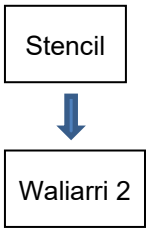


FIGURE 8.45 INDIVIDUAL SUPERIMPOSITIONS OF STYLES/STYLE SEQUENCE AT MARAWUN 4.

Like Tangalma, Marawun 4 has many engravings on a ledge separate from the areas both inside the cave and an outer sheltered area with pigment art. This may be an indication of different techniques practiced at different times, or in parallel. Like those at Tangalma, the engraved markings do not have superimposition.

Moonggaroonggoo

There is one recurrent superimposition relationship identified at Moonggaroonggoo (Figure 8.46), and thus, a single sequence for the site.

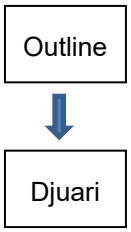


FIGURE 8.46 INDIVIDUAL SUPERIMPOSITIONS OF STYLES/STYLE SEQUENCE AT MOONGGAROONGGOO.

The superimpositions at this site are primarily with figures in the Generic Monochrome group; thanggari (water lilies) and many zoomorphs fall into this group. This site has several Historical Inscriptions, which would also form part of a sequence if included. If all styles and groups were included there would be six individual superimpositions and three resulting style/group sequences (Figure 8.47), with Historical Inscriptions the most recent, and Djuari (Mamo/Djuari) and Black & White figures the oldest.

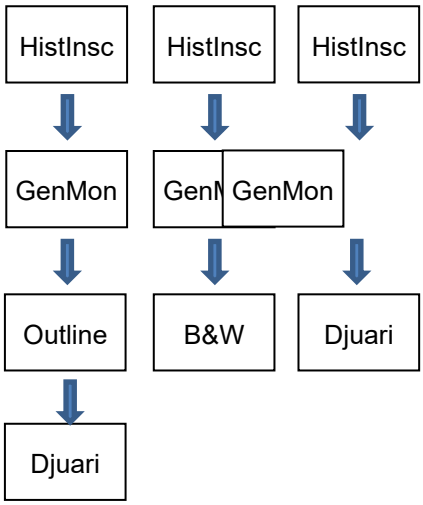


FIGURE 8.47 SEQUENCES AT MOONGGAROONGGOO IF ALL STYLES AND BROAD GROUPS INCLUDED.

Fairfield 2

There are three recurrent superimpositions at Fairfield 2 (Figure 8.48). This resulted in three sequences (Figure 8.48). The sequences show the Waliarri 1 (Complex) and Waliarri 2 (Simple) as the most recent figures at this site.

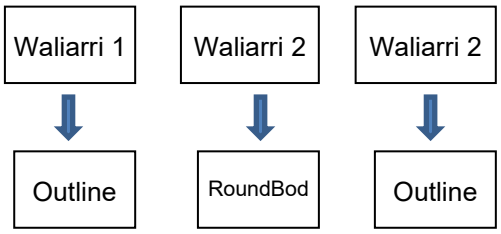


FIGURE 8.48 INDIVIDUAL SUPERIMPOSITIONS OF STYLES/STYLE SEQUENCE AT FAIRFIELD 2.

It should be noted that at this site there are only 21 superimposition relationships. There are many figures without superimposition. It is a long site, with an estimated floor area of 228m^2 and considerable wall space on which the rock art is spread out, with more space available but not featuring extant rock art.

Riwi

There are three recurrent superimpositions at Riwi (Figure 8.49). Two sequences resulted (Figure 8.50). Both sequences show the Waliarri 1 (Complex) as the most recent style and Waliarri 2 (Simple) as the oldest.

Riwi has many figures without superimposition (n=37, 34%), and this limits the analysis of sequences. If the additional groups were included in this analysis there would be five sequences, with Waliarri 1 (Complex) still the most recent, along with Monochrome Outline.

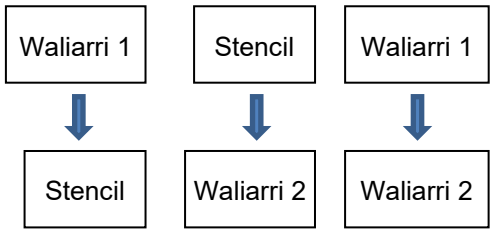


FIGURE 8.49 INDIVIDUAL SUPERIMPOSITIONS OF STYLES AT RIWI.

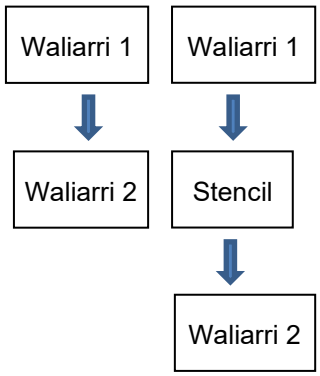


FIGURE 8.50 STYLES SEQUENCES AT RIWI.

Emanuel Gap 4

There are five recurrent superimpositions at Emanuel Gap 4 (Figure 8.51). This resulted in four sequences (Figure 8.52). Three styles emerge as the most recent: Monochrome Outline, Black & White, and Mamo/Djuari, with Waliarri 1 (Complex) always more recent than Waliarri 2 (Simple) in the individual sequences.

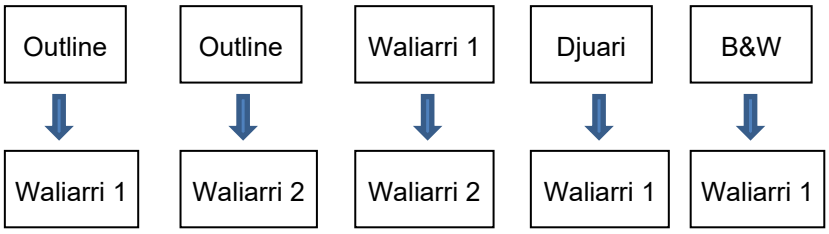


FIGURE 8.51 INDIVIDUAL SUPERIMPOSITIONS OF STYLES AT EMANUEL GAP 4.

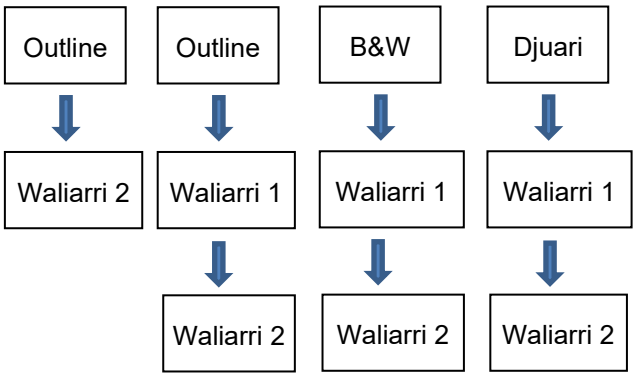


FIGURE 8.52 STYLES SEQUENCES AT EMANUEL GAP 4.

Langurmurru

There are five recurrent superimpositions at Langurmurru (Figure 8.53), resulting in three sequences (Figure 8.54). The sequences show one style and one broad group as the most recent: Monochrome Stencils and Monochrome Outline.

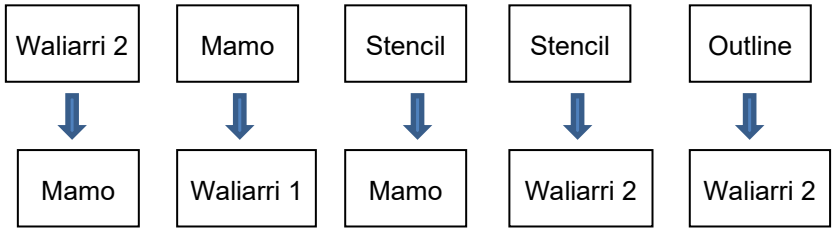


FIGURE 8.53 INDIVIDUAL SUPERIMPOSITION RELATIONSHIPS OF STYLES AT LANGURMURRU.

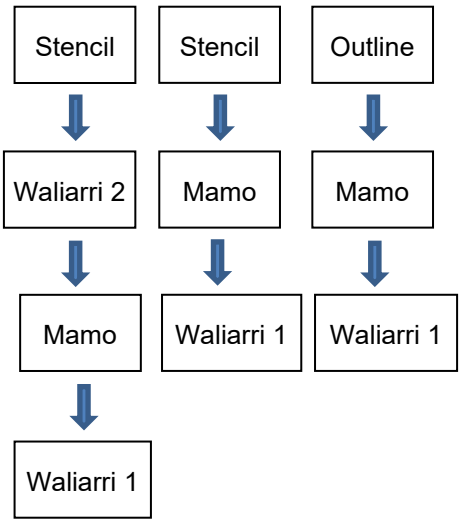


FIGURE 8.54 STYLES SEQUENCES AT LANGURMURRU.

The Waliarri 1 (Complex) and Waliarri 2 (Simple) styles are in the sequences in superimposition with other styles. Their superimposition on one another was excluded because there were cases of reversal. This leaves the left sequence in Figure 8.54 open to question as the three lower layers are motif variations within the Waliarri style as described in Chapter 7, limiting analysis of chronology at this site, at the same time as suggesting continuity of the family of styles.

A Chronology for Styles?

There is too little information available, and too few sites with suitable samples to use Uranium/Thorium dating to make any definitive statement on dating the rock art in the southern Kimberley. The only marker available is not yet published and reviewed. It provides a possible time frame for rock art at one site (Mount Behn 1, from 3,300BP to 16,800BP), and suggests that rock art may have been created continuously over that period, but it is too limited to draw conclusions regarding the chronology of rock art styles in the study area.

Dating rock art by association is equally limited. For sites excavated for the *Lifeways* Project, and earlier (e.g. Balme 2000; O'Connor & Fankhauser 2001) there is clear occupation/site use up to c.50,000BP (Hiscock et al. 2016; O'Connor et al. 2014; Vannieuwenhuyse et al. 2016b; Whitau et al. 2016a; Wood et al. 2016). One date relates to a pigment marking which cannot be linked to a specific figure (O'Connor & Fankhauser 2001), making definite dates for rock art at that site impossible at this stage.

Evidence of pigment at the excavated sites (see Tables 8.4-8.7) suggests that it has likely been used from the Pleistocene to modern times, and flakes of painted limestone have been dropping onto the floor for a similar period. Neither pigment nor flakes have been linked to figures. Their presence suggests that rock art and/or other decoration using pigments are likely to have been part of human activity over the long period of occupation in the southern Kimberley, but it is not evidence which links to styles or figures in the assemblage.

Developing sequences using superimposition is one way of developing a chronology for rock art/styles that may work in the southern Kimberley. Comparing the results of superimpositions across sites with >100 figures was limited in providing a secure sequence of any depth. Comparing sites and their sequences to one another produces another set of results. Removing all reversals across those sites left nine individual superimpositions (Figure 8.55). Converted to a Harris Matrix and separated into sequences, the result was three style sequences (Figure 8.56).

Aggregating the superimpositions is problematic because they produce sequences which contradict individual site superimpositions and sequences. For example, the aggregate sequences suggest that Waliarri 2 (Simple) is always superimposed on Mamo/Djuari, which in turn superimposes Waliarri 1 (Complex). This is not the case at many sites. Five sites have Waliarri 1 (Complex) superimposing Waliarri 2 (Simple), and three sites have the reverse, Waliarri 2 (Simple) superimposing Waliarri 1 (Complex). The aggregate sequence suggests this is not the case, despite observed reality and individual site superimpositions contradicting this.

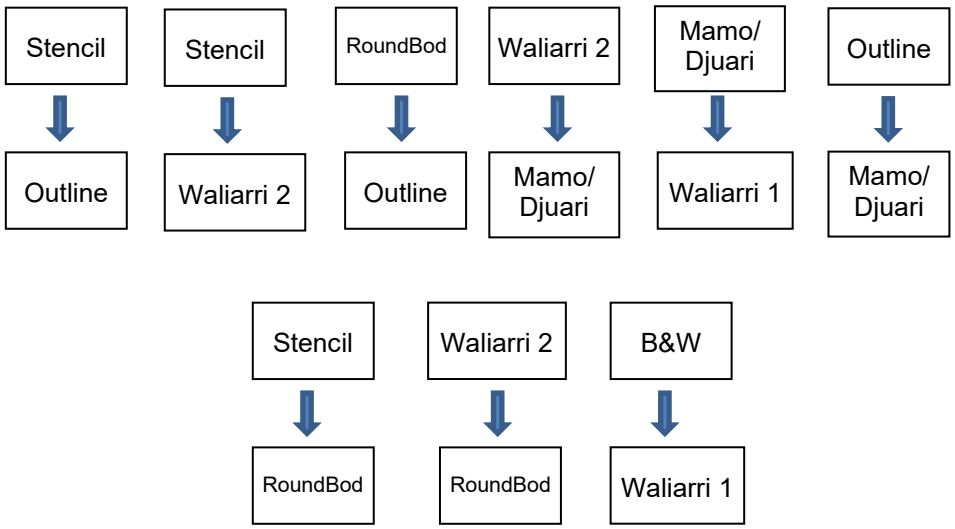


FIGURE 8.55 INDIVIDUAL SUPERIMPOSITIONS OF STYLES FROM AGGREGATED RESULTS FOR TEN SITES WITH >100 FIGURES.

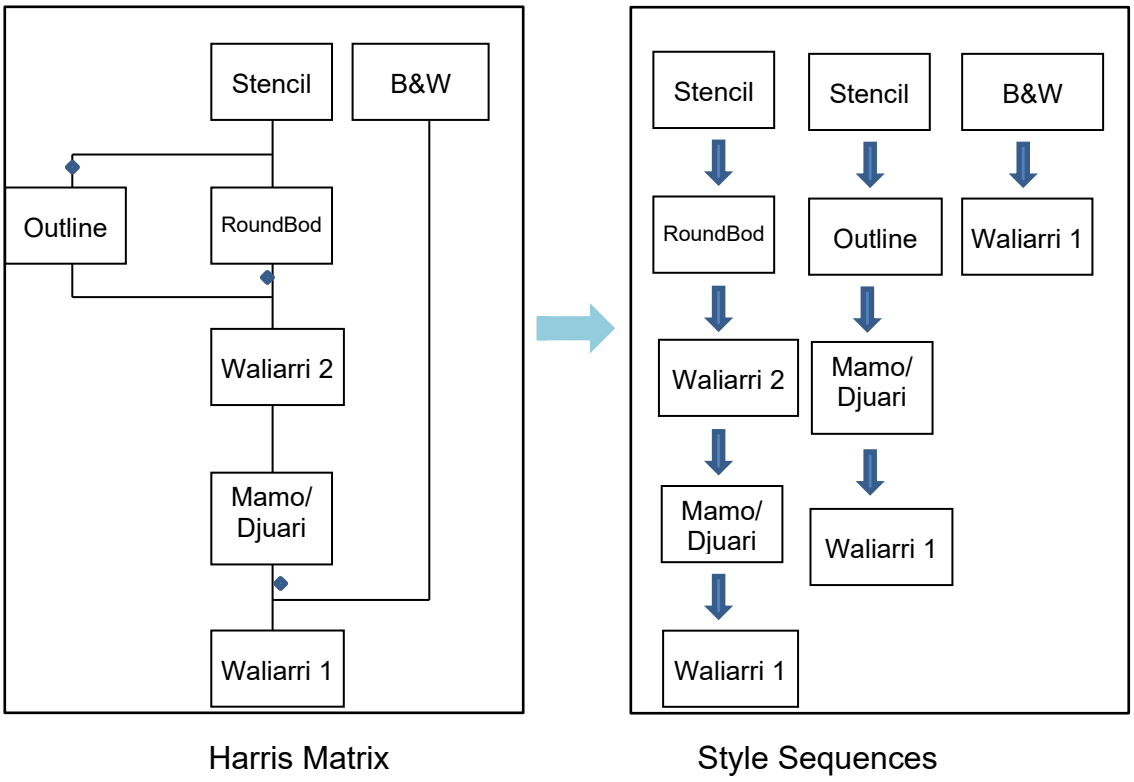


FIGURE 8.56 AGGREGATE HARRIS MATRIX AND STYLE SEQUENCES FOR TEN SITES WITH >100 FIGURES.

Similarly, the aggregate sequences suggest that Monochrome Stencil is always more recent than any other style. This is clearly not the case at individual sites. For example, Monochrome Stencil is superimposed by Waliarri 1 (Complex) at Riwi, and by the Mamo/Djuari at Elimberrie Springs. The reverse occurs at Langurmurru. Therefore, aggregate sequences provide too much contradiction of evidence to be an appropriate tool to analyse chronology.

Aggregates by cultural areas results in different sequences; five for Bunuba (Figure 8.57) and two for Gooniyandi (Figure 8.58). Bunuba site results suggest that Monochrome Stencil

is always the most recent, which is not consistent with observed evidence and individual site sequences. The two short sequences in Gooniyandi Country provide little information. Individual site sequences provide greater complexity of superimposition and support the Monochrome Outline group and Black & White style being of recent origin (Figure 8.52).

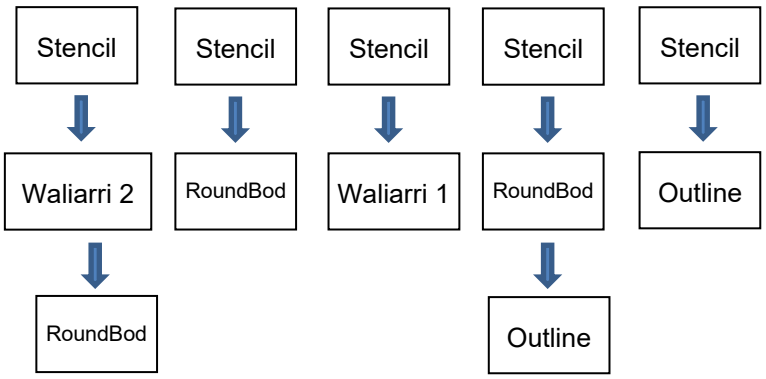


FIGURE 8.57 AGGREGATE SUPERIMPOSITION SEQUENCES FOR BUNUBA SITES WITH >100 FIGURES.

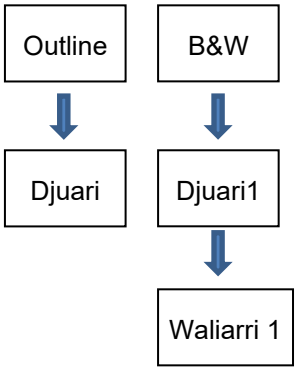


FIGURE 8.58 AGGREGATE SUPERIMPOSITION SEQUENCES FOR GOONIYANDI SITES WITH >100 FIGURES.

Despite the potential of aggregating superimposition across cultural or geographic areas it does not provide clear sequences, and it often contradicts observed superimposition and individual site style sequences. Removing contradictory results would serve no purpose other than to gloss over the differences between sites, and between the two cultural areas regarding superimposition. This eliminates aggregation as an appropriate way to identify an overall chronology.

Using a site-by-site comparison to detect patterns of superimposition is more promising. Examination of individual sequences from the site-specific Harris Matrices (Appendix 10) shows that:

- The Generic Monochrome and Generic Bichrome groups are interspersed throughout the layers with many styles;
- Historical Inscriptions are always at the most recent layer;

- It is not possible to place Engraved Animal Tracks or Cupules, Incised lines and Historical Inscriptions or the not elsewhere allocated group within any sequences because they rarely have any superimposition relationships, and chronometric dating for engraved markings has not been attempted as there is no widely accepted method at present (e.g. Whitley 2012);
- Waliarri 1 (Complex) and Waliarri 2 (Simple) styles are interchangeable in terms of recency in superimposition;
- Mamo/Djuari appears to be more recent than the Waliarri 1 (Complex) style, but is consistently superimposed by Waliarri 2 (Simple) at Langurmurru (where the two Waliarri styles are interchangeable in superimposition) but not at Mount Behn 1, further supporting the that the Mamo/Djuari and Waliarri are, while not identical, motif variations within the same style;
- Monochrome Stencils are only visible in recent layers, but this may be because they are small, are mostly fine pigment spray, and are more easily fully obscured by other figures. They are presently identifiable to four layers at Mount Behn 1, suggesting their presence over time, and may have been continuous like the Generic Monochrome and Generic Bichrome broad groups; and
- The Round Bodied Grouped Anthropomorphs style appears recent but is not the most recent at all sites. The figures are superimposed by Monochrome Stencils at Marawun 1 and Waliarri 2 (Simple) at Fairfield 2.

Separating this analysis by cultural area suggests two slightly different chronologies, noting that there are styles present in each area not present in the other, and there is a marked difference in the number of sites recorded due to cultural and time restrictions. Superimpositions at Bunuba sites suggest that:

- Monochrome Stencils are present through many layers, and may, therefore, be assumed a continuing style;
- Waliarri 1 (Complex) have been painted for longer than the Waliarri 2 (Simple);
- The depth of layers of superimposition for the Waliarri 1 (Complex) from levels lower than the Waliarri 2 (Simple) style, to both being present in the most recent layers, suggest both have been painted continuously over a long period;

- Mamo/Djuari is a more recent introduction than Waliarri 1 (Complex) and Waliarri 2 (Simple), but is also present in the most recent layers except for one site (Langurmurru), where it is superimposed by the Waliarri 2 (Simple) style;
- Abraded/Scratched Solid Infill is a local style and recent, with figures identified as having been created during the 20th century (Johnny Bell 2012 pers. comm., 6 September); and
- Monochrome Outline group and Round Bodied Grouped Anthropomorphs styles are not separable in terms of superimposition, but likely less recent than Abraded/Scratched Solid Infill style, as there is no Traditional Owner knowledge or evidence to suggest that they have been created since colonisation. Note that the Monochrome Outline group is only included in the proposed sequence because it does not follow the pattern of the other groups and is not interwoven through the layers.

This information suggests a continuity of some styles and groups over time, but introduced at different times, meaning they co-existed in this assemblage (Figure 8.59) with both the older Monochrome and Bichrome Generic groups which are interwoven through all layers. and more recent rock art. The Waliarri 1 (Complex), Waliarri 2 (Simple) and Mamo/Djuari are contemporary in recent superimposition layers, supporting their relatedness as motif variations within a style family.

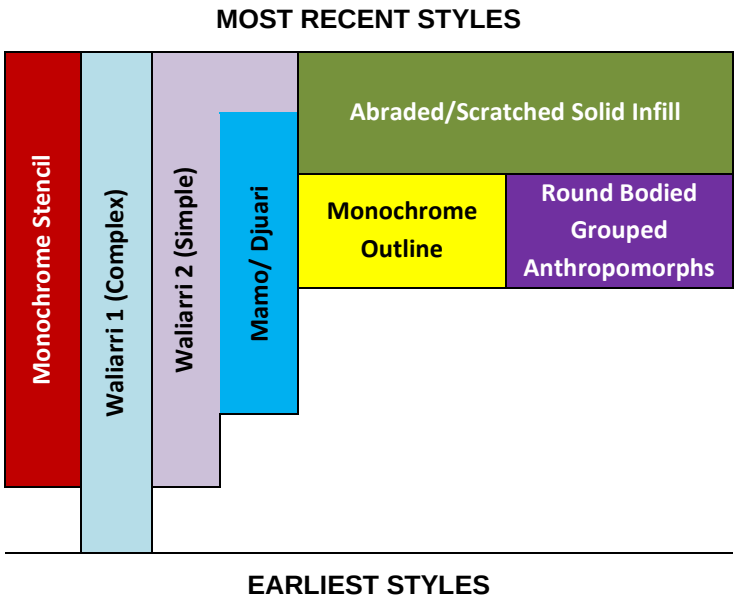


FIGURE 8.59 PROPOSED STYLE SEQUENCE IN BUNUBA COUNTRY, WITH ABRADED/SCRATCHED SOLID INFILL THE MOST RECENT AND WALIARRI 1 (COMPLEX) THE OLDEST.

Superimpositions in Gooniyandi Country reveal a slightly different outcome. Noting that the Engraved Animal Tracks, Abraded/Scratched Solid Infill and Round Bodied Grouped Anthropomorphs styles are not present, but that the Black & White style is, analysis of Gooniyandi sites with >100 figures reveal that:

- Black & White is always the most recent style;
- Waliarri 1 (Complex) is more recent than Waliarri 2 (Simple), except for one site (Riwi) where it is reversed;
- Mamo/Djuari style is more recent than Waliarri 1 (Complex), but may also be contemporary with the Bichrome Black & White style; and
- Monochrome Stencils, which have a limited presence, are interspersed with the other styles to the same level as Waliarri 1 (Complex).

This results in a slightly different proposed sequence in Gooniyandi Country, with the Waliarri 1 (Complex) and Waliarri 2 (Simple) styles showing continuity through superimposition layers (Figure 8.60) with Waliarri 2(Simple) at the lowest (oldest) superimposition layer, similar in their more recent contemporaneity and continuity in Bunuba Country.

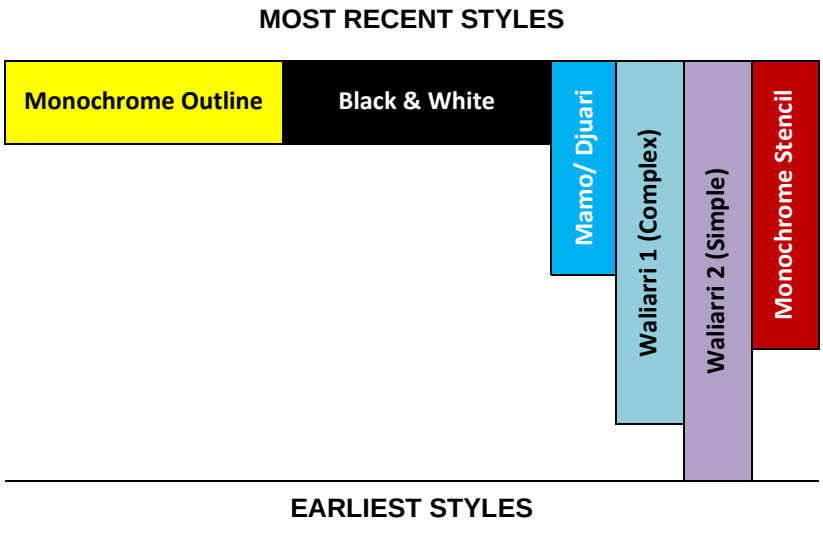


FIGURE 8.60 PROPOSED STYLE SEQUENCE IN GOONIYANDI COUNTRY, WITH MONOCHROME OUTLINE AND BLACK & WHITE THE MOST RECENT, AND WALIARRI 2 (SIMPLE) THE OLDEST.

It should be noted that for both cultural areas the inclusion of figures from the broad style groups and the unallocated figures (see Table 7.14) would suggest those are always most recent, and often also the oldest. However, without any detailed attributes identified or in common, they cannot be placed reliably within this type of style sequence.

In answer to the question posed at the beginning of this section, there are two possible chronologies for style in rock art in the southern Kimberley. Four styles have continuity through time in each of the cultural areas, with differences between Bunuba and Gooniyandi Country in the less prolific styles and the broad group of Monochrome Outline figures.

Thus, a linear approach to chronologies may not thus be appropriate for the southern Kimberley. Bunuba and Gooniyandi people appear to have embraced styles at different stages in relation to one another, whilst maintaining continuity in others over what may be a long period, where changes in environment and other factors impacted their lifeways (e.g. Balme 2000; Balme et al. 2009; Balme et al. 2018c; Frawley & O'Connor 2010; Langley et al. 2016; Maloney 2015; Maloney et al. 2017a; Maloney et al. 2014; Maloney et al. 2018a; Maloney et al. 2016; McConnell & O'Connor 1997; O'Connor 1995; O'Connor & Fankhauser 2001; O'Connor et al. 2014; Vannieuwenhuyse 2016; Vannieuwenhuyse et al. 2016a; Whitau et al. 2016a; Whitau et al. 2018; Whitau et al. 2017; Wood et al. 2016). Time is not directly linear for Indigenous Australians (e.g. Rose 1988; Stanner 1963), and developing a western academic chronology is not likely to represent a realistic Bunuba or Gooniyandi cultural concept of how styles may follow a more circular and intertwined chronology, and more recursivity and two way thinking would be worthwhile, and should be considered in future analysis of this rock art assemblage (e.g. Harrison 2005; McDonald 2013; Morphy 1999, 2012; Motta et al. 2020; Porr & Bell 2012).

Summary

This examination of temporal relationships has shown that there are several ways to approach the development of chronologies for rock art. Direct dating with radiocarbon and Uranium/Thorium dating has limits. A single instance U/Th dating suggests rock art as early as the terminal Pleistocene at Mount Behn 1 (Table 8.1), though only the upper layers dated at 4,605 +/-35BP (Figure 8.2) may be linked to a figure, but not to a style.

Excavation close to, but not connected with, the pigment art is limited. An indication for how long rock art has been at the site through the stratigraphic association of radiocarbon dated organics with recovered pigment and wall flakes is possible. This has provided evidence of rock art in Bunuba Country for up to 40,000 years (O'Connor & Fankhauser 2001). Excavations for the *Lifeways* Project have confirmed this, with pigment and flakes recovered from stratigraphic layers:

- To the terminal Pleistocene at Langurmurru (Table 8.4);

- The early Holocene at Djuru East (Table 8.5);
- To at least the mid Holocene at Mount Behn 1 (Table 8.6); and
- In Gooniyandi Country earlier than 47,000BP at Riwi (Table 8.7).

Stratigraphic association in the southern Kimberley suggests periods of discontinuity in intensity of occupation and site use (e.g. Dortch et al., 2019; Maloney et al. 2016: 80, 82, 84; Maloney et al. 2018: 206, 209) and the association of pigment and flakes with applied pigment throughout those periods suggest they were concurrent with those periods. This should be treated with caution as those periods of discontinuity in rock art could be as little as a day or as long as a millennium (see also Brady et al. 2021; May et al. 2010:63). The main limitation of stratigraphic association is that the pigment could not be linked with individual figures or styles, but it does confirm that pigment was used likely use to create still visible rock art.

Statistical approaches have limitations for working out relative chronologies. They are useful in eliminating hypotheses such as relationships between superimposition and site size, numbers of figures and site size, and or styles and site size or superimposition layers. Statistical techniques provide scope to test the strength and direction of such relationships. Correlations showed slight differences between Bunuba and Gooniyandi Country in numbers of figures at different sized sites and no, or negligible, correlations between numbers of figures and superimposition layers. The final hypothesis of relationships between styles and superimposition layers was also unproven at the aggregate level with no correlation, and in sites with >100 figures very small or negligible correlation. Eliminating the possibility that figure placement, superimposition and style are based on physical features, or directly related to one another, means that statistics are a good indicator that superimposition and stylistic choices emerge for other reasons.

To finalise the relative chronological relationships between figures and the styles, which are highly complex at many of the sites, I used the Harris Matrix to examine and test whether a style sequence was identifiable through superimpositions. Aggregating the superimpositions over multiple sites produced inconsistent and often contradictory results. Comparing sites within each cultural area produced more consistent and reliable information. Coupled with field observations and analysis of superimposition of styles this resulted in two possible sequences for rock art styles (Figures 8.59 and 8.60) which, while not having great complexity do indicate both change and continuity in identified styles over time.

Chapter 9 is the final stage of these analytical chapters, examining the way the figure classes and styles have been distributed or concentrated across Bunuba and Gooniyandi Country to add to the discussion on rock art as a marker of cultural identity, and how or where this has changed over time. This is brought together with a case study that considers the related styles of Waliarri 1 (Complex), Waliarri 2 (Simple) and Mamo/Djuari and their relationship to borders, identity and affiliations.

Distribution and Density

It is a basic assumption that rock art will be located in a patterned way in relationship to both the landscape and other cultural remains, as it is integrated with a variety of specific activities that are in themselves presumed to be non-random.

(Schaafsma 1985:261).

Introduction

The movement of people is often linked to the seasons, subsistence activities, and gathering/dispersal following environmental changes (Martin 1974; Mauss & Beauchat 1904: both cited in Conkey et al. 1980:609; McGowan et al. 2012). Movement creates pathways that link places through constant use (Harvey 2015; Ingold 2011; Ingold & Vergunst 2008; Svensson et al. 2021) and can be an outcome of a complex social process of environing. It is part of knowing and being in, of, and on the land (Ingold 2011), and is fundamental to the creation of rock art, particularly that which may be Ancestral Beings embedded in the rock (e.g. Blundell 2003; Crawford 1968; Love 1930; Taçon et al. 1996). There are strong arguments that there is more to the picture. Researchers suggest that ritual and social activity influenced groups to come together and disperse, arguing that alliances formed for marriage and trade may have been key to meetings of otherwise disparate groups, and where they exchanged of ideas and information (e.g. Conkey et al. 1980:610; McDonald & Veth 2012b; Wade et al. 2011; Williams et al. 2015; Wobst 1976; 1977). There are examples of those documented in anthropological and archaeological studies, in Australia and around the world (e.g. Balme et al. 2009; Barker et al. 2016; David 2009; Elkin 1932; Garfinkel et al. 2016; Goldhahn 1999; Jolly 2005; Kolig 1982; Lee 1972a; 1979:325;

McNiven 2003; McNiven & Russell 2002; Ross & Davidson 2006; Tonkinson 2002; Virili 1983).

The distribution of rock art shows how people have moved and created the landscape, and density at sites points towards gatherings and the intensity of activities. Density and distribution together provide insight to answer questions about social interaction and information exchange; building and reinforcing alliances and affiliations nurtured through ceremony and stories.

To examine how rock art is influenced by, or reflects, movement and place in the land this chapter describes the distribution and density of rock art and the patterns which emerge in the southern Kimberley by sites, motif classes and the styles defined in Chapter 7, including comparisons with Western Australian Registered sites with rock art (Government of Western Australia 1972). This is also explored through the analysis of site groupings which may create 'Rock Art Locales' following the approach of MacDonald and Veth (2012b), by examining the possibility of intensive activity at larger sites with diverse, densely painted surfaces, compared to that at smaller sites in the vicinity.

I conclude this chapter with a case study of the distribution and density of the three related styles described in Table 7.13 (Waliarri Family of styles), and how their distribution and density relate to Bunuba identity, and neighbourly relations.

Distribution of Sites

Aboriginal heritage sites are prolific in the study area, but not all are registered in the Western Australian Aboriginal Cultural Heritage Inquiry System (ACHIS). Traditional Owners keep some sites and locations confidential for cultural reasons and protection by not pursuing registration (see Pannell 2000:56-97; Toussaint et al. 2001), while others have been de-registered for a range of reasons including destruction, lack of evidence, and changes to legislative/regulatory interpretations.

There are 39% more registered sites in Gooniyandi than in Bunuba Country (Table 9.1), but sites with rock art registered in Bunuba Country are 2.9 times that in Gooniyandi Country, slightly lower than the ratio of sites recorded in this study (4.4:1). The latter is the result of opportunistic recording of sites in Bunuba Country, and cultural factors limiting time in Gooniyandi Country. Pannell (2000) documented many sites in Gooniyandi Country which are registered, but those are more often associated with creation stories and classified as mythological sites on ACHIS.

TABLE 9.1 REGISTERED SITES FOR BUNUBA AND GOONIYANDI NATIVE TITLE AREAS.

	Bunuba #2 Application		Gooniyandi Combined #2 Determination		Total Registered Sites	
ACHIS Sites	Number	%	Number	%	Number	%
Sites with rock art	63	57	27	18	90	34
Sites with other heritage significance	48	43	127	82	175	66
Total Sites	111	100	154	100	265	100

Note: For Bunuba this includes the excised area for Bunuba Parks & Conservation which is covered by an ILUA.

There are many differences between Bunuba and Gooniyandi Country; size, history, environment, and people (see Chapters 2 and 3). The Bunuba Native Title area is 6,528km^2 (Federal Court of Australia 2012), while the Gooniyandi area is almost double at 11,209km^2 (Federal Court of Australia 2013). The Bunuba Native Title grant excludes national and conservation parks and pastoral leases which, if included, would make the areas closer in size (Figure 1.2). This study includes the national and conservation parks as part of the traditional areas of both groups, meaning the spatial maps cover similarly sized areas for Bunuba and Gooniyandi Country.

Each is environmentally distinct. There are variations in the availability of resources and proximity to permanent or reliable water. Trade, cultural and/or linguistic affiliations, and cultural variations such as marriage laws, men's and women's business, and ancestral stories, are among many social and economic differences (e.g. Bates n.d.; Elkin 1931; Kaberry 1937; 1939; McGregor 1996; Radcliffe-Brown 1930a; 1913).

There is similar geology (Playford et al. 2009) but there are differences in how this is manifest. The western end of the Oscar and Napier Ranges (Bunuba) is characterised by long escarpments and wide plains with perennial water courses, springs and seasonal creeks. The escarpments have rockshelters and caves providing shelter and viewing platforms from which to plan hunting and gathering when the land cools in the late afternoon (June Oscar 2012 pers. comm. 14 July). The rockshelters are long fissures in the escarpment with ample space for rock art; many sites cluster along sections of the escarpments In Bunuba Country in Figures 9.1 and 9.2.

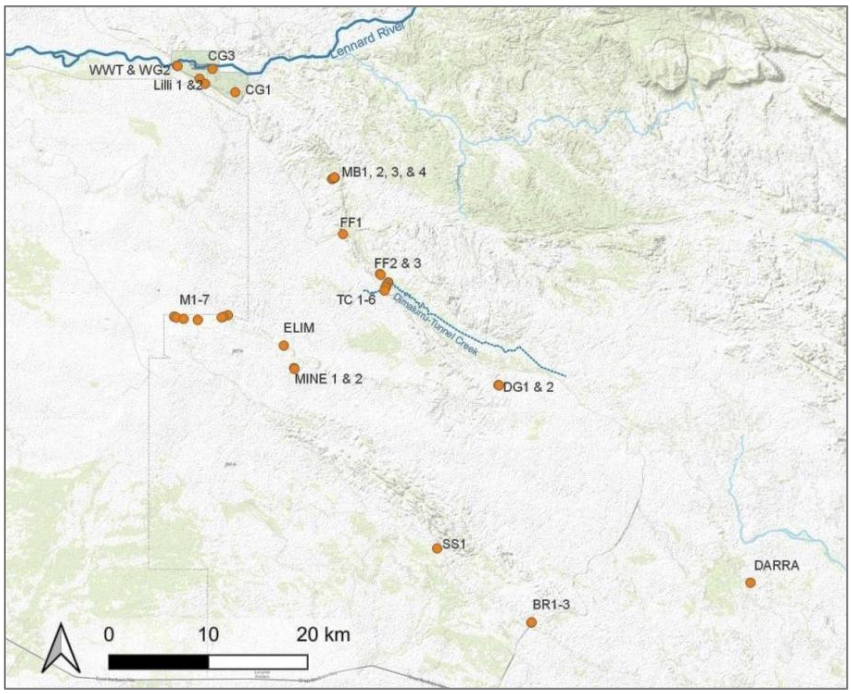


FIGURE 9.1 SITE LOCATIONS IN BUNUBA COUNTRY (SEE TABLE 4.2 FOR SITE NAME ABBREVIATIONS).

FIGURE 9.2 THE NAPIER RANGES BETWEEN BANDILNGAN AND DIMALURRU/TUNNEL CREEK.

In Gooniyandi Country there are fewer long escarpments, and caves and rockshelters are more often found in limestone outcrops, less regular and less connected than in the west. The wide plains in this region are similarly punctuated by large water courses, springs and seasonal creeks.

Geographical, environmental and cultural variations influence the movement and interaction of people in the southern Kimberley, and are likely to have an impact on the distribution,

techniques, figures and styles of rock art, and how these have been shared by Bunuba and Gooniyandi people over time.

This study recorded 43 sites with rock art in the study area; 48% of ACHIS sites registered with rock art in Bunuba and Gooniyandi Country (Table 9.1), most along the Napier Range and Marawun escarpments. Four key locations were recorded (Figure 9.3) in Gooniyandi Country, spanning a wide geographic area. Five of those are close together in Emanuel Gap (also known as Menyous Gap or Yualaron), in the Pillara Range to the east of Fitzroy Crossing (Figure 9.4), with springs and an ephemeral creek at the north end, and two sites in large rocky outcrops (Moonggaroonggoo and Riwi), and another in an escarpment overlooking the Margaret River (LD1 in Figures 9.3 and 9.5).

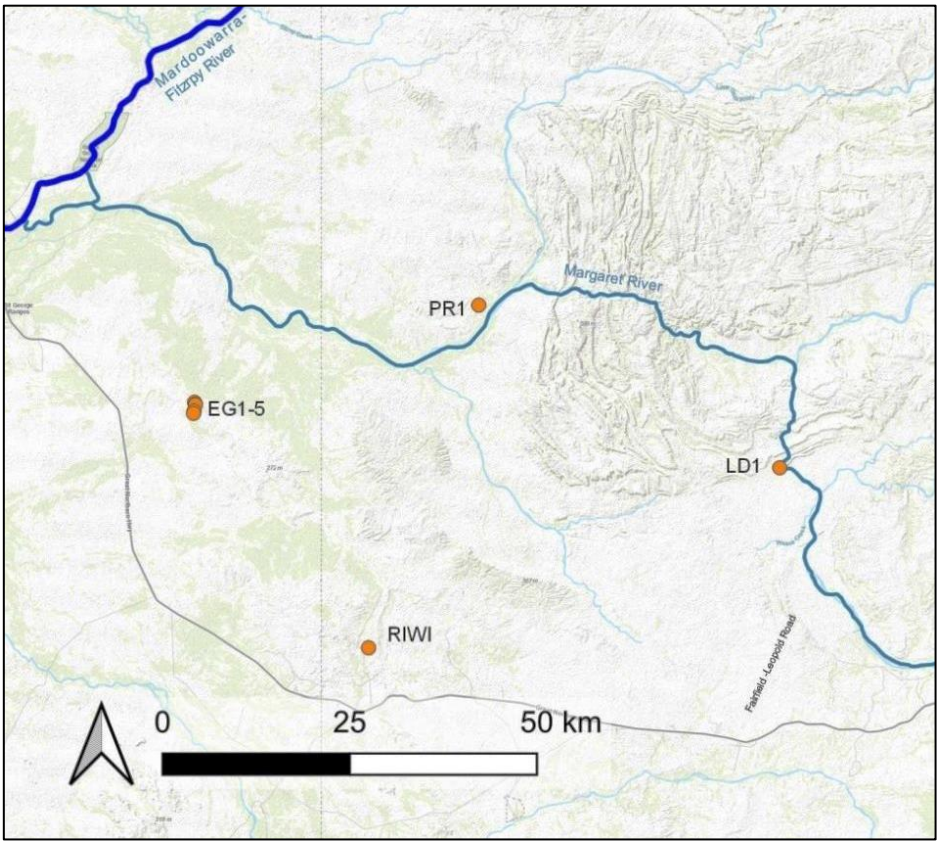


FIGURE 9.3 SITE LOCATIONS IN GOONIYANDI COUNTRY (SEE TABLE 4.2 FOR SITE NAME ABBREVIATIONS).

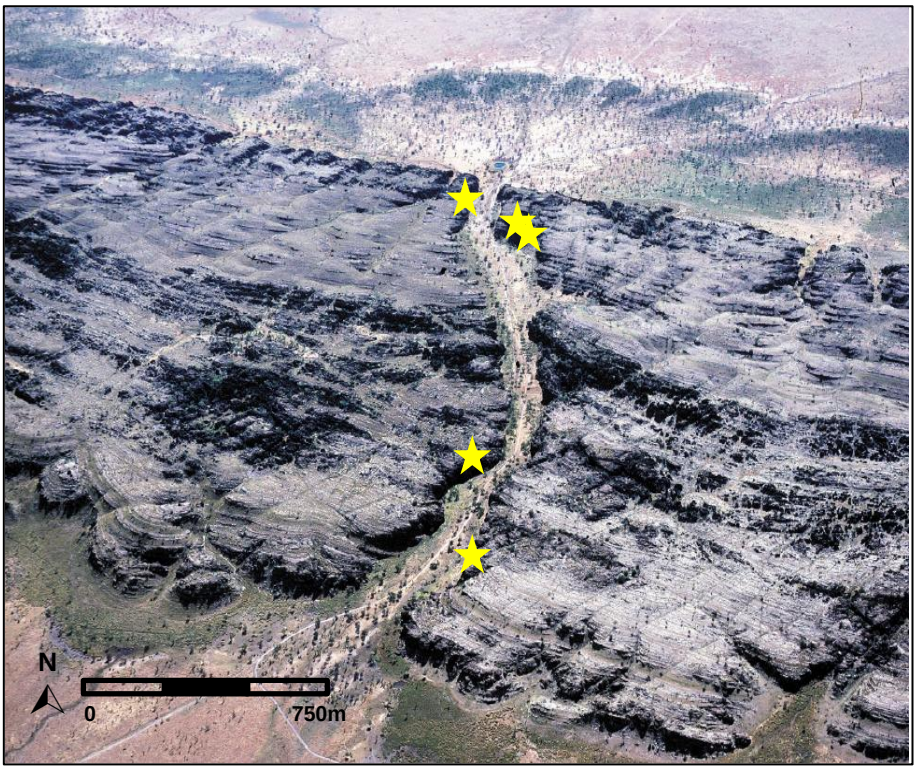


FIGURE 9.4 AERIAL VIEW OF EMANUEL GAP LOOKING NORTH. YELLOW STARS SHOW SITES RECORDED (ADAPTED FROM FIGURE 301 PLAYFORD ET AL. 2009:231). *IMAGE COURTESY OF GEOLOGICAL SURVEY AND RESOURCE STRATEGY DIVISION, DEPARTMENT OF ENERGY, MINES, INDUSTRY REGULATION AND SAFETY ©STATE OF WESTERN AUSTRALIA 2024.*

FIGURE 9.5 ESCARPMENT OVERLOOKING THE MARGARET RIVER AT LOUISA DOWNS 1. PHOTOGRAPH JANE BALME.

Density of Rock Art Figures

The number of figures at sites ranges from a single figure at three sites to 619 at Mount Behn 1. Density is determined by the number of figures at a site and, by extension, in its surrounding area in the density maps in this chapter. The density circles in the figures in this section have a radius of approximately 2km, creating crossover for sites close to one another. Thus, density at individual sites is partially obscured in the wider study area maps. The centre of the density circles indicates the site's geographic location.

Density at Sites

Figure density by site is greatest in the west of the study area (Figure 9.6). High density sites in the west are close together in three main groups. The northerly sites cluster in two areas, one close to the Lennard River at Bandilngan, the other closer to Dimalurru/Tunnel Creek. The southerly sites in the west cluster along the northern face of the Marawun escarpment. The group of 5 sites at Emanuel Gap to the east of Fitzroy Crossing appear to form another cluster of high-density sites, resulting from their proximity to one another (Figure 9.6).

The density pattern is similar whether the figures are determinate (Figure 9.7) or indeterminate (Figure 9.8). The concentration of densely marked rock art sites in in Bunuba Country decreases the closer they are to Fitzroy Crossing in the centre of the study area where the geology changes from long escarpments to rocky outcrops.

Sites in Gooniyandi Country have greater density closer to the Crossing than those located further south and east. That is, they tend to have more figures at each site, whether they are determinate (Figure 9.7) or indeterminate (Figure 9.8).

This suggests that whilst Bandaral ngadu (Fitzroy River) may have been a border of sorts between Bunuba and Gooniyandi Country, there was less rock art creation at the borders between the two cultural groups than at sites further from the borders and closer to their other neighbours in the west and the south. The abundance of resources close to the river is likely to have been an area where social and economic networks were open, with less need to mark territory (David & Chant 1995; David & Wilson 2002a; Smith 1992b), less need to have regular or frequent rituals and gatherings to form and reaffirm alliances (Wobst 1976, see Chapter 4), or that rituals in such meeting places took different forms. At the Bunuba, Ngaranyin and Unguumi borders to the west, and Gooniyandi and Walmajarri to the south, networks may have been less open, and thus the need for more ritual rock art and intensive interaction to maintain affiliations for marriage and trade (Wobst 1976). Establishing

separate identities whilst sharing information and ideas may be what is reflected in the diversity and density of the rock art, and the presence of greater numbers of iconic figures in some border areas, while not necessary because of the openness of relationships in others.

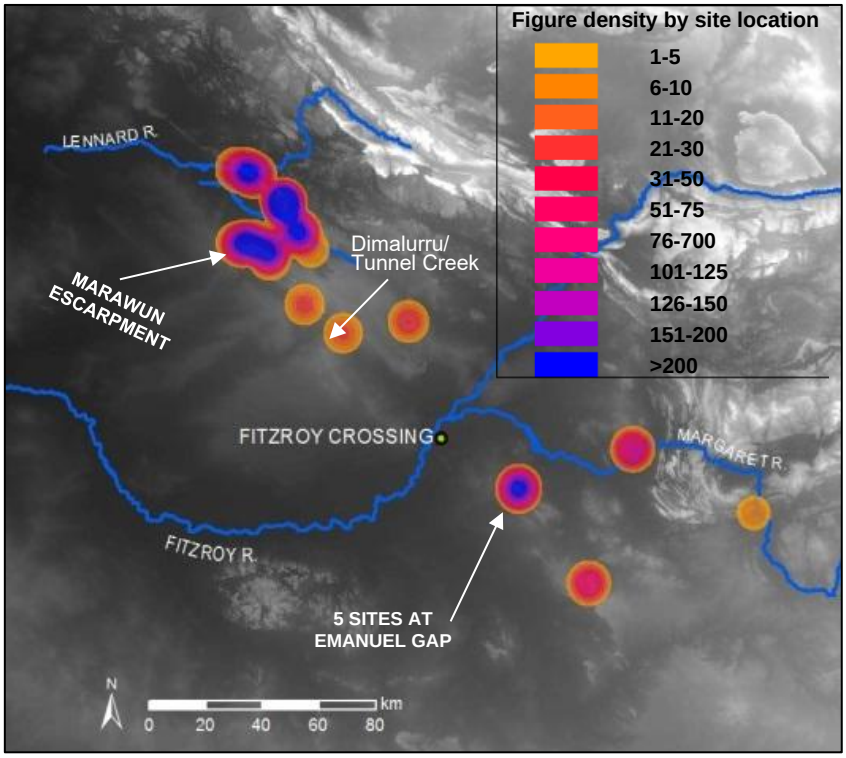


FIGURE 9.6 DISTRIBUTION AND DENSITY OF FIGURES AT ALL SITES IN THE STUDY AREA. THANKS TO TOM WHITLEY, SONOMA STATE UNIVERSITY, FOR THE DENSITY MAPS IN THIS SECTION.

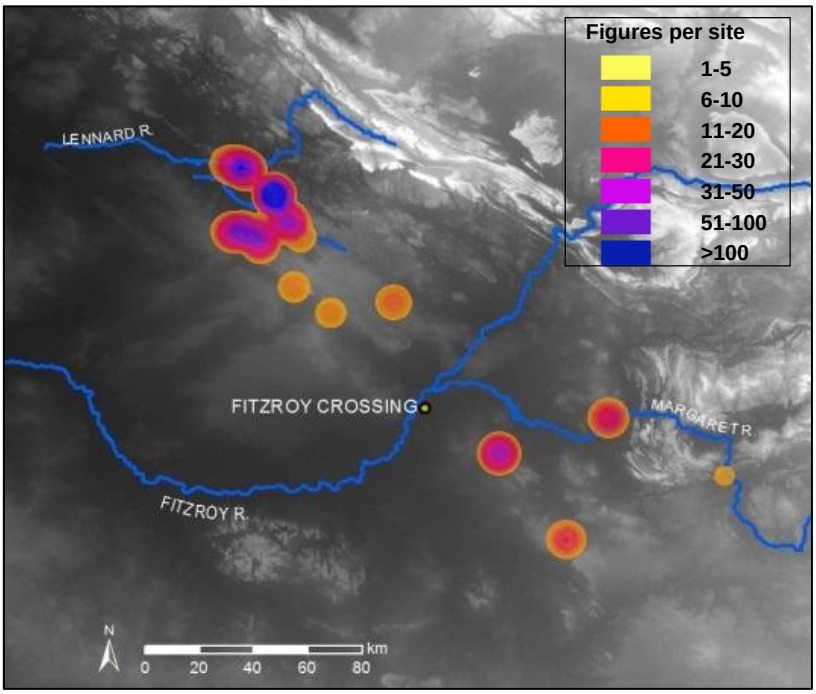


FIGURE 9.7 DISTRIBUTION AND DENSITY OF DETERMINATE FIGURES AT ALL SITES IN THE STUDY AREA.

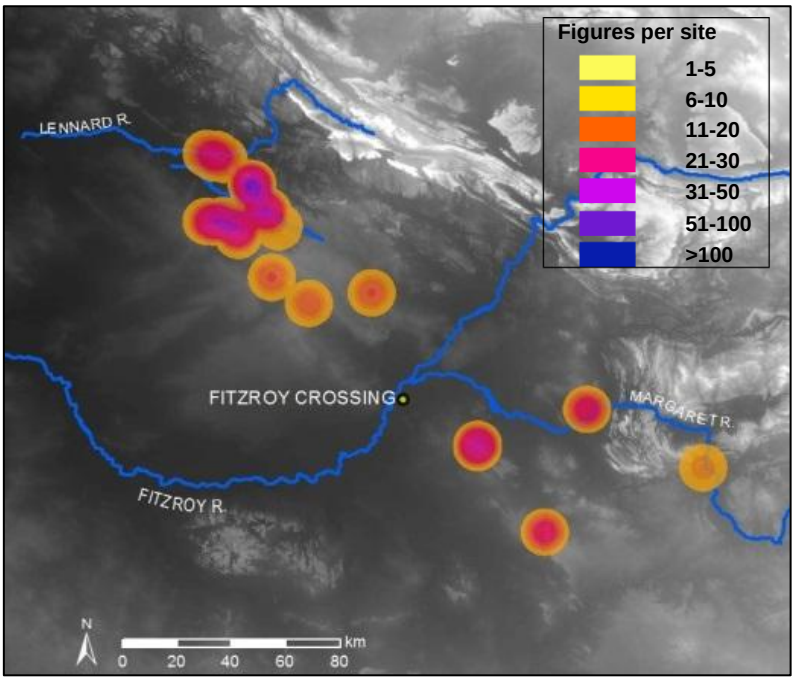


FIGURE 9.8 DISTRIBUTION AND DENSITY OF INDETERMINATE FIGURES AT ALL SITES IN THE STUDY AREA.

Density and Superimposition

With the exception of Mount Behn 1, high numbers of figures do not translate into many superimpositions (Hypothesis 2, Chapter 8 and Figure 9.9). There is no discernible distribution pattern of superimposition density in the study area, such as clusters of sites with similar numbers of layers. Close to the Lennard River sites with four or five layers are interspersed with sites with no superimposition, and there are similar variations in superimposition across the study area.

It may be inferred from the outlined theoretical perspective (see Chapter 4) that within closely grouped sites some sites have been either been visited more often, used intensely over a long period, or intensely during short periods for rituals, meetings (e.g. creating marriage networks, Wobst 1976), or intense periods of occupation, resulting in many layers of superimposition. This suggests differential use of sites in close proximity to one another and implies an aggregation locale, rather than a single aggregation site (cf. Conkey 1980; McDonald and Veth 2012b), which may apply to groups of sites within a radius of 1-2 hours walk, which is discussed in more detail below.

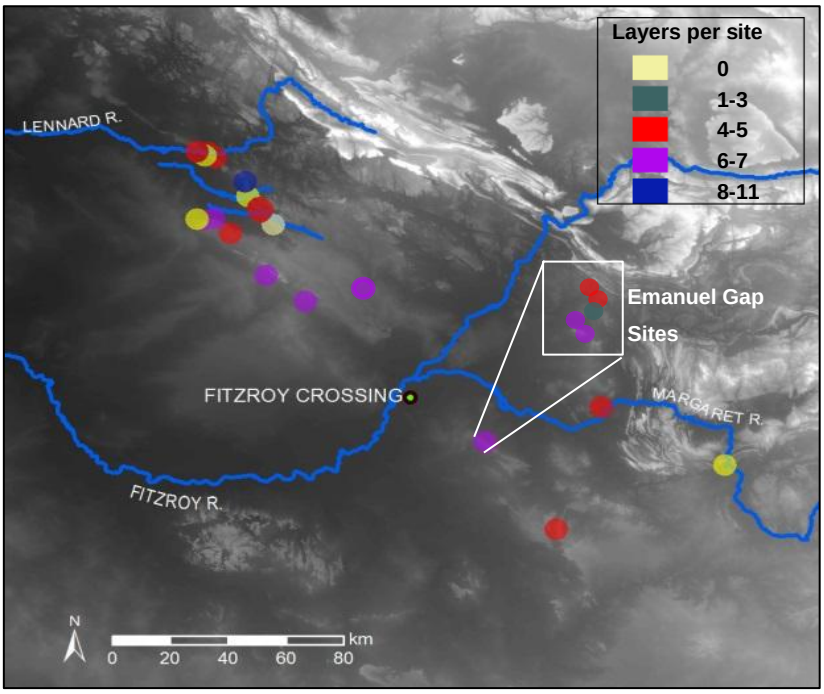


FIGURE 9.9 DENSITY OF SUPERIMPOSITION LAYERS AT ALL SITES IN THE STUDY AREA.

Density by Site Size

Another way to examine figure density is the number of figures according to site size, figures per square metre of floor area (Table 8.8, Figure 9.10). Floor area may be used as a proxy to estimate the potential for people to occupy the site in different group sizes continuously or periodically.

Density of figures at a site does not follow the same distribution pattern or clustering as site size or density of figures per m^2 by sites in the study area. The variation in the number of figures per square metre is more likely related to the shape and function of the site. June Oscar (2012, pers. comm., 12 July) described some sites as shelters for the 'hot times' and looking out over the plains to scan hunting grounds, and others as 'holiday camps' (June Oscar, Mona Oscar 2011, pers. comm., 15 August), or cool 'hidey holes' for shelter during long days rounding up cattle (Johnny Bell 2011 pers. comm., 6 September).

Some sites are small but intensively marked. Marawun 7-1 (Figure 9.11) has a floor area of approximately $3m^2$ with 51 figures ($17/m^2$), compared to Mount Behn 1, which is densely painted, and multi layered with a large floor area (619 figures and approximately $497m^2$ floor space, $=1.2/m^2$) resulting in markedly different results for figure/*size* density (Table 8.8, Figure 9.10) to the figure/site density (Figure 9.6).

This suggests short term, or transitional use, for small sites that are little more than a shady shelter, or a stopping point, and characterised by small mostly monochrome figures. Longer term and/or large group occupation may be more likely for large sites characterised by

complex polychrome figures. This is reflected in the proportion of figures without superimposition being markedly different between two such sites (Marawun 7-1=16%, n=8, Mount Behn 1=32%, n=200), implying different site use, including the purpose of the rock art, within the shelters.

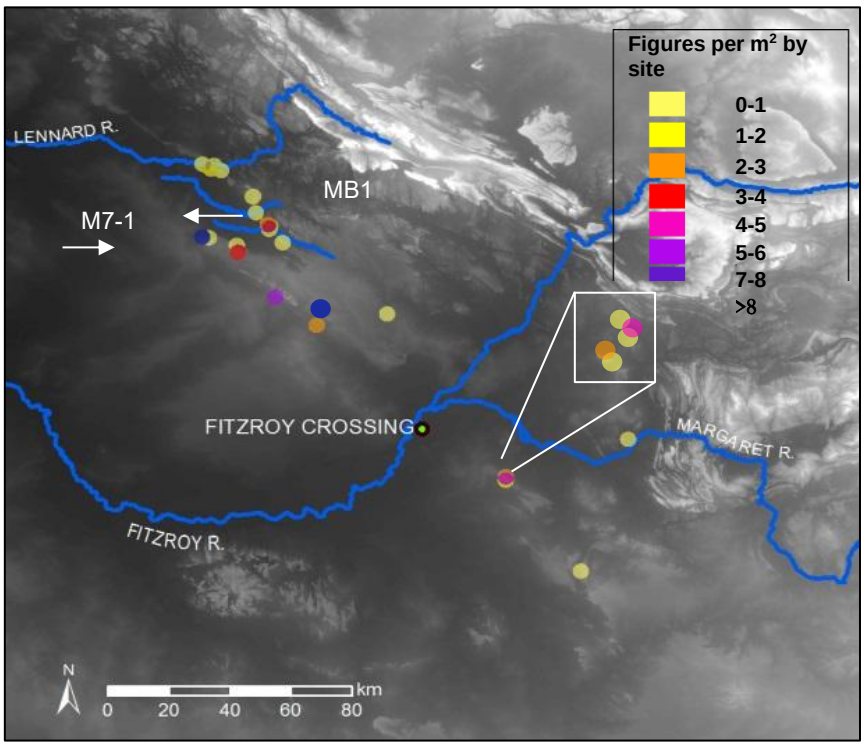


FIGURE 9.10 DENSITY OF FIGURES BY SITE SIZE AT ALL SITES.

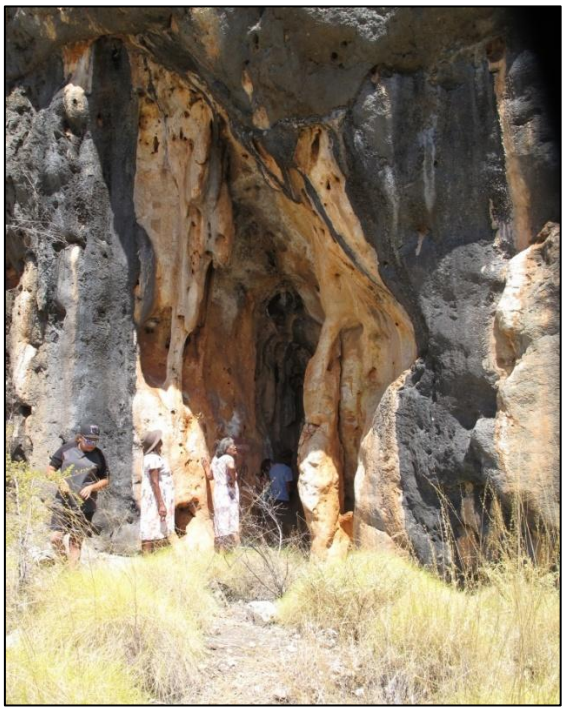


FIGURE 9.11 ENTRANCE TO MARAWUN 7-1, BUNUBA COUNTRY. NOTE: THIS IMAGE FEATURES BUNUBA TRADITIONAL OWNERS AND MUST NOT BE REPRODUCED OR USED WITHOUT DIRECT PERMISSION.

Contributing Factors

Density of figures by site size is also influenced by the size of figures and accessibility and condition of surfaces.

At Langurmurru there are 103 figures, with up to five layers of superimposition, yet the density of figures is 0.4/m^2. There are two major contributing factors to the low figures/m^2. Only part of the large space at the site is used as a gallery (Figure 9.12); the sloping wall/ceiling above a well-lit terrace at the northern part of the shelter (see Figure 8.8). Few (<5) figures are on the exposed southern rockface, and a single figure in the spacious cave between them.

The main gallery is dominated by large figures, placed high on the wall/ceiling, which may have been difficult to access, leaving less accessible space for new figures to be added without superimposition. The cave interior is comparatively dark, and the surface varied, offering few areas where rock art may be easily created or visible, and the outside area is very exposed to the elements offering little hope for preservation of painted rock art (Figure 9.12).

Excavations show that fires were lit inside the cave (O'Connor et al. 2014) possibly obscuring any rock art that may have been previously visible. Similarly, the southern area is exposed to wind and rain and pigment on this surface may have been weathered away, as suggested by the faded and patchy appearance of the extant figures (see Figure 5.9).

In contrast, Moonggaroonggoo also has five layers of superimposition for 146 figures but a density of 2.4/m^2. While zoomorphs are dominant (n=31) there are two images which arrest the view on entry: the large Dancing Man in a central position on a wall, and the thanggari (water lilies) superimposed on many other figures (Figure 9.13).

FIGURE 9.12 A VISIT BY SCHOOL CHILDREN SHOWS THE ACUTE ANGLE OF THE MAIN SHELTER (ABOVE), AND THE DARK INTERIOR AND WALLS OF THE CAVE AT LANGURMURRU IN 2012. PHOTOGRAPHS JANE BALME. NOTE: THIS IMAGE INCLUDES BUNUBA TRADITIONAL OWNERS AND MUST NOT BE REPRODUCED OR USED WITHOUT DIRECT PERMISSION.

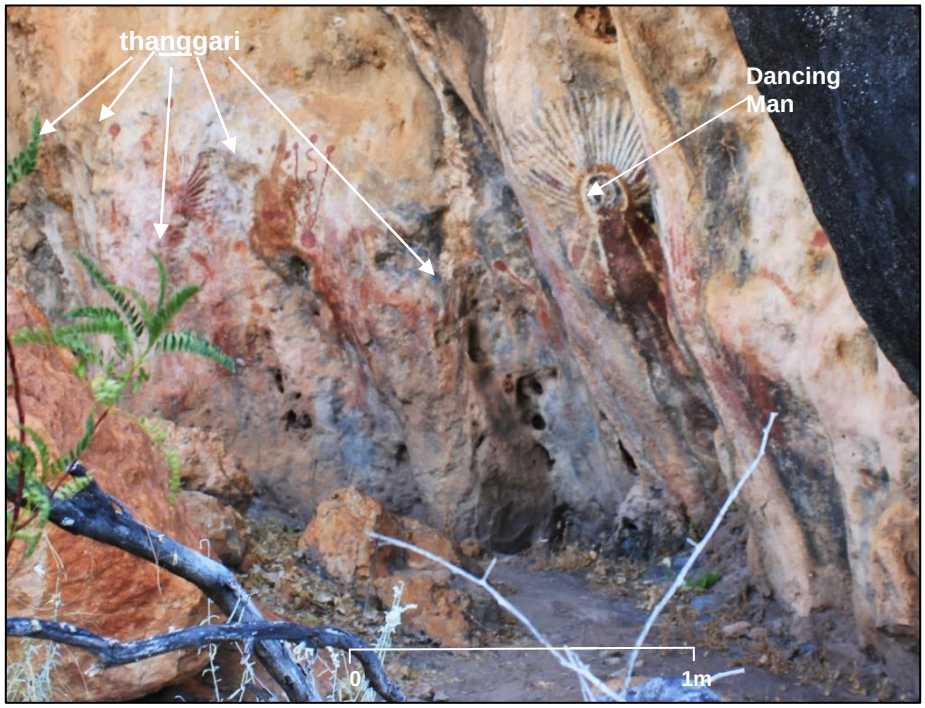


FIGURE 9.13 THE ENTRANCE TO MOONGGAROONGGOO. BOULDERS/LEDGES RISE UP TO THE LEFT IN THIS PHOTOGRAPH.

Moonggaroonggoo has a smaller floor area than Mount Behn 1, with large boulders/ledges forming substantial sitting areas as well as a canvas for engravings. The floor area at Moonggaroonggoo provides easy access to vertical wall space for painting (see site plans in Maloney et al. 2017a and Appendix 5) but the share of figures without superimposition at both sites is similar (Mount Behn 1 32%, Moonggaroonggoo 37%). The intensity of superimpositions is different at each. At Moonggaroonggoo figures are in 29 individual superimposition relationships, whereas at Mount Behn 1, with 42% more figures, there are 166 individual superimposition relationships.

Each of the sites examined has different density of figures because of site size, the variation in superimposition relationships, the dominance of different motif classes, and the use of all surfaces, versus selected surfaces. This suggests that choices regarding the number and superimposition of figures are made for reasons other than available space.

Distribution and Density by Motif Class

Not all motif classes are at every site in this study. Historical Inscriptions are at seven sites and tracks at 24, and there are 35 sites with anthropomorphs compared to 23 with phytomorphs, and 38 with zoomorphs.

The density of the motif classes varies within the classifications, as it does for their densities at sites although there are concentrations of classes such as anthropomorphs and zoomorphs in the sites with high figure density.

This section describes distribution and density for the nine motif classes (Table 5.4), with emphasis on the distribution and density of anthropomorphs, zoomorphs, phytomorphs and tracks, the most prolific classes recorded in this study.

Anthropomorphs

Anthropomorphs are the second most prolific motif class recorded: 553 figures at 35 sites (Figures 6.9 and 6.10). The greatest concentration of anthropomorphs is in the western part of the study area, particularly around the area between the Lennard River and Dimalurru/Tunnel Creek (Figure 9.14). Mount Behn 1 has the most, with >100 anthropomorphs and most sites in the vicinity have 51-100 anthropomorphs. Emanuel Gap has highest density in Gooniyandi Country at 31-50 anthropomorphs, but this is for the five sites combined, rather than any individual site along the 1.6 km Gap.

Zoomorphs

Zoomorphs are the most prolific motif class recorded; 614 figures at 38 sites. There are no sites in this study with >100 zoomorphs (Figure 9.15), but they are densest at sites in the west close to the Lennard River, on the Marawun escarpment (51-100) and the combined five Emanuel Gap sites in Gooniyandi Country.

Distribution of zoomorphs is more dispersed than anthropomorphs, with fewer sites without zoomorphs. There are sites, particularly in Gooniyandi Country, where the zoomorph concentration is greater (e.g. Moonggaroonggoo and Emanuel Gap 1-5) and one where there are zoomorphs, but no anthropomorphs (LD1).

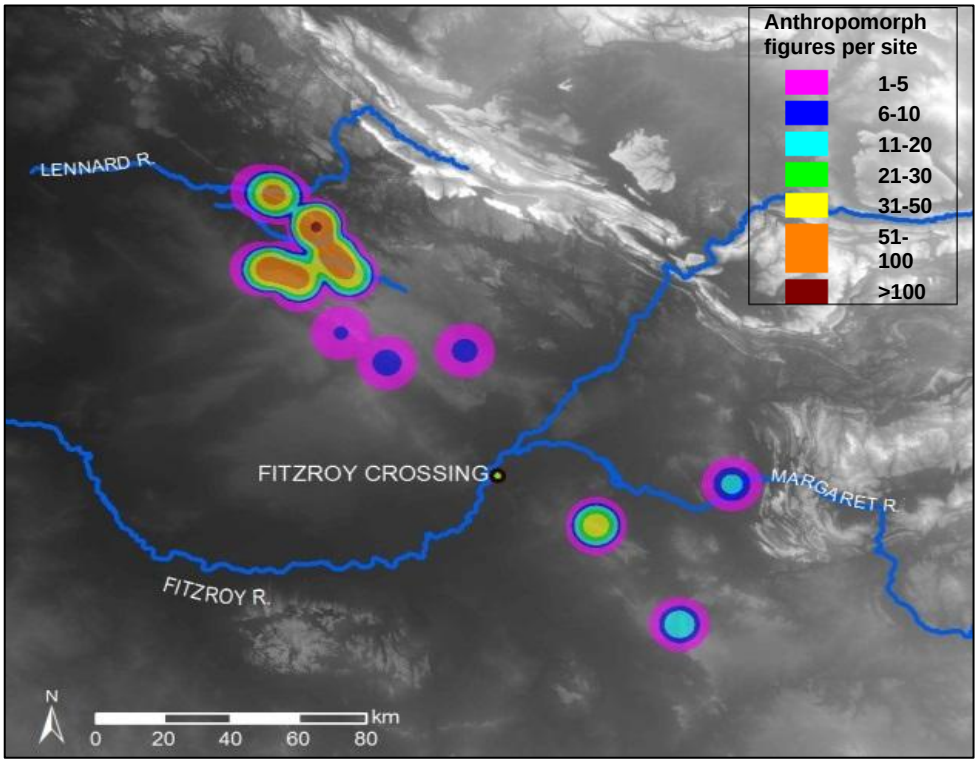


FIGURE 9.14 DENSITY OF ANTHROPOMORPHS AT ALL SITES. THANKS TO TOM WHITLEY, SONOMA STATE UNIVERSITY, FOR THE DENSITY MAPS IN THIS SECTION.

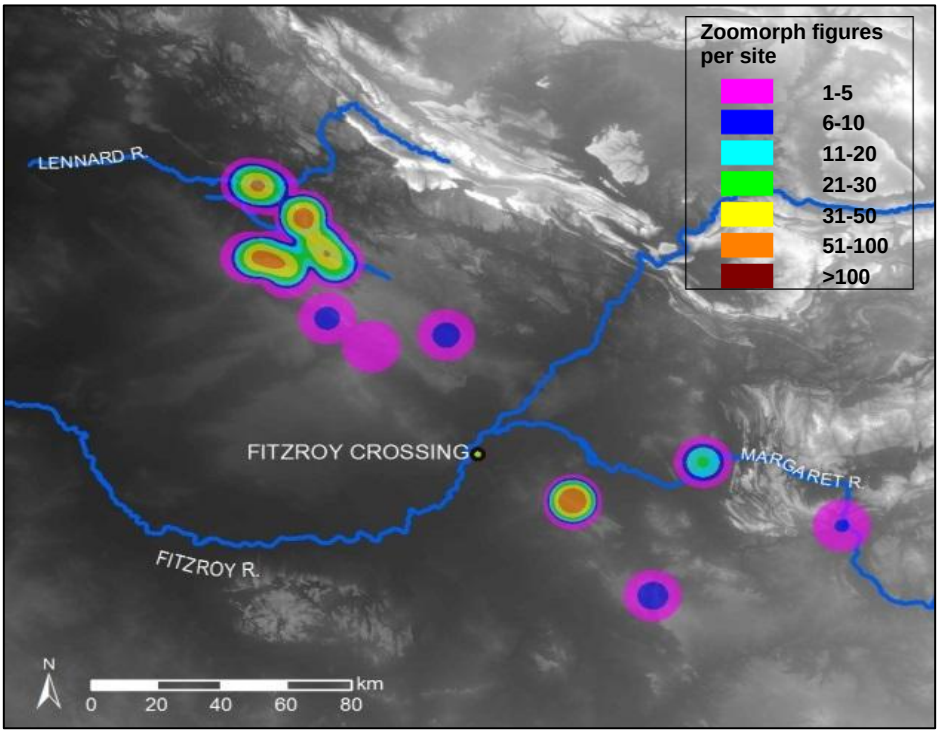


FIGURE 9.15 DENSITY OF ZOOMORPHS AT ALL SITES.

Phytomorphs

Phytomorphs are the fourth most prolific motif class: 155 figures at 21 sites. Only at Mount Behn 1 is there a concentration of phytomorphs (n=52), mostly wanggu (yams) (Figure 9.16).

Next in phytomorph density are Moonggaroonggoo to the east (28 thanggari), and Elimberrie Springs in the Marawun Escarpment (19 wanggu).

While wanggu are recorded across the study area, two phytomorphs, the thanggari and wajarri (boab nuts), have limited distribution. Thanggari are found only at Moonggaroonggoo, wajarri are found at six sites in a limited geographic area in Bunuba Country (Figure 9.16) and a single motif at Emanuel Gap 5 in Gooniyandi Country.

Gooniyandi Traditional Owners at Moonggaroonggoo identified the thanggari as eaten in living memory in the area (June Davies, Helen Malo 2011 pers. comm., 1 September). Thanggari are not present in rock art or mentioned at other sites visited by Traditional Owners during this field work, so it is likely that this food source is only associated with this site, although its consumption in the north is known (e.g. Woodward et al. 2012).

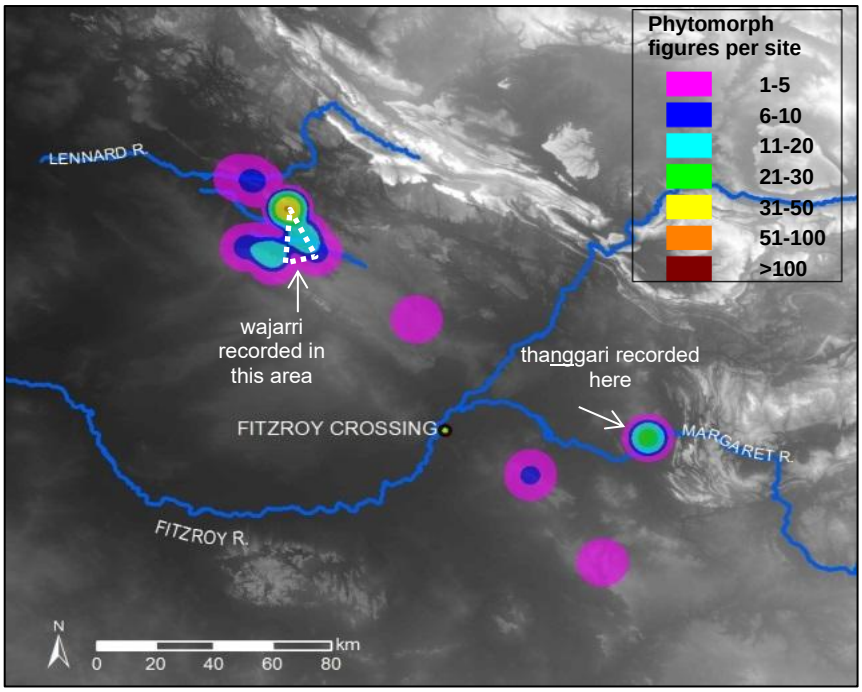


FIGURE 9.16 DENSITY OF PHYTOMORPHS AT ALL SITES.

The wajarri were similarly identified as a food source by Traditional Owners during visits to Fairfield 2 where the Bunuba Rangers (2012 pers. comm., 15 July) assisted in documenting the site. Other sites with the wajarri are in an area limited by Mount Behn 1 in the west, Elimberrie Springs in the south and Tunnel Creek 4 in the east (Figure 9.16). Largarri (Boab trees) are found from the coast to near Fitzroy Crossing, so the area where the wajarri are painted is more restricted than the trees. Wajarri are painted at sites in areas with many visible and accessible trees (Figure 9.17). It is likely that this has also been an area of intense occupation, with wajarri an important food source.

FIGURE 9.17 LARGARRI ALONG THE NAPIER RANGES LOOKING WEST TO TANGALMA.

Tracks

Tracks are ubiquitous in the Pilbara to the south (e.g. McDonald & Veth 2007; McDonald & Veth 2009; Mulvaney 2015b; Mulvaney 2010), and in other parts of the Kimberley (Jo McDonald & Peter Veth 2015 pers. comm., 7 November). This led me to expect that they would be found at all or most sites in the southern Kimberley. However, while tracks are numerous (n=392), they were only recorded at 23 sites, mostly in the west. The two sites with the greatest density of tracks (Mount Behn 1, human, and Tarakalu 1, birds) are both in the western part of the study area (Figure 9.18). There are other concentrations close to the Lennard River in the west of Bunuba Country, including a concentration of engraved bird tracks at Tangalma and Tangalma A.

It is notable that although there are tracks in Gooniyandi Country to the east of Fitzroy Crossing there are fewer than ten figures per site, even in the five Emanuel Gap sites where there is a concentration of zoomorphs.

Tracks are not seen in the rock art across Gooniyandi Country to the same extent or density as they are in Bunuba Country. This suggests either a gap in the distribution of sites recorded, or that there were different cultural practices associated with making hand stencils or the presence of bird/animal tracks often found in the Pilbara and the Western Desert (e.g. see Fyfe 2010b:60; McDonald & Veth 2009:51; Mulvaney 2010) to the south of the study area.

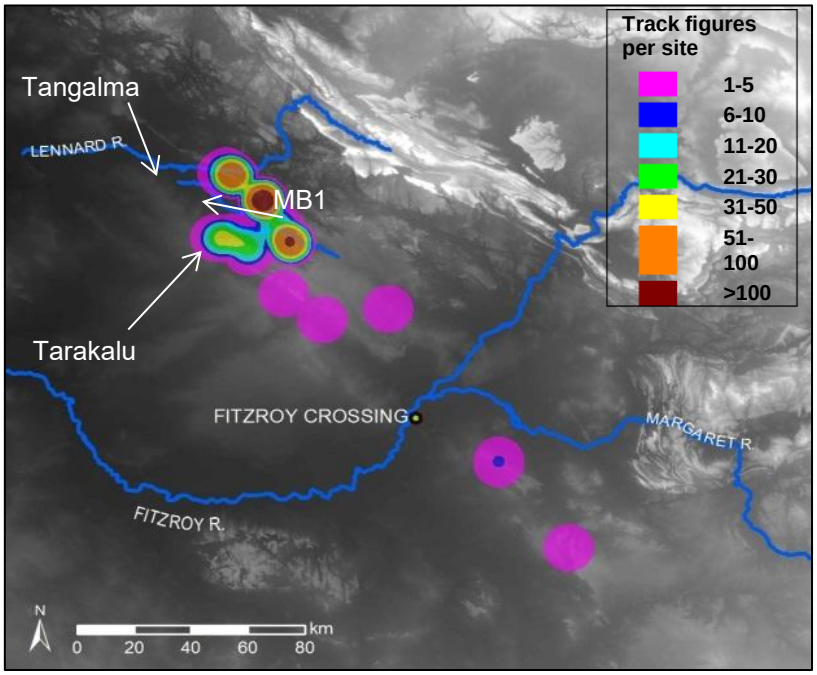


FIGURE 9.18 DENSITY OF TRACKS AT ALL SITES.

Material Culture

Unlike the Gwion Gwion figures in the northern and coastal Kimberley (e.g. Bradshaw 1892; Doring 2000; Doring & Nyawarra 2014; Lewis 1997; Morwood et al. 2010; Ross et al. 2016; Travers & Ross 2016; Walsh 1988a; 1994; 2000; Walsh & Morwood 1999; Welch 1993a; 1993b; 1993c; 1996a; 1996b; Welch 1997) or the engraved images at Murujuga (Mulvaney 2015b; Mulvaney 2010) anthropomorphs in the study area are seldom recorded with items of material culture. Of the 61 material culture figures, 19 are directly associated with or attached to anthropomorphs. In one case a spear is directly attached to a crocodile at Langurmurru (Figure 7.27). The remaining items of Material Culture are separate from other figures (unless in a superimposition), and are, therefore, identified as individual figures.

There are 12 sites with material culture rock art in this study with Mount Behn 1 having the most. Emanuel Gap and Riwi are the only sites in the east with material culture rock art (Figure 9.19).

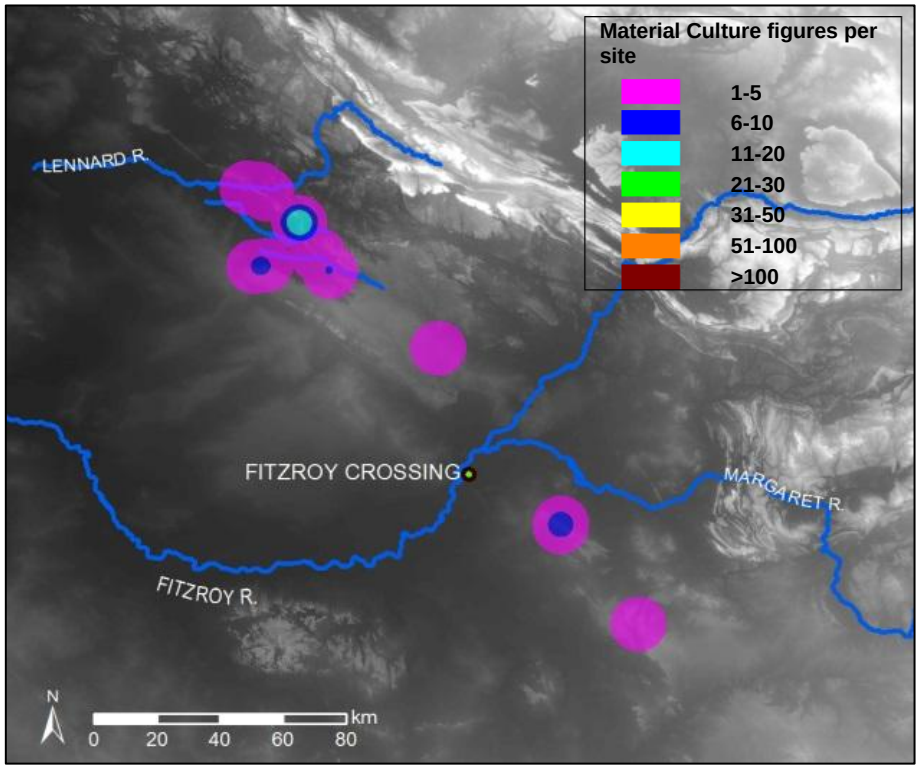


FIGURE 9.19 DENSITY OF MATERIAL CULTURE FIGURES AT ALL SITES.

Geometric

Geometric rock art (n=112) is at 25 sites in this study. Geometric markings range from single unattached lines and shapes to groups of deeply incised lines. There are distinct groups of shapes identified in this study, including a collection of circles at Tunnel Creek 5 (Figure 6.41), concentrated groups of deeply incised lines at Marawun 4, Tangalma and Tangalma A, and abraded grooves at the latter two sites. There are consistently 11-20 figures at these sites (Figure 9.20). Incised lines are present at Riwi in the east, although not as deep or in the same types of groupings, or frequency as in the western part of the study area.

It should be noted that there is at least one site in Gooniyandi Country with deeply incised lines, Minnie Pool (DAA 1989). The lines were observed in slides taken during survey work in the 1980s. The slides do not show the whole site, or the extent of the lines. This site was not recorded as part of this study as time in Gooniyandi Country was limited, and it was not one which the Traditional Owners wanted to take the team to see in the time we had available together. I estimated from one slide that there are at least ten groups totalling >160 incisions on a vertical surface, superimposed on or by ≥7 pigment images, making this a site of intense activity for this marking practice. This suggests that while the sites recorded in this study provide a good cross section of figures in the Gooniyandi area, there are gaps

which still need to be filled, and the overall representation for some motif classes is incomplete.

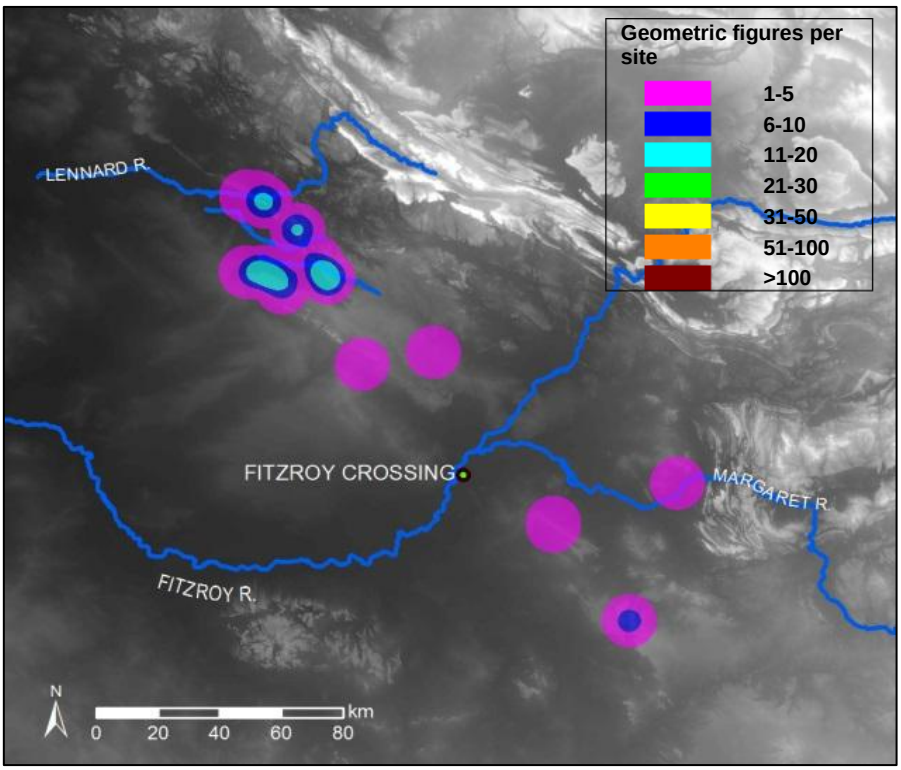


FIGURE 9.20 DENSITY OF GEOMETRIC FIGURES AT ALL SITES.

Historical Inscriptions

Despite pastoral incursions, settlement and ongoing hostilities from the late nineteenth century (Hawke 2008; Kinnane 2008; Pedersen 1984; Pedersen & Woorunmurra 1995) only 16 Historical Inscriptions were recorded at 7 sites in the study area, with at least one by a known living person (Dorothy Surprise 2011 pers. comm., 30 August, and Figure 6.42).

The only recorded Historical Inscription in Bunuba Country is at Tunnel Creek 3, at the southern tunnel entry/exit, but not at other sites close by (Tunnel Creek 1, 2 and 5). Moonggaroonggoo has six Historical Inscriptions, more than any other site. The result is a wide distribution and very low density for this motif class (Figure 9.21).

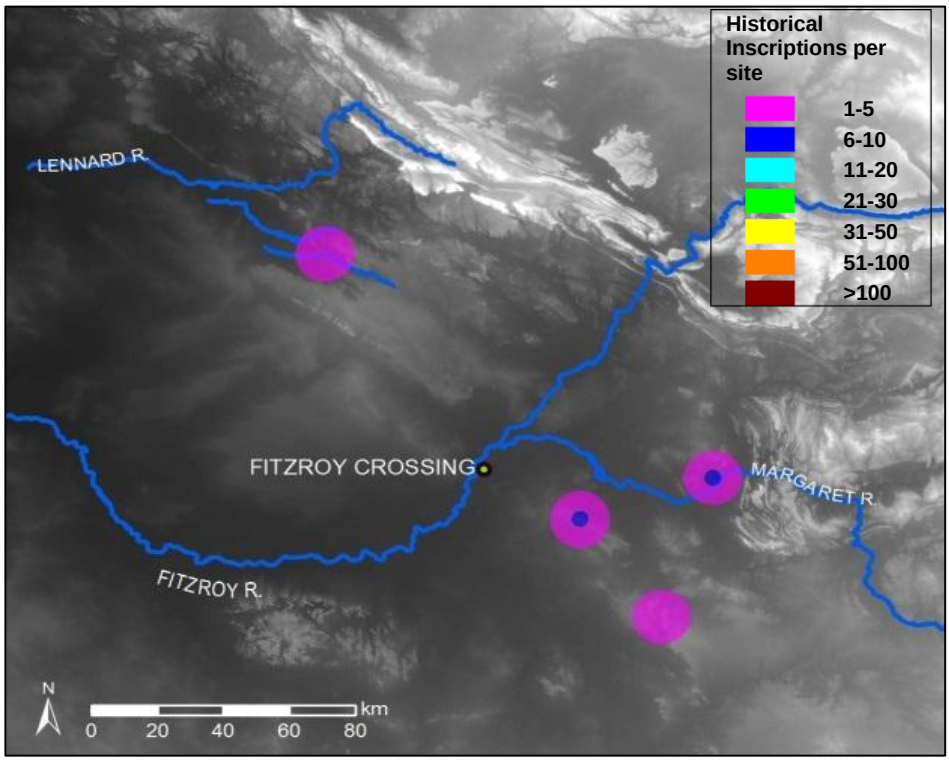


FIGURE 9.21 DENSITY OF HISTORICAL INSCRIPTIONS AT ALL SITES.

Other Non-Figurative

Other non-figurative markings (n=25, sites=9) are mostly in the area between the Lennard River and Tarakalu in the west of the study area (Figure 9.22). The most numerous are cupules. There are small numbers at Marawun 1 and 4, Mount Behn 1, and Tarakalu 1 and 2 in Bunuba Country, and Emanuel Gap 3 in Gooniyandi Country. At Tangalma there is a large group of cupules (Figure 6.49, n=32); other sites have one or two, with four together at Emanuel Gap 3, the next largest group.

Other

The Other motif class refers to rock art at four sites, with one of those the large starburst/lightning figure at two sites, and the others each at a single site. All are in the west of the study area.

There are too few locations to observe any distribution or density pattern (Figure 9.23). However, the existence of the starburst/lightning figures at Mount Behn 1 in bichrome and monochrome, and Mine Access Site 1 in monochrome suggests that the form is of more importance than other attributes such as colour combinations. It is large and highly visible at Mount Behn 1 and the eight figures at that site cover a large section of the wall and ceiling

undercover where people would have taken shelter and created the other rock art, also large and highly visible, around it.

There are no distinctive or unique determinate figures that would belong to the Other classification in Gooniyandi Country, either at the sites in this study, or those examined through the ACHIS and DAA files[1].

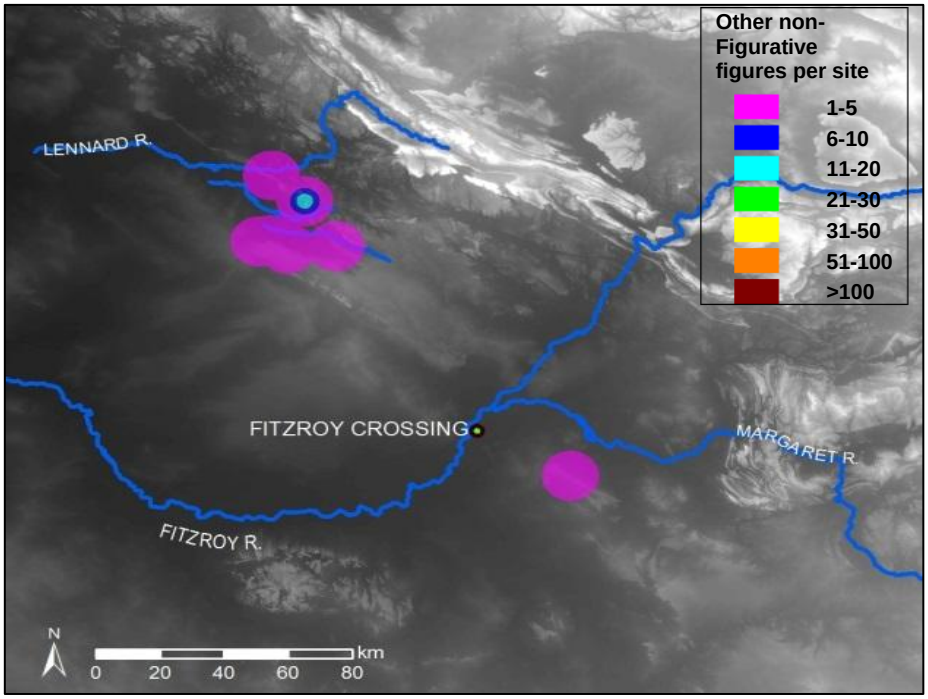


FIGURE 9.22 DENSITY OF OTHER NON-FIGURATIVE FIGURES AT ALL SITES.

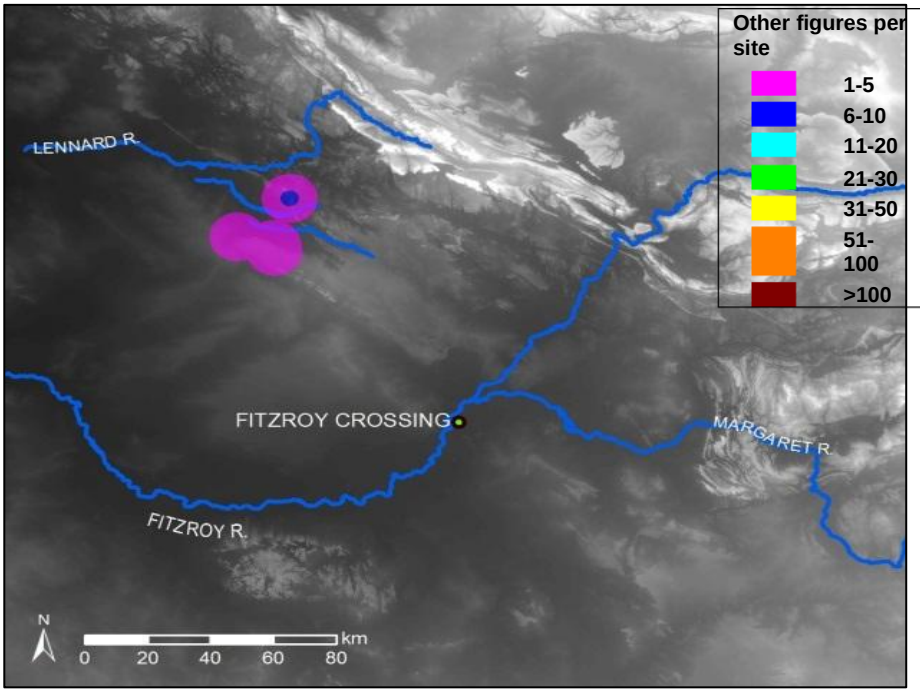


FIGURE 9.23 DENSITY OF OTHER FIGURES AT ALL SITES.

[1] As previously noted, this is currently part of the Department of Planning, Lands and Heritage, Western Australia.

Distribution and Density by Style

The styles/broad groups described in Table 7.13 are in different concentrations across the study area. Most follow the pattern of concentration in the west. There are, however, variations in style distribution and density which show either relatively consistent distribution across the study area, or a concentration in one area to the exclusion of others.

Study Area Wide Styles

Waliarri 1 (Complex)

The 223 figures in this style are 12% of determinate figures, and include zoomorphs, anthropomorphs, phytomorphs, and material culture (Table 7.14). Figures in this style are at 23 sites, with Mount Behn 1 (n=115), Marawun 1 (n=21), Elimberrie Springs (n=15), and Marawun 4 (n=14) each with significant numbers of figures (Figure 9.24). There are fewer figures in this style in the east; Emanuel Gap 4 (n=4) and Moonggaroonggoo (n=2).

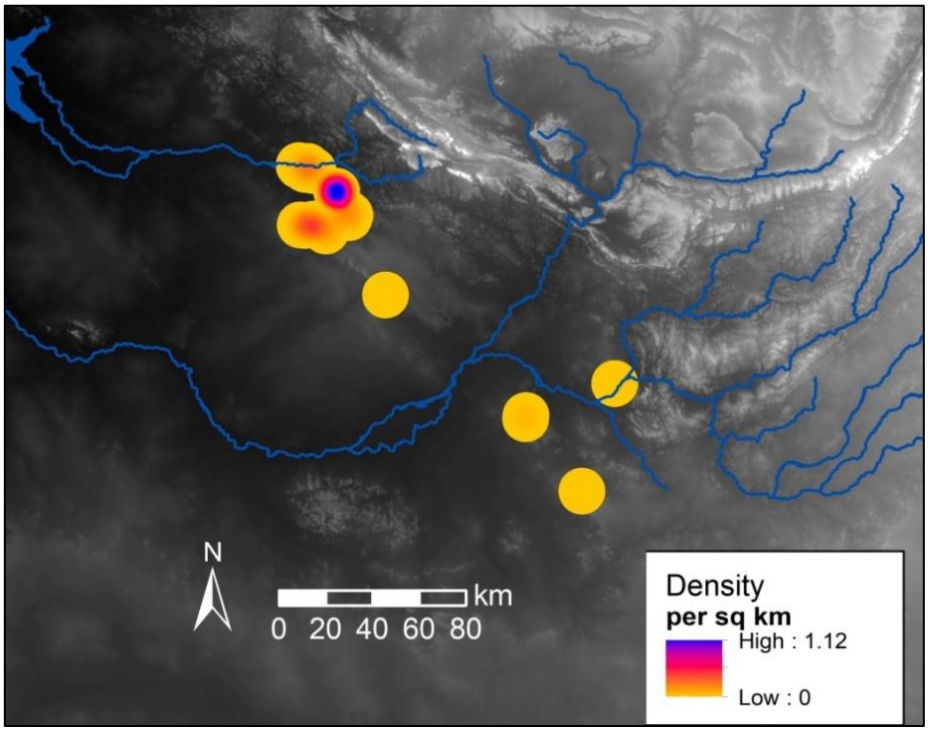


FIGURE 9.24 DISTRIBUTION AND DENSITY FOR FIGURES IN THE WALIARRI 1 (COMPLEX) STYLE IN THE STUDY AREA.

Waliarri 2 (Simple)

This style represents 6% (n=120) of determinate figures, and it is dominated by anthropomorphs (n=112), with few zoomorphs (n=7) and phytomorphs (n=1) recorded (see Table 6.11). Figures in this style are at 25 sites across the study area, with the greatest density at Elimberrie Springs (n=16), Riwi (n=11) and Mount Behn 1 (n=10) in Figure 9.25.

Mamo/Djuari

This style is at eight sites across the study area, and with a total of ten figures. Density is low at all sites (Figure 9.26). There are two Djuari figures at Riwi in the east and two Mamo at Langurmurru in the west. All figures in this style are anthropomorphs.

Monochrome Stencil

Monochrome Stencils are at 17 sites in the study area, with the concentration of sites, and the sites of high density in the west of the study area (Figure 9.27). A total of six Monochrome Stencils are in Gooniyandi Country: Riwi (n=3), Emanuel Gap 2 (n=2), and Emanuel Gap 4 (n=1). Mount Behn 1 in the west has the greatest concentration of stencils (n=149), far greater than any other site, followed by Marawun 1 (n=23) and Elimberrie Springs (n=19).

This distribution and density was unexpected. In an area where there is prolific use of pigments it might be supposed that most sites would have at least some stencilled hands to mark individual presence and cultural connection (Colin Hamlin 2011 pers.com., 18 July; Sam Woolagoodjah in Crawford 1968: 22). Given easy access to pigments across the study area it seemed incongruous that so few hand stencils were observed in Gooniyandi Country.

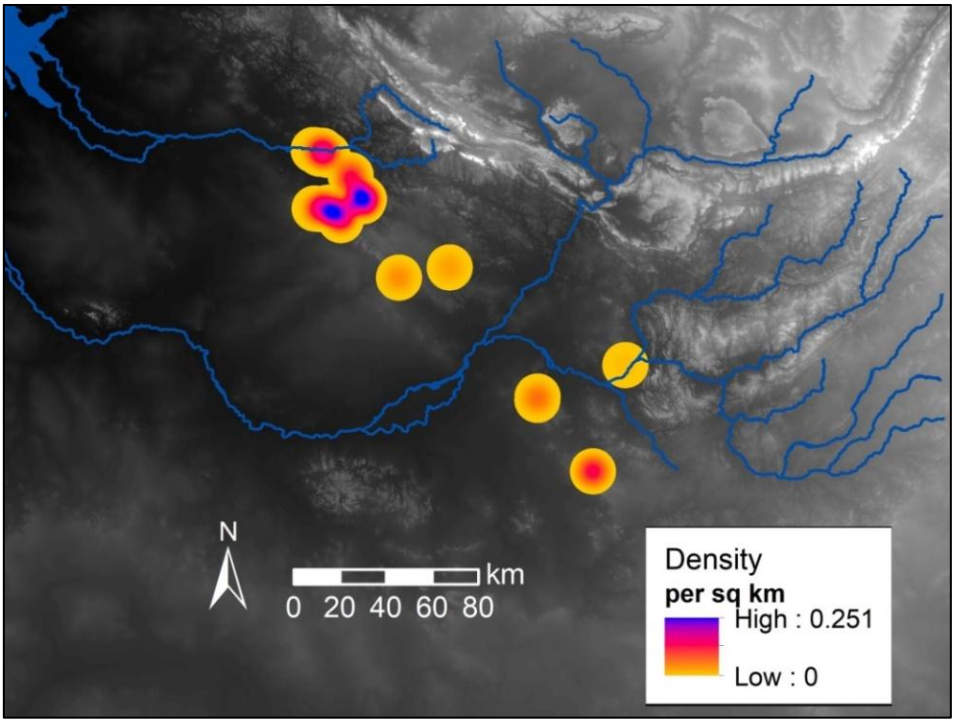


FIGURE 9.25 DISTRIBUTION AND DENSITY FOR WALIARRI 2 (SIMPLE) STYLE IN THE STUDY AREA.

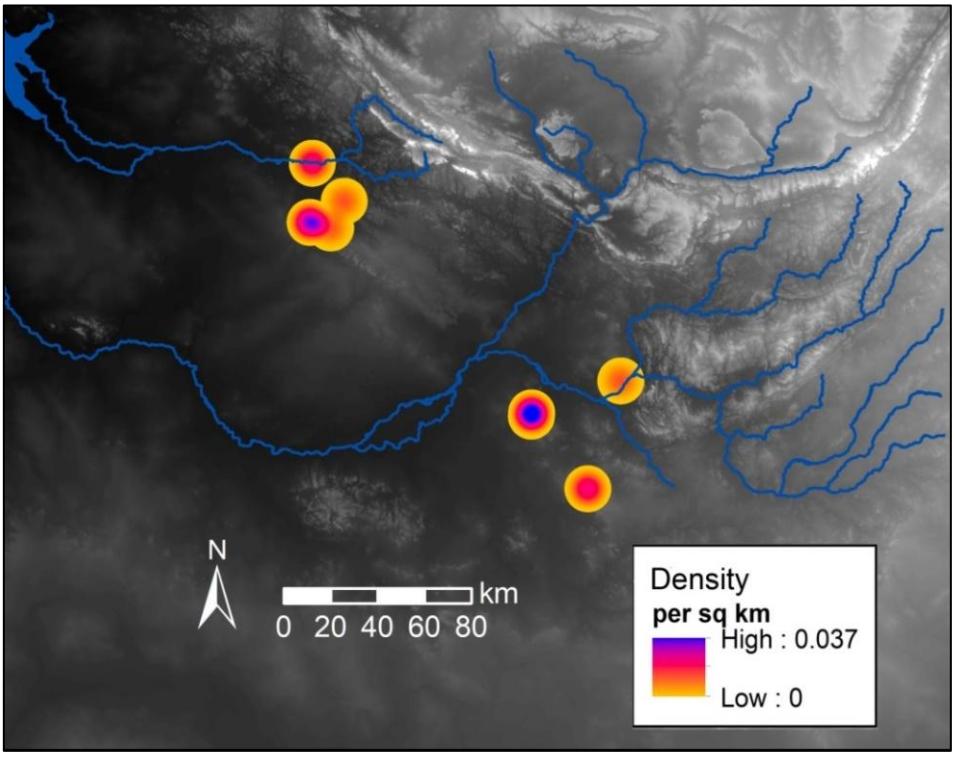


FIGURE 9.26 DISTRIBUTION AND DENSITY FOR MAMO/DJUARI STYLE IN THE STUDY AREA.

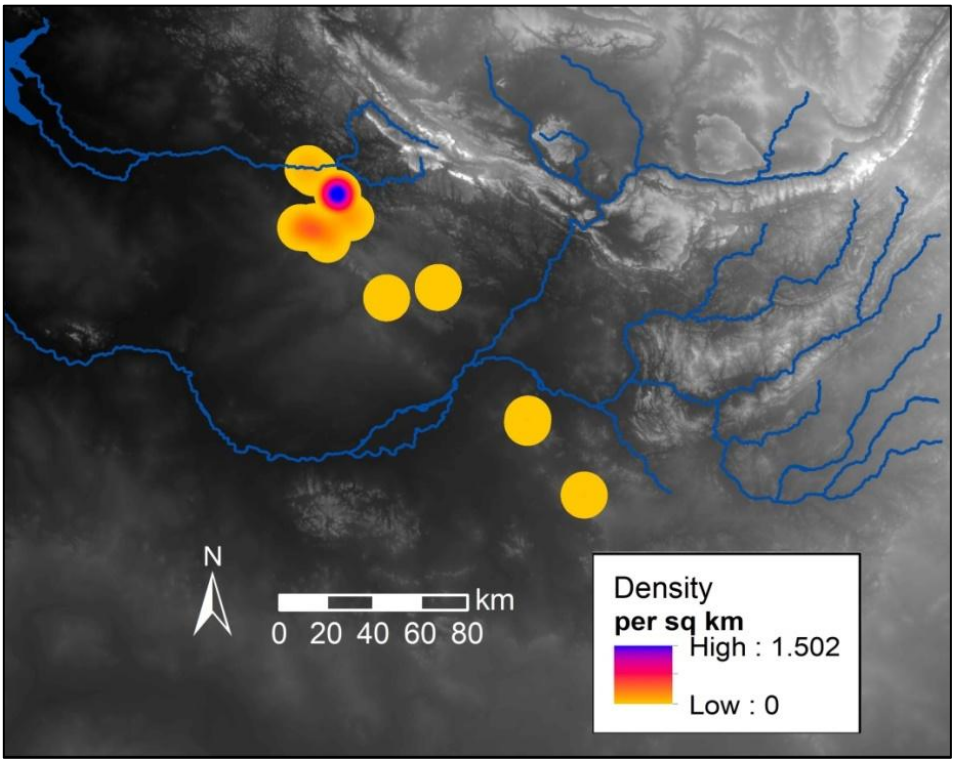


FIGURE 9.27 DISTRIBUTION AND DENSITY FOR MONOCHROME HAND STENCILS IN THE STUDY AREA.

Local Styles

Bichrome Black Solid Infill with White Outlines (Black & White)

The distinctive Black & White style is almost exclusively found in the east (Figure 9.28): six sites in Gooniyandi and one in Bunuba Country. Not all sites in the east have figures in this style, with none at Riwi. The style is dominated by zoomorphs (n=38), with figures also recorded in other motif classes (Table 7.14).

The single motif in the west of the study area, Lillimooloora 1, is in a cave used in historical times. Contemporary and current use of the cave makes it less than certain that this style has a cultural connection to those in Gooniyandi Country, suggesting the style may be a recent addition to the rock art. While not discounted from the analysis, the location of the single figure in Bunuba Country is viewed with caution.

Figures in this style are 3% of determinate figures and are generally concentrated at Emanuel Gap 5 (n=27) and Emanuel Gap 2 (n=12), with fewer than three recorded at any other sites.

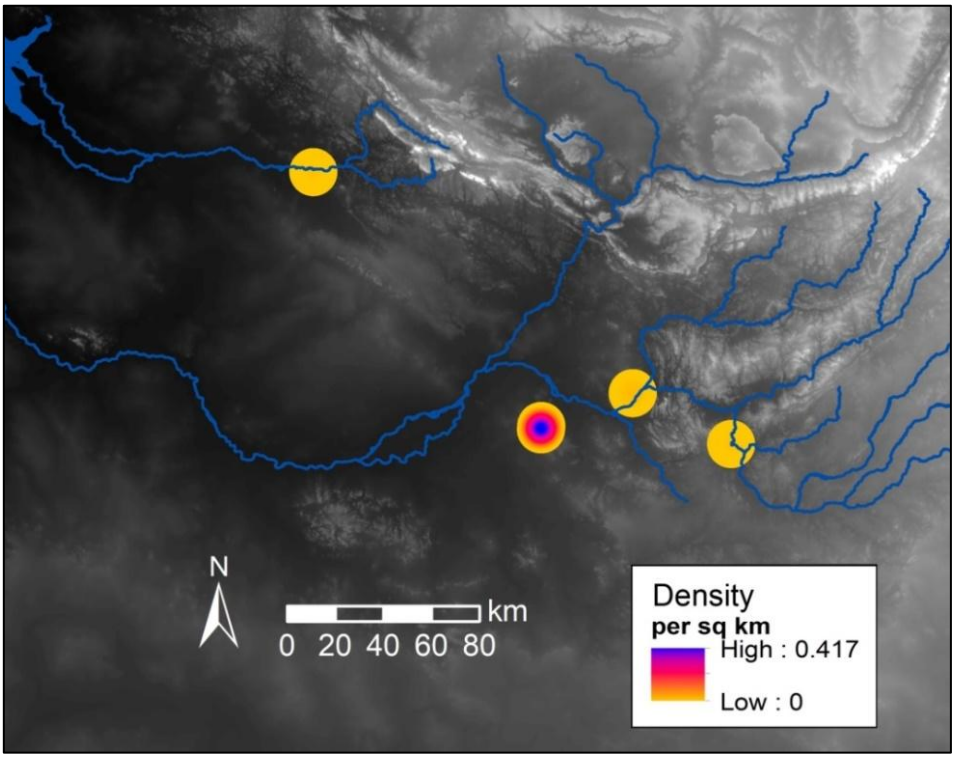


FIGURE 9.28 DISTRIBUTION AND DENSITY FOR FIGURES IN THE BICHROME SOLID INFILL BLACK WITH WHITE OUTLINES STYLE IN THE STUDY AREA.

Engraved Animal Tracks

Engraved Animal Tracks are at two sites in the study area (Figure 9.29), Tangalma (n=86) and Tarakalu 1 (n=1). The figures are limited to bird, macropod and quadruped tracks, like those described by Mulvaney (2015). Extractive techniques are used for other marks such as groups of deeply incised lines. The Engraved Animal Track style is only present where deeply incised lines are also present.

Abraded/Scratched Solid Infill

This style is at a single site in the study area (Figure 9.30), Stumpy's Soak 1 (n=11). The style is limited to anthropomorphs (n=4) and zoomorphs (n=7). There are many other indeterminate scratched and abraded markings also present in the small cave, with a total of 57 figures, of which 24 (57%) are indeterminate, suggesting that there may have been more rock art in this style at the site obscured by superimposition which has damaged the visibility of underlying engraved figures and/or environmental damage.

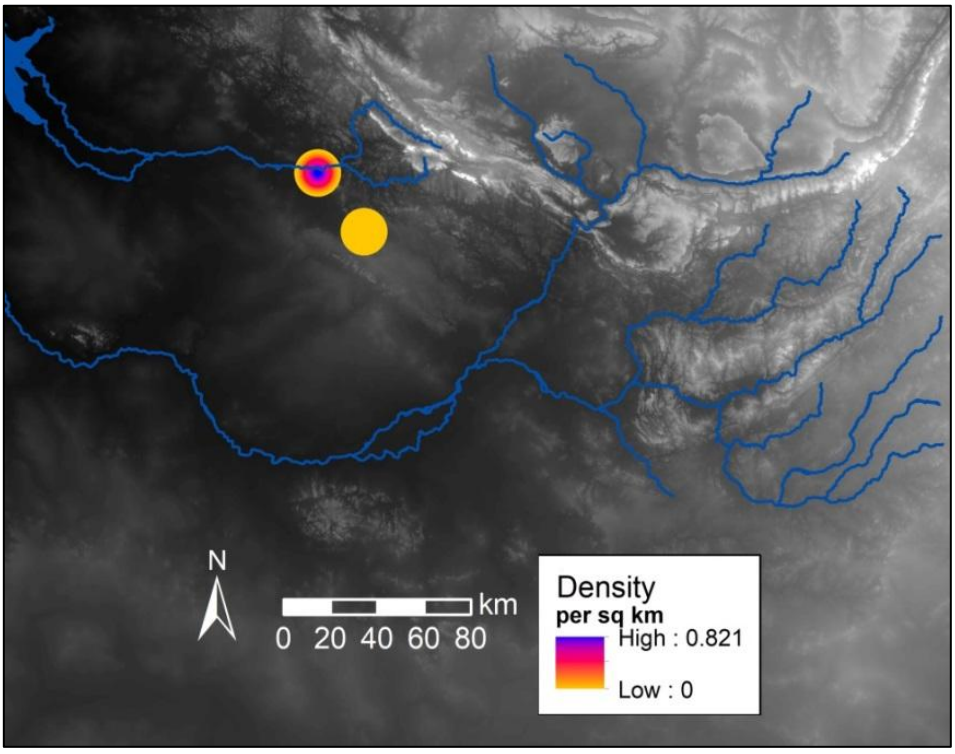


FIGURE 9.29 DISTRIBUTION AND DENSITY FOR ENGRAVED TRACKS RECORDED IN THE STUDY AREA.

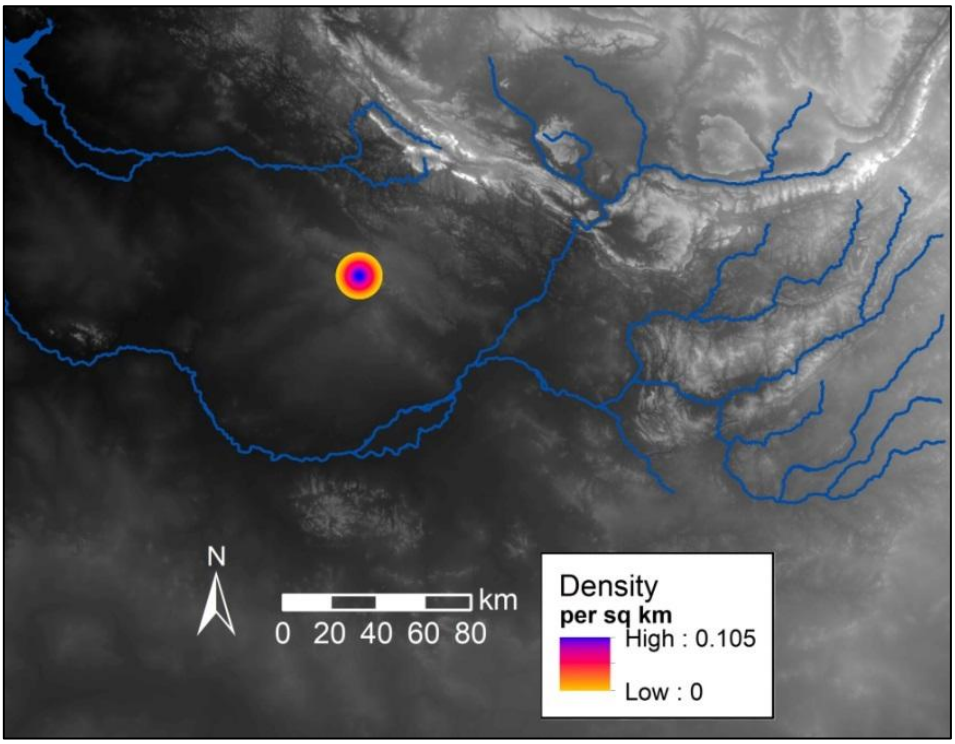


FIGURE 9.30 LOCATION AND DENSITY OF THE LOCAL STYLE OF SOLID INFILL ENGRAVED FIGURES RECORDED IN THE STUDY AREA.

Round Bodied Grouped Anthropomorphs

This local style is at three sites in the study area (Figure 9.31); Mount Behn 1 (n=33), Marawun 1 (n=16) and Fairfield 2 (n=15). The style is limited to anthropomorphs, and the area of distribution is limited to the western part of the southern Kimberley.

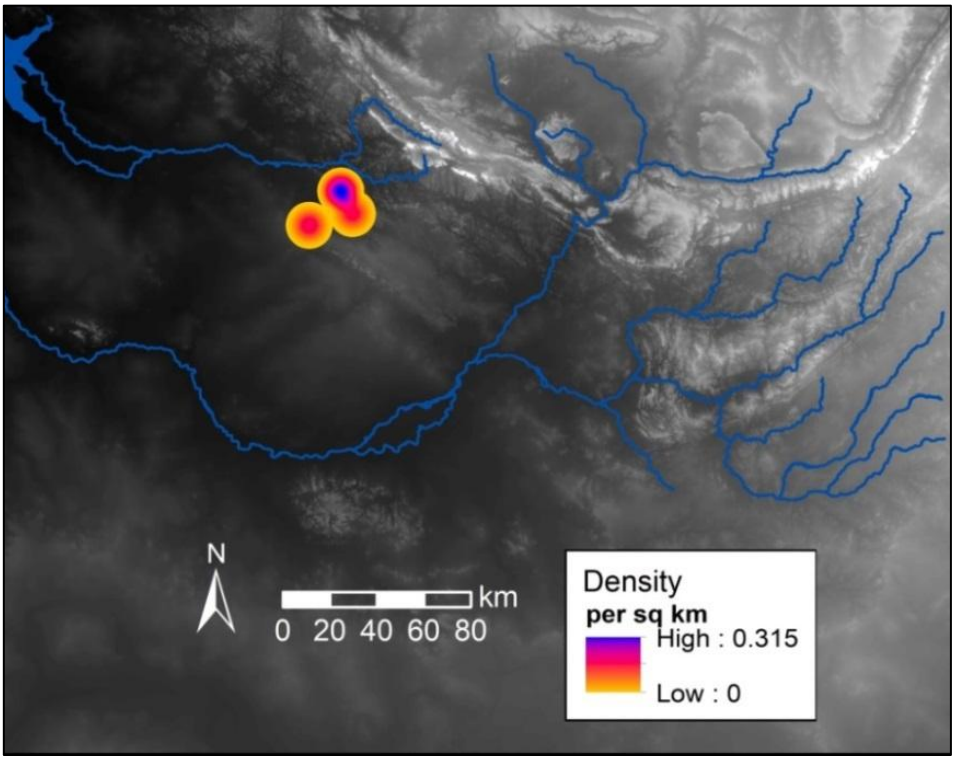


FIGURE 9.31 LOCATION AND DENSITY OF THE LOCAL STYLE OF ROUND BODIED ANTHROPOMORPHS IN GROUPS RECORDED IN THE STUDY AREA.

Broad Groups

As described in Chapter 7 there are many figures which do not fit into what may be described as styles, but sometimes have at least one common attribute that allows them to be grouped for inclusion in the analysis. The following addresses this to an extent, ensuring that while not as definitive in informing discussion on identity and affiliations in spatial distribution and density as style may, it contributes to discussions on the presence and prescience of rock art across the southern Kimberley.

Monochrome Outline

This group is present at 25 sites, with most sites having fewer than five figures (Figure 9.31). The 98 figures in the style are spread across both Bunuba and Gooniyandi Country, representing 5% of all determinate figures. There are more of this broad group at sites with large numbers of figures, Mount Behn 1 (n=18) and Elimberrie Springs (n=14), than the scattering of between one and five figures at most sites in the study area.

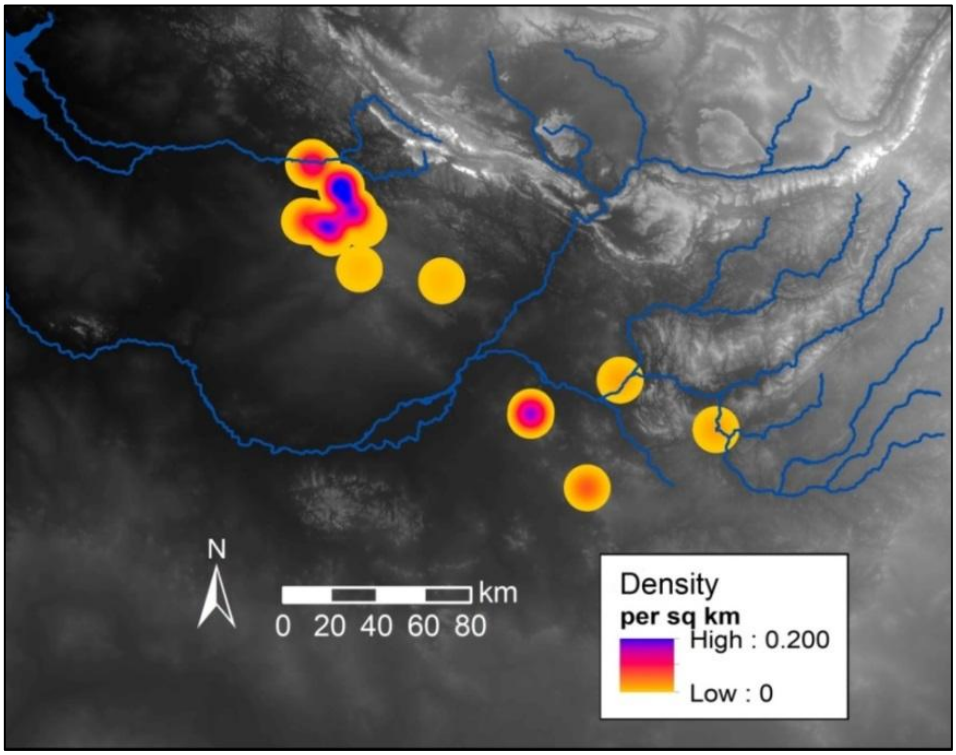


FIGURE 9.32 DISTRIBUTION AND DENSITY FOR MONOCHROME OUTLINE BROAD GROUP IN THE STUDY AREA.

Generic Monochrome

This is a ubiquitous group, occurring at all but two sites in this study, and featuring rock art from all classifications, including Historical Inscriptions.

Wide distribution, and the prolific numbers in this group (n=811) make it important in the assemblage (Figure 9.33 and Table 9.1). Elimberrie Springs (n=94) and Mount Behn 1

(n=88) are the most prolific, followed by Moonggaroonggoo (n=68) and Marawun 1 (n=67). However, there is a different emphasis on motif classes at the sites. Three of the four have more zoomorphs than anthropomorphs, whereas at Moonggaroonggoo phytomorphs dominate (41% compared to MB1 7%, ELIM 10% and M1 4%), skewed by the presence of the thanggari. If thanggari occurred at any other sites it might be appropriate to say it is a local style, but unlike the Round Bodied Grouped Anthropomorphs style, no other sites had thanggari in monochrome or any other arrangement.

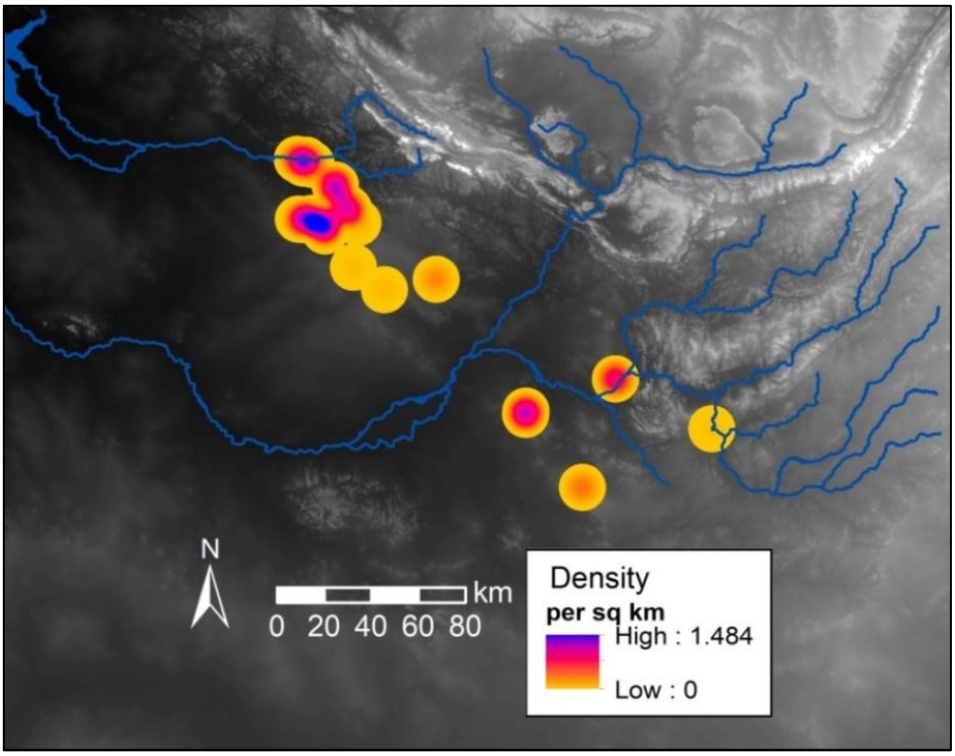


FIGURE 9.33 DISTRIBUTION AND DENSITY FOR FIGURES IN THE MONOCHROME SOLID INFILL STYLE RECORDED IN THE STUDY AREA.

TABLE 9.2 DENSITY BY MOTIF CLASS FOR THE FOUR SITES WITH GREATEST DENSITY OF FIGURES IN THE GENERICS MONOCHROME GROUP.

Motif Class	Sites with greatest density (Number of figures)			
	Elimberrie Springs	Mount Behn 1	Moonggaroonggoo	Marawun 1
Anthropomorphs	38	27	9	27
Zoomorphs	38	38	27	33
Phytomorphs	10	6	28	3
Material Culture	0	1	0	3
Tracks	3	6	0	0
Geometric	4	9	4	1
Historical Inscriptions	0	0	0	0
Other Non-Figurative	0	0	0	0
Other	1	2	0	0
Total Figures in Broad Group	94	88	68	67

Generic Bichrome

The number in this broad group is significantly lower than in Generic Monochrome (n=84). They are in low density at 23 sites (Figure 9.34), with Mount Behn 1 the only site where there are more than ten figures present (n=19).

Many of the figures at Mount Behn 1 are damaged and close to the floor, likely from animals rubbing against the surface (observed in the field) and water flow (Vannieuwenhuyse 2016). These figures may have had additional colours and detail no longer visible, making it possible that there were at one time fewer intentionally bichrome figures than currently indicated, and possibly in identifiable styles.

There are slightly greater concentrations of Generic Bichrome figures at two sites in the west, and one in the east of the study area, with each having six to ten figures in this group.

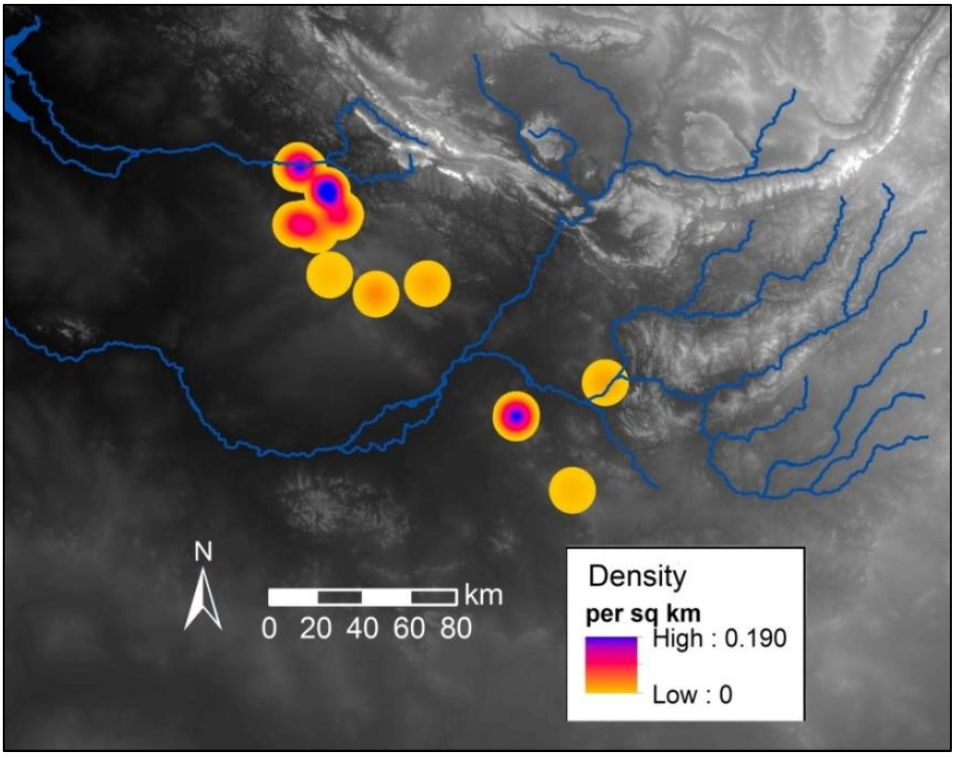


FIGURE 9.34 DISTRIBUTION AND DENSITY FOR FIGURES IN THE GENERIC BICHROME GROUP RECORDED IN THE STUDY AREA.

Cupules, Incisions and Historical Inscriptions Not Elsewhere Allocated

Figures in this group are at 17 sites in the study area (Figure 9.35), with the most in groups at Marawun 4, where there are 14 groups of incisions (n=214 arranged in groups of three to 46), and a single cupule close by. At Tangalma there are 11 groups of incisions and one of cupules, with a total of 77 incisions/abraded grooves and 32 cupules in in total. There are no Historical Inscriptions at those sites.

Historical Inscriptions are distributed across five sites, with the greatest concentration at Moonggaroonggoo (n=6).

Insufficient Information to Allocate to a Style or Broad Group

Many rock art figures are not allocated to any style or broad group because they have too few attributes, and too little knowledge from Traditional Owners, to be reliably classified to one, but enough to identify that they are or have been a figure. Figures in this group include pigment and engraved rock art, which are usually too incomplete or obscured through superimposition or damage to be further categorised. The unallocated figures are at 14 sites (Figure 9.36), with the only concentration at Mount Behn 1 (n=13), likely by virtue of being the largest assemblage with the most layers of superimposition in the study. No other sites in the study area have more than four unallocated figures.

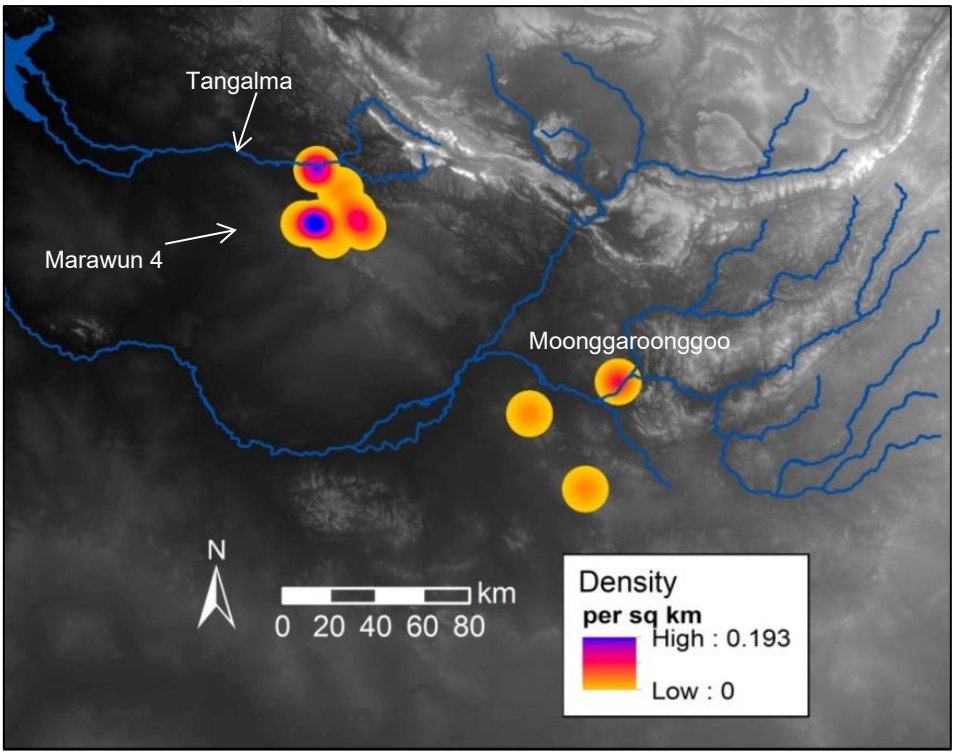


FIGURE 9.35 DISTRIBUTION AND DENSITY FOR FIGURES IN THE GROUP OF CUPULES, INCISIONS AND HISTORICAL INSCRIPTIONS RECORDED IN THE STUDY AREA.

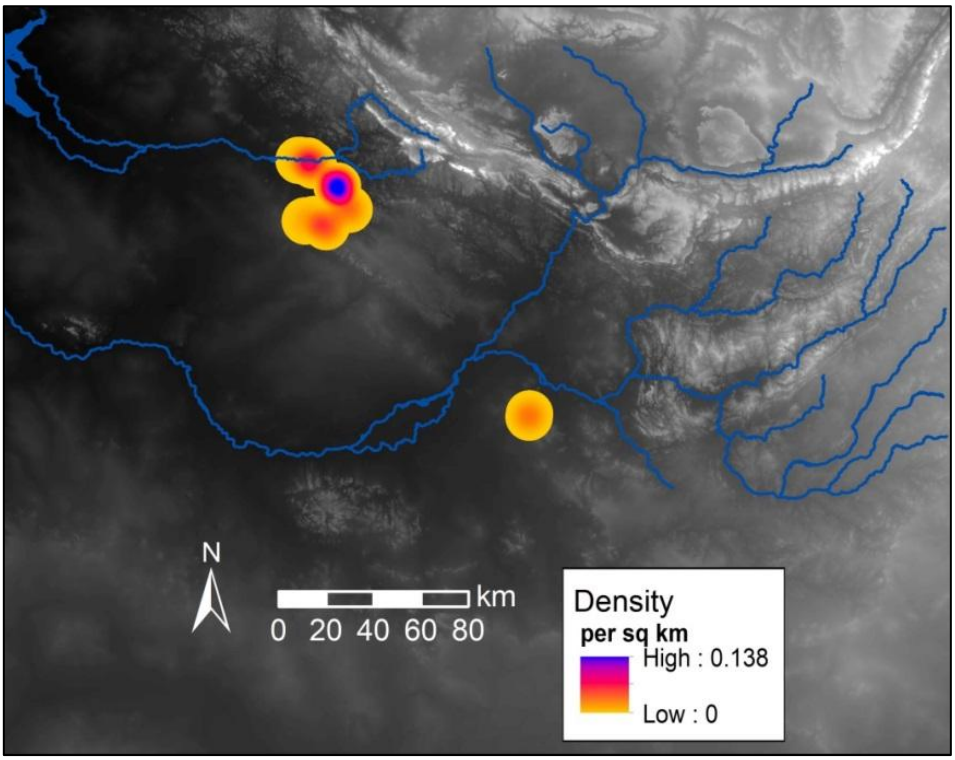


FIGURE 9.36 DISTRIBUTION AND DENSITY FOR FIGURES NOT ALLOCATED TO STYLES OR BROAD GROUPS IN THE STUDY AREA.

Synopsis

There is considerable variation in the distribution and density of rock art classes, styles and broad groups of figures in this study. Figures in the closely related Waliarri 1 (Complex), Waliarri 2 (Simple) and Mamo/Djuari styles account for 18% of all determinate rock art and are concentrated in the west. This 'style family' is dominated by anthropomorphs, zoomorphs and phytomorphs. In sites with large assemblages, they are recorded on panels both close together and overlapping, with variations in infill, colouring and superimposition.

Differentiating between Waliarri 1 (Complex) and Waliarri 2 (Simple) styles provides delineation in spatial distribution and density in the study area. The more detailed Waliarri 1 (Complex) is denser in the west, whilst the Waliarri 2 (Simple) is spread more widely across the southern Kimberley, giving some insight into the relative importance of the more colourful and complex figures in either border definition or affiliations along the western and southern borders compared to those between Bunuba and Gooniyandi peoples at the central border of Bandaral ngadu (David & Chant 1995; David & Cole 1990; Taçon 1999; Wobst 1976).

The relationship between the two Waliarri style variations and the Mamo/Djuari is clear in the form of the figures, common attributes including headdresses, large eyes, and defined hands and feet, without the complexity of the colours, features, and patterning of the Waliarri

1 (Complex) and Waliarri 2 (Simple). There are fewer Mamo/Djuari, and they are in low density across the study area.

The Black & White style is concentrated in Gooniyandi Country, while Monochrome Stencils are concentrated in Bunuba Country.

The other three local styles are restricted both in distribution and density. The larger groups of rock art figures in broad groups are widely distributed and vary in density in a similar pattern to the overall pattern of rock art in the southern Kimberley.

Rock Art Locales

The distribution of rock art sites leads to further questions about why the sites were chosen, and if they have any relationship with one another. The many sites surveyed in 2011 and 2012 provide shelter and access to water and food; not all have evidence of occupation or extant rock art. Areas around sites were surveyed for lithics and lithic resources (Maloney 2011; 2012, 2013 pers. comm., various dates in September; July-September; March), and evidence of occupation in open areas to explore the geospatial and ethnographic relationships between sites (Josue Gomez 2012; 2013, 2022 pers. comm., 6 July, 11 March, 17 March). The results are included in other doctoral research and publications (e.g. Balme et al. 2018c; Maloney 2015; Maloney et al. 2014; 2017b; Maloney et al. 2016; Maloney et al. 2018b; Maloney 2019; O'Connor et al. 2014; Vannieuwenhuyse 2016; Vannieuwenhuyse et al. 2016; Whitau et al. 2018; Whitau et al. 2017). Sites with extant rock art, potential occupation, and those identified by Traditional Owners were chosen for recording rock art and excavation in 2011 and 2012, and later in a separate project in 2013 (Maloney et al. 2017a).

Rock art sites include rockshelters, caves and exposed rockfaces (Figure 6.1). Langurmurru (Figure 6.2) is one of several sites with all three; others have combinations of two components (e.g. Mount Behn 1). Not all suitable surfaces at sites have extant rock art (see site plans in Appendix 5). None of the sites in this study (Figure 5.1) are more than a few hours walk from a permanent spring or fresh water source, and therefore, access to plants and animals to provide sustenance over the seasons.

Site choice may be influenced by suitability for family gatherings; ceremony, or meetings with neighbours to share resources, trade and arrange marriages. Each gathering may have different site requirements, but most would need the site to be big enough to provide shelter

for large groups of people, access for people of all ages and food and water, as gatherings may include groups of visitors from some distance.

Smooth, uninterrupted rockfaces may not always be essential for rock art. However, gatherings incorporating ceremony, such as meetings for trade or marriage, may be occasions for large or iconic figures, requiring space, so sites with a combination of surfaces may be more desirable than one with limited opportunities for placement of rock art.

During fieldwork and post field analysis I observed that sites were often clustered around one another, all with easy access to water and hunting grounds. These clusters appeared to be made up of a large rockshelter, with prolific painting and many superimposition layers, and several smaller shelters/caves nearby, with fewer figures and less superimposition, if any. The large sites could shelter 30 or more people, which would be three to five families according to the information shared by Bunuba Rangers who visited these sites[2], while smaller sites ranged from enough space for a single person to a smaller family of four to six. This combination of sites suggests aggregation locales; groups of sites facilitating meetings and ceremony to reinforce and nurture the land, including creation and maintenance of rock art with the large site being the primary gathering place, and the smaller sites stopping or resting places during transit, or for overflow from the focal site.

In the southern Kimberley, when there are one or two high density rock art sites there is often three or more lower density, smaller sites nearby. McDonald and Veth's (2012b:99) work in the Western Desert suggests that aggregation locales, rather than specific aggregation sites, occur in some areas, particularly where a single site may not have the physical or resource capacity to support large numbers of people. The distribution sites with high and low densities of rock art recorded in e southern Kimberly in this study mostly follows a similar pattern.

To test this hypothesis two sites, close to the Lennard River, Tangalma and Langurmurru, were examined, because the river is part of the contemporary western border for Bunuba Country, and an area where there is likely to have been regular exchanges between the neighbours. Both have:

- >100 figures;

[2] Bunuba Rangers and Elders accompanied the *Lifeways* team on several occasions to inspect sites, assist with excavations, and the Rangers worked with me (the author) on other occasions to record and discuss rock art. The Rangers informed me that their immediate families ranged from 6-10 including parents, and that this was usual for their generation. Of course, they made it clear that their complete family was in the hundreds if you counted all their relatives through their kinship system. When they were talking about there being space for several families at sites their were talking about their immediate families in the sense of the parents or aunties they were brought up by and their siblings (Bunuba Rangers 2011, 2012 pers. comm. various dates August 2011, and July/August 2012).

- four and five superimposition layers respectively (Tables 6.3 and 8.8);
- large, distinctive figures in the Waliarri Family of styles (n=7 Waliarri 1 (Complex) at Tangalma and n=9 at Langurmurru); and
- large floor areas (Tangalma + Tangalma A is similar in size to Langurmurru, Table 8.8).

Both shelters are accessible; Langurmurru is accessed via a steeper slope with large boulders impeding passage in places, but access may have been easier in the past as many of the boulders are unstable, suggesting there has been movement over time.

Within walking distance of up to an hour from the two sites are several small sites: Djuru, Djuru East, Lillimooloora 1 and Lillimooloora 2. These sites all have rock art, provide shelter and have easy access to water and food. Djuru and Djuru East are within five minutes' walk of the Lennard River, and the other sites <30 minutes east, along the escarpment. All are easily accessible at ground level (Figure 9.37). Other locations between the two larger sites, with small numbers of figures and limited shelter, were noted but not recorded, during ethnographic surveys in 2012 (Josue Gomez, B'Geella Romano 2012 pers. comm., 16 August). This suggests that there may have been many smaller places at which people sheltered or camped on their way to or from the larger sites, or that they visited those smaller sites for other reasons while staying at larger sites or small sites with better shelter.

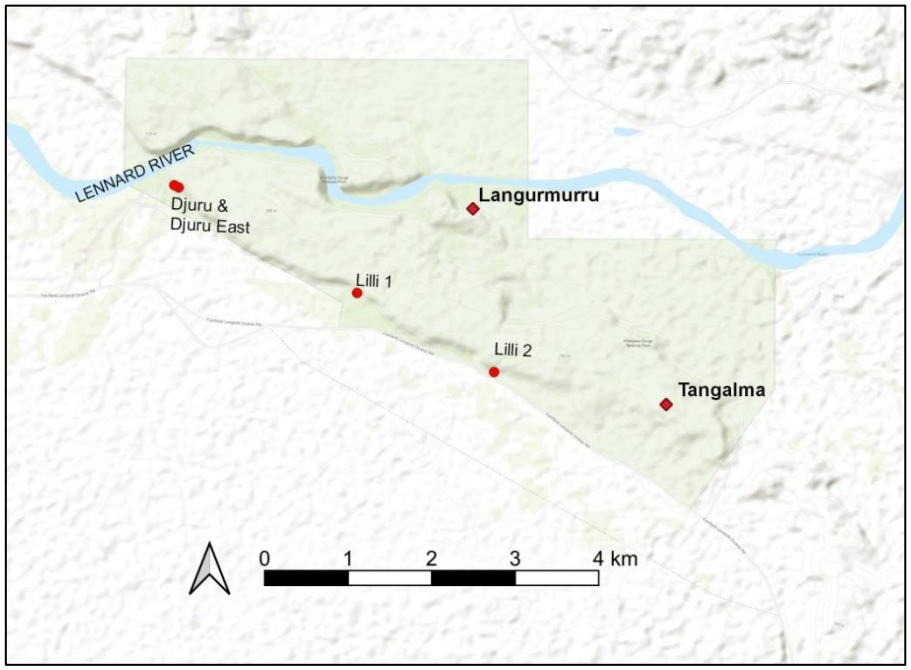


FIGURE 9.37 SITES WITH ROCK ART IN CLOSE PROXIMITY TO TANGALMA AND LANGURMURRU.

Rock art signifies that sites have been visited and/or occupied. The density of rock art and superimposition at Tangalma and Langurmurru suggests they may have been at the centre of a group of sites where people met to engage in ceremony, as along with density and

superimposition they also have iconic figures[3] recognised by Traditional Owners (June Oscar, Mona Oscar, Dillon Andrews 2011, 2012, various dates in September and July-September). Following the work of previous scholars (e.g. Conkey et al. 1980; McDonald & Veth 2006; 2012a; 2012b; Veth 2006) I suggest this infers that rather than a single rock art aggregation site, rock art density, iconic figures and site size, and the lack of these at nearby sites puts Tangalma and Langurmurru at the centre of what I term a Rock Art Locale, an area with focal sites and satellite sites leading to or surrounding it.

This builds on Wobst's ideas of the maintenance of marriage alliances to sustain populations, and the ways people make choices to interact with material culture (i.e. rock art) and their environment (1976; 1977; 2000). Alliances need strong communication channels, meetings, exchange and ceremony to retain potency; thus begins the process of information exchange through socio-cultural exchange, more likely to begin in border areas as relationships develop. One way in which the extent to which the socio-cultural exchange happens is in the development of dense, complex, multi layered rock art sites. By extrapolation, the intermingling of motifs, figures and styles which are most likely contemporary, in large numbers, and in many layers, suggests that Tangalma and Langurmurru are likely to have been sites where such exchanges took place, and the many layers of superimposition suggest that this was over a long period. Wobst (1976:55) suggests that 'mate exchange' could be both more stable and predictable and improve affiliation and, therefore, the exchange of ideas and traditions between cultural groups if traditions such as the kinship (section/subsection) systems in the Kimberley were in place (see Kaberry 1937; Radcliffe-Brown 1930b: among others).

The idea that rock art is produced in larger complex sites during gatherings and the consequent exchange of information is also in keeping with Wobst's contention that people have agency in their interactions with material culture, shown in the creation process, superimposition and introduction of new figures, colours, techniques, compositions (Wobst 2000). This is also important in people's decisions on site choices and creation of rock art. Thus, when we look at the complexity of the large figures and their prominent placement at sites like Langurmurru and Tangalma, the density of the rock art within those shelters and the layers of superimposition, we get a picture of complex interactions and decision making in which many people may have been involved, either contemporaneously or over time. The repeat and/or refreshment of figures at these sites over time suggests that the act of creating them may have been an important activity to reinforce relationships with neighbours, for

[3] Which may also be Ancestral Beings.

marriage, trade, and resource sharing, whilst nurturing the land to ensure fertility (people, food, water) in coming seasons (cf. Conkey et al. 1980). The presence of the distinctive figures with common characteristics is likely the result of the information exchange in the border areas, where affiliations may be strongest. How they are evident in Bunuba Country is discussed in the Anthropomorph Case Study later in this chapter.

In contrast, the rock art at the smaller sites within easy walking distance is limited, with fewer figures, less colour variation and few, if any, superimpositions. For example, at Djuru East snakes and eels in shades of red dominate, and while some appears to be well absorbed into the rock surface, and may not be recent, there is little superimposition. There is some protection from the wind and sun, little from the rain. It is close to Bandilngan, where food and better shelter is available, suggesting that its use may have been transitory, stopping to enjoy the proceeds of fishing and hunting, and taking time to paint before going to gatherings at the larger sites of Tangalma and Langurmurru, within easy walking distance.

This pattern is repeated for other groups of sites in Bunuba Country. Mount Behn 1 is densely painted with >600 figures, and up to 11 layers of rock art. It is large, easy to access via a gentle scree slope, and close to water and food. At least three small shelters with rock art and access to the same resources are within five to ten minutes' walk (Mount Behn 2, 3 and 4). As the largest site, with a large under cover area featuring iconic anthropomorphs and great diversity, Mount Behn 1 is the focal site in this Rock Art Locale (Figure 9.38).

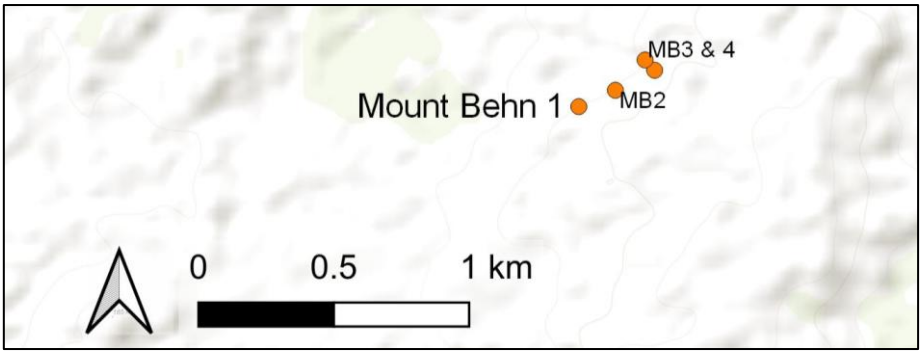


FIGURE 9.38 SITES WITH ROCK ART IN CLOSE PROXIMITY TO MOUNT BEHN 1.

Similarly, two sites along the Marawun escarpment (Marawun 1 and 4) have large rock art assemblages, large figures, diversity and multiple superimposition layers. This, once again, emphasises how the complexity of the rock art and the complexity of the figures indicates there are sites which focus on intensive interaction, possibly for trade, marriage networks and the ceremony associated with maintaining them (Wobst 1976), and their closeness to the western border area reinforces the likelihood of regular or frequent interaction. Both sites

have shelter, access to springs and a seasonal creek, clear views and direct access to a wide plain for hunting and gathering (June Oscar, Mona Oscar, Patsy Bedford 2012 pers. comm., 14 August). They are easy to access at ground level. Scattered along the escarpment close by are several small shelters providing sanctuary for small groups of people. Three shelters have extant rock art (Marawun 7-1, 7-2 and 7-3), and there are also caves and shelters without rock art along the 6km stretch of the escarpment (M2, M3 and M6); not included in this study at least one we visited[4] which is associated with 'Women's Business' (Mona Oscar 2012 pers. comm., August 14) (Figure 9.39).

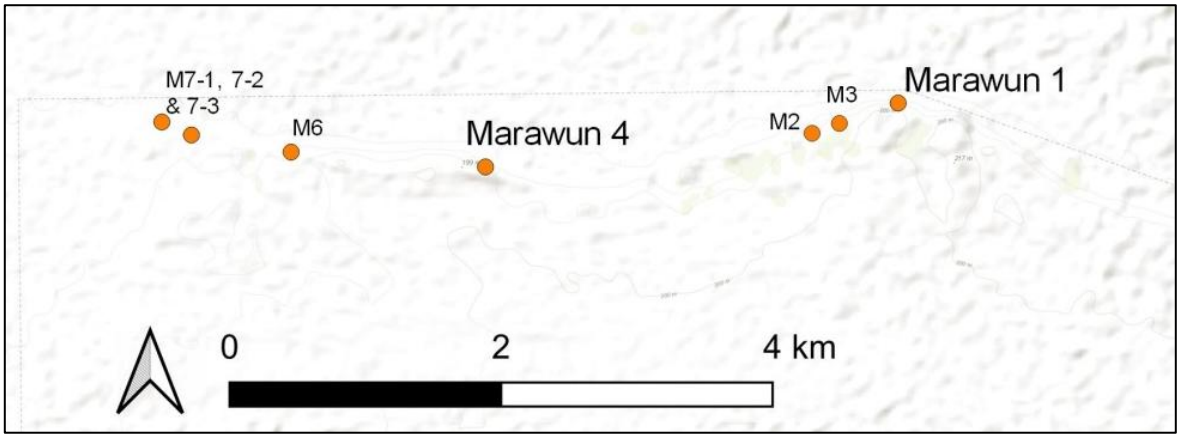


FIGURE 9.39 SITES WITH AND WITHOUT ROCK ART ALONG THE ESCARPMENT NEAR MARAWUN 1 AND MARAWUN 4.

In Gooniyandi Country the sites in Emanuel Gap may also be part of a Rock Art Locale. The five sites (Figure 9.40) all have rock art in multiple superimposition layers and four provide shelter. Emanuel Gap 2 is difficult to access, with contemporary access involving climbing steep boulders, although this may not always have been the case. The other sites are at or close to ground level. All are within easy reach of one another, with access to water and food resources. Emanuel Gap 4 has the most figures (n=106) without substantial shelter; however, Emanuel Gap 5 is distinguished by the presence of a large iconic anthropomorph, surrounded by large zoomorphs in the solid black infill/white outline style of the area and multiple superimpositions (Figure 9.41) mostly within a cave, suggesting that it is more likely to be the focal site in the Rock Art Locale.

[4] Note, this was on a women only expedition with Bunuba women and children from which the male archaeologists in the *Lifeways* team were excluded, as the Bunuba women knew we would be looking for a women's site.

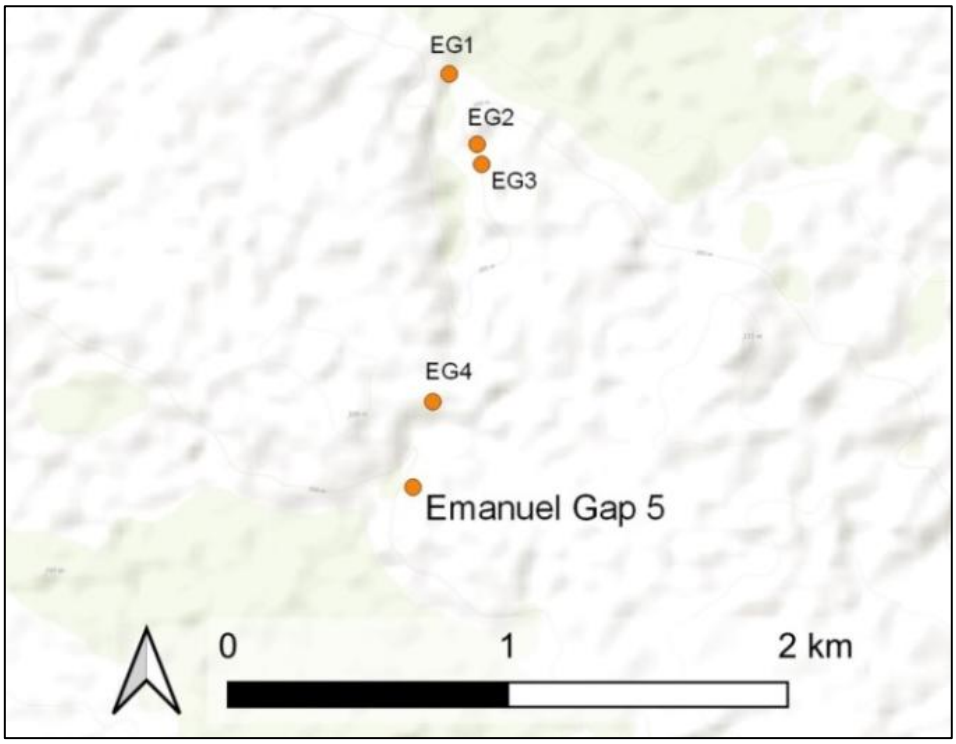


FIGURE 9.40 SITES WITH ROCK ART IN EMANUEL GAP IN GOONIYANDI COUNTRY.

It is possible there may be other site groups that are Rock Art Locales using the following criteria:

- one or two large sites;
- a high number of figures;
- ≥4 superimposition layers;
- floor area sufficient to accommodate multiple families; and
- rock art featuring one or more large/iconic anthropomorphs, most likely related to spiritual or creation beliefs.

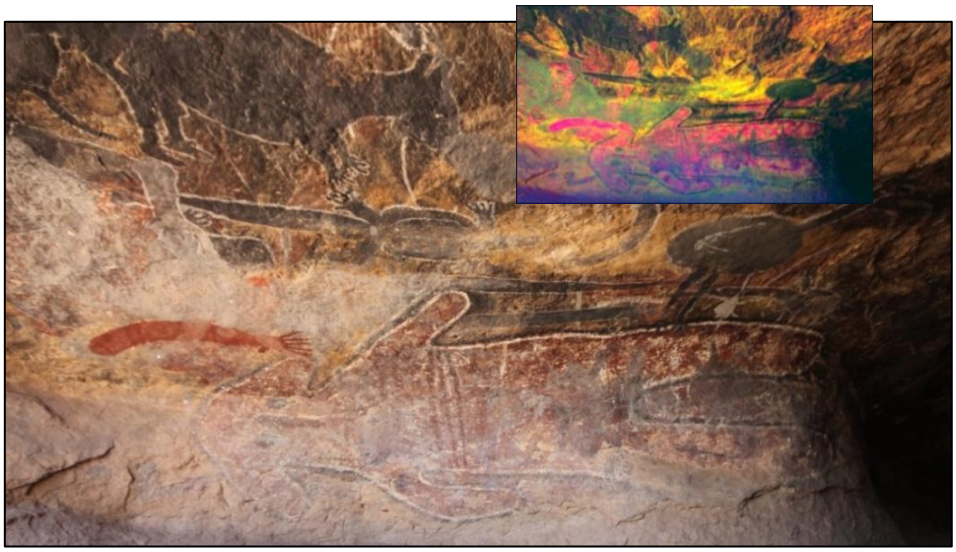


FIGURE 9.41 THE PANEL AT EMANUEL GAP 5 ON THE NORTH SIDE OF THE CAVE ENTRANCE. INSERT ENHANCED WITH DSTRETCH© YBK/SCALE 20.

The three Fairfield sites may be part of a Rock Art Locale. The anthropomorphs at Fairfield 1 and 3 are badly deteriorated, and neither is as large or prolifically decorated with rock art as Fairfield 2, which sits between them, and is the largest of the three sites. The presence of a skull and femur, daubed with ochre, at Fairfield 2[5] in the vicinity of the Small Round Bodied Anthropomorphs in Groups and wajarri (boab nuts) suggest this site may have ceremonial/mortuary significance, making it important in the group of sites, and possibly the centre of an aggregation or Rock Art Locale at one time. The escarpment between Fairfield 2 and 3 has many smaller rockshelters, many of which were visited and while they would provide good shelter, they did not have visible rock art.

There are six sites above and south of Dimalurru/Tunnel Creek, which also vary in density of rock art. Tunnel Creek 4 (at the southwest) is the densest and most superimposed site, with sufficient floor space for several families. However, sites around the tunnel exits (Tunnel Creek 1, 2 [NE], 3 and 5 [SW]), and above (Tunnel Creek 6) have either known historical associations (see Chapter 2) or are publicly accessible. These sites are potentially damaged, created or added to by contemporary visitors, compromising their consideration as aggregation or Rock Art Locales for Traditional Owners at this time.

Other sites across the study area may be part of Rock Art Locales, but gaps in Traditional Owner knowledge, and time to explore further, limited the number of identified in this study. Sites such as Darrananna are known by Traditional Owners (June Oscar, Mona Oscar, Raelene Oscar 2011 pers. comm., 7 September) to be places that they went for ‘holidays’, while Stumpy’s Soak 1 as a shelter during hot days during pastoral work (Johnny Bell 2011 pers. comm., 6 September), and Elimberrie Springs is not only densely painted, including with iconic figures, it features directly in creation stories (Chungul et al. 1988) but time, flood damage in 2011, and resources, limited the exploration of the area around these sites.

In Gooniyandi Country other sites do not show observable distribution patterns. The site Japi, within 200m of Riwi, is described as ‘richly decorated with paintings … [and] abraded grooves in several places’ (Balme 2000:1) but was not recorded in this study for cultural reasons (sorry business). If, as indicated (Balme 2000) the rock art assemblage is of similar size and with similar characteristics, and both are occupation sites, then they may be part of a Rock Art Locale with smaller sites within the Mimbi Caves. This would be worth further investigation to assess if the pattern persists where the environment becomes less tropical

[5] No photographs are shared for cultural reasons, although they were taken as part of the site record with permission from the Bunuba Rangers.

with fewer permanent water sources, and the rocky outcrops replace escarpments to the southeast.

Synopsis

Identifying four groups of sites meeting the Rock Art Locale criteria suggests that it is likely that there may be other such locales in the southern Kimberley. The proximity of such site groupings to subsistence resources as well as one another, and the capacity for differing numbers of people suggest that smaller sites may have been stopping points on the way to gatherings, shelters when a central site was at capacity, or people were separated for cultural/kinship reasons. This is a similar arrangement to aggregation/dispersal sites in the Western Desert (McDonald & Veth 2012b) to the south of the study area. It suggests that there may have been a common approach to how which sites and rock art style were used in the two areas, suggesting that the southern Kimberley may be a transition area between the tropical Kimberley and the arid Pilbara.

Grouping sites into Rock Art Locales also introduces the potential for other types of analysis, particularly around developing sequences of motifs or styles for each locale and considering them as sub regions within Bunuba and Gooniyandi Country that may reflect family or clan domains. This analysis is outside the scope and size of this thesis but would be worth discussing with Traditional Owners for future research.

Anthropomorph Case Study: Family Connections

Anthropomorphs which the Bunuba people call the Waliarri (June Oscar 2012, pers. comm., 15 August), and contemporary Gooniyandi people also refer to as Wanjina (Jane Balme 2015 pers. comm., 12 March) are mostly in the western part of the study area. They are a distinctive and complex group bearing a strong resemblance in form to the Wanjina of the Worora, Ngaranyin and Unguumi to the west and northwest of Bunuba Country, and documented throughout the western and coastal Kimberley by archaeologists and anthropologists working with Indigenous people since the late 19th century (e.g. Akerman 2016; Blundell 1974; Blundell & Woolagoodja 2012; Brockman 1902; Crawford 1968; Elkin 1948; Grey 1841; Lommel & Lommel 1959; O'Connor et al. 2008b).

The Waliarri figures may be related to the Wanjina in overall form, making them part of a broader Wanjina family. It is important to underline that Wanjina has been used as an overarching name for Ancestral Beings[6] with a range of different names by different peoples in the region. The Wanjina name may originate from Woonggúja, thought to be an earlier name used by the Worora (Love 1930:3) and spread across the region, although the name now used for a similar being in the east Kimberley, Kaluru is notably linguistically different (Love 1946:259).

It is also important to note that within the anthropomorphs referred to as Wanjina in much of the published literature, there is considerable variation in form and detail. Some Wanjina are shown with arc-shaped headdresses (Grey 1841) as shown in Figure 9.42, which Crawford (1968:30) refers to as a simplification of style, while others have arcs, plus rays (Figures 1.3 and 7.32).

There are also differences in the overall form and the way they are depicted and/or arranged on panels, heads only, heads and partial bodies and full figures, etc. (Akerman 2014:2). However, all the figures described as Wanjina have common characteristics:

> *halo-like headdresses and mouthless faces with large round eyes, fringed with eyelashes, set either side of an ovate nose. Most … are depicted without a mouth … The body … is usually infilled with either coarse stippling or stripes of colour on a brilliant white background, creating a glowing effect that reinforces the presence of ancestral forces* (Akerman 2014:2).

[6] See Glossary

FIGURE 9.42 GEORGE GREY'S PAINTING OF A GROUP WANJINA FIGURES (1841:202-203).

It is difficult to distinguish between simplification and amplification, as there is no evidence to tell us which features are included or excluded by different cultural groups, other than some information on the function of some body parts (see the anatomy of the Wanjina in Akerman 2009b; 2014). What can be concluded is that there are differences in detail, both the amount of detail and the type of detail. Differences in detail may be deterioration, creative choice, or differences in the stories associated with an anthropomorphic ancestral being, and the level of power or influence those beings have in the living world (e.g. Crawford 1968:27-31).

Waliarri 1 (Complex) anthropomorphs have varying levels of similarity with the Wanjina. However, they have one major difference from Akerman's (2014:2) defining characteristics, they are not painted or drawn on the glowing white background. As will be discussed below, some Waliarri have white pigment as part of the infill on bodies and face (see Figures 7.33 and 9.44), and this creates a strong contrast with red, orange and yellow pigments and black and red outlines used in Waliarri 1 (Complex), but none surrounding the figures, as discussed below. There is also more variation within the Waliarri 1 (Complex) themselves than within published images of the Wanjina, with major variations that may reinforce Crawford's (1968:30) idea that there are simplifications in the anthropomorph's depiction in some areas.

The idea that the depictions of the figure are simple or complex versions of the same figure takes an academic approach and may not be in keeping with Aboriginal ways of knowing,

doing and being (Barbara Bynder, Neville Collard, Farley Garlett, Frida Ogilvie 2018-2024 pers. comm. various dates). Another way of looking at this is that these are all related, and that when it's time for ceremony (e.g. at gatherings, trade, marriages) they are dressed in ceremonial regalia. Lots of time, and many resources are given to dress up to prepare for ceremony, and so lots of time, and colour and attention to detail is put into the rock art created for, or at these ceremonies. In everyday life people wear the simple clothing and accessories necessary to survive, and so the everyday rock art is quicker and less detailed perhaps reflecting everyday life (e.g. Bigourdian & McCarthy 2007; Burningham 2004; Gregory & Paterson 2015; Paterson 2012; Wesley et al. 2012). The preparation for ceremony has always been part of traditional life in Australia's northwest, and continues today (see Figures 6.17 and 6.19, and KALACC 1994), so it is not inconceivable that the same may apply, or have applied to, the complex and colourful versus the plain and monochromatic versions of rock art, and thus a continuum of the same practices in different contexts.

The imposition of a western intellectual framework on Aboriginal worldviews is problematic at best, and leads to many misunderstandings, not least in the role and practice of spirituality for Aboriginal peoples, which has been closely related to rock art (e.g.Hampson 2015; Love 1935). For example, the Dreaming is a widely known word for describing creation times for Aboriginal people, but it is far from an accurate or appropriate description in an Aboriginal world view. Where I live (Binjareb Noongar Country) it is called Nyitting, for Bunuba people it is Ngarranggani, for their Ngaranyin neighbours to the west it is Unguud and to the southeast the Pitjantjarta people call creation times Tjukurpa. Each has different stories but similar themes of creation by a different Ancestral Beings from the sky, earth and water, along with the understanding that the Ancestral Beings may no longer be creating the world but they are still present in modern life in many ways, including in the rocks and the rock art (Charlesworth et al. 2005 and Mikhailovich et al. 2011 provide useful summaries of some of the major concepts), and that there are many other spirits always active in the land that were around at creation, but not responsbile for it (e.g. Brady et al. 2016; Brady et al. 2024; Flood 1989; May et al. 2017; 2020; Rose 1988, Stanner 1984). Taking this into consideration an open mind is important in the analysis that follows.

In this study I have identified three major variations for the Waliarri, defined in Chapter 7 as separate styles for the purposes of analysis. The first is Waliarri 1 (Complex), a highly detailed, polychromatic figure, with solid and patterned body infill, large eyes, noses, breast plates and headdresses encompassing rays, arcs, feathers and other enhancements

(Figure 9.43). It also has clearly marked body divisions; curved lines separating the neck from the torso, mid lines across the body suggesting a belt or waistline, and/or lines across the arms or legs suggesting elbows and knees, or at the ends of the limbs suggesting ankles and wrists. In many cases it also has detailed shaped feet and hands with digits (Figure 9.44). The Waliarri 1 (Complex) is predominantly at sites close to Bandilngan and the Lennard River (Figure 9.45), the contemporary boundary between Bunuba and Unguumi Country, and the greatest concentration of anthropomorphs in this style is at Mount Behn 1 (c20km southeast of Bandilngan).

FIGURE 9.43 WALIARRI 1 (COMPLEX) AT MT BEHN 1 (M1808, BRIGHTNESS + 20%).

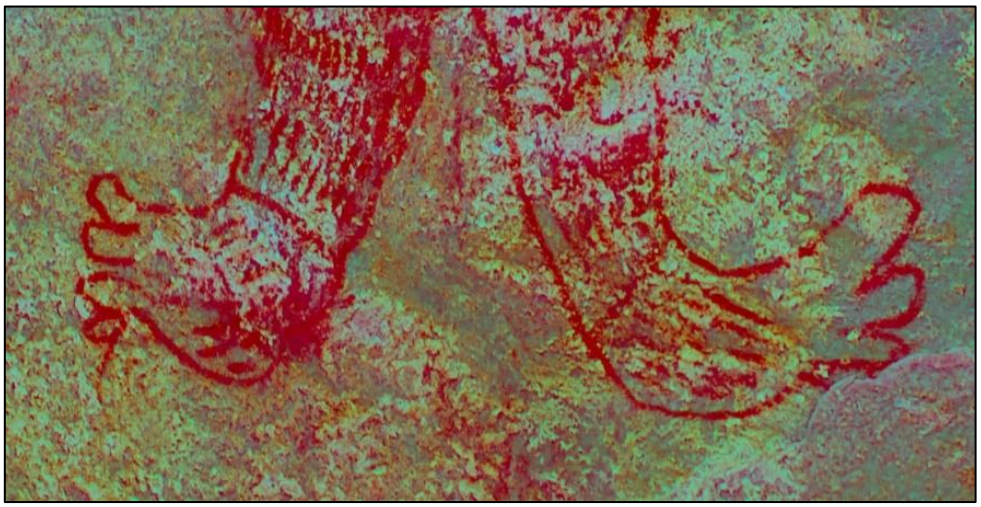


FIGURE 9.44 WALIARRI 1 (COMPLEX) WITH DETAIL AT ANKLES, PATTERNED INFILL, OUTLINE, SHAPING OF FOOT AND CLEARLY DEFINED DIGITS. IMAGE ENHANCED USING DSTRETCH© LRE/SCALE 20.

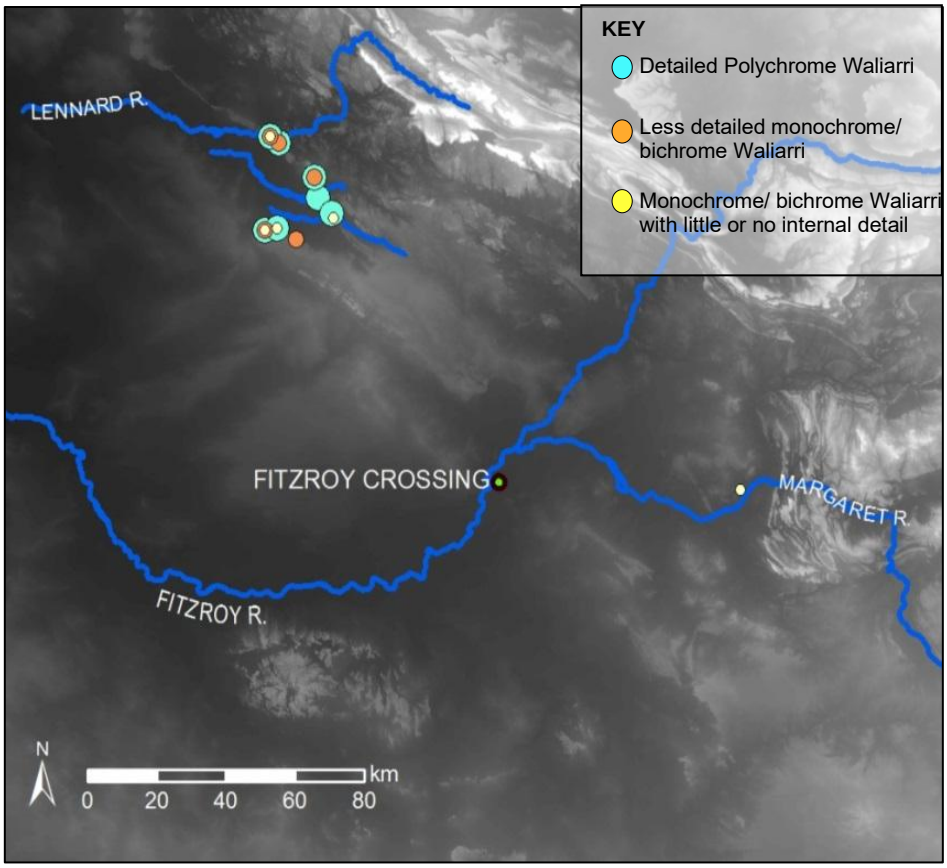


FIGURE 9.45 DISTRIBUTION OF DISTRIBUTION OF WALIARRI 1 (COMPLEX) AND WALIARRI 2 (SIMPLE) WITH DIFFERENT LEVELS OF DETAIL.

The second, Waliarri 2 (Simple), is less detailed, without internal divisions, and fewer colours (monochrome or bichrome), but with rayed headdresses, a defining attribute of the Waliarri (June Oscar, Mona Oscar 2011, 2012 pers. comm., 15 August). The headdresses may or may not have enclosing arcs. It has defined arms, legs, hands and feet, and may also have a solid and/or pattern infill on the body in the same or contrasting colour to the outline (Figure 9.46).

Waliarri 2 (Simple) anthropomorphs are also predominantly in the western part of the study area, with many close to the western border of Bunuba Country (Figure 9.45). However, there are examples of Mamo/Djuari which can be added to the Waliarri, such as the Dancing Man (Figure 9.47, added to the distribution and density in Figure 9.48) at Moonggaroonggoo in Gooniyandi Country. The boldness and freshness of the white outline and rays on the Dancing Man suggest that these may have been added to this anthropomorph later as it clearly superimposes the body, the head and the left feather in the headdress, and the figure may previously have been in the least complex Mamo/Djuari style. However, the outlines and rays are just as likely to have been refreshed as part of rock art maintenance, a regular practice in the Kimberley associated with nurturing the ancestors and the land (Bowdler 1988; Mowaljarlai & Peck 1987; O'Connor et al. 2008b; Vinnicombe 1992).

FIGURE 9.46 WALIARRI 2 ANTHROPOMORPH AT MARAWUN 7-1 IN BUNUBA COUNTRY (M2903). NOTE THE ROUNDED FEET, THE LACK OF HANDS, FACIAL FEATURES OR INTERNAL PATTERNING.

FIGURE 9.47 DANCING MAN WITH RAYED/FEATHER HEADDRESS, INNER ARC AND FACIAL FEATURES AT MOONGGAROONGGOO.

The third, the Mamo/Djuari, has the characteristic headdress of extended rays and/or feathers. It is mostly monochrome (although there bichrome figures with contrasting outline, or simple eyes), with less defined/not present hands and/or feet and an absence of internal features, such as eyes or patterning. These include the Medicine Men that, although small, dominate the rear wall panel at Riwi.

There are other markings which may have some characteristics of a Waliarri 1 (Complex) or Wanjina. One of the Traditional Owners at Riwi (Dorothy Surprise, 2011 pers. comm., 30 August) described a wide red arc on the wall as the start of a Wanjina. There was nothing else present to suggest this was the case in terms of the characteristics of the Wanjina (Akerman 2009; 2016) or Waliarri (cf page 246), so, while not discounting Traditional Owner knowledge, the motif and the information is incomplete without additional information from Elders, and therefore not included in this style, or the anthropomorph motif class.

There are commonalities identified for the anthropomorphs in the three earlier identified styles that suggest that they are related, that they are in fact variations within a style. Although they have different stories, this is would be in keeping with an Aboriginal world view where the many Ancestral Beings grouped under the name Wanjina all have different stories but have important and related roles in creation, lore and law (Akerman 2016; Blundell & Woolagoodja 2012; Crawford 1968; Woolagoodja 2020). On this basis it seems appropriate to refer to them as the Waliarri Family, related but not the same.

Waliarri were recorded in both Bunuba and Gooniyandi Country (Figure 9.48). The Waliarri Family constitute 35% (n=191) of anthropomorphic figures recorded in this study, with Waliarri Family zoomorphs at 15% (n=90) and phytomorphs at 41% (n=65) of their motif classes respectively, making it an important and dominant style in the southern Kimberley.

The variations are in keeping with the defining characteristics of the Waliarri anthropomorphs, as described by the Traditional Owners in Bunuba Country (June Oscar, Mona Oscar 2011, 2012 pers. comm., 15 August), particularly the headdress, which as Akerman (2014:36-37) suggested, are associated with the power to control the rain and storms and, therefore, give life to the land and the people. However, it is the Waliarri 1 (Complex) in the western part of the study area (Figure 9.48), that are closest in form, and in sizes that are either highly visible or dominant at sites, to the Wanjina of the neighbours to the west and north.

The presence of these figures in the western part of Bunuba Country may reflect movement in ideas from the north-west to the southern Kimberley. The contemporary border areas are not likely to have been static over time, people will have moved between them, interacted to engage in trade, marriage and sharing of resources in times of environmental stress (Frederick 2014; Ingold 2011; Officer 1992; Smith 1992a; Wobst 1976). The outcome is that through this likely sharing of resources alliances may have formed and information been shared such that parts of ideas overlapped and found their expression in the rock art. Where these elements are expressed in motifs such as those of the Waliarri family and the Wanjina they show there have likely been shared cultural protocols and kinship links (see, amongst others Elkin 1930a; 1932; 1962; Kaberry 1937; 1938; 1939; McConvell 2016; Morphy 1991)[7], expressed in every day life by Aboriginal Australians as ways of knowing, being and doing (Barbara Bynder, Neville Collard, Farley Garlett, Frida Ogilvie 2018-2024 pers. comm.

[7] Note that marriage exchange as a way of spreading the Bunuba language and culture through marriage was one of the imperatives of survival and was a conscious action by Bunuba women in the 20th century according to Elders (Patsy Bedford, Selena Middleton 2012 pers. comm. 14-16 August, and June Oscar, Mona Oscar 2012 pers. comm. 18-20 August).

various dates, see also Martin 2003), and in the rock art in continuity is specific elements in these anthropomorphic motifs. This is reinforced by the presence of the Dancing Man in Gooniyandi Country (Figure 9.46), which has contrasting elements in the detailed headdress, simplified facial features and different body form to the Waliarri 1 (Complex) and Waliarri 2 (Simple) in Bunuba Country, but an overall similarity of form and visibility that makes it part of the family. Similarly headdressed figures were referred to as Wanjina by Traditional Owners in Gooniyandi Country during later field work (Jane Balme 2015, pers. comm., 12 March), but they are few, and were not recorded because of limited access and different priorities at that time.

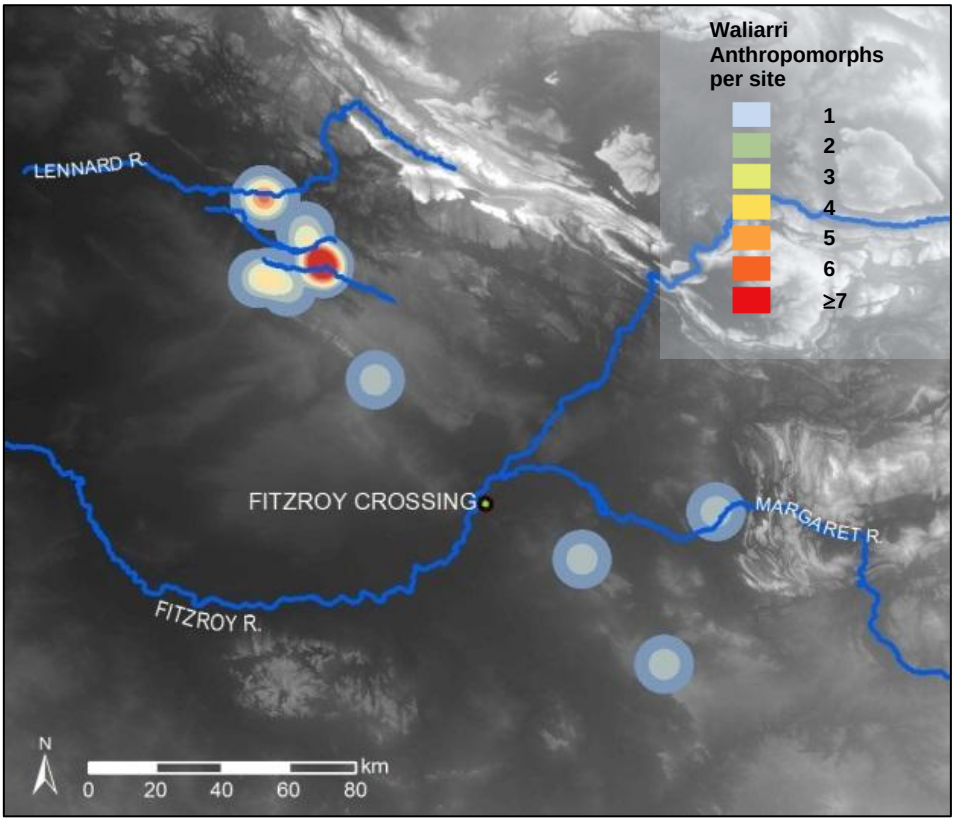


FIGURE 9.48 DENSITY AND DISTRIBUTION OF ALL WALIARRI FAMILY OF ANTHROPOMORPHS.

The relatedness of the Waliarri Family to the Wanjina is discussed in Chapter 10, and this includes how ideas about Wanjina-like figures might have been transmitted from west to east, which is in accordance with Akerman's (2014) suggestion that there is a Wanjina Belt extending to parts of Bunuba Country (Figure 9.49) but not reaching Gooniyandi Country to the east until more recently. This is Information Exchange Theory in action (Wobst 1976; 1977). Where people share land and resources, develop networks and kinship links they also share ideas. Reproducing versions of those on the walls of shelters and caves further and further from point of origin gives an indication of how information and ideas may also have been shared in the southern Kimberley.

If Waliarri are associated with travels of Ancestral Beings like the Wanjina, and painted large, prominent, and highly visible in the landscape so that they can be marked by others as part of this ancestral group, they may have travelled into contemporary Bunuba Country (Figure 9.49). The most colourful, large and detailed Waliarri have travelled as far as sites close to Dimalurru/Tunnel Creek (Fairfield 1 and 3) and as far south as Elimberrie Springs. That does not preclude the presence of Waliarri further east or south; however, it does suggest that the travels of this anthropomorph in full regalia may have been limited in the study area.

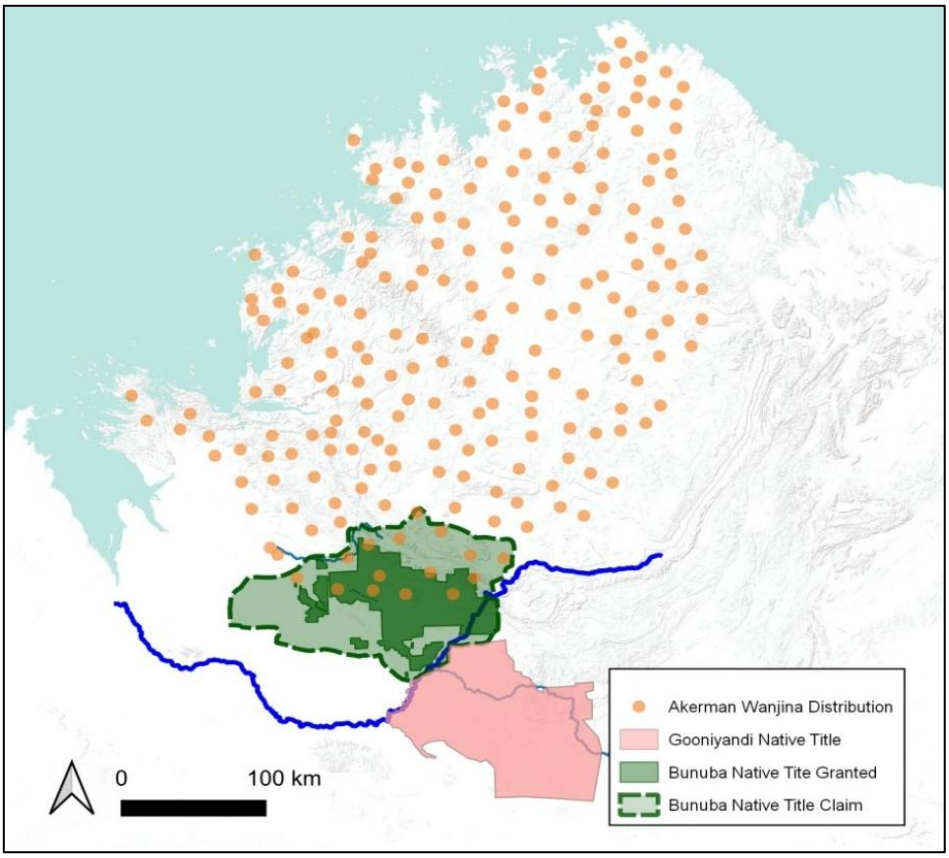


FIGURE 9.49 AKERMAN'S 'WANJINA BELT' SHOWN IN RELATION TO BUNUBA AND GOONIYANDI NATIVE TITLE AREAS IN THE KIMBERLEY, WESTERN AUSTRALIA. ADAPTED FROM AKERMAN'S MAP AND GEOREFERENCED TO MY OWN MAPS ON GOOGLE TERRAIN BASE MAP GDA84 USING QGIS 3.22[8].

Waliarri 1 (Complex) is prolific in sites with large assemblages and concentrated around the western borders of Bunuba Country (Figure 9.48). This supports the contention that these figures are placed only at focal sites within Rock Art Locales (e.g. Conkey 1980, McDonald 1994:286), and that different areas have varying types and density of these types of distinctive figures. The Waliarri presence at sites close to the contemporary western borders where there is also a significant linguistic change from non-Pama Nyungan to Pama Nyungan, suggests that there is overlap both in the movement of people and definition of

[8] Note: The darker green areas within the Bunuba Native Title Claim area are those described at the beginning of this chapter as those excluded from the settlement because they are National Parks and Pastoral Leases. These areas are subject to Indigenous Land Use Agreements. Rock art was recorded within those areas.

cultural areas, but also in the information that is being exchanged for not only the range of reasons discussed earlier (e.g. Hantman & Plog 1982; May et al. 2020; McDonald 1998b; 2000; 2008; Wobst 1976), but to maintain the health and wellbeing of the land, and the important role of these powerful Ancestral Beings.

This case study and the context, data and analysis presented in Chapters 2 to Chapter 9 forms the basis for in which the questions posed in Chapter 1 under the headings Figures and Style, Change Over Time, Rock Art Locales, and Kimberley Chronologies will address the overarching aim of the study to determine whether the Bunuba and Gooniyandi people have distinct identities, as expressed in the rock art, which distinguish them from one another and their neighbours to the west, and whether this has always been so. These and related issues will be further developed in the ensuing chapter of the thesis.

… left on the rocks

We leave something of ourselves behind when we leave a place, we stay there, even though we go away. And there are things in us that we can find again only by going back there.

(Mercier 2009)

Introduction

As humans we see ourselves living in places, not spaces (Ingold 2011:145-164). That is, places defined and delineated by language, culture, beliefs and the traces of our ancestors; traces in the paths, tools, fireplaces and food remains, and the marks on the rocks. In Western Australia people have been leaving traces and marks of their presence for more than 50,000 years (e.g. Balme et al. 2009; Balme & O'Connor 2015; 2017; Balme et al. 2018b; Hiscock et al. 2016; Veth et al. 2021). Identity, history and culture are embedded in what has been left behind, and the ancestors of Bunuba and Gooniyandi people are alive in the land, the waterways, the animals, the song lines, and the rock art.

People moved through the land exchanging information and building relationships as they shared tools and hunting, stories, songs and dances (e.g. Barton et al. 1994; Fisher 1997; McDonald 2008a; Veth et al. 2011; Wiessner 1982; Wobst 1976), all of which linked the places; and the people filled them in the with enduring rock art. The motifs and styles of the rock art are read and understood by each generation (Ingold 2013:125-141) and our contemporary research seeks to translate that into a western intellectual framework informed by Indgenous perceptions and ways of knowing, being and doing (cf Barbarba Bynder et al. 2018-2025 pers. comm., see also Martin 2003).

Following the outlined aim of this thesis I have analysed rock art images, styles, chronology, distribution, and density, to determine whether Bunuba and Gooniyandi people express identities which reflect cultures distinct from both one another and their neighbours to the west, and whether this has always been so. Building on the statistics and analysis in earlier chapters I will attempt to unfold and answer this under the four major headings, and the questions asked for each.

- Rock Art and Style
  1. *What are the major types of rock art in Bunuba and Gooniyandi Country?*
  2. *Are there rock art motifs and styles that are particular to the study area?*
  3. *How do rock art motifs and style profiles compare to those of western neighbours?*
- Change Over Time,
  4. *Do rock art motifs and/or styles change over time?*
- Rock Art Locales
  5. *Are rock art sites chosen for particular characteristics and if so, what are the characteristics that define site choice?*
  6. *Do site characteristics vary for motif types or styles, and are these the same in Bunuba and Gooniyandi Country?*
  7. *Are site characteristics the same in Bunuba and Gooniyandi Country?*
- Kimberley Chronologies
  8. *Are there clear rock art borders between Bunuba and Gooniyandi, and between Bunuba and western neighbours, and if so, did such borders change over time?*
  9. *Does the southern Kimberley share a rock art motifs, style and chronology with the wider Kimberley region?*

Rock Art and Style

In this research, rock art is broadly defined as marks made by humans. The definition of motif classes comes from the sum of elements which make up the overall recognisable figures (Tables 5.4 and 5.5), and for styles from the way of doing this to create a distinctive appearance within those forms (Table 7.13). Although these definitions are recognised as a construct, and can be problematic, for the purposes of analysis and attempting to understand rock art in an academic context it is useful to have a structure and definitions which can be replicated.

Figures

The rock art figures are divided into nine motif classes in this thesis (e.g. after Brady 2010; Maynard 1977; Muzzolini 2006; Nowell & d'Errico 2007; Rosenfeld & Smith 1997):

- Anthropomorphs;
- Zoomorphs;
- Phytomorphs;
- Tracks;
- Geometric;
- Material Culture;
- Historical Inscriptions;
- Other figurative; and
- Other.

Anthropomorphs and zoomorphs dominate the motifs across the southern Kimberley (Figure 1.2), but there are more anthropomorphs than zoomorphs in Bunuba Country, and, in contrast, more zoomorphs than anthropomorphs in Gooniyandi Country (Table 10.1). This difference cannot be solely attributed to the different number of sites recorded in each area and may relate to cultural morés in rock art in each cultural area.

TABLE 10. 1 ANTHROPOMORPHS AND ZOOMORPHS RECORDED BY CULTURAL AREA.

Cultural Area / Motif Type	Bunuba		Gooniyandi	
	Number of figures	% of total	Number of figures	% of total
Anthropomorphs	473	52%	80	32%
Zoomorphs	441	48%	173	68%
Total	914	100%	253	100%

Some anthropomorphs have stories, but none were identified by individual names by Elders in this study, despite similar beings with their own names in other areas in the vicinity (Crawford 1968:41; Donaldson & Kenneally 2007). In the southern Kimberley the stories are often linked to sites rather than to individual figures. For example, one such story tells how Yilimbirri (Elimberrie Springs) has two dog-like rocks overlooking it (Chungul et al. 1988:19-23), but the story does not extend to the rock art or other motifs at the site.

Gooniyandi stories are more recent, with tales of men hiding out in caves, and of life on stations (Allan 1989; Bohemia et al. 1993; McGregor 1988b; Pannell 2000), while maintaining the strong continuous associations with Country through Ancestral Beings (Federal Court of Australia 1999; 2012a; 2012b; 2013; 2016; Pannell 2000). Most

Gooniyandi stories relate to places without rock art, sometimes referring to shapes, features and pathways in the landscape, rather than where people lived (Kimberley Stories are included in Appendix 3 and 8). It might be expected that such places would have introduced material culture, dress or animals in the rock art from people familiar with station life (Fyfe 2010b; Paterson 2000; 2005c; 2005b; Taçon et al. 2012), but this is rare in the southern Kimberley. The *Lifeways* Project visited few sites with rock art suggesting contact with settlers, and Traditional Owners did not know of others than those we did visit (Patsy Bedford, Serena Middleton, Mona Oscar 2012 pers. comm. 15 August; Tommy Dick and Helen Malo 2012 pers. comm. 23 August; Dorothy Surprise 2011 pers. comm. 1 September, see also Balme & O'Connor 2015; O'Connor et al. 2013).

Some general names are used for anthropomorphs:

- Waliarri (Figure 10.1) were identified and named in Bunuba Country (June Oscar, Mona Oscar, Raylene Oscar 2011 pers. comm., 27 August, Bunuba Rangers 2012 pers. comm., 19 July);
- Mamo was first identified at the Marawun sites in Bunuba Country (Patsy Bedford, June Oscar, Mona Oscar 2011, 2012 pers. comm.; Dillon Andrews 2012 pers. comm., 5 September);
- Dancing Man, the only specifically identified anthropomorph, and Djuari are specific to Moonggaroonggoo, Gooniyandi Country (Helen Malo, Lorraine Shandly, Jimmy Shandly 2011 pers. comm., 1 September); and
- Medicine Men at Riwi (Dorothy Surprise 2011 pers. comm., 30 August).

Traditional Owners did not know of other names (Patsy Bedford, Serena Middleton, Mona Oscar 2012 pers. comm. 15 August; Tommy Dick and Helen Malo 2012 pers. comm. 23 August; Dorothy Surprise 2011 pers. comm. 1 September), but recognised and identified the motifs at many sites, and identified many of the zoomorphs and phytomorphs which were not always clear to an unfamiliar eye. Connecting the motifs and styles in the rock art with the stories passed down through many generations may provide some insight into how the rock art reflects Bunuba and Gooniyandi identity and interactions.

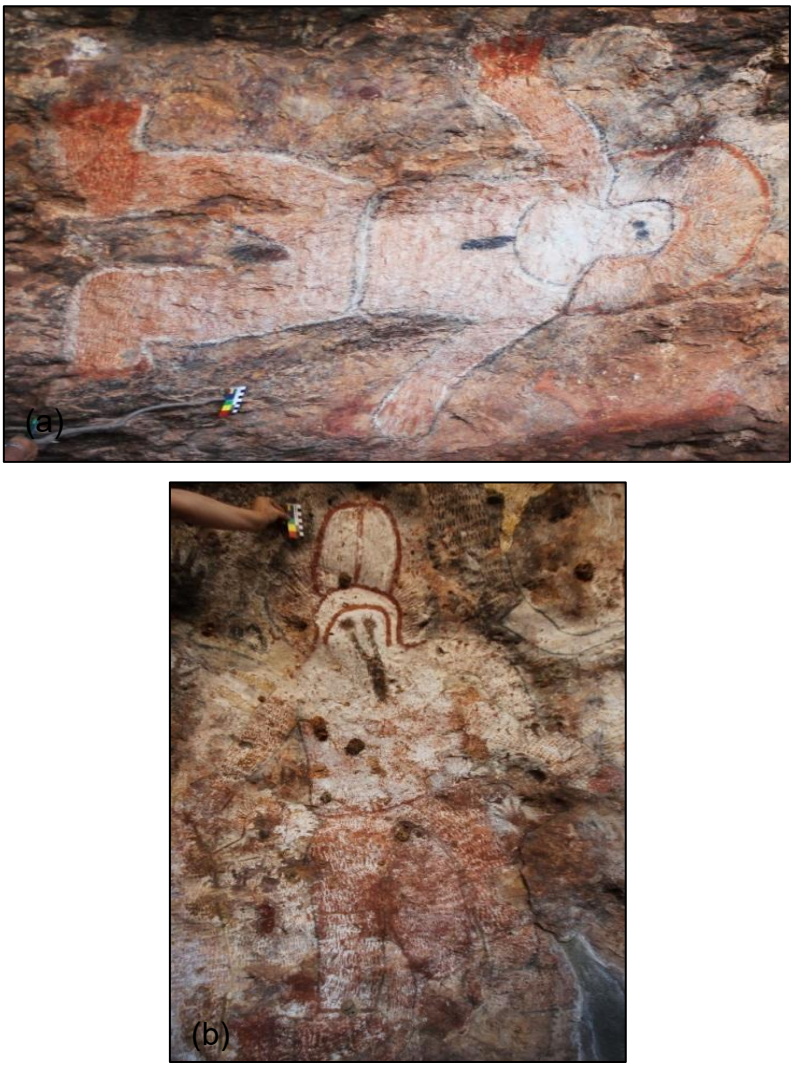


FIGURE 10.1 WALIARRI IDENTIFIED BY TRADITIONAL OWNERS IN THE FIELD AT (A) TANGALMA (B) MOUNT BEHN 1. BOTH ARE ON THE VERTICAL WALLS OF THE ROCKSHELTER IN THE ORIENTATIONS SHOWN IN THE PHOTOGRAPHS.

Of the anthropomorphs identified, the Mamo, Djuari and Medicine Men have many of the same physical attributes and stories, which include their impish behaviour and eventual embodiment in the rock by other Ancestral Beings to control the mischief.

Some animals in Bunuba Country have stories, mostly birds, which appear as engraved tracks at a limited number of sites (Chapter 5), but rarely as figures in this study. The Galurru[1] (rainbow serpent), bilanyi (snakes), lalanggarra (crocodiles) and baniy (goanna) of the stories are well represented in rock art, whereas wanyjirri (kangaroo), which is prolific on the plains, and tharra (dog/dingo) less so.

[1] Note that this is capitalised because it is the proper name of an Ancestral Being, whereas the others are common names in the Bunuba language.

Plants also appear in rock art, including wanggu (yam) and wajarri (boab nuts), and the thanggari (water lilies). Although the latter appear in Bunuba stories (Chungul et al. 1988) they were only observed in Gooniyandi rock art.

Tracks (mostly human hands) are prolific, as are phytomorphs, and material culture is present to a lesser extent than in assemblages in other parts of the Kimberley, particularly those where Gwion Gwion are recorded with accoutrements (e.g. Ross et al. 2016; Travers & Ross 2016; Walsh 1994). Fewer than half (n=20) of the material culture rock art in this study is associated with anthropomorphs or zoomorphs, suggesting that they may not be as significant as in other places.

As discussed earlier, some rock art in this assemblage is so unusual it does not fit neatly into any motif class or style. Some figures are limited to one or two sites, some are unique. The starburst/lightning is one of those (Figures 6.12 and 6.43). Elders and Bunuba Rangers were not familiar with it and made numerous suggestions about its origin and meaning such as maps or star tracks, described in detail in Chapter 6. Star-like figures are not unique in Australia (e.g. Taçon et al. 2022), but I have not found any like these in other places in this study.

The prominent placement and size of such rare rock art suggests that it may be important, but a name for the form, and therefore any interpretation remains a mystery. Rare or unusual motifs may be the work of visiting artists, the choices of individuals or a group of artists, though it may be assumed the continued dominance of the images at both sites makes it important for reasons which are not presently known. Mount Behn 1 is 20km (a day's walk) from the contemporary border at the Lennard River, so it is likely that this shelter would be within a liminal area for two cultural groups and artists may have shared their ideas.

While the rock art in the southern Kimberley has a range of motifs that are important in creation stories, and in maintaining culture (Chungul et al. 1988; Kimberley Language Resource Centre 1991; 2000; Mudeling 1998; Oscar 2000; Street & Chestnut 1983) Traditional Owners did not relate the rock art directly to their creation stories, other than the mischievous anthropomorphs described above. In addition, there are stories which show the importance of some animals in culture, such as the wanyjirri and tharra, which are rare in the rock art, along with the absence of thanggari which appears in Bunuba stories, but only in Gooniyandi rock art.

Styles

Identification of anthropomorphs by Traditional Owners meant I was able to recognise their attributes for comparisons. Following Maynard (1977), I used a multi layered approach, grouping the broad attributes like colour and fill, before considering finer attributes, like features, patterns and techniques, to identify styles and allocate figures to those styles (Chapter 7). That is not to say that some styles were not immediately visible, or expected, based on both field observations and guidance from Traditional Owners, such as the polychrome Waliarri. Analysis confirmed field observations, and consistent definitions were able to be applied to ensure all relevant figures were included.

Almost 50% of the rock art was categorised in the initially identified Monochrome Solid Infill style, followed by Monochrome Hand Stencils (13%, Table 7.1). Detailed analysis resulted in four distinct styles within that initial grouping, figures with the same overall form, composition, or specific technique (Tables 7.6 and 7.13), or the same way of doing rock art. This was the first stage of refining styles described step by step in Chapter 7. The result of the refinement was that eight styles were identified, of which four were local to either a single site or small area which could be reasonably expected to be part of seasonal pathways, within one or two days walk of one another, and water, food, and shelter along the way. The remaining figures, where it was not possible to categorise them to a style, were allocated to five broad groups, an interim categorisation that may be refined in future studies, or when more data becomes available (Table 6.10).

Southern Kimberley Styles

In answering the question of whether any of the styles are distinctly of the southern Kimberley I looked firstly at the highly visible. While there is a clear distinction in colour choices, patterning and internal features, complexity of headdresses and hands and feet, there is a consistency in the form of the Waliarri 1 (Complex), Waliarri 2 (Simple) and Mamo/Djuari anthropomorphic figures, leading them to be described as a Waliarri Family of styles in Chapter 9. This was recognised in the initial analysis in Chapter 7, but they were retained as separate styles partly because Traditional Owners initially identified them as different beings with different stories (June Davis, Isaac Cherel, Helen Malo 2011 pers. comm., 1 September; June Oscar, Mona Oscar, Raylene Oscar 2011 pers. comm., 6 September; Patsy Bedford, Selena Middleton, June Oscar, Mona Oscar 2012 pers. comm., 15 August; Dorothy Surprise 2011 pers. comm., 30 August) and partly because it was an

opportunity to follow through and determine if there were other markers in chronology and spatial distribution which indicated separateness.

When considering the figures in the spatial context (Chapter 9), the distinctions may be in the realm of time and effort invested in their creation determined by the context and purpose of that creation (e.g. as part of or preparation for ceremonies versus place marking, decoration), which may result in numerous polychromatic figures (e.g. at Marawun escarpment sites), large and dominant figures (e.g. at Tangalma, Langurmurru, Moonggaroonggoo, Mount Behn 1) or a collection of many small similar figures (e.g. at Riwi). This is a similar approach to Maynard's (1977) description of style as a way of doing rock art, where the way of doing it may include ritual as part of the preparation or activity, as well as the technique and process involved in creating a final form.

The styles' variations were found to be contemporaneous in chronological analyses in Chapter 8, and their distribution and density in Chapter 9, and it became clear that their conformity was greater than their differences and would no longer be referred to separate styles. Thus, in a Western academic classification and stylistic analysis the figures are better defined as three anthropomorph motifs within a single style called the Waliarri Family, though grouping them this way may not align with the Bunuba or Gooniyandi worldview. The Waliarri Family includes the non-anthropomorphic figures previously categorised as Waliarri 1 (Complex), and only anthropomorphs were categorised in Waliarri 2 (Simple) or Mamo/Djuari in post field analysis or by Traditional Owners.

This follows approaches used for other styles in the Kimberley, using the anthropomorphs as the index figure for classification. The Wanjina and Gwion Gwion, are known by other names and have a wide range of attributes and powers in different cultural areas, i.e. different stories (e.g. Blundell 1974; 2003; Blundell & Woolagoodja 2012; Crawford 1968; Elkin 1930b; Layton 1992; Love 1930; Woolagoodja 2020). There is contrast, for example, between the Sea Wandjinas[2] at Langgi (Figure 10.2b) and those dispersed to the west (Figure 10.2a) after the battle at Tunbai in the central Kimberley (Crawford 1968:55-56). The Kaiara (Figure 10.2c) have some similarities, and great powers which bring cyclones when they are even slightly annoyed (Crawford 1968:69-80).

[2] This was an earlier spelling for this Ancestral Being, and in this case the term used by Crawford 1968 is used in keeping with the author's nomenclature. I use the current spelling, Wanjina, elsewhere in this thesis, unless it is a citation.

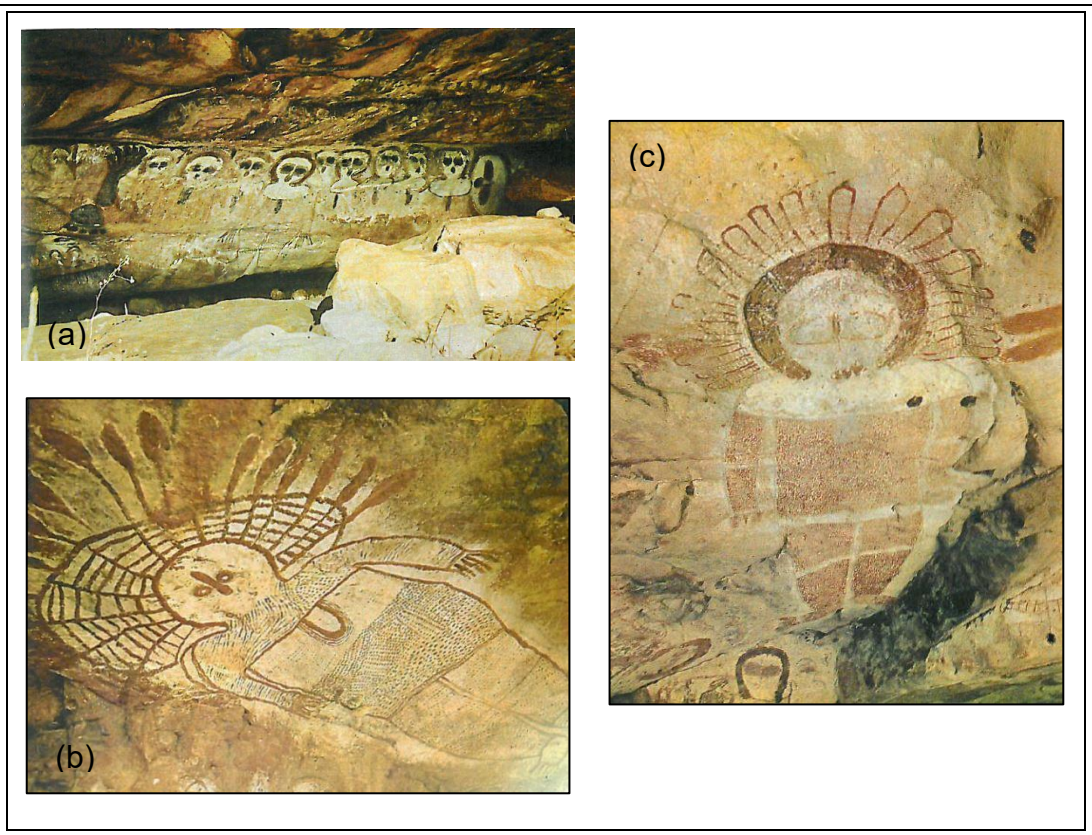


FIGURE 10.2 PHOTOGRAPHS SHOWING DIFFERENCES IN THE WANJINA MOTIF. (A) AT MANNING CREEK (CENTRAL KIMBERLEY) 1964 (CRAWFORD 1968:45) (B) *NAMARALI* AT LANGGI (CRAWFORD 1968:58) (C) *KAIARA* AT CHALANGADAL (CRAWFORD 1968:75).

The Wanjina name is associated with the Worora and Ngaranyin to the north and west of Bunuba Country, and the Wunambal Gambera people in the northwest Kimberley. The name is now used for many figures of similar form in Kimberley, although not by the Traditional Owners on Country. It has become recognised nationally and internationally as an iconic symbol of the Kimberley; from the 2000 Olympic Games in Sydney to the spate of graffiti in Perth 2,000km south (Frederick & O'Connor 2009; Mangolomara et al. 2018; Woolagoodja 2020). The prominence of the name Wanjina makes the recognition of the differences in form and detail, and the nomenclature used by many different cultural groups for whom this rock art figure is part of the pantheon of Ancestral Beings, problematic. Its common contemporary use suggests that in a broad sense it is an appropriate way to recognise this group of variable Ancestral Beings as a Kimberley phenomenon for purposes of comparisons in the region, whilst acknowledging that there is considerable variation and a wide range of nomenclature across cultural areas. This advances the idea that both the Waliarri Family and the Wanjinas may be related as a Kimberley wide style, applying primarily to anthropomorphs, but also to zoomorphs and phytomorphs. There may also be resemblance with similar or iconic figures elsewhere in Australia with similar stories of creation and fertility (Figure 10.3).

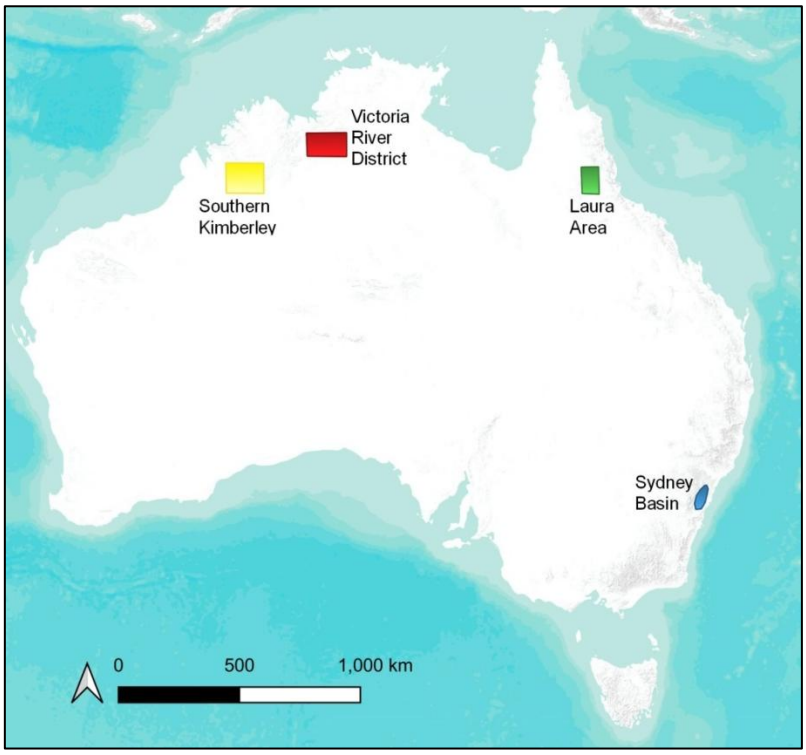


FIGURE 10.3 MAP OF AUSTRALIA HIGHLIGHTING AREAS MENTIONED IN THIS SECTION.

The similarity in relative size and prominence of placement, and in some details of decoration and patterning, to McDonald's Culture Heroes in the Sydney Basin (McDonald 2008a:49, 286-291, 331, 333, 336-339) suggests some similarity of expression within a confined style, and therefore the possibility of an engraved style which bridges distance. However, while there are attributes in common such as body divisions and some internal fill patterns the overall form, faces and headdresses which are an important part of the Waliarri and Wanjina anthropomorphs, are not present in the engraved Culture Heroes in the Sydney Basin (Figure 10.4), discounting these iconic beings as linked; although it should not be discounted that they may have fulfilled a similar position in culture, identity and ceremony. The consistency of style within a defined area and connection across regions should not be discounted in terms of Indigenous links and kinship across large areas through song lines and warrants further investigation and analysis in how this may translate in rock art provinces.

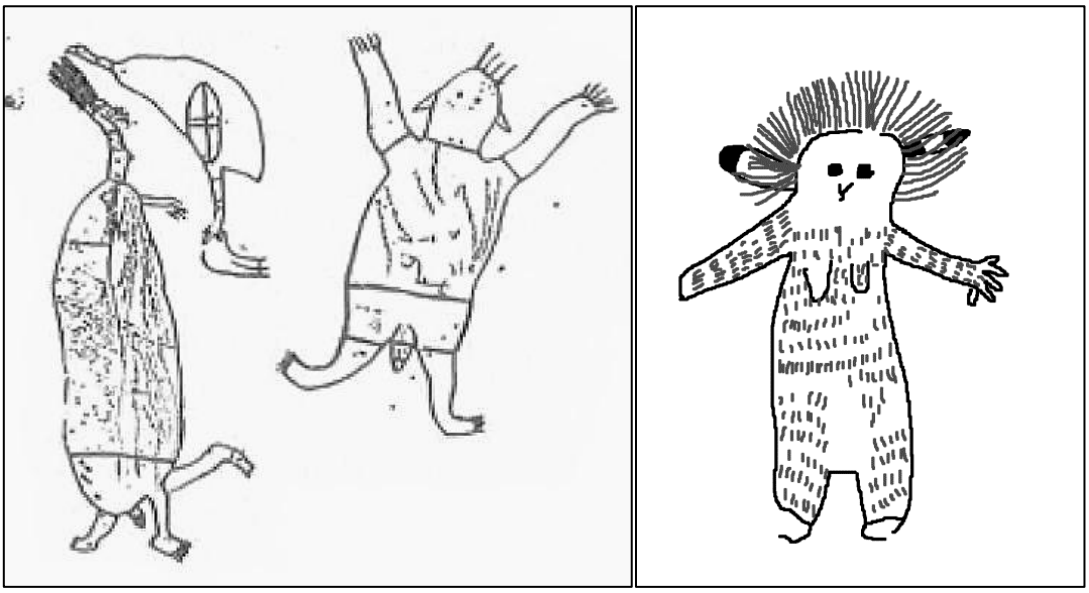


FIGURE 10.4 ENGRAVED CULTURE HEROES (MCDONALD 2008A:290 REPRINTED WITH THE KIND PERMISSION OF JOMCDONALD) IN THE SYDNEY BASIN (LEFT) COMPARED TO A PAINTED WALIARRI IN THE SOUTHERN KIMBERLEY (RIGHT).

Anthropomorphic figures in the Northern Territory and north Queensland may have more similarity to the Waliarri Family and Wanjina styles. This is unlikely to extend north to the nearby Torres Strait Islands where figures are markedly different (Brady 2008a; 2008b; 2010; Brady et al. 2004; Fyfe 2010b).

In the Victoria River District (Northern Territory) bordering the east Kimberley, (Figure 10.3) are large painted anthropomorphs referred to as Lightning Brothers (Figure 10.5). They are in pairs in Wardaman and Nungali Country, and with variation in colour in Ngarinman Country to the southwest (McNickle 1991:39). They resemble the Waliarri Family and the Wanjina-like figures on Miriuwung and Gajerrong[3] Country in the east Kimberley between the two sub regions, having similar headdresses and facial features.

In the same area are anthropomorphs which resemble the Mamo/Djuari variation; dual feathers, or horns as suggested by McNickle (1991:40), and limbs, hands and feet. These figures are often carrying axes and are painted reclining on ceilings, rather than upright with outspread arms/legs and hair like clumps between the feathers, characteristic of the southern Kimberley figures (Figure 10.5), but have enough in common to suggest they may be related (Figure 7.17).

[3] I have used the spelling from the Native Title decision here. It should be noted that there are several spellings used in different contexts, and over time, which is characteristic of Australian Aboriginal languages which were not written prior to colonisation.

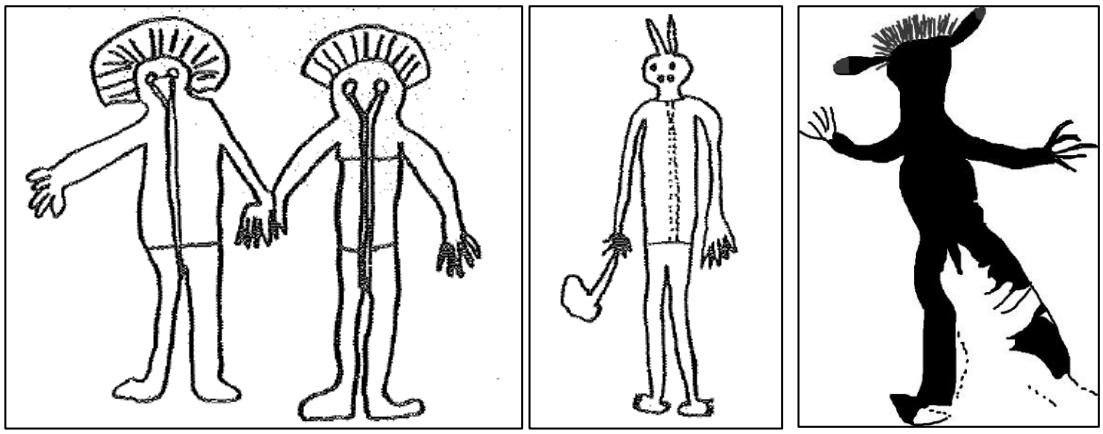


FIGURE 10.5 THE LIGHTNING BROTHERS FROM NUNGALI COUNTRY (LEFT), THE 'HORNED ANTHROPOMORPH' (CENTRE) FROM THE WEST BAINES AREA (MCNICKLE 1991:39, 40[4]), AND A WALIARRI (MAMO VARIATION) FROM BUNUBA COUNTRY (RIGHT).

In Cape York (Queensland), around the township of Laura (Figure 10.3), intersecting the lands of the Kokowarra, Guugu-Yimidhirr and Kuku-yalanji peoples, Trezise (1971b:18, 44-45, 67, 90, 96) recorded many sites with figures resembling the Waliarri and Wanjina. They have the enclosed rayed headdresses shown on the Lightning Brothers (Figure 10.5), the most often recorded feature, in common. Although some figures include dividing lines, eyes and patterned infill many are monochrome solid infill with no internal attributes, so more like the less complex Waliarri 2 variation in the southern Kimberley. These anthropomorphs are not prominent or large relative to other rock art and are intermingled with a wide range of figures on densely painted panels with many layers of superimposition. This does not rule out a stylistic connection as not all members of the Waliarri Family in this study are large, but the figures may not have the same importance as the large polychrome Waliarri in the Kimberley or the Lightning Brothers in the Northern Territory, where they dominate panels.

There are also a range of zoomorphs in the Laura area with lines and pattern infill. These are in distinct grid or a linear arrangement, which is different to those recorded in the southern Kimberley Waliarri Family, where zoomorph infill patterning is mostly the same as the anthropomorph infill patterns (Figure 6.25).

The closest relationship the Waliarri Family may have to other rock art provinces in Australia, outside of the Kimberley, is to figures in the Victoria River District, the geographically closest location identified in my review of published literature. However, they lack commonality in some areas, such as the pairing of the Lightning Brothers, the infill, and the attachment/accompaniment of material culture. There is only one possible pairing which I observed, at Tangalma, with the male and female Waliarri, where the female is much smaller

[4] Reprinted with kind permission from Rock Art Research.

and, while adjacent, does not have the same prominence as the male. The Lightning Brothers are clearly related in form, if not in composition and style, to the Waliarri Family and Wanjina, and are likely to belong to a northern Australia motif style. Further detailed analysis of the rock art in context, and ethnography that follows the song lines and trade routes linking the areas would provide more information linking the styles if that is the case.

Gooniyandi people refer to similar figures painted within living memory as Wanjina (Dorothy Surprise 2011 pers. comm., 30 August; Jimmy Shandly 2012 pers. comm. 23 August). However, discussion on individual figures suggests they have been named differently in the past, with the adoption of the Wanjina name a contemporary western linguistic shortcut, which does not embrace the 'complexity, interconnectedness and relationality' that might be elicited through further input and discussion with Traditional Owners (Roberts 2020:56). Discontinuity and broken or inconsistent linguistic connections because of colonisation, and the partial integration of Gooniyandi people in station life in the twentieth century (Marshall 2011; Smith 2000; 2001), makes it unlikely that more information on past naming conventions will be forthcoming.

It has become clear that the Waliarri Family style is connected to the Wanjina, an umbrella term more appropriate to Worora and Ngaranyin Country, but used mostly by non-Indigenous people to refer to a wide range of Ancestral Beings with similar attributes in the Kimberley region. The relationship to the Lightning Brothers is also possible, but less certain, and more research would be needed to determine the strength of such a relationship. It is likely there are links between named figures and styles in the Kimberley and the Victoria River District, but it should be acknowledged that the naming of Waliarri is particular to the southern Kimberley, with motif variations within the Waliarri Family, which includes anthropomorphs, zoomorphs and phytomorphs.

Therefore, the Waliarri Family is related to the Wanjina, but it has its own way of being, with its range of colours and colour combinations (including monochrome), its lack of prepared backgrounds from which to shimmer, and its splayed arms and legs. While these make them different, their form, infill, body divisions and faces, and the general shape and composition of the headdresses show they are cousins rather than siblings (or twins). Thus, there is a broad style, or way of creating these Ancestral Beings, which likely unites cultures across the Kimberley and across northern Australia, it allows for maintenance of local cultural differences in motif and linguistic variation.

The other study area wide style, Monochrome Stencils, is present worldwide, so it was not unexpected in the southern Kimberley. What was unexpected, given my own and other

researchers' experiences, including in other parts of the Kimberley (Jo McDonald and Peter Veth 2015 pers. comm., 7 November), is that hand stencils are overwhelmingly white and material culture stencils only in reds in Bunuba Country. There is no lack of red ochre in Bunuba Country, as attested to by its dominance in the rock art (Figures 6.4 and 6.5). This suggests that white is a Bunuba choice, perhaps to make the stencils stand out from the other rock art and thereby affirm personal connection and Bunuba identity at sites.

It was also unusual that hand stencils were less present in Gooniyandi Country (Table 6.42). Despite fewer sites recorded in Gooniyandi Country the five hand stencils[5] (three white, two red) statistically averages to less than one hand per site, compared with an average of more than eight per site in Bunuba Country. Sites in Gooniyandi Country are more separate because of the geology and semi-arid environment, compared to sub-tropics of western Bunuba Country, suggesting that the lack of hand stencils may mean less need for territorial marking by family groups in Gooniyandi Country (David 1991; David & Chant 1995; Smith 1992b; Storey 2012; Taçon 1994; 1999; Williams et al. 2015).

Thus, while white hand stencils are not as common as red stencils, they are far from unique (Dobrez 2013; Taçon et al. 2022) and may be more of a local or clan variation than a stylistic one particular to the southern Kimberley.

Local Styles

The Round Bodied Grouped Anthropomorph style has limited distribution, and many of its attributes might be described as a more generic monochrome style. Literature reviews have not revealed any similar compositions of this form of anthropomorph, although groups are not uncommon (Trezise 1971; Wesley et al. 2017). The group compositions, round bodies, small round heads, and simple linear limbs splayed as if jumping and reaching outwards at the same time suggests they represent an idea, or a gathering of people in ritual or celebration (Figures 7.4 and 7.5). Most figures in this style are white pigment, and this precludes the inclusion of zoomorphs in the style, as there are few in white in this area despite its availability. It does not bar the inclusion of wajarri (boab nuts) at the same sites, which are also white, of similar preservation, and may be of a similar age and classified in the same style. However, only Fairfield 2 has wajarri in possible composition with anthropomorphs in this style, and in the same colour. If Fairfield 2 is the index site for the style, then only the anthropomorphic component has been adopted at other sites; if not,

[5] Note, this differs from the numbers in Table 6.42 because two of the human hands were either painted or printed.

then, the wajarri have been added only at that shelter. It is possible that an association between anthropomorphs and phytomorphs may not have been clear, and therefore extended to other sites, or that the association is unique to Fairfield 2. In the absence of other evidence, the style is restricted to anthropomorphs at specific sites (Figure 9.32), making it a local style particular to Bunuba Country.

Abraded/Scratched Solid Infill style is even more local. Personal recollections (Johnny Bell 2011, pers. comm., 6 September) confirmed that the rock art was created in living memory. While metal implements such as fence wire and knives may have been used, the rock art represents traditional subject matter including anthropomorphs with conical headdresses (Figures 6.15, 6.17, and 6.18) and emus (Figure 7.9). This is important because it is representative of the continuity of rock art, the continuity of tradition in the face of colonial incursions, and a style defined primarily by the way it is created, technique (O'Connor et al. 2013). The style is site specific, but further exploration of sites in the vicinity or on stations, which was not possible during this study, where some of the same people are likely to have worked, may reveal more figures in this style. Having a style defined by technique alone is in keeping with some of the discussion around the need for style at all, given such a large proportion of most rock art assemblages do not get classified into a stylistic group (55% of figures in this study were placed in broad groups or not grouped at all, Tables 7.14 and 7.15), and thus not fitted into analysis in a meaningful way from a Western academic perspective (Johnston et al. 2017 discuss this in some detail). By defining this as a style it allows it to be considered as an important variation in how rock art is and was produced in the southern Kimberley and provides insight into the different approaches and meaning of rock art in culture outside of the remit of this thesis, but useful to future scholars.

Not so tightly localised, but not found everywhere, is the Black & White style. This style was first observed at Emanuel Gap, and then later at Louisa Downs 1, the easternmost site in this study. Unlike many of the other styles being defined by anthropomorphs this style is not only defined by zoomorphs but dominated by them (Table 7.14). A single figure has been recorded in Bunuba Country suggesting that this style is local to Gooniyandi Country, but there is some doubt it is part of a stylistic tradition that has extended to Bunuba Country, as the Bunuba site has been publicly accessed by colonial settlers and other visitors for at least a century. This is a very particular depiction of humans and animals that make them stand out from the other rock art and may have been a motif of an individual or a family group moving through Country. Traditional Owners (Mervyn Street and June Davis 2011 pers. comm., 14 September) indicated that they moved over great areas, as their ancestors had

done, to camp beside the permanent pools of the river when the rains did not replenish the streams, including from Moonggaroonggoo to Louisa Downs 1.

The Engraved Animal Tracks style is local to Bunuba Country. These were recorded at only two sites (Tangalma and Tarakalu 1). This is an unusual omission in rock art assemblages (e.g. McDonald & Veth 2007; 2009; Mulvaney 2015b), especially given the availability of surfaces and tools at most sites recorded in this study (Maloney 2020; Maloney et al. 2017a; Maloney et al. 2017b; Maloney et al. 2018a; Maloney et al. 2016), including those where deeply incised lines or abraded grooves were recorded such as Marawun 4 and Riwi. Those sites are in the western part of Bunuba Country (Figure 9.30). While found in Bunuba Country in this study, engraving animal tracks is a widespread practice in Australia and fits within the Panaramitee style described by Maynard (1976) and observed widely in Australia (e.g. Franklin 2007a; Fyfe 2010b; McDonald 1993; McNickle 1984; Mulvaney 2015b; Taçon et al. 2022). Therefore, while this can be isolated as within the southern Kimberley it does not stand as a style separate from other regions in Australia, and would be included within the geometrics, circles, spirals and tracks of the Panaramitee style.

Three localised (but not all exclusive to the southern Kimberley) styles in Bunuba Country (concentrated in the west/southwest) and a different style in Gooniyandi Country suggest that there is some separation of identities between the cultural groups. The Bunuba local styles are towards the contemporary borders with western neighbours, suggesting the potential for information exchange through trade, marriage networks and sharing of resources (e.g. Conkey 1978; DeBoer 2009; McDonald 2008a; McDonald & Harper 2016; Wobst 1976). The Gooniyandi style (though limited by the number of sites recorded) is spread across their Country suggesting sharing information over greater areas, and perhaps more movement over seasons, given the less hospitable environment. This suggests that there are styles within Bunuba and Gooniyandi Country which are there to mark territory or express identity (locally), within an area where other styles are simultaneously present which show they are part of a wider cultural identity and territory with affiliations and ongoing interaction and movement in the southern Kimberley.

Colour and Pigment

Colour in rock art is important in two ways: firstly, colours and colour combinations may define a style, making it particular to a place, an area or a cultural group, and secondly it may be used to link artefacts or features in excavations with extant rock art.

As described above, the Black and White style is characterised by the distinct combination of colours, in a composition of black infill and comparatively wide white outlines. Published sources I have examined do not have this combination, and it has not been mentioned in discussions in which I have participated. That makes colour and pigment the major defining characteristic of this style, and intrinsic to the way in which Gooniyandi people may express their identity or mark their territory.

Pieces of limestone with paint, and pieces of pigment in the dominant pigment colours (red and white) were recovered in excavations. None were matched directly with figures, and, therefore, with any style or motif. This means there is no clear link between rock art and site chronology, other than to acknowledge that at dated levels where flakes and fragments were found it is likely that rock art was produced at the site (e.g. O'Connor & Fankhauser 2001).

Lack of links between rock art and excavated remains does not mean that this is not worth exploring further. Pigment sources may provide information on trade and social links, as well as the potential antiquity of the rock art. This may be possible with Portable XRF scanners, the results of which can be used to compare painted rock art with potential ochre sources (Huntley et al. 2015; Huntley et al. 2014; Huntley et al. 2011; Vázquez et al. 2008). It may be useful to identify whether all colours used in a polychrome figure were from the same place, and if sourced from different places, then the rock art may have been produced over time or only executed when all the resources were present in a special ritual, where different participants brought different pigments as part of the ceremonial exchange; telling a new story for rock art production, rather than the idea that people created images, styles or compositions in one sitting, or at one time.

Some analysis requires both touching and removal small ochre samples, and permission to do that is becoming easier as Traditional Owners become well informed about the researchers, the process and the results that could benefit them in political, economic and social pursuits (McDonald et al. 2008; Scadding et al. 2015).

Pigment deterioration rates vary, depending on environmental and exposure factors (Ford et al. 1994). If one pigment location was found, or a chemical analysis made, it may not provide sufficient or reliable evidence to provide insight into rock art or life in the area, and therefore whether the use of that pigment is or was integral to the style, motif, or creation of the rock art or not.

While colour, and colour combinations have been part of describing and sometimes defining the idea of style, they are also part of the story of trade and movement and additional

analysis of the pigments themselves would add substantially to knowledge of variations in the rock art in the southern Kimberley.

Synopsis

There are figures and styles for which the presence of colour combinations is important, others for which a single colour is a defining factor. There are some for which technique is more important. Each contributes to the description of styles, the ways of creating rock art in the southern Kimberley.

The nine motif classes in the southern Kimberley are common across most rock art provinces. There is one figure, starburst/lightning, specific to Bunuba Country, two local styles not seen elsewhere (Round Bodied Grouped Anthropomorphs, and Abraded/Scratched Solid Infill), one style that is common throughout the world but only found at two sites in Bunuba Country in this study (Engraved Animal Tracks) and another which is also worldwide but dominated by the less common white pigment and not widespread in Gooniyandi Country (Monochrome Stencils). Similarly, the Black and White style is local to Gooniyandi Country.

The Waliarri Family style, with three major variations, is found across the southern Kimberley, and it can be concluded that it is connected to the Wanjina (which also has variations) of western, northwestern and north-eastern neighbours in the Kimberley, and likely to adjacent areas in the Northern Territory in the Victoria River District, and possibly more widely across northern Australia.

Keeping up with the Joneses: Style and Motif Profiles West to East

Defining borders is intrinsically difficult, but to answer the questions on how motifs and style differ from neighbours it is useful to know the extent of territory claimed by each cultural/linguistic group, and how they describe it themselves.

Borders are not always clear to contemporary people and may never have been well defined (e.g. Williams 1982; 1986[6]). Colonial policies separated people from both culture and Country, and knowledge of Country, and borders, waned for other reasons too. Alcohol and its impact on the community and the Elders meant that knowledge was not always passed on by some generations (June Oscar 2011 pers. comm., 7 September). Place names are a

[6] Williams provides considerable insight into how the Yolngu (see Glossary) see borders as negotiable, challenged and not always exclusive, depending on the circumstances and the economic and socio-cultural context, which are 'ultimately rooted in myth, to indicate their social identity … [they] do not conceptualize boundaries in terms of rights or exclusive enjoyment so much as rights to allocate use to others' (Williams 1982:131).

good example of how relatively recent information, or interpretations, may be disputed or unclear. This may create difficulties for researchers who seek definitive answers, but archaeological results are often inconclusive and subject to different interpretations, so it becomes less of an issue if the changes are documented, and we keep good records (e.g. May et al. 2017).

Broome (1994:14-15) suggested that in northern Australia people saw their territory as static, and did not seek to live in, or own, the Country of other tribal groups

> *Our fathers taught us to love our own country, and not to lust after the lands belonging to other men. They told us that Ilbalintja was the greatest bandicoot totemic centre amongst the Aranda people, and that, in the beginning, bandicoot ancestors had come from every part of the tribe to Ilbalintja alone and had stayed there for ever: so pleasing was our home to them* (cited in Broome 1994:14).

The idea of static territories in is not always supported by evidence in the Kimberley; people moved, travelled, were not always present at, or visited places periodically during times of stress or change (e.g. McGowan et al. 2012; O'Connor et al. 2014; Smith 1992a; 1992b; 1999; Vannieuwenhuyse 2016; Vannieuwenhuyse et al. 2016b). This may equally suggest that there are shared or liminal areas in which there was greater movement, and in which visitors, traders and new people were welcomed, whilst a core of static territory was maintained.

Like the Aranda, contemporary Bunuba and Gooniyandi people are certain of their Country, and do not seek to expand it. They do seek to maintain language and culture and increase their population through intermarriage with other cultural groups (Patsy Bedford 2012 pers. comm., 14 August).

The most widely used and accepted map of Aboriginal nations/languages in Australia is Tindale's map (2009), which was the result of extensive research in the 1920s and 1930s, and Native Title maps broadly follow these boundaries. Even though the map may not reflect Indigenous ideas of boundaries, they do reflect a 21st century adaptation to accommodate relatively static legal requirements within a cultural framework.

In this study Native Title Claim boundaries are used, including excluded areas, such as National Parks or private property (Figure 1.2), which are still traditional Country, but without the legal rights associated with Native Title Grants. Bunuba and Gooniyandi people have the same linguistic roots, so they have less difficulty understanding one another than their neighbours. They are physically and geographically separated by the Bandaral ngadu

(Figure 1.2), and there are climatic, geological, and environment differences between the two cultural areas (Chapter 2).

In Social Interaction Theory, which has some similarities to Group Boundary Formation Theory (Veth et al. 2021), sharing information suggests that increased contact between people results in homogenous rock art (Hill 1985). Information Exchange Theory, on the other hand, suggests that increased interaction results in more heterogeneity, as different people communicate their differences through establishing and maintaining different styles; a way to protect their intimate and familial identities (Wobst 1977), or conform with variations to form alliances (Veth et al. 2021; Wobst 1976).

Archaeological and ethnographic studies tend to support the Information Exchange Theory (Chapter 4), on the understanding that information is exchanged for many purposes, and to different degrees, including defining boundaries to protect resources and cultural identities. These may be expressed in creating the same motifs with variations to support alliances but maintain separateness, or more definitively with different motifs and styles to reinforce difference (McDonald 1999; 2000; Smith 1992b; Veth et al. 2011; Wiessner 1983; 1985; 1989; Wobst 1976; 1977). These may exist together in the same landscape; styles to unite and styles to divide.

It is clear there are local styles established in the southern Kimberley, which may form borders because of interaction between the cultural groups leading to a need to mark parts of territory using distinctive figures or styles. The Abraded Solid Infill style is a strong statement by Bunuba stockmen that they were connected to Country by creating traditional imagery with non-traditional tools (O'Connor et al. 2013), communicating this to both one another and any non-Bunuba stockmen who might wander into the cave, adapting to the working relationships, while maintaining cultural heritage.

Weissner (1983) describes these as assertive styles which differentiate individuals or smaller groups, compared with the more emblemic styles which link the larger cultural groups, to form what Wobst describes as affiliations, such as for establishing marriage networks (1976). This suggests a need to assert identity, to build strength through establishing differences between cultures. It indicates that for some Bunuba people this may have been more important for family/clan groups at their western borders in recent times, than between themselves and Gooniyandi people to the east, which were well established geographically by the Bandaral ngadu and required less maintenance through rock art differentiation.

The overall motif and style profiles of Bunuba and Gooniyandi Country cannot be directly compared to their neighbours at this stage, as published analysis of the full corpus of rock art from their neighbours has not yet been undertaken. However, near neighbours to the west/northwest including the Worora, Unguumi and Ngaranyin have well documented Wanjina figures, though distribution is not clear as most of the recording has been incidental to other research, and incomplete because the other rock art on the panels around it was not recorded (Akerman 2009b; 2014; Blundell 1974; Blundell & Woolagoodja 2012; Crawford 1968; 1973; Donaldson 2012b; Playford 1960; Playford et al. 2009; Welch 2016). The relatedness of the Waliarri Family in the southern Kimberley to the Wanjina in the west and north (Unguumi and Ngaranyin neighbours) is shown in the dense concentrations of the style in the west of Bunuba Country (Figure 10.6), suggesting that there are, or have been, strong interactions or affiliations between the cultural groups, with the variations reflecting that some differences will be maintained.

To share these ideas there must be information exchange (Balme & Morse 2006; Balme & O'Connor 2017; 2019; Balme et al. 2018a), through marriage (e.g. Bates n.d.; Blundell & Layton 1978; Elkin 1931; Kaberry 1939) or trade (after Smith 1992a; Smith 1992b). Therefore, for as long as the Waliarri Family have been prevalent in the western part of Bunuba Country the borders between Bunuba, Unguumi and Ngaranyin must have been porous, flexible and with people likely moving between them on a regular basis.

The linking motif and style from the west to east between the Bunuba and Gooniyandi people, and their western neighbours, are the Waliarri anthropomorphs. There are Waliarri anthropomorphs at recent levels of superimposition in Gooniyandi Country linking the two areas stylistically, and therefore, linking them with their western neighbours, whilst maintaining their separateness from one another and those neighbours through the local styles (David & Chant 1995; Franklin 1986; 1989; McDonald 1999; 2000; Sackett 1986; Smith 1999; Wiessner 1982; 1985; Wobst 1977; 2000).

The differences in the rock art profiles of Bunuba and Gooniyandi Country include the dominance of anthropomorphs (Bunuba) and zoomorphs (Gooniyandi). This is visible in the Gooniyandi specific Black & White style which is mostly zoomorphs (78%), and is placed either in the first two layers, or without superimposition (88%). This suggests little change in the style or figure choice over time but indicates a stable and maintained style-border between Bunuba and Gooniyandi rock art, and perhaps a need to distinguish between the two peoples through the rock art in recent times with strong, distinct stylistic markers (Wobst 1977).

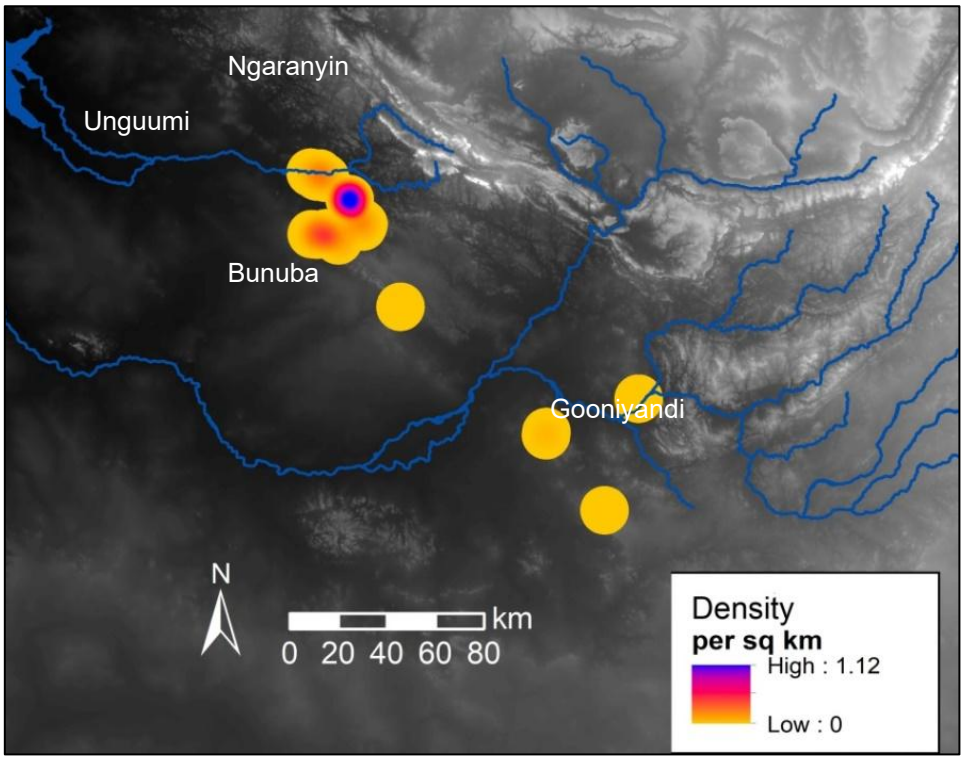


FIGURE 10.6 DENSITY OF WALIARRI CLOSE TO BORDERS WITH UNGUUMI AND NGARANYIN COUNTRY.

The Gooniyandi Black & White style requires further investigation as comparatively few sites were recorded in this study. Its presence across a wide geographical distance in Gooniyandi Country and several layers of superimposition suggests border maintenance may have been important for the larger group, and for longer, perhaps because the permanent pools of Bandaral ngadu, and the Mary and Margaret Rivers may have been areas of intense competition for resources from neighbours from the southern arid areas during the dry season (Veth et al. 2021:197-199 has an in depth discussion on Group Boundary Formation). The Bunuba people are less likely to have been seeking these water sources in their semi-tropical climate, which is reinforced with the closest site with the Black & White style c.40km SE of Fitzroy Crossing, well within Gooniyandi Country.

Other figures in recent superimposition layers in Bunuba Country include the local Round Bodied Grouped Anthropomorphs. Like the Black & White style, this establishes difference, belonging, identity (Wobst 1977; 2000). This local style occurs within Bunuba Country, with families possibly competing for resources where the sites are located close to water sources. Like the Black & White style in Gooniyandi Country these figures are a long way (>100km) from the Bunuba/Gooniyandi border areas.

The detailed polychromatic variation of the Waliarri is not well represented in Gooniyandi Country, suggesting that it may be a relatively new figure. Its presence suggests that where

ritual or ceremony is associated with its creation it is likely part of information exchanged by special visitors, most likely from Bunuba Country. Gooniyandi Elders refer to one large polychromatic figure as Dancing Man (Figure 9.47), but do not have stories relating it to place, Country, or any stories of abundance, fertility or floods as do Wanjina legends (June Davies, Helen Malo 2011 pers. comm., 1 September). This implies that interactions in which such information was shared may have been rare, implying that Bunuba-Gooniyandi borders are likely to have been well-defined over time, but more porous in recent times as the motifs and style spread from west to east, with more variations developed as it travelled east.

Synopsis

The longer-term connection is not as strong between the Bunuba and Gooniyandi as it is between Bunuba and Unguumi/Ngaranyin to the west. They do not share a high density of anthropomorphs (or any other motif) with the common attributes that the polychromatic Waliarri has with the Wanjina (Figures 10.2 and 10.6). However, the presence of the Waliarri Family variations across the southern Kimberley shows the likely spread of the shared style in recent rock art.

Distinctive local styles not shared with western neighbours, or one another, suggests that there may have been a need to have a level of border demarcation between Bunuba and Gooniyandi people for identity reinforcement or continuity. This was not substantial enough to restrict sharing information, marriage or trade between the cultural areas; suggesting that while the movement of the shared styles was acceptable it was also important to show visitors that they were not the same people, they had different cultures, different identities.

It becomes clear through this analysis that when the rock art styles and motifs are compared between the Bunuba and Gooniyandi and their western neighbours there is a similar dominant style (Waliarri Family/Wanjina) which links them and suggests substantial interaction between them. However, smaller localised styles reinforce their differences and define territory, and that a balance has been maintained between interaction and information exchange whilst retaining cultural distinction.

Change Over Time

Many of the sites in this study have always been important to Bunuba and Gooniyandi people (cf. June Oscar, Mona Oscar, Raelene Oscar, Bunuba Rangers, Christopher Dann, Dylan Andrews, Jonny Bell, Jimmy Shandly, Lorraine Shandly, Helen Malo, June Davies, Mervyn Street, Isaac Cherel, Tommy Dick, Rosemary Nuggett, Dorothy Surprise, Patsy Bedford, Selena Middleton, Patrick Green, Joe Ross, Jamika Oscar, 2011, 2012 pers. comm.), and occupation in the region and the many layers of rock art superimposition suggest this has not changed (Balme 2000; Balme et al. 2018b; Frawley & O'Connor 2010; Hiscock et al. 2016; Maloney et al. 2014; Maloney et al. 2016; Maloney et al. 2018b; McConnell & O'Connor 1997; O'Connor 1995; O'Connor & Fankhauser 2001; O'Connor et al. 2014; Vannieuwenhuyse et al. 2016a). To have the same or similar figures present and to have images refreshed over time (Bowdler 1988; Mowaljarlai et al. 1988; O'Connor et al. 2008b; Vinnicombe 1992) shows continuity of tradition and ceremony, and maintenance and reinforcement of connection to Country (Morphy 2012a; Motta 2019).

Rock art is one of the touchstones to ancestors, and a central element of contemporary life. When the *Lifeways* team went into the field with Elders we were introduced to the land and the spirits; reinforcing the importance of places we would visit and their responsibility to care for the land. In Bunuba Country this included being splashed with water from a brook with water spirits, and burning special wood gathered by Bunuba women where we camped, and where they walked towards us with the smoking branches saying to the spirits ‘These fellas are coming to see you old folk, they won’t do any harm, welcome them to your place’, and keeping the wood smoking overnight for protection.

In Gooniyandi Country there were also smoking ceremonies, with words of introduction to greet the spirits of the ancestors, and sometimes extra protection with Traditional Owners staying back to share stories and share knowledge about the plants and medicines as we worked. These cultural and safety measures are essential when working on Country. Traditional Owners know the Country, know the dangers and will ensure that people are safe in the physical and spiritual realms, which comes from building trust and respect for the protocols.

Telling stories of the land and your relationship to it is central to understanding how the land is, how it has been and how it will affect you. The Ngarranggani[7] are the beliefs and practices that provide a discourse for life (Pannell 2000). While being introduced to Country is a mere

[7] The Dreaming/Dreamtime.

snippet of my interactions with the Country and the people, they are important to my own understanding of Country now and in the past, as they are to the Bunuba and Gooniyandi people. Pannell (2000) believes it is important to know the role of the Rainbow Serpent, Galurru[8] (Chungul et al. 1988), a common theme in the contemporary belief systems of the Bunuba, Gooniyandi and cultural groups around them. Galurru shapes the land and the rocks; it carves out the creeks and rivers, filling them with water. Galurru has meteorological powers (Pannell 2000); creating the seasons, the clouds, thunder and lightning, both bringing and holding off the rain, and rolling down hailstones when human behaviours harm the land. This is comparable to Rainbow Serpent stories in central and northern Australia (David 2002; David et al. 2006; Flood 1989; 2006; Morwood 2002; Taçon et al. 1996), which anchor people to deep history. To the north and west of the study area creation of the land and control of the weather are also the province of Wanjina. The importance of Wanjina and Galurru working together, or separately, is seen in recurring themes in the rock art in those areas (Capel 1939; Elkin 1930a; Mudeling 1998; Taçon et al. 1996; Woolagoodja 2020), reinforcing the continuity and connections with the past, though not explicitly in the southern Kimberley.

Dating continuous occupation of the region does not mean that creation of rock art was continuous but does suggest that occupation sites were also those chosen for rock art (e.g. Balme 2000; Balme et al. 2018b; Hiscock et al. 2016; Maloney et al. 2017a; Maloney et al. 2014; Maloney et al. 2016; Maloney et al. 2018b; O'Connor 1995; O'Connor et al. 2014; Vannieuwenhuyse et al. 2016a; Whitau et al. 2016a; Whitau et al. 2017; Wood et al. 2016).

The earliest occupation at Tangalma is likely more than 40,000 years ago, and a slab of limestone with ochre markings recovered in excavation suggests rock art of similar antiquity (O'Connor & Fankhauser 2001). There are periods of no, periodic or occasional site use (Maloney et al. 2018a; Maloney et al. 2018b; O'Connor 1995), and up to four layers of superimposition in the rock art. This tells us little about the frequency, or intensity of rock art over that period, only that it did not experience as much superimposition as the other site of similar occupational antiquity close by, Langurmurru. It is not easy to date the cupules, incised lines and abraded grooves, or the large incised crocodile on a ledge at Tangalma (Figure 7.15), but, if these are among the earliest form of human marking as suggested by Taçon et al. (1997) and others (Bednarik 2008; Veth 2013; Veth et al. 2021; Welch 1990),

[8] Also known as Unguud, and other names across the Kimberley and Australia, e.g. where I live in Noongar Country it is the Waugul/Waugyl. See Glossary.

then they may represent early rock art at Tangalma and suggest change from early engraving to the more recent painting.

Langurmurru 3km away was occupied from 29,450 +/- 200BP to the historic period, with some periods of discontinuity. Bayesian modelling suggests the discontinuity may have been longer and related to extreme climate variation and aridity making the area inhospitable for humans (O'Connor et al. 2014: 13-15, 18-20), although other factors may also be at play, such as intense occupation or flooding events eroding evidence (Vannieuwenhuyse 2016; Whitau et al. 2018). Changes in styles, motifs and five superimposition layers suggest that this site has most likely been continuously or episodically used during that time. There is no dated anchor point for rock art at Langurmurru, such as at Tangalma (O'Connor & Fankhauser 2001), but calcite overflow on the thylacine (*Thylacinus cynocephalus*) at this site (Figure 10.7) may provide some insight the antiquity of the rock art if new dating methods are applied.

Excavation at other sites, and studies of lithics in southern Kimberley, confirm site use and occupation from c.50,000BP to the late Holocene (Balme 2000; Balme et al. 2018b; Dortch et al. 2019; Goldhahn et al. 2022; Hiscock et al. 2016; Langley et al. 2016; Maloney 2015; Maloney et al. 2017a; Maloney et al. 2014; 2017b; Maloney et al. 2016; Maloney et al. 2018b; O'Connor et al. 2008a; Vannieuwenhuyse 2016; Vannieuwenhuyse et al. 2016b; Veth et al. 2019b; Veth et al. 2021; Whitau et al. 2016a; Whitau et al. 2017; Wood et al. 2016). Excavations also recovered ochre, flakes and stone marked with ochre (Chapter 8, Tables 8.4, 8.5, 8.6 and 8.7), but none could be linked to the rock art. What these finds did indicate was that ochre, whether used for rock art, personal decoration, ceremonial, or other activities, was used at the same times when datable remains show the sites were occupied, and therefore rock art was likely at those times too because of the presence of the ochre and marked flakes. At Langurmurru this could be extrapolated to rock art being present between at least as early as 11,250 +/- 50BP (Table 8.4), although likely less at Djuru East with the earliest ochre marked flake likely less than 8,807 +/- 50BP (discounting an anomaly date at XU25, Table 8.5). At Mount Behn 1 a single flake was recovered at layers below the oldest dated XU (5,060 +/- 40BP), which is consistent with the older dates within layers in the flake from the wall analysed by Maxime Aubert (see Figures 8.1 and 8.2, and Table 8.1) potentially older than 13,900 +/- 2,900BP. Similarly, at the east of the study area flakes were recovered at layers below the oldest dated XU in Squares 3 and 4 at Riwi, suggesting rock art is likely to have been created for more than 42,000 years (Table 8.7) and consistently over that time until the present.

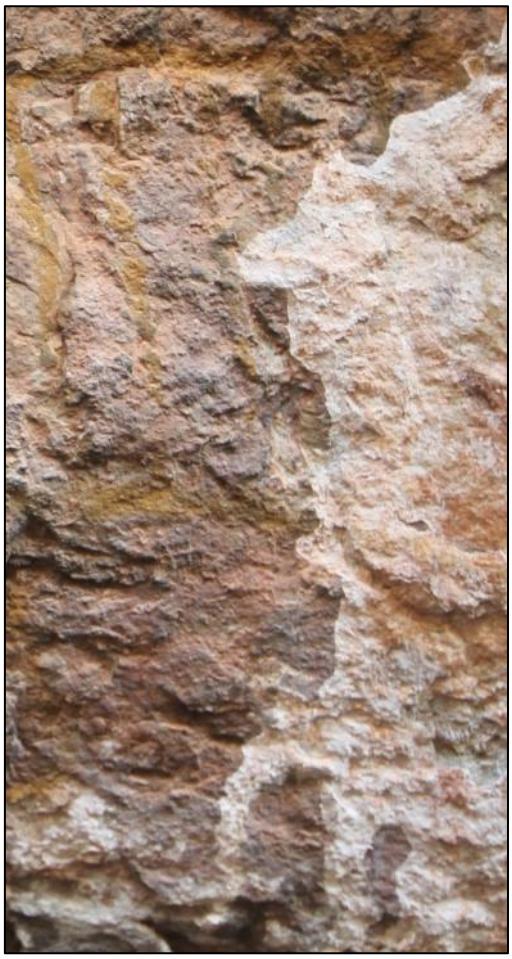


FIGURE 10.7 CALCITE FLOW WHICH COVERS PART OF A THYLACINE AT LANGURMURRU (SEE ALSO FIGURE 7.24).

Certain styles and their associated figures occur at most layers of superimposition and might be said to have a continuous presence. The Bunuba style sequence (Figure 8.59) shows that the three variations in the Waliarri Family co-existed in Bunuba Country, and at the same time as the Monochrome Stencil style, in more recent superimposition relationships. That continuity in superimpositions is also present in Gooniyandi Country (Figure 8.60) suggesting that if:

- the Waliarri Family presence through superimposition layers is continuous, then cultural identities associated with this style are likely to have been continuous, or episodically reinforced over time;
- the Waliarri Family style figures are primarily superimposed by one another, then either:

  (i) the figures may have been created over an intensive short period, as part of a ceremonial or ritual activity; or

  (ii) there was a clear understanding that like must be replaced by like over a longer period; or

- the Waliarri Family style is identified at both the oldest and most recent superimposition layers it may not be contemporaneous with other styles, rather, it may be preserved, or refreshed as an important part of the iconography necessary to:

  (i) maintain links with neighbours for trade, marriage and sharing of resources during times of scarcity (e.g. Smith 1992b; Wobst 1976);

  (ii) maintain continuity of beliefs and identity (Mowaljarlai et al. 1988; O'Connor et al. 2008b; Utemara & Vinnicombe 1992; Vinnicombe 1992; Woolagoodja 2020); and/or

  (iii) mark territorial boundaries (David & Chant 1995; David & Cole 1990; Franklin 2007b; Ross 2002).

Another style recurring over time is the Monochrome Stencil, in the classes Tracks (hands) and Material Culture. The hands are particularly prevalent in some areas, and predominantly stencilled in white pigment (91%), the majority of which are left hands (57%).

At Mount Behn 1 hand stencils are grouped, and in complex superimpositions. At most other sites they are in small groups, single figures, or superimposed on other figures. It is possible that the dense group of hand stencils at Mount Behn 1 (Figure 6.37) was created in a single intensive episode, as all of the white pigment is similarly bright and well preserved. Hand stencils are in multiple superimposition layers, with greater density towards the western part of Bunuba Country making this an important, if localised, practice. The use of white pigment when red is freely available is a distinctive choice in this area; especially when adjacent areas in the southwestern Kimberley have large numbers of red hand stencils (McDonald & Veth 2014 pers. comm., 7 November). It is also a remarkable choice, given that all stencils of material culture recorded in this study are red. White pigment for hand stencils is consistent through superimposition layers, suggesting it may also be a marker in this territory which has been maintained in the southern Kimberley over time. The family group of red hand stencils at Elimberrie Springs (Figure 7.37) is less usual in this assemblage, and it is possible that non-Bunuba visitors made these stencils, maintaining their own traditions. It may also be an indicator of intermarriage where one tradition is chosen over another at this site close to the southern border.

Groups of deeply incised lines and cupules are recorded at a small number of sites. While this potentially early form of marking (Bednarik 2008; Taçon et al. 1997; Veth 2013; Veth et al. 2021; Welch 1990) is present in the western part of Bunuba Country, lack of

superimposition means it cannot be chronologically sequenced or change over time detected. Similarly, cupules and incised lines do not have any visible differences which would suggest style change over time.

The only other figures in the assemblage which might indicate change over time or place are zoomorphs. Reptiles are the most prolific across the study area, particularly snakes and lizards. Snakes are at most superimposition levels and are found at almost every site. As snakes are important in the local stories (e.g. Chungul et al. 1988; Elkin 1930a; Taçon et al. 1996; Woolagoodja 2020), as well as a food source and a danger, this was not unexpected.

Snakes in Waliarri Family style suggests a connection with creation stories about Galurru: all snakes in this style are in Bunuba Country, with most (70%, n=14) at Mount Behn 1, and few in superimposition relationships to suggest change over time. Lizards are spread across the study area; Elimberrie Springs (n=22), Mount Behn 1 (n=18) and Moonggaroonggoo (n=18) are the only sites with more than ten lizards. There are two lizards in Waliarri Family style, both at Mount Behn 1.

Crocodiles are also recorded, but more scattered: five are in Gooniyandi Country and 31 in Bunuba Country. There are two crocodiles in Waliarri Family style, both at Mount Behn 1, linking the presence of Waliarri Family style lizards, snakes and crocodiles in this style primarily to this site. This makes Mount Behn 1 a site of importance for both anthropomorphs and zoomorphs in Waliarri Family style, but with little superimposition for zoomorphs change over time cannot be reliably assessed.

While snakes, lizards and crocodiles are present across the study area they are either not distinct enough to be part of a style other than those in the Waliarri Family style, which is not present for zoomorphs in Gooniyandi Country, and only a small number of snakes at Mount Behn 1 and four other sites in Bunuba Country.

What might have been expected in the rock art are depictions of kangaroos, wallabies, dogs/dingos and fish, all of which are important food sources or companion animals, prolific in the area (personal observation) and which are present in other proposed Kimberley chronologies (Goldhahn et al. 2022; Ross et al. 2016; Veth 2013; Welch 1993b; 2016). These figures are depicted in the rock art in the study area, but they are few and scattered, they are not dominant by size, or in any style or group, at any site, or at multiple superimposition layers that may suggest changes in form or style over time.

Wanggu (yams) make up the majority of phytomorphs (63%) and are recorded across the study area. The greatest number recorded at Mount Behn 1 (n=47, 48% of all wanggu), and

a total of 12 (12%) in Gooniyandi Country. Wanggu are mostly in Waliarri Family style (62%) at Mount Behn 1 (n=42, 43%), with small numbers at other sites in Bunuba Country. Wanggu are mostly recorded in the top 2 superimposition layers, or without superimposition (n=77, 79%), suggesting their inclusion may be either relatively recent or important enough not to be superimposed.

Synopsis

The most common theme in superimposition layers, in distribution density and visibility is the strong presence of Waliarri Family style, concentrated in the west of the study area. This occurs most intensely at sites within 20km of the Lennard River, notably at Mount Behn 1, Tangalma and Langurmurru. It is also well represented in sites to the southwest along the Marawun escarpment including Elimberrie Springs.

The Waliarri Family style is continuous through superimposition layers, and contemporaneous with other styles. This suggests that while the differences in complexity and colouring in figures was maintained, those differences were also retained over time. Shared beliefs about creation and caring for Country associated with the sites and Ancestral Beings associated with this style may have been an important aspect of maintaining trade, marriage links and sharing resources (Ross 2003; Taçon & Faulstich 1993; Wiessner 1989; Wobst 1976). This becomes clear in the degree of homogeneity between the Waliarri Family and Wanjina anthropomorphs over time, and the inclusion of wanggu and zoomorphs in the Waliarri Family style in recent superimposition layers, despite differences in nomenclature and variation in form, which are sufficient to differentiate the cultural areas, but close enough to express affinity over time.

The complexity of the superimposition at most sites (Appendix 10) makes it near impossible to determine whether there are compositions of rock art that might indicate changes in more composite symbolism marking changes in cultural identity over time. There are panels with many layers of rock art with figures wholly or partly superimposed on one another to the extent that it becomes a confusion of figures. The figures in this study rarely display any clear relationship with one another, such as a group of Waliarri Family style figures placed together in any kind of composition, unlike in other cultural areas (Figure 10.2a). Waliarri Family anthropomorphs are more commonly interspersed with other styles and figure types, suggesting that they have been contemporary with other styles and figures over time, and their importance is likely as much in the process of creation, through or in preparation for ceremony, as in their place on the rockface, as they are clearly a continuing part of ceremony in the rock art and song and dance (Figures 6.17, 6.18 and 10.8).

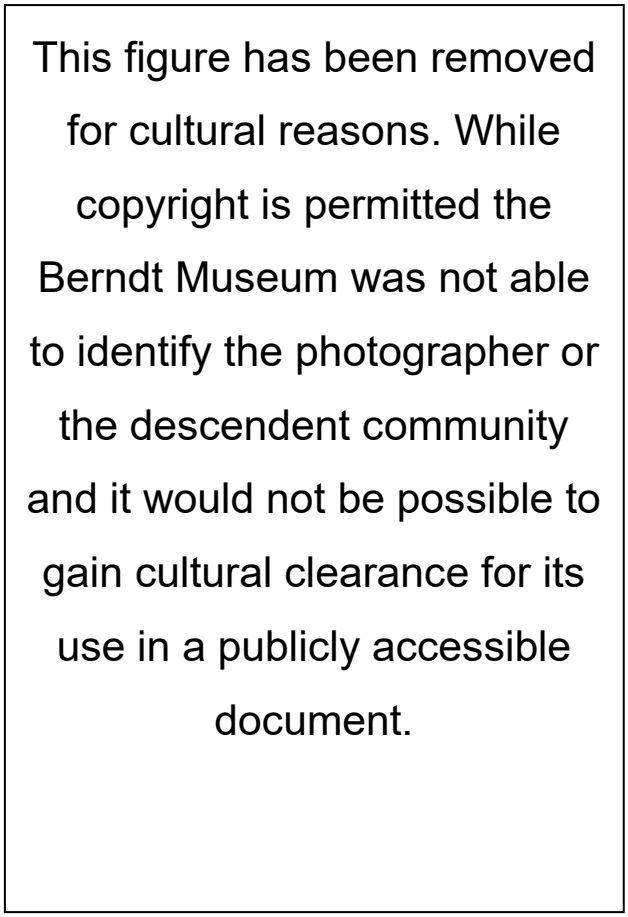


FIGURE 10.8 MEN WITH WANJINA STYLE HEAD DRESSES ON SUNDAY ISLAND, KIMBERLEY WA (INTENTIONALLY BLURRED AND REPRINTED FROM THE BERNDT MUSEUM COLLECTION. 1903 AO NEVILLE: PHOTO NUMBER 13127).

Rock Art Locales

Choosing where to create rock art is as much a part of marking territory (e.g. David & Chant 1995; David & Cole 1990; David & Wilson 2002a) as it is of opening and maintaining communication channels (e.g. Conkey 1978; McDonald 2008a; Veth et al. 2011; Wobst 1976; 1977). Site choices are part of the relationship between of creators and viewers of rock art (Figures 4.1 and 4.2).

Most sites where rock art was found are either rockshelters or caves (Figure 6.1), all with easy access to water and food sources, and this seems to be a major factor in site selection. While shelter helps preserve painted rock art, it may not have been the only reason caves and rockshelters were chosen. Rock art is also extant on exposed rock faces and exposed areas at large rockshelters, so it is not clear the choice was made for the type of site, making it more likely that access to the sites, the resources and protection of humans were the first imperatives, rock art the second, and preservation of the rock art a lower priority in some cases, particularly when it was painted. There was no difference in the types or

characteristics of sites in Bunuba or Gooniyandi Country, with rock art on enclosed, protected and exposed rock surfaces across the southern Kimberley.

Analysis in Chapter 8 showed that site size was not a determining factor in how much rock art was at a site, or how deep the superimpositions (Table 8.8 and Figures 8.14 and 8.17). Building on this I explored the distribution and density of rock art across the southern Kimberley and at sites with large assemblages, or within closely accessible groups of sites (Chapter 9), to determine the extent to which they may have been chosen for different purposes, motifs or styles. This identified where the Waliarri Family were clustered (Figure 9.48), the commonality of rock art motifs and styles across cultural areas, and the liminality of borders as discussed above.

The results suggested that rock art sites may be in clusters, which I call Rock Art Locales. These clusters are made up of one or two physically large sites with large, diverse rock art assemblages, multiple superimposition layers, and at least one large anthropomorphic image in the dominant style or motif of the area, which might be called an iconic figure because of its dominance, size, visibility and vibrancy (Waliarri in Bunuba Country and Black & White in Gooniyandi Country), with smaller sites around or leading to it, with smaller, less diverse and/or superimposed assemblages.

These clusters occur in at least three places in Bunuba (Mount Behn, Marawun Escarpment and Tangalma/Langurmurru close to Bandilngan/Windjana Gorge) and one in Gooniyandi (Emanuel Gap) Country (Figures 9.37, 9.38, 9.39 and 9.40). The presence of highly visible, mostly polychromatic, anthropomorphic figures and great diversity in the rock art at each of the focal sites suggests that they are where large gatherings and ceremonies took place. This supports the earlier suggestion that the polychromatic, highly detailed large anthropomorphs may have been created through a process that was like dressing up for, or being dressed for a ceremony; for trade, marriage or what Conkey and others have at times referred to as aggregation (Conkey et al. 1980; Hook & di Lello 2010; McDonald & Veth 2012b; Zeanah et al. 2015). The idea that such sites are selected for social and economic reasons, requiring places suitable for large groups, has been supported in research over several decades (McDonald & Veth 2012b; Ross 2003; Vogels et al. 2021). Although this may also have been to share scarce resources, particularly water (Kinahan 2018; Lee 1972b; Vogels et al. 2021; Yellen 1977), the intense and diverse rock art featuring iconic or Ancestral Beings over a long period of time at the larger sites in the southern Kimberley supports the likelihood that they are also likely to be social and cultural choices.

The large iconic motifs were all recorded in rockshelters or caves. This may be a result of preservation, or the choice to preserve them. It may also be an important part of the social group formation that they be preserved in places where large groups of people could meet, be sheltered, engage in rituals and access resources.

That these large motifs were not recorded at exposed sites may be one site characteristic which determined the type of site chosen for this type of rock art, which is consistent across the southern Kimberley. The large images were likely only limited in terms of site choice by available space. Some images filled almost the entire wall space (Figure 6.13), while others were among many large and small images (Figure 10.9), some were painted on smooth surfaces (Figure 6.13), some on rough (Figure 10.9), or on almost vertical walls (Figure 10.10) compared to sloping overhangs (Figure 10.9). This may be explained by the idea of creator/viewer interactions where information is exchanged (Figure 4.1 and Carter & Geczy 2006), and the intimacy/distance of relationships in Wobst's (1997) Information Exchange Theory, whereby visitors who understand the information or code are welcomed into those shelters where the motifs are not visible from outside (Figure 4.2), and different exchanges take place or alliances are formed and reinforced, as part of the rituals of viewing and/or creating the rock art.

FIGURE 10 9 PART OF THE MAIN PANEL AT LANGURMURRU SHOWING THE MORE THAN 2M WALIARRI AMONG A RANGE OF SMALLER ROCK ART FIGURES.

FIGURE 10.10 WALIARRI ANTHROPOMORPH AT MARAWUN 1 PAINTED ON A VERTICAL, SMOOTH WALL.

Engravings were not observed to be present in sites with special characteristics either. There were many sites like Tangalma, Moonggaroonggoo, Riwi and Marawun 4 with smooth ledges or wall areas where it would have been possible to create incisions, engravings and abraded grooves, but had none.

The limits of time and resources meant that some areas in Bunuba Country which may have similar cluster characteristics were not further explored, including around Elimberrie Springs, Darrananna and Stumpy's Soak 1, or known rock art locations around Darnkgu (Geike Gorge). Similarly, in Gooniyandi Country time and cultural business restricted investigation. This leaves room for further investigation to determine how widespread this model of Rock Art Locales is present in the southern Kimberley. One possible locale may be at Riwi, located on the edge of the Mimbi Caves in the Mueller Ranges (Figure 10.11), where least one other site with rock art is within 200m (Japi, see Balme 2000), and the topography and geology suggest there are likely to be others.

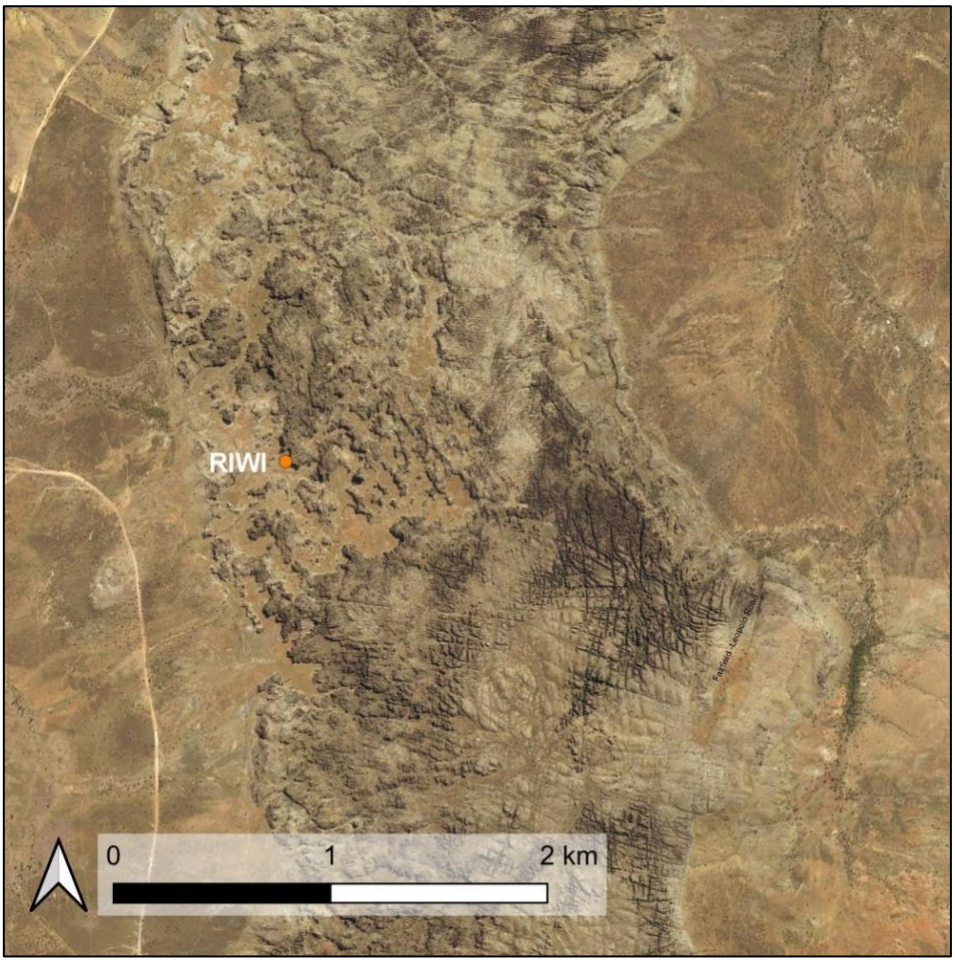


FIGURE 10.11 SATELLITE IMAGE OF RIWI WITHIN THE MUELLER RANGES (BING SATELLITE BASEMAP IN QGIS 3.22).

Figure 10.12 shows another possible cluster at Dimalurru/Tunnel Creek, where one site (TC4) has a large iconic anthropomorph, one of only 26 determinate figures (Table 6.6). It has a sufficient floor area (~100m^2) to provide shelter for about 20 people and is accessible up a gentle slope from Dimalurru/Tunnel Creek. It also has an adjacent cave, which is accessible through a narrow opening or climbing over high boulders, in which there is no rock art, but skeletal remains on a shelf, making it likely to have been an important site for the Bunuba people. It was not included with the clusters because although there are smaller sites in the vicinity, on the walk from the creek to this shelter, these are along a tourist trail that has been accessed for at least 100 years, since it became well known as one of the last stands for Jandamarra (Chapter 2), and integrity of the rock art at four of the six sites is compromised because of this.

Rock Art Locales and aggregation locales fit well with Indigenous ideas about the holistic nature of life which enmeshes the past with the present, and the health and wellbeing of the land into the future (Adams 2009; Kingsley et al. 2013; Martin 2003; Pleshet 2018).

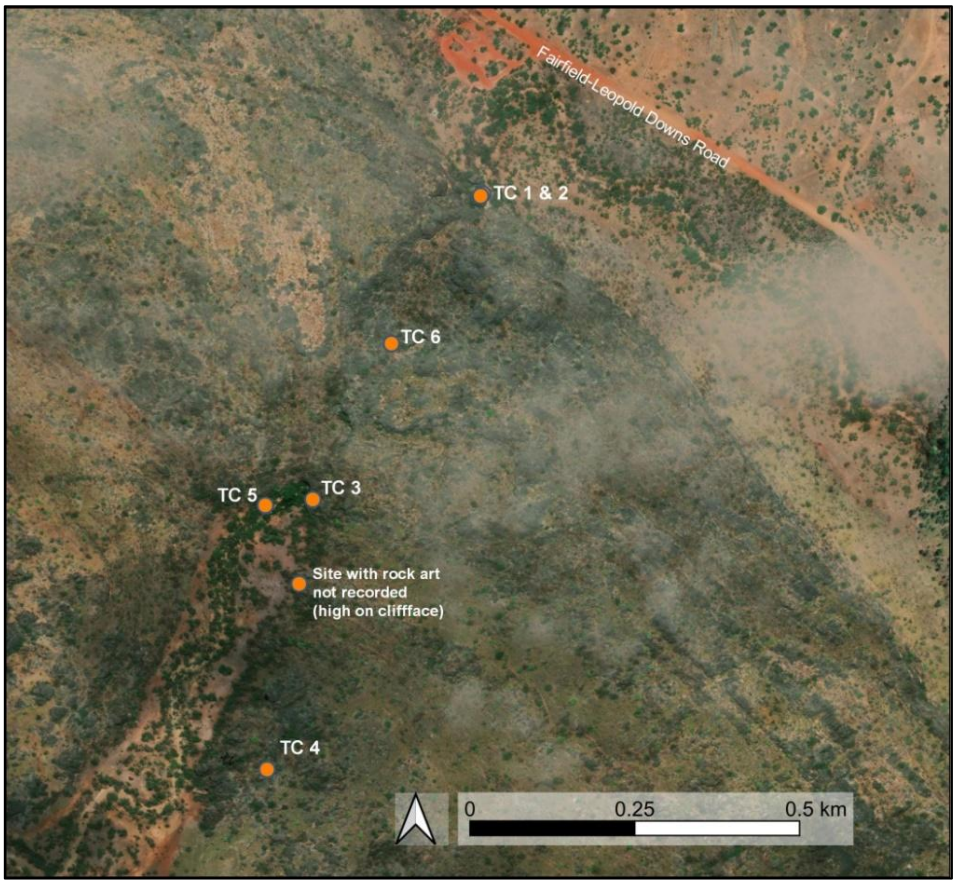


FIGURE 10.12 SATELLITE IMAGE OF SITES AROUND DIMALURRU/TUNNEL CREEK (BING SATELLITE BASEMAP IN QGIS 3.22).

Traditional Owners did not live in one place until recently, they moved through the land with the seasons (Woodward et al. 2012), visiting special places for ceremony and gatherings, camping at others for shelter and sustenance and creating a landscape connected through songlines, Dreamtime tracks, and trading routes (Cairns & Harney 2004; Clarke 2003; Kerwin 2010; Mulvaney & Kamminga 1999:95), which might also be described as

> *… a path or corridor along which a creator moved to bring country into being … the geographical expression of their songs, dances and paintings animating the country, and ecological proof of the unity of things* (Gammage 2011:24).

Rock art is a part of the songlines, where the larger, highly decorated sites may be a destination and the smaller sites stopping points to rest, stay or practice rock art motifs along the way. Every songline has one or more destinations, while many intersect and may criss-cross large parts of Australia (Mulvaney & Kamminga 1999; Tindale 1974). The travels and destinations are also part of the way in which people build relationships through trade and marriage, through sharing ideas. They are pathways along which people may engage in rituals through the production of special rock art like the creation and maintenance of iconic or Ancestral Beings at focal sites in the Rock Art Locales described in Chapter 9 (Balme et

al. 2009; Conkey et al. 1980; Fisher 1997; McDonald 2000; McDonald & Veth 2012b; Wobst 1976).

In these scenarios some sites are significant and sacred within the wider landscape linked by the songlines, and will have their own markers in the rock art. Others will be more local created by families or clan groups, and others may be more temporary and/or of less significance. Some sites may simply be functional and rock art a diversion while taking shelter from the sun or rain (June Oscar 2012 pers. comm., 16 July, also Mulvaney 1996). This is reflected in the diversity and iconic images at the focal sites compared to the limited rock art at the satellite sites which I visited and recorded travelling along well-worn tracks on the journey to the larger sites.

The proximity of such clusters to resources, as well as one another, is a similar arrangement to those observed by McDonald and Veth and referred to as aggregation/dispersal sites in the Western Desert (2012). It shows there may have been a common approach to how sites were used, suggesting that the southern Kimberley may be a transitory area between the tropical Kimberley and the arid Pilbara where there are common site use traditions, and this would be an area for further investigation of the rock art, ethnographic and cultural contexts that link or divide them.

Synopsis

Rock art sites in the southern Kimberley are selected because of their proximity to resources (food and water) and their ability to provide shelter. This is consistent across the study area. That rock art is present in those sites is due to the presence of people for what may be different purposes, and this seems to determine the amount, density and continuity of rock art (in part expressed through superimposition) at those sites. There were no special characteristics of sites which indicated that a particular type or style of rock art would be present at any site in the southern Kimberley, other than having sufficient wall space for larger images.

The analysis shows that the iconic anthropomorphic figures described above are present at large sites, with permanent shelter, a substantial and diverse rock art assemblage with multiple layers of superimposition. These are, in many cases either surrounded by, or have pathways leading to them with a series of smaller sites with less diverse and no iconic images. It is possible that larger sites are selected for larger images for two reasons, firstly because larger, complex motifs may be created as part of a ritual or preparation for ritual, and secondly because they provide more shelter and gathering space for larger groups of

people where ritual, trade or simply hosting visitors may occur any, and all, of which may result in rock art production and preservation. Smaller sites may be resting places, or camping places, for smaller groups or individuals around the larger gathering sites and have less rock art and less diversity because they are less often used and have less people using them (Conkey et al. 1980; Vogels et al. 2021).

I have called this grouping a Rock Art Locale, as it represents a cluster of sites which may be used by the same people, subgroups of those people, or visitors who gather at the large sites for ceremonial, trade, alliance or group forming activities (e.g. Conkey et al. 1980; McDonald & Veth 2012b; Veth et al. 2021; Wobst 1976). Rock Art Locales may offer other ways to look at styles, motifs and chronological sequences, which while interesting, informative and possibly reflect an Aboriginal world view, is outside the scope and word limits of this thesis.

Kimberley Chronologies

The question of how the Bunuba and Gooniyandi rock art fits into Kimberley wide styles has been partly addressed in discussion above examining the commonalities of the Waliarri Family and Wanjina. I concluded that both are examples of the same style with variations across the Kimberley, as well as within the study area. Distribution and density showed that there is not a clear style boundary between Bunuba people and their western neighbours, or between Bunuba and Gooniyandi Country. However, within both cultural areas there are local styles which mark what may be family or clan territories, with one almost certainly an expression of cultural continuity for Bunuba people (O'Connor et al. 2013), reinforcing the wider connections and affiliations while maintaining locally defined identities.

What has not yet been addressed is whether there are other styles which are in common with the wider Kimberley region, and where they fit within proposed chronological sequences. It should be noted that the use of style as a marker of chronological change is a matter under discussion, particularly given that only part of the rock art recorded is ever included in the analysis of style (Chippindale & Taçon 1993), including in this research, and, as Johnston et al. pointed out there are hundreds of reasons why variations may be seen as stylistic differences (2017:111). This is one of the reasons I have included Broad Groups in this study, to provide a place for otherwise excluded rock art in the analysis, and investigate whether it may add to our knowledge of the recursive nature of rock art creation (McDonald & Veth 2013; Morphy 2012b; Motta et al. 2020), linked to memory and ritual, as well as territorial marking and alliance building (cf. David & Chant 1995; David & Cole 1990;

Smith 1992b; Wobst 1976). However, given the limitations of a thesis, and the lack of this in published data, it is not explored as thoroughly as it may be in this study, and the comparisons are limited.

Identifying and allocating rock art figures to styles did not result in a clear chronology for the southern Kimberley, or Bunuba and Gooniyandi Country separately. This creates two dilemmas, the first whether the borders as discussed earlier changed over time, and the second whether the figures and styles identified in the southern Kimberley are reflected in styles and chronologies for the wider Kimberley region. The first may be answered to some extent by examining the latter.

A recent analysis by Veth et al. (2021) proposed a Kimberley chronology built on their own and previous models (Ouzman et al. 2018; Ross et al. 2016; Veth 2013; Veth et al. 2018; Walsh 1994; Welch 1993a; 2016). It includes rock art dating that has become available using new scientific applications (Finch et al. 2021a; Finch et al. 2021b; Finch et al. 2020; Green et al. 2017a; Green et al. 2021a; Green et al. 2021b; Green et al. 2017b), which it is suggested provides a stronger argument for dating some styles and stylistic change than has previously been possible. The authors acknowledge that not all figures fit with their proposed style phases, and some dates are concurrent with or overlap defined style phases (Veth et al. 2021:202). This leaves rock art stylistically unclassified as much as in this study, and therefore style phases which, at best, may be preliminary.

Other studies continue, with Gunn et al. (2019) suggesting that Kimberley Stout Figures may fit into chronologies before the Wanjina/Painted Hand phase. Research on the Kimberley Stout Figures is limited and is not incorporated in the amalgamated model (Table 10.2) proposed by Veth et al. (2021) and cannot be applied to figures recorded in this study at present.

Veth et al.'s (2021) analysis shows that there has been continuity of occupation (Balme 2000; Balme et al. 2009; Balme et al. 2018b; Dilkes-Hall et al. 2019b; Dortch et al. 2019; Hiscock et al. 2016; Maloney et al. 2016; Maloney et al. 2018b; Moore et al. 2020; O'Connor 1990; 1995; O'Connor et al. 2014; Taçon et al. 1997; Vannieuwenhuyse et al. 2016a; Veth et al. 2019b; Veth et al. 2019a; Veth et al. 2021:196, Table 8.1; Wood et al. 2016) and rock art created in the Kimberley from at least 50,000 years ago years (Aubert 2012; Finch et al. 2021a; Finch et al. 2021b; Finch et al. 2020; Green et al. 2017a; Green et al. 2021a; Green et al. 2021b; Green et al. 2017b; Huntley et al. 2014; Morwood et al. 2010; O'Connor & Fankhauser 2001; Ross et al. 2016). It suggests that while there may be individual site discontinuities, they are unlikely to relate to regional discontinuities and have occurred for a

range of reasons other than the often-cited environmental stresses, other than movement of people inland as sea levels rose and halved the Kimberley land area (e.g. Balme et al. 2018b; Dortch 2004; Vannieuwenhuyse et al. 2016a; Veth et al. 2017a).

It may be clear that some styles appeared earlier than others (Appendix 10, Figures 8.59 and 8.60, and reconfigured for the amalgamation of Waliarri Family, with motif variations in Figures 10.13 and 10.14) and continued alongside other styles, but their continued presence indicates that associated culture and rituals are also likely have been constant over that time. The presence of monochrome stencils throughout most of the sequences (Figures 8.59, 8.60) is consistent with Gunn et al.'s (2019) suggestion that hand and boomerang stencils have been present in the rock art from about the same time as Veth et al.'s (2021) proposed Irregular Animal Infill style phase (Table 10.2). If the latter existed in the southern Kimberley it is covered by subsequent figures and no longer visible, and therefore not known in the area.

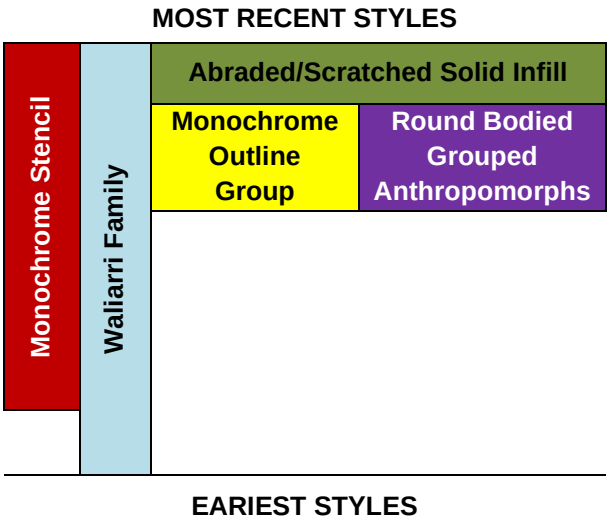


FIGURE 10.13 AMENDED STYLE SEQUENCE BUNUBA COUNTRY[9].

[9] Monochrome Outline Group is retained in this amended sequence because it is the only one of the Broad Groups which does not appear at every level or have reversals and/or contradictions between sites in superimpositions.

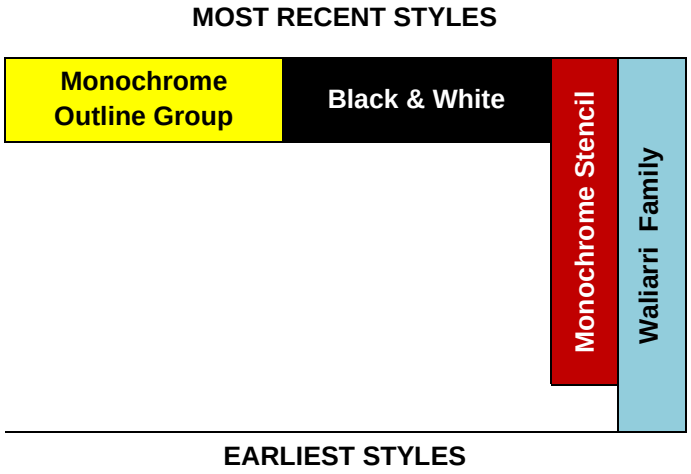


FIGURE 10.14 AMENDED STYLE SEQUENCE GOONIYANDI COUNTRY.

The idea of superimposition has an attraction in an academic approach to rock art, as we concentrate on quantifying and sequencing styles and motifs to provide insight into life in the past, however,

> *… rock art superimpositions have a different meaning for Indigenous people. They demonstrate continuity, often the continuity of a tradition initiated by ancestral beings in the past … but lasting into the present* (Domingo-Sanz 2011:16).

Continuity is reinforced by repainting/refreshing figures, an important link with the Ancestral Beings and essential to maintain fertility (e.g. Bowdler 1988; Crawford 1968; Morphy 1995; O'Connor et al. 2008b; Vinnicombe 1992). This is one form of multiple layering that may imply continuity rather than change, or establishing borders or identities (after Morphy 1991; 2012a; Motta et al. 2020; Smith 1992b). Does this also apply to the lack of superimposition? Were the creators of new art travellers, style changers or storytellers from other places? Do multiple layers of the same figure in the same style mean that the connection with the past has been continuous, and is refreshed and maintained through new ceremonies to create new rock art? (Motta 2019; Motta et al. 2020).

These questions might be answered by comparing figures and styles to a wider corpus in the Kimberley region, a contemporary physical distinction between the tropical/semi tropical north and the arid Pilbara region to the south. There are commonalities in the physical environment of the Kimberley which meant people were familiar enough with the environment to move about, and linguistic links, despite many orthological, grammatic and vocabulary differences (McGregor 1988a; McGregor 2004), showing communication which enabled interaction and information exchange between the many cultural groups.

Veth et al. (2013; 2018; 2021) suggested that changes in rock art styles in the Kimberley, built on comparisons with other chronologies (Ross et al. 2016; Walsh 1994; 2000; Welch 1993b; 2016), may be linked to factors such as climate change, cultural and territorial marking, moving from homogeneity to heterogeneity in mark making (Appendix 9), and supported by recent scientific research (Finch et al. 2021a; Finch et al. 2021b; Finch et al. 2019; Finch et al. 2020; Green et al. 2017a; Green et al. 2021a; Green et al. 2021b; Green et al. 2017b; Ross et al. 2016).

Comparisons between the relative chronologies for the Kimberley provides limited insight into questions of what superimposition, or lack thereof, can tell us about rock art in the southern Kimberley, because not all styles are present across the Kimberley (some of the earlier sequences are mapped in Ouzman et al. 2018; Veth et al. 2018), and some are not mapped as anywhere near the southern Kimberley (Figure 10.15).

The earliest suggested markings, cupules, incised lines and abraded grooves (Table 10.2) are present in the southern Kimberley. The presence of these markings from 50,000BP is consistent with occupation in the southern Kimberley, and confirmed in *Lifeways* Project excavations (e.g. Balme 2000; Balme et al. 2018b; Frawley & O'Connor 2010; Hiscock et al. 2016; Maloney et al. 2018b; O'Connor 1995; O'Connor et al. 2014; Vannieuwenhuyse et al. 2016b; Wood et al. 2016).

The only other figures recorded in the southern Kimberley which may fit into the proposed Kimberley Chronology (Figure 10.2) are the Waliarri Family, which I have described as related to the Wanjina (Veth et al. 2021:196). C^{14} dating of a Waliarri anthropomorph from a charcoal outline is consistent with the suggestion that these figures have been present from at least 4,600BP (Figure 8.2). It is possible the style was present earlier as suggested by U/Th dates calcite over pigment at 13,900 +/- 2,900BP at Mount Behn 1, where the superimposition of Waliarri on Waliarri is frequent. These dates only confirm pigment sandwiched between layers of calcite, not a style or figure, making such a hypothesis difficult to prove at present. It is equally likely that the older dates relate to a different style/phase and/or motif wholly superimposed by Waliarri figures. However, it does confirm that ochre and charcoal were being applied to the rock surface at or before those dates.

Confirming that the Waliarri Family and Wanjina are part of the same style phase in the Kimberley allows for discussion of the rock art/style borders in the Kimberley. As discussed earlier there is a liminal boundary in terms of the Waliarri/Wanjina in the area between Bunuba, Ngaranyin, and Unguumi Country and this would be a good reason to extend the Wanjina style distribution arc further south than Veth et al.'s (2021) proposal suggests

putting the southern Kimberley well within the Wanjina Style Province for both the polychrome (Figure 10.15) and all variations within the Waliarri Family and an extension of the southern boundary to embrace this style variation (Figure 10.16).

Static Polychrome is the smallest style province (Figures 10.15 and 10.16) but sits between the Painted Hand/Wanjina and the Gwion Gwion/Elegant Action Figure phases (Table 10.2), suggesting possible contraction of movement and/or interactions during sea level rises, which may have prompted boundary marking and heterogeneity in the rock art (Veth et a. 2021). The Painted Hand/Wanjina expansion south suggests a period of movement as climatic conditions change and risks were minimised by the formation of new groups and alliances further to the south.

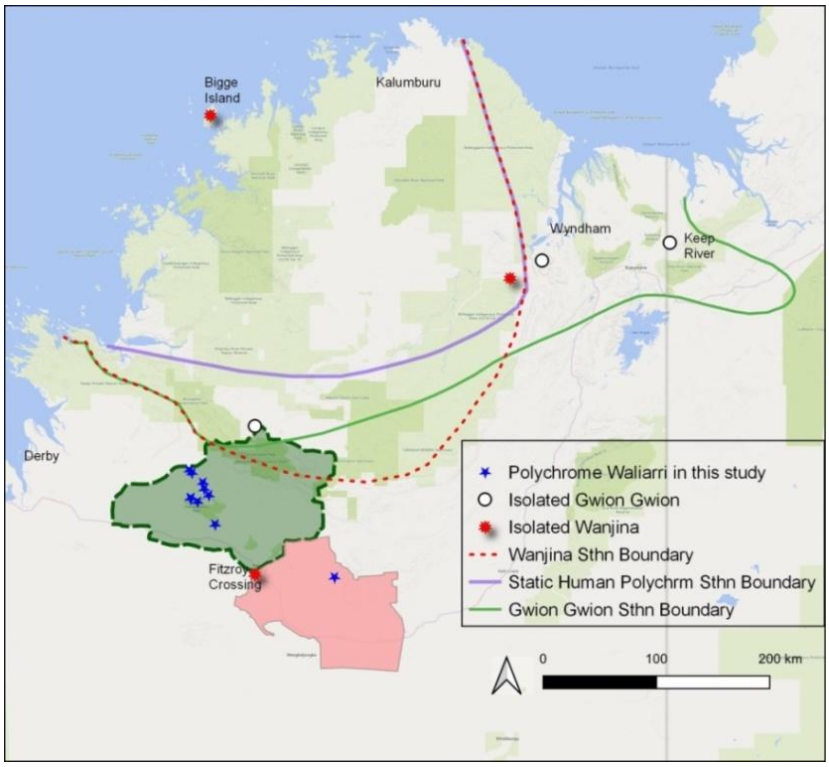


FIGURE 10.15 DISTRIBUTION OF STYLE PHASES IN VETH ET AL.'S (2021) KIMBERLEY CHRONOLOGY COMPARED TO THE LOCATION OF POLYCHROME WALIARRI IN THE SOUTHERN KIMBERLEY. [10]

[10] This map was created in QGIS using multiple layers and georeferencing to incorporate Veth et al.'s (2021) published maps, Akerman's (2009; 2014) Wanjina belt, Native Title and my own data from fieldwork.

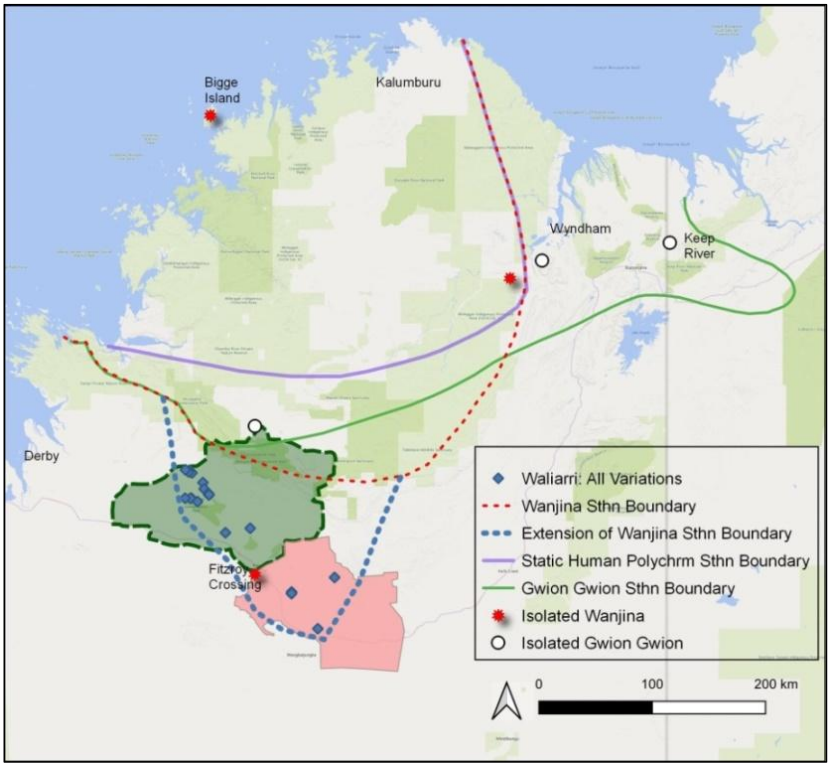


FIGURE 10.16 SUGGESTED EXTENSION OF SOUTHERN WANJINA DISTRIBUTION BOUNDARY.[11]

Synopsis

Bandaral ngadu (the Fitzroy River) forms a physical border between Bunuba and Gooniyandi Country, but this does not translate to a clear rock art border, either in motifs or styles. There is some difference in the dominance of anthropomorphs (Bunuba) and zoomorphs (Gooniyandi) in each area, but not in how they are depicted.

Within each cultural area there are local styles. They are not widespread or prolific and are relatively recent additions to the rock art assemblage, most likely by family or clan groups. Other styles identified in the southern Kimberley appear to have been contemporaneous, suggesting that there have been open communication pathways and social networks that have changed little over time, until the mostly recent introduction of the local styles.

Comparison of southern Kimberley styles with the wider Kimberley region and proposals for chronological sequences, most recently termed art phases (Veth at al. 2021), shows that the only phase in common is the most recent Painted Hand/Wanjina phase. The Wanjina style is the common link in this shared phase, and the lack of any rock art resembling any from other phases, other than cupules and incisions, which are a worldwide phenomenon.

[11] See Note 9 above.

TABLE 10.2 THE KIMBERLEY CHRONOLOGICAL MODEL AND ROCK ART RECORDED AND IN THE SOUTHERN KIMBERLEY.

Art Phase *Years BP*	**DEFINING CHARACTERISTICS AND ENVIRONMENTLA FACTORS**	**Presence in this study**
Cupule and Rock Marking **c.50,000 onwards**	  Pecked and abraded cupules, deeply incised lines and abraded grooves. *Not related to environmental change*	Cupules at Emanuel Gap 3, Mount Behn 1, Tangalma, Tarakula 1, Marawun 4. Incised lines at Marawun 1, 4, 7-1 & 7-3, Mine 1, Moonggaroonggoo, Riwi, Tangalma, Tangalma A, Tarakula 2, Tunnel Creek 2. Abraded Grooves at Tangalma and Tangalma A.
Irregular Infill Animal **c.20,000-14,000**	 Beings at the time of the sea as low as 130m below current levels. Ranges from aquatic species to land mammals and reptiles, plants and some human figures. Focus on animals. Use of dark ochres, infill with short lines and dots and occasional solid infill on extremities such as feet. Gunn (2007) suggests this also includes hand and boomerang stencils	Irregular infill animals were not recorded in this study. Hand Stencils at Bunuba Roadside Caves 1, Darrananna, Elimberrie Springs, Emanuel Gap 2, Emanuel Gap 4, Fairfield 1 & 2, Langurmurru, Marawun 1, Marawun 4 & 7-1, Mine 2, Mount Behn 1 & 2, Riwi, Tunnel Creek 1. Boomerang Stencils at Tangalma, Marawun 4, Mount Behn 1, Tunnel Creek 1.
Gwion Gwion and elegant action figure **c.14,000-10,000**	Slim/elongated anthropomorphs in red/mulberry ochre with accoutrements including boomerangs, dilly bags and sticks. Includes anthropomorphs with body decorations such as headdresses and tassels, often depicted in active pose such as running and dancing. Small animals associated with them in compositions. Highly variable. *Begins as an arid period ends and summer monsoons re-established ➢ rapid sea level rise and art transitioned into next phase rather than sharp change.*	 Not recorded in this study.
Static Polychrome **10,000-6,000**	Bichrome and some polychrome human figures with detailed material culture accoutrements, and headdresses in static frontal pose. *Warm and wet conditions ➢ increasing sea levels ➢ loss of land. Likely a period of establishing boundaries and increased heterogeneity of rock art.* 	Not recorded in this study, but Veth et al (2021:200) and Ouzman (2018) include drawings in this style which include images that are similar to the thanggari (waterlily) recorded at Moonggaroonggoo which are at the most recent levels and clearly superimposed on Waliarri anthropomorphs. Gunn et al. (2019) suggest that their Kimberley Stout Figures may fit between this and the next phase.
Painted Hand and Wanjina **mid/late Holocene ~ 5,800-present**	Two distinct style phases occurring possibly contemporaneously for some of this time.  Reflects changes in lithic organisational strategies with introduction of bifacial points around 5,000BP (Maloney 2015:207) that may have been part of risk reduction with the less predictable resource availability as the monsoon strengthened.  Each has some conventions, but lots of variability within them, suggesting a period of making boundaries.	 Polychrome Waliarri (Waliarri 1 (Complex)) present at Elimberrie Springs, Langurmurru, Mount Behn 1, Marawun 1 &4, Fairfield 1 & 3, Tunnel Creek 4, Moonggaroonggoo, Tangalma. Waliarri Family Style is present across the southern Kimberley and dominant in the west. As described above this is likely part of a wider Wanjina related style with substantial variation across the Kimberley.

Sources: Ouzman 2018, Veth 2013, Veth et Al 2018, Veth et al 2021. **Image sources:** Cupule and rock markings Author's photographs. Irregular Infill Animals, Gwion Gwion, Static Polychrome and Painted Hand, Reprinted from Veth et al., 2018: Figure 2, with permission from Elsevier. Wanjina Crawford 1968.

Interactions facilitating information exchange through rock art between the northern and southern Kimberley have been ongoing since the oldest dated Wanjina at c.5,800BP (Veth et al. 2021).

The distribution of rock art in the Veth et al. (2021) art phases for the Kimberley excludes Bunuba and Gooniyandi Country, suggesting that it does not fit into the chronology, but the findings in this research suggest that at least one distribution border should be expanded south, and recognise the inclusion of Bunuba and Gooniyandi rock art in the most recent Kimberley rock art phases. Further analysis of the large percentage of rock art that tends to be excluded from the data sets (Chippindale & Taçon 1993) may find other art phases where motifs and/or styles stretch across the wider Kimberley region into the southern Kimberley.

Summary

The dominant rock art figures in Bunuba Country are anthropomorphs (52%), while in Gooniyandi Country the zoomorphs are the most prolific (68%), and the most prominent style common to both is the Waliarri Family (18%); however, there are a myriad of determinate figures that are not classified as any style, but grouped according to some basic characteristics like colour combinations (39%, excluding Cupules, Incisions and Historical Inscriptions not elsewhere classified). This leaves a substantial chunk of determinate rock art outside of the analysis and discussion using a conventional stylistic analysis. However, I created Broad Groups to give a sense of whether there were any differences in these simpler broad groupings from west to east, or over time and found that, other than Monochrome Outlines, they were consistently represented at all layers of superimposition. This did not differ between the two cultural areas, throwing no additional light on motifs, styles or chronologies between Bunuba and Gooniyandi Country.

There are physical and linguistic borders and differences between Bunuba and Gooniyandi Country, but the relative homogeneity of styles and motifs tells us there are no clear rock art borders between them. Local styles, however, exist within the two cultural/linguistic areas, where the shared styles and motifs are also present, and this co-existence seems to have been consistent over time. The internal style pockets may be family or clan identity markers or territorial boundaries (David & Chant 1995; David & Cole 1990; Smith 1992b; Storey 2012; Taçon 1999) and are recent in their positions within superimposition layers. The white pigment in some of the local styles can deteriorate more quickly than red pigments in the wet conditions experienced in the southern Kimberley, which supports their recency (Brady 2006; Cook et al. 1990; Pecchioni et al. 2019; Stuart & Thomas 2017), while living

knowledge supports the recency of the Abraded Solid Infill style (Johnny Bell 2011 pers.comm. 6 September).

There is a concentration of the Waliarri Family style, particularly the detailed polychrome variation, to the southwest of Bunuba Country, within easy access of the contemporary Ngaranyin/Unguumi borders (see case study in Chapter 9). This suggests a liminal border, which may have been useful for building alliances, trade and shared ritual, and suggests a period of open social networks when they were created; extending from the west to the east into Gooniyandi Country through which there has been continuous interchange shown in their mostly shared rock art motifs, styles, and languages (Balme et al. 2009; Conkey 1978; McDonald 2000; 2008; McDonald & Veth 2012b; Smith 1992a; 1992b; Taçon 1994; Wiessner 1982; Wobst 1976; 1977). Wanjina have not been scientifically dated in the southern Kimberley, so it is not clear how long this interaction of Bunuba and Gooniyandi people with their western neighbours may have been occurring.

The sites where rock art is found across the southern Kimberley reflect the need for shelter and survival; all the rock art sites are close to water and food resources. Large sites did not always have more rock art than smaller sites, or more layers of superimposition, rock art was found on smooth and rough surfaces, sloped and horizontal ceilings, vertical walls and ledges in both Bunuba and Gooniyandi Country. However, clusters of sites of different sizes with diversity of motifs and styles indicated there has been a pattern of site use or occupation in locales, rather than individually. From the comparison of sites within easy reach of one another and with access to the same resources I concluded that there were several areas which could be called Rock Art Locales. A Rock Art Locale is comprised of one or two large sites, with smaller satellite sites close by. I have reasoned that the larger sites may be chosen for larger gatherings, especially where ritual or ceremony is part of the gathering because of the amount, diversity and complexity of the rock art, the iconic images and the large floor space, while the smaller sites may be resting spots for small groups or families, practice canvases, or shelters for overflow from larger sites. There are examples of Rock Art Locales in both Bunuba and Gooniyandi Country, suggesting that there was no difference in why sites, or groups of sites, were chosen in the southern Kimberley.

The rock art of the southern Kimberley does not fit neatly into stylistic chronologies (or art phases) proposed for the wider Kimberley region (e.g. Veth et al. 2021). Worldwide motifs such as cupules, rock markings and stencils are present in both areas, and recent research and the long term occupation of sites where they are found in the southern Kimberley, supports cupules and rock markings as one of the earliest rock art phases (Balme 2000;

Balme et al. 2018b; Dilkes-Hall et al. 2019b; Dortch et al. 2019; Green et al. 2017a; Green et al. 2021a; Green et al. 2021b; Maloney et al. 2018b; Wood et al. 2016). Hand stencils have been dated to near the same antiquity to the north in Borneo (Aubert et al. 2018), and older still in Europe (Hoffmann et al. 2016; Pike et al. 2012), and they continue to be made by Traditional Owners in Australia in the 21st century (Colin Hamlin 2011 pers. comm., 18 July, also Sam Woolagoodjah[12] in Crawford 1968: 22), meaning they could fit in anywhere in time in an Australian context.

Between cupules and the Wanjina there is no figurative rock art in common between the southern Kimberley and the wider Kimberley region. This suggests that while the borders between the southern Kimberley and its neighbours became less defined during the Painted Hand/Wanjina art phase around 5,800BP (Veth et al. 2021), it may not always have been the case.

Evidence from the *Lifeways* Project and previous investigations (Balme 2000; Balme et al. 2018b; Dilkes-Hall et al. 2019b; Dortch et al. 2019; Maloney et al. 2018b; O'Connor & Fankhauser 2001; Wood et al. 2016: and Table 8.2, 8.4, 8.5, 8.6, 8.7 and Figure 8.2) has shown that pigment has been applied to rock surfaces in the southern Kimberley for longer than the Painted Hand/Wanjina art phase which cannot easily be accounted for by crossover during transition of styles. The slab of rock dated by O'Connor & Fankhauser (2001), ochre and charcoal in the lowest layers in Figure 8.2, a painted flake below a layer dated 12,650 +/- 190BP at Langurmurru (Table 8.4), and several painted flakes below layers dated older than 38,000BP at Riwi (Table 8.7, Square 4) suggest that rock art has been present in the southern Kimberley at least as long ago as the proposed Irregular Infill Animal art phase (Table 10.2) and subsequent phases in the wider Kimberley region (Veth et al. 2021).

Veth et al. (2021) made a strong case for continuity of occupation, and continuity of rock art production. However, the five phases identified may be far from covering the full range of styles present in the rock art, as the distribution of most of those is limited. Other styles are being proposed (Gunn et al. 2019), stencils are not included, and a huge range of recorded rock, such as monochrome figures (including those from this study), have not been classified into any of these style phases. The Kimberley chronology is a good starting point to get researchers thinking about links across the region, but it is far from complete in a vast and often inaccessible land area, not to mention the equally vast area of submerged sites and likely lost rock art in what were coastal areas 20,000 years ago. It should also be noted that

[12] Note: there are 2 spelling for this name depending on where it is published, Woolagoodja and Woolagoodjah. It is not unusual for Indigenous names to change spelling over time.

there are areas of the Kimberley north and east of Bunuba and Gooniyandi Country to which the suggested style/art phases do not currently apply, and substantial investigation would be required before any comparisons may be made for the whole region (Figures 10.15 and 10.16). Gaps may never be filled because the best preservation will be at the most recent sites and analysis will be skewed to sites with Holocene provenance, especially for painted rock art which will be preserved differently on surfaces with a wide range of environmental conditions, as well as human, flora and faunal disturbance.

Wider connections with iconic figures across the north were considered because Indigenous Australians follow long and complex song lines along which they create shared knowledge and build alliances and trading relationships (Mulvaney & Kamminga 1999). There are major differences in style and technique between the southern Kimberley polychromatic Waliarri and other motifs, and while there are similarities in headdresses with figures in northern Queensland (Tresize 1971a) the figures are small and scattered. The Wanjina of the Kimberley (to which the Waliarri Family is related) and the Lightning Brothers in Nungali Country (McNickle 1991) have some common characteristics, but the space between, like the area north of Gooniyandi and Bunuba Country is not well documented, so a very wide stylistic/geographic gap still exists. This may be the next frontier to be explored, to bring scientific evidence to support the stories of travel and exchange between peoples across the north of Australia, stories that Traditional Owners know to be true. New research and new stories from the gaps would determine if, and what, ideas were shared, or whether the rock art has emerged spontaneously and concurrently in separate places.

In this research, the limits of dating techniques, deteriorated rock art, complex superimpositions and lack of clear stylistic change meant it was not possible to identify what Bunuba and Gooniyandi people have been painting for longer than the late Holocene, nor whether there were distinct borders defined by rock art styles prior to that time. What is clear is that in the Holocene connections with neighbours has been important, particularly in the north and west, and the presence of local styles has more recently established or maintained a form of local cultural identity. Information exchange has ensured that there are variations of styles and motifs which keep lines of communication, affiliation and alliances strong, whilst creating new styles has been a way of communicating the maintenance of separate cultures and identities within Country.

Conclusion

The answer, my friend, is blowin' in the wind

The answer is blowin' in the wind

*(*Bob Dylan 1962)

Introduction

The aim of this study is to determine whether the motifs and styles in the rock art in the southern Kimberley could tell us if Bunuba and Gooniyandi people have distinct cultural identities, from one another and/or their neighbours.

Like many archaeological studies this investigation has imperfections. Limits of time and resources constrain how many sites can be recorded. Contemporary Traditional Owners have gaps in their knowledge of sites and rock art, there are places that are vaguely remembered which could not be found during fieldwork, and there may also be places that are known but not shared with the team for cultural or other reasons, such as not having access to the correct Elders for some places. However, it is a starting point. It is the first archaeological study to systematically record sites in the southern Kimberley with the assistance of Bunuba and Gooniyandi Traditional Owners, create an accessible digital archive, and identify and analyse rock art which will increase knowledge of rock art and identity in the southern Kimberley.

Support and advice from Traditional Owners, the *Lifeways* Project and Rock Art Australia assisted in recording rock art at 43 sites in Bunuba and Gooniyandi Country. This was complemented by other archaeological analyses, with ochre and marked flakes, organic remains, hearths and lithics from seven sites recovered and analysed (Balme 2000; Balme

& Morse 2006; Balme et al. 2018a; Balme et al. 2018b; Dilkes-Hall 2015; Frawley & O'Connor 2010; Hiscock et al. 2016; Langley et al. 2016; Maloney et al. 2017a; Maloney et al. 2014; 2017b; Maloney et al. 2018a; Maloney et al. 2016; Maloney et al. 2018b; O'Connor 1995; O'Connor et al. 2008a; O'Connor & Fankhauser 2001; O'Connor et al. 2014; Vannieuwenhuyse et al. 2016a; Whitau et al. 2016a; Whitau et al. 2016b; Whitau et al. 2018; Whitau et al. 2017; Whitau 2018; Wood et al. 2016).

The information gathered was categorised and analysed primarily within the framework of Information Exchange Theory (Barton et al. 1994; Conkey 1978; 1990; Fisher 1997; Hodder 1978; McDonald 1998a; 2008; Sackett 1982; 1986; 1990; Veth et al. 2011; Wiessner 1982; 1983; 1985; Wobst 1977), and this final chapter of the study brings this together under the four headings outlined in Chapter 1: Rock Art and Style, Change Over Time, Rock Art Locales, and Kimberley Chronologies. This serves as a guide to answering the research questions posed that underpin to what extent the aim of the study has been achieved.

Rock Art and Style

This research recorded and classified nine figure classes (Tables 5.3-5.6) for determinate rock art, which represented 64% (Table 6.4) of images recorded over two field seasons in 2011 and 2012. The remaining rock art was visible, but too deteriorated, incomplete or obscured through superimposition to be classified (Figure 11.1). Most of the rock art in the southern Kimberley is painted (>74%, Table 6.7), and the dominant figures have similarities with those found all over the world, anthropomorphs and zoomorphs (Figure 6.7), though their form and styles differ.

In Bunuba Country anthropomorphs are dominant, while zoomorphs dominate in Gooniyandi Country. This suggests different ideas about what figures are important to each cultural group, and by extrapolation which information is embedded in the rock art, although this may be skewed by the much smaller number of Gooniyandi sites recorded.

Anthropomorphs come in various forms, sizes and colours ranging from polychromatic figures three metres tall to monochrome charcoal figures smaller than 30cm. They include a small number of therianthrope figures (30), including bird/human and lizard or snake/human combinations, and Veganthrop figures (5), all of which are wanggu (yam)/human combinations (Figure 6.22). Most of the anthropomorphs do not have gender markers (Table 6.11), and of those that do they are overwhelmingly male.

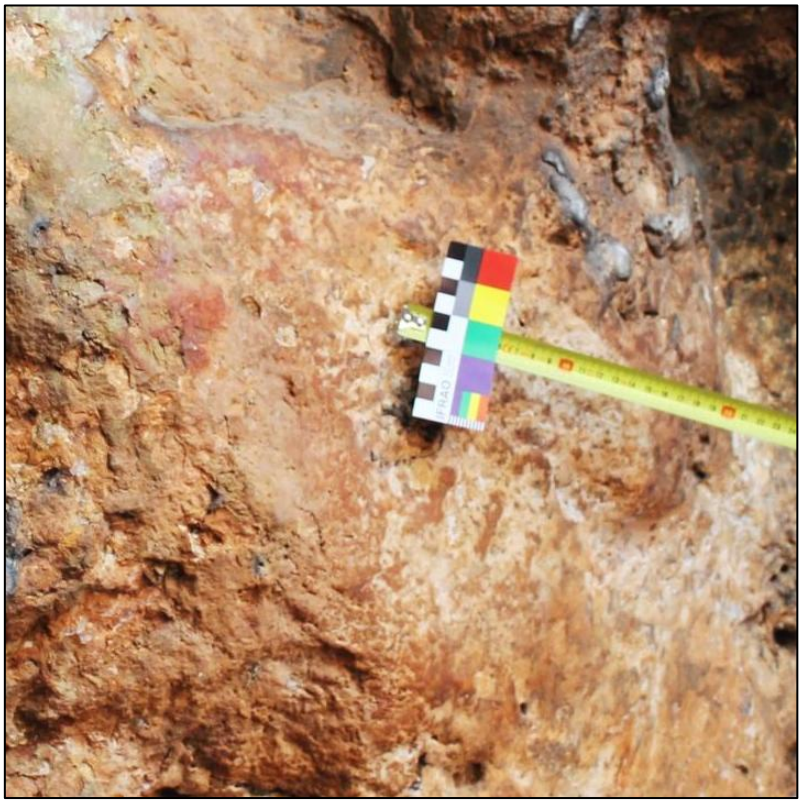


FIGURE 11.1 THE REMAINS OF PAINTED ROCK ART WITH TOO LITTLE DEFINITION TO BE CLASSIFIED AT DIMALURRU/TUNNEL CREEK 4 (M305), BUNUBA COUNTRY.

There are four names for anthropomorphs in the southern Kimberley: Waliarri, Mamo, Djuari and Medicine Men (Mona Oscar & June Oscar 2012 pers. comm., 18 August; Dorothy Surprise 2011 pers. comm., 2 September; Patsy Bedford 2012 pers. comm., 16 August; Mervyn Street, June Davis & Helen Malo 2011 pers. comm., 1 September). The Mamo and Djuari are Bunuba and Gooniyandi names respectively for the same figures with the same stories and are referred to in this thesis as Mamo/Djuari. Each has their own characteristics but are of a similar form with headdresses and poses. Like every anthropomorph recorded they are depicted in full frontal position, with full bodies and limbs, with at least one of the latter visible through layers of superimposition. The Medicine Men (Dorothy Surprise 2011 pers. comm., 2 September) are almost identical smaller, monochrome versions of the Mamo/Djuari.

Zoomorphs are widely painted in the southern Kimberley and depict a wide range of food sources (lizards, crocodiles, snakes, macropods, fish, birds) as well as a small number of possible companion/hunting animals, dingos/dogs (Table 6.23).

Hand stencils are prolific and characterised by mostly white pigment in Bunuba Country, and while also recorded in Gooniyandi Country they are less common, and mostly red.

There are also phytomorphs, material culture and geometric figures painted, drawn and stencilled across the southern Kimberley. The phytomorphs are all local foods: wajarri (boab nuts), thanggari (water lilies), and wanggu (yams) with three images of grass, and one of pods along a vine making up all the phytomorph figures.

There are a small number of Historical Inscriptions across the southern Kimberley (16), an indicator of non-Indigenous presence. The paucity of Historical Inscriptions is unusual for an area of pastoral settlement since the late 19th century and tourism in the 20th, when similarly occupied areas in the Pilbara to the south have many inscriptions alongside traditional and contact rock art (e.g. Bednarik 2000; Fyfe 2010b; Paterson 2006; Paterson & Wilson 2009; Smith 2008; Strano 2009).

Cupules and incised and abraded lines/grooves are also present, though not observed distributed evenly across the region. This is skewed by the limited number of sites recorded in Gooniyandi Country and evidence that there is at least one site with at least 160 incised lines photographed in an earlier survey which I was not able to access during fieldwork (Minnie Pool, DAA 1989). The largest engraved figure recorded is a large, deeply incised crocodile at Tangalma (Figure 7.15), where there are also scratched and incised bird tracks, more common in areas with more exposed sites where painted art would not survive long in the Pilbara (Mulvaney 2011; 2013; 2015; Ouzman et al. 2002). The only other engraved figures are emus in the Scratched/Abraded Solid Infill style at Stumpy's Soak 1.

The southern Kimberley has motifs and figures that are unique, or so rare that whilst recognisable as complete and figurative they have nothing in common with other figures or styles (e.g. Figures 5.7, 6.8 and 6.43), and only speculation from Traditional Owners on what they may represent (see discussion in Chapter 10). These are unique to the southern Kimberley as far as I can determine from published literature, or other records to which I have had access during this research (e.g. Grahame Walsh Collection, courtesy of CC Myers, Boola Bardip WA Museum's Notes and Slides from Ian Crawford's 1960s Kimberley research, and a wide range of photographs of Kimberley and Northern Territory rock art from David Welch).

Following analysis, the southern Kimberley styles were distilled down to the Waliarri Family and Monochrome Stencils, with the latter part of a worldwide tradition, particularly in hand stencils (e.g. Dobrez 2013).

The identification of local styles adds an extra dimension and indicates that in more recent times Bunuba and Gooniyandi people have developed their own styles, one within living

memory (Johnny Bell 2011 pers. comm., 6 September). The Scratched/Abraded Solid Infill style is defined by technique, with anthropomorphs in traditional poses and zoomorphs of endemic fauna. Unlike the engraved rock art at stations in the Pilbara (Fyfe 2010b; Paterson 2005a; 2011; 2012; Paterson & Van Duivenvoorde 2013; Smith 2008; Strano 2009) or the paintings at a single site in Gooniyandi Country (Balme & O'Connor 2015) there is a single non-traditional figure (Figure 6.14) in this style, suggesting that despite the tools and techniques used this may have been created by kartiya[1] or been an expression of identity showing the face of a new kartiya cultural group occupying Bunuba Country (O'Connor et al. 2013).

The other local style in Bunuba Country is Round Bodied Grouped Anthropomorphs (Figures 7.4 and 7.5). This style was recorded at three sites relatively close to one another and may be associated with a family group or group of related families (moiety).

Engraved Animal Tracks are also local to Bunuba Country, but these are found throughout the Australia and the world (Franklin 2007a; Gunn et al. 2011; McDonald 1993; Ouzman et al. 2002; Tindale 1951) and are prolific in the Pilbara to the south of the study area (e.g. Mulvaney 2015b). This cannot usefully be called local because of at least one known site with incised markings which may also be animal tracks (though not recognisable or identified as such) in Gooniyandi Country (Minnie Pool, DAA 1989).

In Gooniyandi Country the local style is Black & White. It is distinctive, and with well-preserved white outlines indicating that they are either of recent application or have been regularly refreshed to maintain cultural identity and ancestral connections (Bowdler 1988; Mowaljarlai & Peck 1987; Mowaljarlai et al. 1988; O'Connor et al. 2008b; Vinnicombe 1992). Traditional Owners said that this style had always been in Country but did not have any knowledge of what it was about, or any stories associated with it (Isaac Cherel, Tommy Dick, Lorraine Shandly 2012 pers. comm. 23 August). This style is spread across Gooniyandi Country, so it is likely to be linked to a wider cultural identity than to a family group or clan like the local styles in Bunuba Country. The presence of common styles across Bunuba and Gooniyandi Country alongside local styles suggests that they may have been more focussed on communicating their local identities and/or territories to visitors than to one another through the rock art (David 1991; David & Chant 1995; Smith 1992b; Storey 2012; Taçon 1994; 1999; Williams et al. 2015; Wobst 1996; 1977).

Landscapes are ever changing and always being sculpted by their users (Ingold 1993; 2007; 2011; Ingold & Vergunst 2008; Pannell 2000), so comparing the figures and styles of

[1] White people in Bunuba language.

western neighbours and Bunuba and Gooniyandi people according to the contemporary borders defined by Native Title does not reflect how this is seen from an Indigenous viewpoint.

Comparison of the Waliarri Family with the northern/western Kimberley Wanjina concluded that they are related styles of iconic being with local and regional variations (e.g. Veth et al. 2021). This suggests that the southern Kimberley is connected to its neighbours to the west/northwest (Ngaranyin/Unguumi) through the Wanjina style, and thus to the wider Kimberley region (Figures 10.15 and 10.16).

Having figures and styles in common with the neighbours suggests interaction, and while the figures and styles cannot be said to be homogenous the similarity does suggest information exchange and the possibility of affinities developed in the ritual or ceremony that may be associated with some of the larger, polychromatic figures (Brady et al. 2022; May et al. 2020; McDonald 2000; Wobst 1976; 1977).

The stylistic analysis excludes many rock art figures. Many figures are in monochrome or bichrome, without attributes which could be said to link them, and these appeared at sites and into deep layers of superimposition across the southern Kimberley. What they say, more than whether they belong to a style or not, is that rock art was most likely part of everyday life and its practice and application in such a wide variety of forms and figures linked people. The more localised and iconic images may have marked identity and both united and separated people in similar ways to the tools, and hunting and gathering practices they shared (Clegg 1987; Conkey & Hastorf 1990; Sackett 1982; Wiessner 1982; Wiessner 1983; 1984; Wiessner 1985; Wiessner 1989; Wobst 1976; 1977; 2000).

So, in answering the questions posed in this section, the identifiable variations in the major Waliarri Family/Wanjina style and the localised styles indicate that there are unique aspects of Bunuba and Gooniyandi identity in the rock art of the southern Kimberley. These maintain their cultural heritage, while maintaining links with the western neighbours through the Wanjina style/art phase variations.

Change Over Time

Dating rock art in this study is limited by the inability to match ochres and marked flakes found in excavations with figures or styles, and the thin or contaminated calcite flows covering and sandwiching rock art. Preliminary dates from a single flake from Mount Behn 1 suggests that pigment was applied to the rockface from the early Holocene until the modern era (Figure 8.2), with the interspersed layers implying that rock art was probably being produced continuously over that period. Excavation findings date occupation at Mount Behn 1 to close to 5,000BP (Table 8.6), but Vannieuwenhuyse (2016) suggests that it may have been longer, as her analysis suggests that deposits were washed away at this site.

Rock art superimposition is complex at many of the sites in the southern Kimberley (Appendix 10). This is encouraging in that it supports continuity of rock art creation over time. Despite the complexity, it is possible to show relative chronologies for individual sites, however, when compared across sites there are contradictions and reversals, and the practice of repainting in neighbouring areas complicates this further (Bowdler 1988; Mowaljarlai et al. 1988; O'Connor et al. 2008b; Vinnicombe 1992), as preservation, refreshing and repainting is selective. The result is more nuanced, suggesting that styles are co-existing, with the three local styles and the Monochrome Outline Broad Group identified as the most recent (Figures 10.13 and 10.14 in both Bunuba and Gooniyandi Country). The Waliarri Family and Monochrome Stencils are continuous through most layers which were able to be isolated within sequences, without reversals or contradictions. Veth et al.'s (2021) date of c.5,800BP for the beginning Painted Hand/Wanjina art phase would be consistent with the Waliarri Family motifs being present at Mount Behn 1 for a similar period.

The Monochrome Outline Group is included because it is the only one of the Broad Groups at a consistent level of superimposition across sites and across the southern Kimberley. This group may have been created in this form, but it is also possible that it may have had infill and/or other details in a pigment that has deteriorated over time and is no longer visible (e.g. Brady & Gunn 2012; Cook et al. 1990; Hall et al. 2007; Pecchioni et al. 2019; Wesley et al. 2014). As there were no other common attributes it could not be considered a style but is included for completeness and to contribute to future discussion on the large body of rock art that is not usually considered in chronological or stylistic analysis (Chippindale & Taçon 1993).

Therefore, in deciding whether rock art motifs or styles have changed over time there cannot be a definitive answer. Yes, new styles have been introduced, as shown by the recency of the local styles (Figures 8.59, 8.60, 10.13 and 10.14). Other styles have been present as far back as superimposition analysis is able to identify them, and continued as new styles emerged, so, a new style need not supplant an older style in a linear fashion.

The place of the Waliarri Family through superimposition layers in Bunuba and Gooniyandi Country suggest this is has been a continuous style, implying that there has been a period during which there has been little need or desire to change expressions of identity or territorial markers until the most recent episodes of rock art creation which created the local styles.

The continuity of styles suggests that there is affinity and familiarity between the Bunuba and Gooniyandi people which coincides with their interactions with the Ngaranyin and Unguumi to the west/northwest through the liminal border areas. This has been continuous since the Waliarri Family emerged, while the more recent emergence of local styles to maintain cultural distinctions and local territorial boundaries within Bunuba and Gooniyandi Country has changed the rock art profile without affecting the continuity of other styles.

Rock Art Locales

Analysis of the location and characteristics of sites identified that they are generally chosen because humans need food, water and shelter, rather than specifically for creating rock art. This was the same in Bunuba and Gooniyandi Country (e.g. Figures 6.3 and 9.4).

Other factors, such as available space, smooth or rough surfaces, walls, ceilings, ledges or overhangs made little difference in where rock art was placed. Rockshelters and caves were popular choices, open exposed rock faces less so. This does not mean that rock art was not there, but, if it was, survival of painted rock art in an exposed environment was not as likely as in protected shelters. That same level of environmental exposure may also be a factor in fewer of those sites selected for human occupation, though proximity to food and water will override protection at times, as is clear from the evidence of long-term site use at the semi open site of Djuru (Maloney et al. 2016).

Sites are in a wide range of sizes. They ranged from one with barely enough room for me (153cm tall) to lie down (much less sit up), with seven layers of superimposition, to another with space for a family of 4 to camp and cook in relative comfort with 21 figures in two

layers (Table 8.8) thus implying the size was not a determinant in site choice or whether it was suitable for rock art on multiple occasions (Table 8.8 and Figures 8.10-8.14).

The variability in site choice means that motifs and styles are not always linked to site characteristics; large figures are equally likely to be in a cave as a rockshelter, or at a site close to the ground as one up a scree slope. Figure size is, of course, related to available wall/ceiling space, but density of figures is not (Table 8.2).

However, investigation of rock art distribution and density revealed a pattern of site clustering with one or two large sites and a group of small sites in proximity, creating Rock Art Locales. The Locales have the full range of motifs and styles present, with at least one large iconic figure or Ancestral Being, diversity and superimposition at the large site/s and fewer figures, and less diversity and superimposition at the smaller shelters. In this arrangement size may have been an issue, but more for accommodation than for space for rock art.

Creating Locales, rather than single sites, to which to move and camp is in keeping with Indigenous seasonal movement and the way people sculpt the landscape as they nurture themselves, their culture and Country (Kingsley et al. 2013; Martin 2003; Pleshet 2018; Woodward et al. 2012). Creating rock art is part of how Bunuba and Gooniyandi people maintain connections with their ancestors. Creating the same figures and styles at the focal sites in each of the clusters where ceremonies likely took place is part of the creation of the pathways or songlines, connecting the places with one another and providing both destinations and stopping points along those songlines (e.g. Cairns & Harney 2004; Clarke 2003; Gammage 2011:14; Kerwin 2010; Mulvaney & Kamminga 1999; Spencer & Gillen 1912; Tonkinson 1991; Witter 2007). Rock Art Locales are similar, and may form a similar function to, the idea of aggregation locales in Australia (e.g. Hook & di Lello 2010; McDonald & Veth 2012b) and other parts of the world (e.g. Conkey et al. 1980; Lee 1972b; Vogels et al. 2021). To use a modern analogy, they may be the hotels, cafes, museums and art centres (small sites) around a convention centre where archaeologists and anthropologists attend conferences to share and celebrate their research (large sites).

The Rock Art Locale model is consistent in the four cases I examined for this study and likely to be repeated in other areas of the southern Kimberley (Figures 10.11 and 10.12). It warrants further investigation and rock art recording in the sub region, particularly extending to Gooniyandi Country where recording was limited. A good starting point for this would be where single sites were recorded without the opportunity to survey the area

for other sites, such as Riwi, Moonggaroonggoo, Darrananna, Elimberrie Springs and Louisa Downs 1.

This model also provides for other types of analysis which could reflect more of the Indigenous ways of knowing, being and doing (Barbara Bynder, Neville Collard, Farley Garlett, Frida Ogilvie 2018-2024 pers. comm. various dates) in Country, such as investigating smaller style provinces and sequences centred on Rock Art Locales, which may reflect seasonal movements, family/clan territories or areas of intense interaction where neighbours meet and engage in ritual, trade and marriage alliances.

Kimberley Chronologies

As outlined previously there is strong archaeological evidence that people have lived in the southern Kimberley for at least 50,000 years (e.g. Balme 2000; Balme et al. 2018b; Dortch et al. 2019; Hiscock et al. 2016; Maloney et al. 2018b; O'Connor 1995; O'Connor & Fankhauser 2001; Vannieuwenhuyse et al. 2016b; Whitau et al. 2017; Wood et al. 2016), and across the Kimberley region and northern Australia for longer (Clarkson et al. 2017; Clarkson et al. 2015; Norman et al. 2022; Ross et al. 2016; Veth et al. 2019). This makes it exciting and challenging to determine if rock art has been created over this time, and what motifs and styles that might include. Scientific dating is close to confirming that that rock art came along with the first peoples (Finch et al. 2021a; Finch et al. 2021b; Finch et al. 2019; Finch et al. 2020; Green et al. 2017a; Green et al. 2021a; Green et al. 2021b; Green et al. 2017b; O'Connor & Fankhauser 2001).

The merging of three styles into a Waliarri Family of styles, with motif variation, led to the conclusion that the Waliarri Family is related to the Wanjina, which is acknowledged to have considerable variation in form and nomenclature across the Kimberley (Veth et al. 2021:207). This enabled me to use the distribution and density of rock art to identify that the borders between the Bunuba and Gooniyandi in and their west/northwest neighbours were liminal, showing that they likely have had affinities and alliances for a long time and were freely moving between the two areas sharing the same motifs and ideas but putting their own spin on them.

Cupules, incised lines and abraded grooves are likely to have been common across the region since 50,000BP, despite the known difficulties and inconsistencies in dating engraved markings (Dorn 1982; 1983; 2001; Roberts et al. 2018; Taçon et al. 1997; Veth et al. 2021; Whitley 2012). The latest Kimberley chronologies position cupules and rock markings as the earliest of five major art phases (Ouzman et al. 2018; Veth et al. 2021;

Veth et al. 2018). Their presence in the rock art of the southern Kimberley at such a phase would be in keeping with Bunuba and Gooniyandi occupation in the southern Kimberley (e.g. Balme 2000; Balme et al. 2018b; Hiscock et al. 2016; Maloney et al. 2018b; O'Connor 1995; Whitau et al. 2017; Wood et al. 2016).

Veth et al.'s (2021) model built on several previous proposals for Kimberley Chronologies (Ouzman et al. 2018; Ross et al. 2016; Veth 2013; Veth et al. 2018; Walsh 1994; Welch 1993a; 2016), incorporating data from recent projects to improve accuracy, but like most models there is a large corpus of rock art which will not be included for a range of reasons, not least of which are the high degree of variation and individuality of figures, and that they are interwoven through superimposition layers. For the art phases from c.20,000BP to 5,800BP there is no comparable figurative rock art in the southern Kimberley (Table 10.2).

In the most recent art phase in the proposed Kimberley model, Painted Hand and Wanjina, the Waliarri Family represents a shared style through its relatedness to the Wanjina. This suggests that there are likely to have been stylistic, and therefore cultural, borders between the Bunuba and Gooniyandi and the remainder of the Kimberley prior to 5,800BP, as there may also have been between them and their neighbours the Ngaranyin and Unguumi.

Rock art recording in the Kimberley has been patchy, and not all of it has attracted the same scholarly interest as Wanjina and Gwion Gwion figures. Collaborative research has increased in the last decade with well supported projects[2], but as Figure 3.1 shows, the Kimberley is a vast region, and the work completed has barely touched the surface. The result is that there are currently areas neighbouring Bunuba and Gooniyandi Country with few sites recorded and sizeable areas without systemic rock art recording. This is also shown in Figure 10.15 where the southern distribution borders for art phases are in the central Kimberley, with large areas not yet included, mostly because they have not been investigated. Research like this project provides evidence for the expansion of the boundary for the Wanjina component of the Painted Hand and Wanjina art phase south (Figure 10.16), and the Waliarri Family to be included within a recent Kimberley art phase.

Thus, in reiterating the conclusions for earlier questions about the borders between Bunuba and Gooniyandi Country it can be concluded that the primary borders have been physical (Bandaral ngadu/Fitzroy River), and while there are local styles in both cultural

[2] Kimberley Visions and the Rock Art Dating Project (northeast), followed on from *Lifeways of the First Australians* (southern Kimberley) and Change and Continuity and Messages in Paint (northwest), each with a rock art component. All are primarily funded by the Australian Research Council and Rock Art Australia in partnership with universities and Aboriginal Corporations.

areas these are contained well within those physical borders and those of the contemporary native title areas (Figure 11.2).

The local styles are at the top of superimposition layers and appear to be contemporary with other styles such as the Waliarri Family and Monochrome Stencils, suggesting that there are likely to have been both shared and separate styles at the same time. Thus, suggesting that while there was while there was a level of shared identity or style at the time these were created, there may also have been a need or desire for a family, or other, group to mark its own borders with its own style.

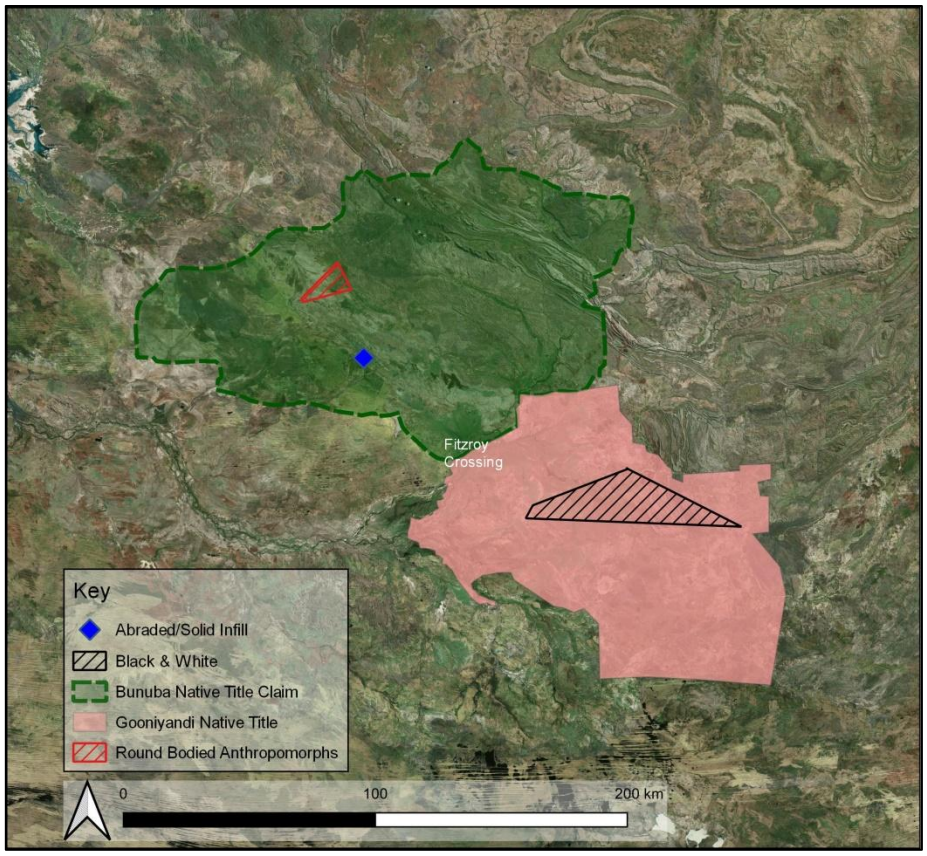


FIGURE 11.2 DISTRIBUTION OF LOCAL STYLES IN BUNUBA AND GOONIYANDI NATIVE TITLE AREAS.

Analysis of rock art and style found that the Waliarri Family and Wanjina are related, and therefore part of the most recent Kimberley art phase proposed by Veth et al. (2021), concluding that they may be described as variations within a widespread style. This means that while the Waliarri Family has been painted in the southern Kimberley there have been cultural links with the neighbours, suggesting open social networks through which trade, marriage and information exchange has likely taken place (e.g. Smith 1992a; 1992b; Wobst 1976). How long this has been may only be estimated, based on the timing of the Painted Hand and Wanjina art phase beginning 5,800BP (Veth et al. 2021), soon after the sea levels began to stabilise and during which people were moving inland to Bunuba and

Gooniyandi Country (Balme & O'Connor 2017), sharing their ideas from the wider Kimberley through rock art. While dating painted flakes and pigment by association with recovered artefacts in excavations is possible and suggests much earlier rock art in the southern Kimberley, not being able to match those with determinate rock art limits the possibility of these dates for the Waliarri Family changing in the future.

Missed Opportunities

This study did not make use of all the data collected, and there are preliminary observations which may shed further light on social and symbolic behaviours in the southern Kimberley.

1. Gendered/non-gendered anthropomorphs. Most anthropomorphs do not have visible gender markers (70%), and in two cases the gender markers have been added. There is scope for exploration of ideas about gender in rock art and its role in fertility and mythology in the southern Kimberley. This would build on anthropological studies of marriage and kinship in the region (e.g. Blundell & Layton 1978; Kaberry 1937; 1938; 1939).
2. Veganthrops. While there are a small number identified in this study it is possible there may be more at sites not yet recorded. This would provide insight into whether the figures in the southern Kimberley (Figure 11.3) are different from those recorded by David Welch in Figure 11.2 (2014 pers. comm., 12 March) and other Kimberley researchers. It would complement the recent PhD by Emily Grey situated in the northeast Kimberley (Grey 2023), and what this tells us about Indigenous relationships with plants and the environment.
3. Southern Kimberley-northern Pilbara links. There is patchy rock art recording in the northern inland Pilbara, usually undertaken within resource or infrastructure development projects. No work has been published for areas in the vicinity of Bunuba or Gooniyandi Country that would have been useful in pursuing this line of investigation and extending the research questions to include southern neighbours. Such work would provide greater insight into where the southern Kimberley fits in wider rock art provinces, rather than within the non-Indigenous geographic boundaries defined in the last 200 years.

FIGURE 11.3 VEGANTHROP, YAM WITH ADDED LEGS, ONE ARM, EYES AND HEADDRESS AT RIWI IN THE SOUTHERN KIMBERLEY. IMAGE ADJUSTED WITH DSTRETCH© LDS/SCALE 20.

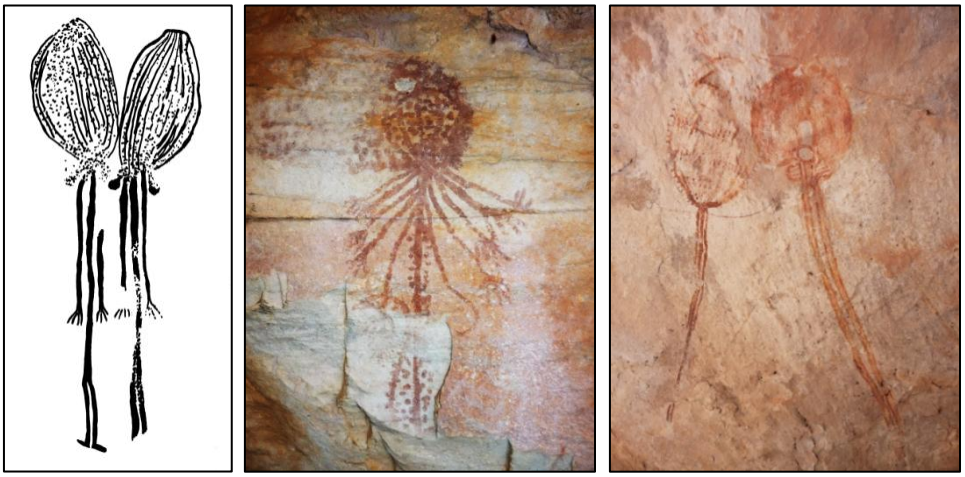


FIGURE 11.4 'PLANT PEOPLE' IN THE KIMBERLEY. ALL IMAGES ARE COURTESY OF DAVID WELCH (2014 PERS. COMM., 12 MARCH).

The Aim

This study began with the aim of determining if the rock art could tell us whether Bunuba and Gooniyandi people had separate identities from one another and from their neighbours, and if so, had this always been the case.

To do this I examined the distribution of rock art and rock art styles across the wider Kimberley, which was necessary because there has not been the systematic recording of the neighbours' rock art, so direct comparisons with neighbours was not possible other than through some geographically or site specific research (e.g. Blundell 1975; 2003;

Blundell & Layton 1978; Blundell & Woolagoodja 2012; Crawford 1964-1968; 1968; Jones 2010; Kenneally et al. 1997) and outcomes from major projects (Figure 3.1) to link the western areas with the wider Kimberley through art phases. This provided an insight into the way rock art has moved through the Kimberley sub regions, and using the framework of information exchange, how identity might be expressed, groups formed, and alliances made and maintained (e.g. McDonald 1998a; 2008; Wiessner 1985; 1989; Wobst 1976; 1977; 2000).

I concluded from the analysis that Bunuba and Gooniyandi people have linked but distinct cultural identities expressed in their rock art. They have a different balance of figure classes (anthropomorph versus zoomorph respectively), and in recent times began to establish local styles which highlight those differences. They are linked through the Waliarri Family style, with motif variations, both within and between Bunuba and Gooniyandi Country. These cultural links do not appear to have changed until the creation of the most recent, local styles in limited areas (Figure 11.2), suggesting that they have had more in common in terms of cultural identity than they have had differences over the period in which the rock art was created.

The dominance of the Waliarri Family style in the west of Bunuba Country and the narrow concentration of local styles suggests that while the Bunuba and Gooniyandi have connections to neighbours to the west, through the adoption of a Wanjina related style, they have created variations which embed their own cultural or individual identities; the Waliarri Family do not appear on prepared white backgrounds and do not have white filled arcs around the heads which are more common for Wanjina in Ngaranyin and Unguumi Country, and the Waliarri Family anthropomorphs are more often complete (sometimes missing feet) than those to the west. Bunuba and Gooniyandi rock art also shows continuity of styles and figure choices through the same superimposition layers where the Waliarri Family are created, suggesting that any identity expressed through the rock art from when they came was maintained, and it was more likely an addition, not a change.

It is less clear whether the cupules and rock marking or the stencils in Bunuba and Gooniyandi Country provide any common identity or cultural links between them and their neighbours across the wider Kimberley. These are all human marks that appear around the world (Aubert et al. 2014; Aubert et al. 2018; Dobrez 2013; García-Diez et al. 2015; May et al. 2020). What they do suggest is that other evidence of rock art creation in the southern Kimberley for more than 40,000 years (O'Connor & Fankhauser 2001) is supported if the cupules are the oldest form of marking and have been present for 50,000

years (Veth et al. 2021). If Gunn (2007) is correct that hand and boomerang stencils, both recorded in the southern Kimberley, were present from around 20,000BP then there is also support for the contention that of rock art creation was continuous despite the gap in art phases between the southern Kimberley and wider Kimberley in Veth et al.'s (2021) model.

There are major themes of rock art, like the cupules and stencils, which show people with similar cultural imperatives or interest to create rock art across the Kimberley, but none to link them through cultural identity or information exchange that may indicate interaction, marriage or trade until the time of the Painted Hand and Wanjina, c.5,800BP (Veth et al. 2021).

The way that Bunuba and Gooniyandi people organise their rock art sites may also be different from their neighbours. Published research has not indicated that sites in the Kimberley are grouped in any specific way. This study found clusters of sites with consistent combinations of rock art assemblages suggesting that Rock Art Locales, linked by songlines, like small towns and cities linked by highways. These may have been part of the seasonal movement, ceremonial gatherings and lifeways of Bunuba and Gooniyandi people. Two of the four clusters identified in this study have dated occupation from the Pleistocene (Langurmurru, Table 8.4 and O'Connor et al. 2014; Djuru East Table 8.5 and Maloney et al. 2016; and Tangalma, O'Connor 1995 and Maloney et al. 2018) to the mid to late Holocene (Mount Behn 1, Table 8.6).

The systematic recording and analysis of rock art with Bunuba and Gooniyandi Traditional Owners in the southern Kimberley has achieved its primary aim. The rock art created from at least the mid Holocene shows that the Bunuba and Gooniyandi people have affiliations with their neighbours (Wobst 1976; 1977) that have been maintained over a period of up to 5,800 years (Veth et al. 2021), but with sufficient variation to sustain their own identities at a cultural and local level through stylistic variation and localised styles, within a broader regional style phase shared with their western and northern neighbours; together but apart in culture and identity.

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Appendix 1
Publications relating to this research

These publications are included with copyright permission from the following publishers respectively

1. Taylor & Francis Informa UK publisher of Australian Archaeology
2. Cambridge University Press/Antiquity Editorial Office

AUSTRALIAN ARCHAEOLOGY, 2016
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SHORT REPORT

Re-excavation of *Djuru*, a Holocene rockshelter in the Southern Kimberley, North Western Australia

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ABSTRACT

Re-excavation of a shelter in Windjana Gorge National Park, Southern Kimberley has extended the known occupation sequence of the site from the mid Holocene to the terminal Pleistocene. The site was previously excavated in 1994 and a non-basal date of ~7,000 cal. BP was recorded. Significantly, the chronostratigraphic sequence represented in the earlier excavation is substantially different to the recent excavation demonstrating stratigraphic variation within a relatively small rock shelter and the need for extensive inter- and intersite and intrasite sampling prior to modeling regional occupation patterning.

ARTICLE HISTORY
Accepted 7 March 2016

Introduction

In 2012 we re-excavated a rock shelter known by Bunuba traditional owners as *Djuru*, meaning outlying or projecting rock (June Oscar and Dillon Andrews pers. comm. 2012). The site is adjacent to the Lennard River in the Windjana Gorge National Park (Figure 1). It has been elsewhere reported as Windjana Gorge Water Tank Shelter (O'Connor et al. 2008) and Windjana Gorge 1 (Balme and O'Connor in press; Maloney et al. 2014). The site was initially registered in 1988 by Vinnicombe and Bradshaw, who described it as a large monolithic column of limestone detached from the range, with mythological associations, surface artefacts, deposit and rock art (DAA Site ID 12588). The monolith and surrounding boulders form two connecting shelters, each with deposit and art panels. The most westerly had a water tank placed within it that was removed in 1993, although associated disturbance such as a plastic water pipe is still visible and extends at least 40 m to the east, where it follows the drip line of the second shelter. It is within this second shelter that the 1994 and 2012 excavations were positioned (Figure 1).

In 1994, a 50 × 50 cm test pit (Square 1) was undertaken which produced a non-basal occupation sequence dating from ~7,000 cal. BP to the historical period (O'Connor et al. 2008). Square 1 produced a sequence with stone artefacts and well preserved faunal remains. In 2012, a 1 m^2 excavation was placed underneath the main rock art panel (Figure 2). The purpose of the re-excavation was to obtain a larger assemblage of archaeological material from the site as part of a regional archaeological project in the area.

2012 Excavation results

Square 2 was excavated in 2 cm excavation units [XUs] (average = 1.45, range = 0.85–2.166) within 50 × 50 cm quadrants. Stratigraphic changes and feature outlines were recorded during excavation. All sediment was dry sieved through 3 mm and 1.5 mm screens. Sediment samples were taken from each XU and from individually recorded features. Charcoal, shell and seeds to be used for dating were plotted in 3-D, as were large stone artefacts.

The deposit is composed predominantly of a matrix of calcitic silts and quartz fine sands originating from the surrounding limestone weathering and the alluvial plain. The sequence shows a complex layering with subtle changes in colour (light grey, brown to dark grayish brown) indicative of variable proportions of ashes, organic matter and charcoal (Figure 2). The layers have been grouped in eight main stratigraphical units [SUs]. Bioturbation has affected some areas of the deposit (burrows and roots).

The sequence in Square 2 is divided by a chronostratigraphic hiatus in two occupation phases: the 'early Holocene phase' and the 'late Holocene phase' (Table 1 and Figure 3). The lowest and earliest date of 13,051 to 12,759 cal. BP (D-AMS 001681) was obtained from a charcoal sample from directly over the decomposing limestone bedrock (transition SU8/7). Multiple radiocarbon dates bracket the early Holocene phase between 13,000 and 8,700 cal. BP

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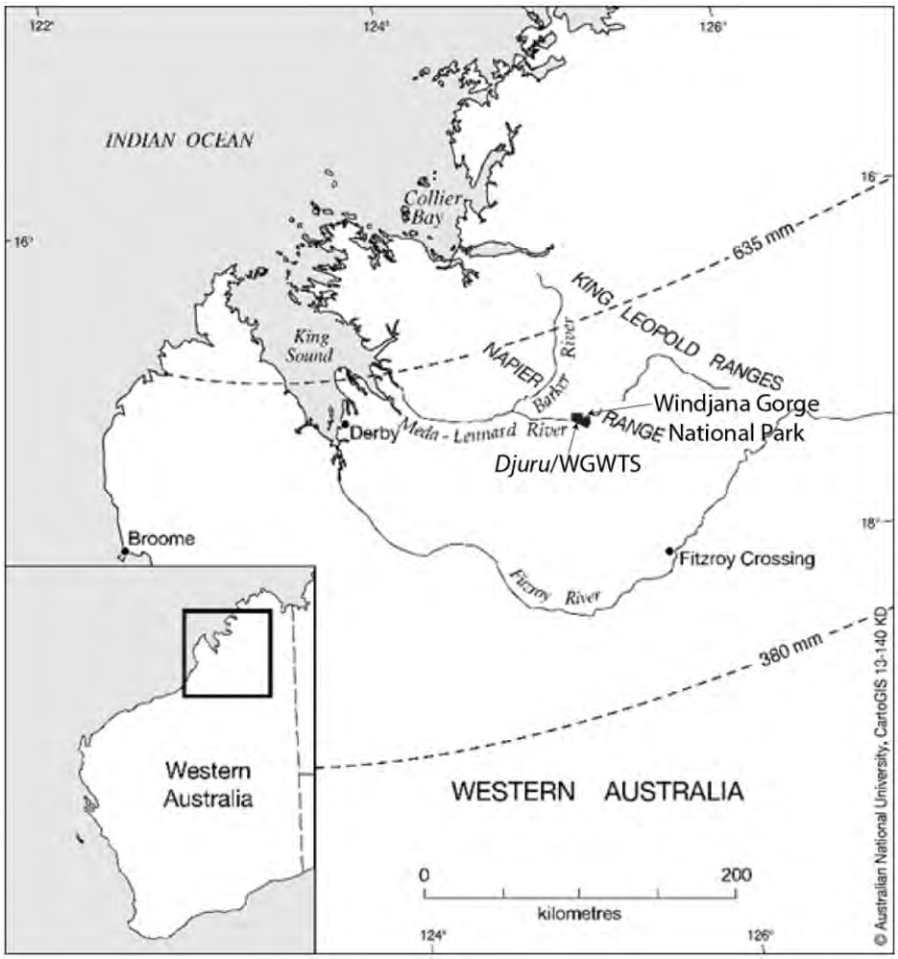

Figure 1. North Western Australia and Kimberley region showing Windjana Gorge National Park and *Djuru*/Windjana Gorge Water Tank Shelter (WGWTS) site location.

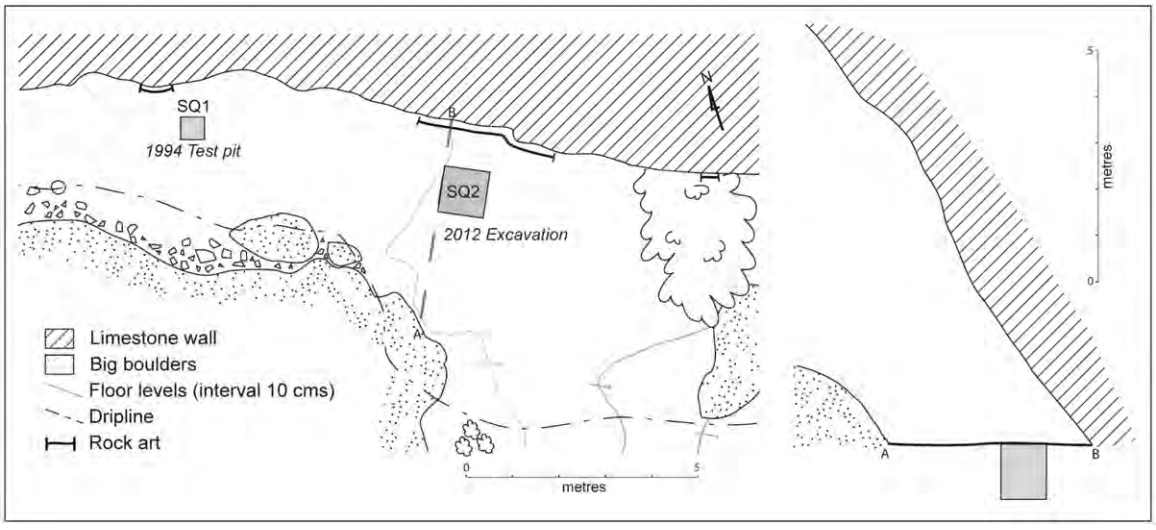

Figure 2. *Djuru* site plan and profile (Dorcas Vannieuwenhuyse).

(XU 52 to 15 and SU 8 to 5). All charcoal samples from SU 4 to 1 date within the last 1,300 years and decrease in age towards the surface. Some late Holocene dates are out of stratigraphical order and are not taken into account in our sequence (D-AMS 001670, D-AMS 001671, D-AMS 001672, D-AMS 001673). Thus the mid-Holocene occupation found in the previous excavation is not represented in this part of the deposit.

The 2012 excavation recovered bone, mussel shell, scaphopod beads and other marine shell fragments, charcoal, ochre, botanical remains, stone artefacts, and a single bone artefact. These finds are summarised in Table 2. As at other inland Kimberley sites (Balme and O'Connor in press), marine shell is present throughout the Holocene both as ornaments and unmodified fragments. Two scaphopod shell beads (Figure 4) were directly dated to ~8,000 cal.

Table 1. Calibrated radiocarbon dates from Square 2.

S#	Lab. Code	XU	Quad	Depth (m)	SU	Sampling context	Material	Curve	d13C	PMC	Radiocarbon age	C14 Age 2 υ
1	D-AMS 001666	1	A	0.0210	1	Sieve residue	Charcoal	SHcal13	−23.9	96.65	273 ± 23	323–151
2	D-AMS 001667	5	B	0.106	2	In situ	Charcoal	SHcal13	−22.1	90.22	827 ± 25	736–671
3	D-AMS 001668	10	D	0.196	3	In situ	Charcoal	SHcal13	−29.2	85.61	1,228 ± 24	1,180–992
4	D-AMS 001669	15	D	0.301	4	In situ	Charcoal	SHcal13	−26	87.56	1,364 ± 29	1,296–1,185
5	ANU-33034	16	A	0.332	5 top	Sieve residue	Scaphopod	Marine13			8,105 ± 45	8,709–8,431
6	ANU-33035	18	C	0.391	5 top	In situ	Scaphopod	Marine13			8,100 ± 45	8,698–8,426
7	D-AMS 001670	18	D	0.371	Burrow	In situ	Charcoal	SHcal13	−31	87.32	1,067 ± 25	966–820
8	D-AMS 001671	18	D	0.385	Burrow	Sieve residue	Charcoal	SHcal13	−18.8	87.32	1,089 ± 26	1,046–920
9	D-AMS 001672	20	D	0.425	Burrow	Sieve residue	Charcoal	SHcal13	−35.8	83.39	1,459 ± 25	1,359–1,285
10	D-AMS 001673	25	D	0.541	Burrow	In situ	Charcoal	SHcal13	−32.4	88.2	1,009 ± 31	930–797
11	D-AMS 001674	25	D	0.536	5	In situ	Charcoal	SHcal13	−22.7	37.07	7,972 ± 30	8,980–8,631
12	D-AMS 001676	29	B	0.666	5	Sieve residue	Charcoal	SHcal13	−25	36.48	8,101 ± 62	9,134–8,649
13	D-AMS 001675	29	B	0.656	5	In situ	Charcoal	SHcal13	−29.8	33.95	8,678 ± 38	9,690–9,531
14	D-AMS 001677	35	D	0.816	5 bottom	In situ	Charcoal	SHcal13	−27.5	33.41	8,807 ± 50	10,120–9,553
15	D-AMS 001678	35	D	0.822	6 top	Sieve residue	Charcoal	SHcal13	−27.2	32.29	9,081 ± 45	10,285–9,943
16	D-AMS 001679	41	B	0.946	6 bottom	In situ	Charcoal	SHcal13	−21.1	31.86	9,188 ± 50	10,489–10,219
17	D-AMS 001680	45	D	1.041	7	In situ	Charcoal	SHcal13	−21.2	30.61	9,510 ± 34	11,065–10,578
18	D-AMS 001681	46	C	1.078	Transition 8/7	In situ	Charcoal	SHcal13	−17.5	25.16	11,085 ± 51	13,051–12,759

Charcoal samples were calibrated using OxCal v. 4.2 (Bronk Ramsey 2009), with the Southern Hemisphere Atmospheric curve [SHcal2013] (Hogg et al. 2013). Marine samples were calibrated using the 2013 marine curve (Reimer et al. 2013).

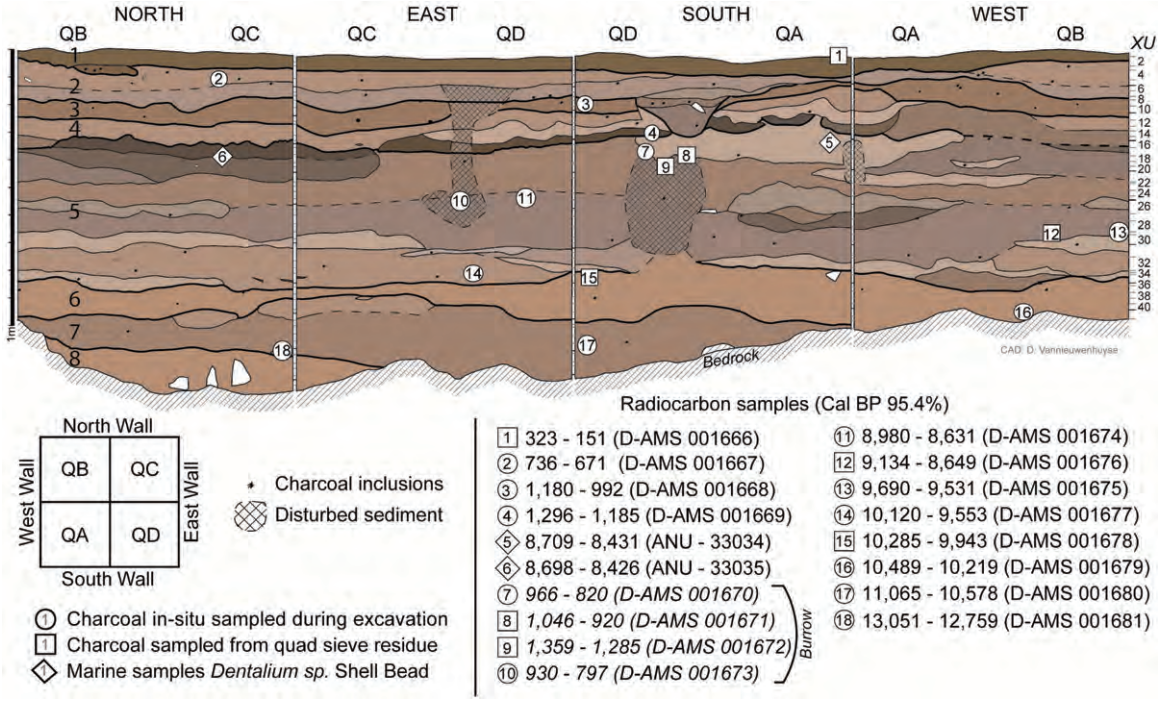

Figure 3. Stratigraphic drawing of square two (Dorcas Vannieuwenhuyse).

BP (ANU-33034, ANU-33035). Other recovered marine shells include eight fragments of *Melo* sp. (baler shell) dated by association to the early Holocene. A single fragment of *Geloina* sp. was recovered from XU 21, also within the early Holocene occupation phase. While these marine shell fragments may have been parts of tools, perhaps similar to others reported from North Western Australia (O'Connor 1999:81, Figure 5.19; Przywolnik 2003:19), they have no traces of use. Fresh water mussel shell (*Lortiella froggatti*) was found throughout Square 2. Most of it is burnt and highly fragmented. This species also occurs in the nearby sites of Carpenter's Gap 1 and 3, throughout the Pleistocene and Holocene (O'Connor 1995; O'Connor et al. 2014:18) and was collected from the Lennard River at the gorge, approximately 200 m to the west. Figure 5(A) illustrates the distribution of fresh water mussel shell, by weight, throughout the sequence. Fresh water mussel is most prevalent in the late Holocene occupation phase, particularly in the uppermost excavation units. This distribution may, in part, reflect the effect of poorer preservation with depth; however, a few peaks in the distribution of shell that appear to correlate with the distribution of charcoal (Figure 5D), suggest that preservation is not the only factor at play. The recovered bone has not been identified to species, although long bones and teeth of rodents and small reptile vertebrae are abundant, and the species composition appears superficially similar to that reported in 2008. In contrast to the shellfish and charcoal, the greatest discard peak in bone occurs in the early Holocene occupational phase, with a marked decline in the late Holocene.

Table 2. Summary of recovered materials from Square 2.

XU	Total vol. (L)	XU depth below surface (m)	TNA #	MNF #	Charcoal (g)	Bone (g)	Painted limestone #	Pigment (g)	*Lortiella froggatti* (g)	Avian Shell (g)	*Melo* sp. (g)	Scaphopod (g)	*Geloina* sp. (g)	Seeds (g)
1	32	0.021	33	23	0.10	13.28			8.65					
2	30	0.050	47	24	7.02	8.43	1		9.64					2.20
3	27	0.071	53	31	14.88	4.41			12.52					1.29
4	30	0.094	43	22	1.29	2.21		3.87	20.68	0.29				0.33
5	22	0.114	35	16	8.93	5.60			12.52	0.47				0.10
6	25	0.135	33	18	3.04	3.86			7.40	0.31				0.13
7	20	0.153	16	7	2.24	2.78			21.83	0.74				0.14
8	23	0.170	16	9	0.73	3.23			2.64					0.17
9	20	0.188	6	4	2.06	1.97			1.13	0.04				0.51
10	27	0.210	15	11		3.43			0.95					0.16
11	29	0.236	37	22	0.18	7.88			0.35	0.15				0.25
12	26	0.254	20	9	0.65	4.48			0.32					
13	26	0.276	12	6	0.02	11.50			1.22	0.02				
14	26	0.291	22	13	3.06	17.53		10.53	6.29	0.17				
15	29	0.312	17	11	0.69	15.16			4.96		0.60			
16	29	0.332	12	6	1.29	7.50		7.6	3.08	0.06	0.40	0.30		
17	32	0.358	21	14	4.53	7.10		1.5	4.76		0.49			
18	31	0.385	19	9		5.25		0.8	6.36			0.18		0.28
19	25	0.397	14	8	1.87	7.92	2	109.18	2.62		0.12			
20	27	0.425	8	6	0.00	12.75			0.56					0.05
21	31	0.451	15	12	3.77	37.34	2	3.29	3.28				2.41	
22	22	0.471	9	8	0.79	4.37			0.87	0.26				
23	29	0.493	18	8	0.24	8.42			3.21					
24	28	0.517	15	11	3.74	8.85			1.09					0.11
25	30	0.541	16	10	1.12	12.80		5.26	1.28					
26	40	0.583	4	4	8.50	12.73			2.33					
27	37	0.613	21	11	2.10	21.23			3.80					
28	31	0.647	14	10	2.80	9.94			1.15					
29	31	0.666	3	2	2.37	7.22			0.68		0.52			
30	34	0.688	8	2		10.33			0.23		1.91			
31	38	0.730	10	9	3.87	10.12			2.34		1.50			
32	27	0.752	15	9	2.26	7.45			2.48					
33	31	0.776	13	7		13.92		2.5	4.00					
34	27	0.793	13	9		11.73		0.7	3.45		0.35			0.27
35	25	0.822	8	6		28.45			0.19					
36	34	0.840	13	6	0.49	10.89			2.30					
37	32	0.865	13	8	1.07	38.05			0.67					
38	22	0.887	39	18		29.44			0.13					0.13
39	24	0.912	67	35	0.19	24.29			0.70					1.38
40	27	0.933	41	24		39.28			0.24					0.08
41	24	0.959	40	20	2.50	15.10			0.42	0.05				0.21
42	31	0.978	18	7	0.50	19.77			0.16	0.08				1.29
43	27	1.008	9	7	5.80	15.19			0.36					0.18
44	17	1.026	3	1	0.52	3.75			0.53					
45	20	1.053	5	4	1.92	1.26			0.09					
46	3	1.083	1	1		1.39								
47	21	1.105				0.19								0.18
48	17	1.115												
49	8	1.161			0.10									
50	3	1.176			7.02									2.20
51	5	1.196			14.88									1.29
52	7	1.201			1.29									0.33

This contrast may suggest a non-anthropogenic origin for the bone, especially as the discard rate for stone artefacts (Figure 6) appears to follow more closely that of charcoal and shellfish.

The apparent absence of aquatic foods other than freshwater shellfish in the diet is puzzling given the site's proximity to Windjana Gorge (~200 m). O'Connor et al. (2008:78) noted the lack of fish bones in the 1994 excavation, suggesting that it may have passed through their sieves, the smallest of which had a 3 mm mesh. However, the 2012 excavation used a 1.5 mm sieve. Aquatic resources such as freshwater crocodiles, barramundi, black bream, eels, freshwater crustaceans and water birds are abundant in the gorge. The presence of mussel shell throughout indicates that the gorge contained standing freshwater and thus the lack of other aquatic fauna seems curious.

A bone point tip fragment with striae dates to the late Holocene (XU5) (736 to 671 cal. BP, D-AMS 001667).

A total of 936 stone artefacts were recovered from Square 2 of which the dominant raw material is crystal quartz (59%). Water rolled cobbles of crystal quartz are found within the Lennard River gravel beds, and formed crystals occasionally occur in conglomerate bands in the limestone. White vein quartz is locally abundant, but was not as frequently exploited (4.2%) as crystal quartz. Other raw materials include fine-grained quartzite (12.5%) and chert (12.3%), with basalt, tuff, sandstone and chalcedony also present (12%).

The lowest observed stone artefacts are from XU 46 (13,051 to 12,759 cal. BP D-AMS 001681) which marks the beginning of a stone artefact discard peak which ends in XU 35 (Figure 6) dated by two overlapping radiocarbon dates of 10,120 to 9,553 cal. BP (D-AMS 001677) and 10,285 to 9,943 cal. BP (D-AMS 001678). For the rest of the early Holocene phase stone artefact discard is lower. The late Holocene occupation deposit reveals an increase in artefact discard peaking around XU 5, dating to 736-671 cal. BP (D-AMS 001667). A single pressure flaked bifacial point is associated with two overlapping dates of 968 to 822 cal. BP (D-AMS 001670) and 1,049 to 916 cal. BP (D-AMS 001671) (see Maloney et al. 2014:139, Figure 2). Two other unifacial points were recovered in the late Holocene units.

The shelter wall has an assemblage of painted art in red, orange and white pigments. The motifs are mostly snakes ($n = 18$) and eels ($n = 4$), identified by the presence of fins behind the head. Ochre pieces and limestone fragments with traces of pigment were found in both occupation phases (Table 2).

Figure 4. Scaphopod beads. (A) Bead from EU 16; (B) bead from EU 18.

Conclusion

The excavation in *Djuru* was extended to bedrock, establishing that the site was used from at least the terminal Pleistocene 13,000 years ago. Differences in the chronostratigraphic sequence across the site were identified. The Square 2 deposit contained two dated phases of occupation representing the terminal Pleistocene to early Holocene and the late Holocene. The period of 7,000 to 1,300 cal. BP identified in Square 1 (O'Connor et al. 2008), is absent in the

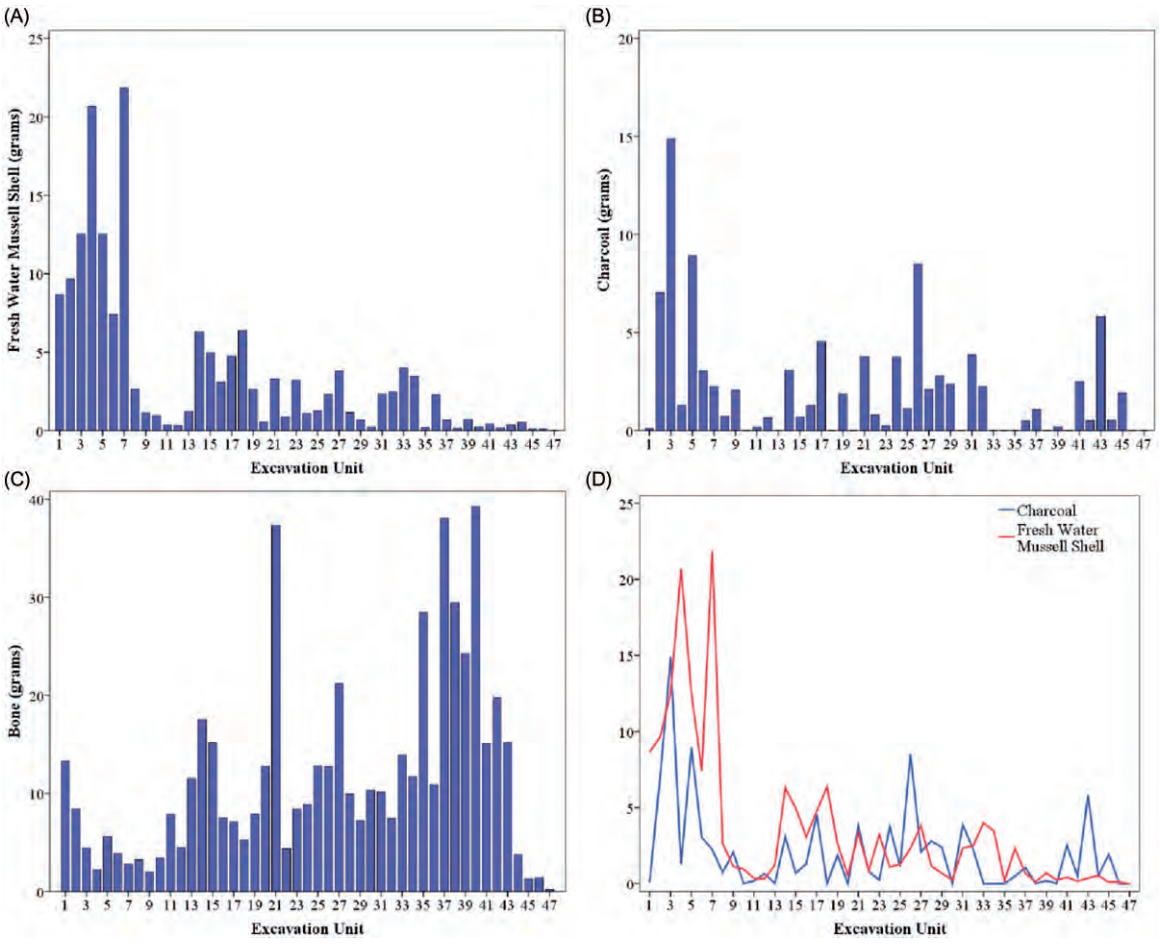

Figure 5. Discard trends relative to excavation units showing weight (g) combined for both 3 and 1.5 mm sieve fractions. (A) Fresh water mussel shell; (B) charcoal; (C) faunal remains; (D) correlation of fresh water mussel shell and charcoal.

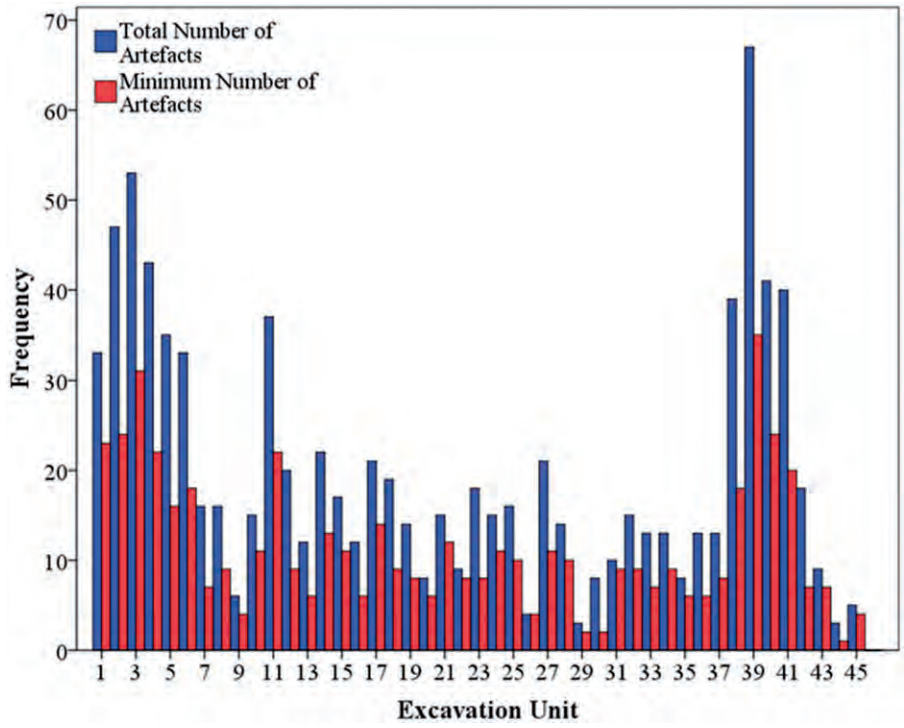

Figure 6. The total number of stone artefacts (936) and the minimum number of flakes (517) (after Hiscock 2002:254) for each excavation unit.

part of the site sampled by Square 2. This small shelter, approximately 10 × 3 m, illustrates how stratigraphy and cultural materials within a site can vary dramatically over small spatial distances, emphasising the need for sampling across the floor of deposits if larger excavations are not possible, and caution in using the chronological sequences in small excavation squares to model regional occupation patterning.

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Disclosure statement

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article

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Marking resistance? Change and continuity in the recent rock art of the southern Kimberley, Australia

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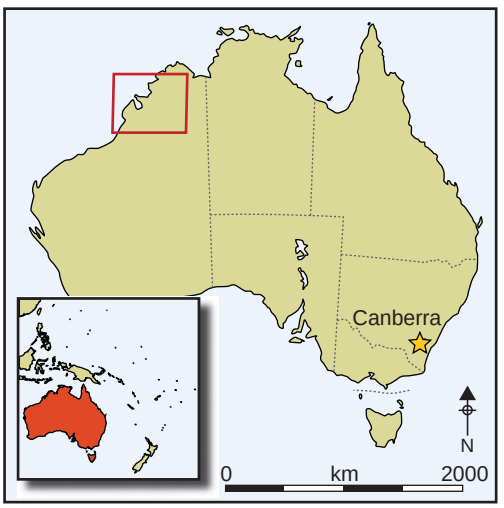

Enhanced by recent survey, the authors define new kinds of rock art along the Lennard and Fitzroy rivers in Western Australia—black pigment and scratch-work images featuring anthropomorphic figures with elaborate head-dresses. These are shown to belong to the Contact period and represent the response of Indigenous artists to European land-taking by recalling and restating traditional themes from earlier times.

Keywords: Australia, Kimberley, Contact period, rock art

Introduction

The classic painted images known as Wanjinas first appear in the last 2000 years and were actively repainted in many parts of the Kimberley into the late twentieth century (Blundell & Woolagoodja 2005; Morwood *et al.* 2010). Blundell (1974) describes repainting as traditionally taking place within the context of landscape renewal. When large numbers of men met to burn the grass and to undertake communal hunting, the sacred Wanjinas were retouched to ensure the coming of the monsoon and the regeneration of all life. The visual impact of Wanjinas with their full frontal pose, prominent eyes and lack of mouth,

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and the highly decorative quality of Wanjina-associated imagery, has led to the impression of stylistic unity in the recent art tradition of the Kimberley region of northern Australia (Rosenfeld 1997).

This impression is, however, somewhat misleading and has resulted in other styles being overlooked. This paper presents a preliminary description of two other forms of art from the south-central Kimberley that have not been previously recorded: black dry pigment and fine scratch-work images and markings. Both styles were recorded in the traditional lands of the Bunuba and Gooniyandi, some of whom are co-authors of this paper and have provided local knowledge about the art. While not directly dated, many of the drawn charcoal and scratched graphics appear, on the basis of superimposition and oral tradition, to be synchronous with, or to post-date, Wanjina imagery.

Although the drawn charcoal and scratched graphics we describe here do not occur in all shelters or caves with art, both styles are sufficiently common across a region spanning more than 20 000km^2 to suggest that they can be viewed as regionally important. The drawn black pigment art has strong parallels with the dry pigment Contact art described by Smith & Rosenfeld (1992: 12) and Frederick (1999) for the Watarrka National Park region of central Australia. Similar scratch-work has been recorded in the West Baines region of the Victoria River District of the Northern Territory, where McNickle (1991) suggests (on the basis of the motifs including horses, people on horse-back and a helicopter) that they relate to the period after European contact. In the Keep River region, also to the north-east, Taçon *et al.* (2003) have recorded scratch-work art as the most recent art. Scratch-work and charcoal motifs have also recently been identified on the Canning Stock Route survey (Veth *pers. comm.).*

In the Kimberley region these two rock art styles may well have gone unrecorded because they do not have the stylistic unity commanded by the Wanjinas and do not depict Europeans—so are not instantly recognisable as Contact-themed art. We suggest that they nevertheless belong to the Contact period and that the concentration on themes of ceremony and continuity in traditional motifs may have been influenced by the particularly violent history of this region.

Rock art research in the Kimberley Devonian Reef region

The Devonian Reef complex discussed in this paper is represented by a number of ranges including the Oscar and Napier Ranges in the west and the Mueller and Sparke Ranges in the east (Figure 1). The boundary between Bunuba lands to the west and Gooniyandi lands to the east is close to the Fitzroy River. The rock art of the Kimberley region is best known for the diminutive and beautifully crafted Gwion Gwion figures (previously known as Bradshaw figures) (see McNiven 2011 for an overview of the history of Gwion Gwion research), and the visually powerful Wanjinas (Crawford 1968). The Gwion Gwions are spatially restricted to the northern Kimberley (Crawford 1968: 82; Layton 1992: 235–36; Welch 1993; Morwood *et al.* 2010). None has been reported from the southern Kimberley region between Derby and Fitzroy Crossing where Wanjinas and associated graphics are the dominant rock art tradition (Crawford 1968).

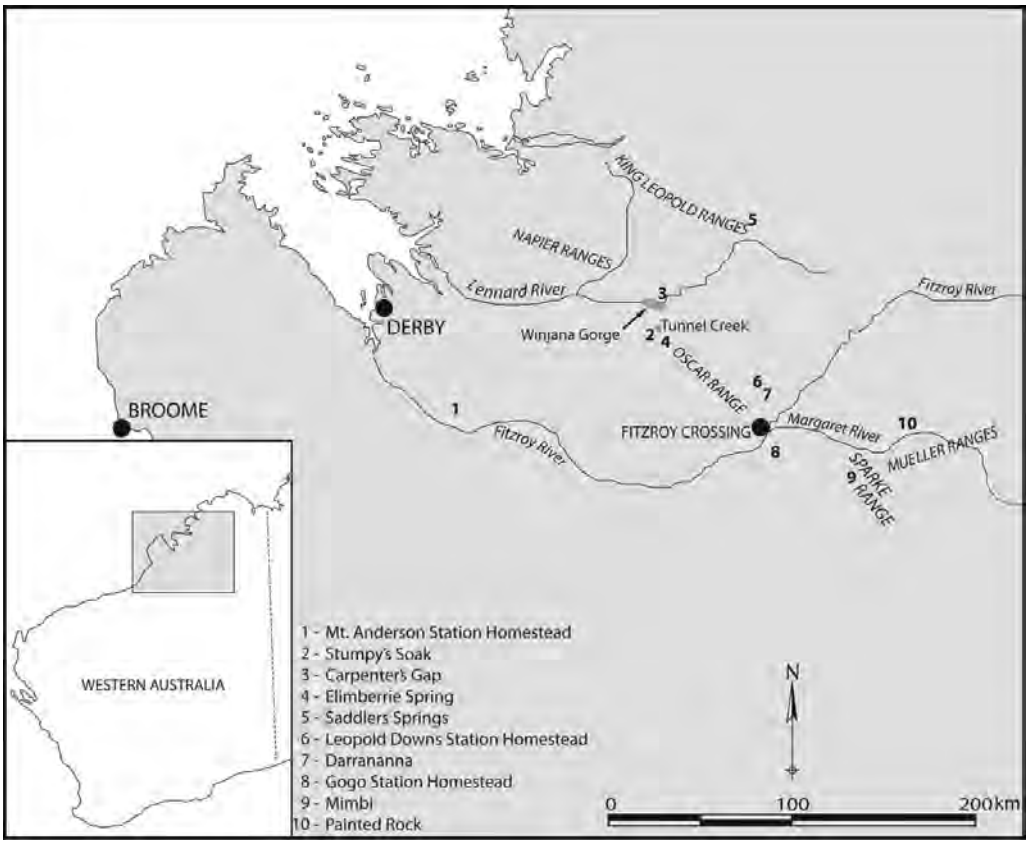

Figure 1. The south-central Kimberley, covering Bunuba and Gooniyandi country.

Wanjinas occur in shelters and caves in the Oscar and Napier Ranges throughout the lands associated with Unggumi and Bunuba (who refer to them as Waliarri), but do not extend east into Gooniyandi country according to current Gooniyandi Traditional Owners. Like the Wanjinas recorded elsewhere in the Kimberley (Crawford 1968; Ryan & Akerman 1993; Frederick & O'Connor 2009), those in Bunuba country are visually powerful and distinctive figures, having haloed heads (Figure 2a), often with radiating line infill, and faces that include eyes and a nose but which lack a mouth. They occur as both large full-bodied individuals, such as the Waliarri at Carpenter's Gap 1 (Tangalma) (Playford 2007: 141), and as simple head or head and shoulders, such as those recorded by Akerman at Saddlers Springs, Iminji (Figure 2b). According to oral tradition, Wanjina paintings are not believed to have been created by humans but rather to have put themselves on the rock (Capell 1939: 390; Schulz 1956: 8–9; Crawford 1972: 304 and Mowaljarlai in Mowaljarlai *et al.* 1988 for an Indigenous perspective). There are also records of people acknowledging that they were regularly retouched or even painted by people (Layton 1992: 21, 33, 37–38, 471; Watchman 1992: 29). Crawford (1968: 49), for example, records that Aboriginal people told him that one man or a very limited number of men were chosen to paint each site. In reference to Wanjina paintings, Woolagoodja (2007: 29) said "our ancestors made this art".

Figure 2. (a) Wanjina with black cockatoo feathers painted in Otilyiyalyangngarri Cave, Mount Barnett (photo by Kim Akerman, 13 April 1985); (b) detail of small Wanjina faces at Saddlers Springs, Iminji (photo by Kim Akerman, November 1973).

Other motifs associated with Wanjinas include a variety of animals and plants, particularly yams (see images in Crawford 1968). Although little has been recorded about the tradition in Bunuba country, in other regions the animals and plants that occur alongside a Wanjina are known to feature in the particular mythic creation events and exploits associated with the individual Wanjina in the shelter (Crawford 1968; Akerman 2009). In Bunuba country, animals that commonly occur in Wanjina caves include crocodiles, lizards including monitors, long neck turtles, dogs, birds, fish and eels. Several sites with Wanjina art include

Figure 3. (a) Waliarri dancing figure and (b) Djuari figure at Painted Rock in Gooniyandi country. Images enhanced using Image J/DStretch.

snakes or rainbow serpents (usually referred to as Ungud) (Crawford 1968: 103). Akerman (2009) discusses the fluidity of the concept of Wanjina and Ungud, both of which are associated with the monsoon.

In Gooniyandi country large anthropomorphs with rayed head-dresses also occur (Figure 3a). Although they share fewer similarities with western Kimberley Wanjina figures than those in Bunuba country, this type was described by Playford as a "typical old-style Wandjina" (Playford 2007: 147–148, fig. 8.35), and our Gooniyandi authors identify it as a Waliarri dancing figure. As well as a prominent head-dress with radiating lines, this Waliarri has two head adornments that look very similar to the red and black cockatoo feathers commonly shown in the Wanjina head-dress, and associated with lightning (Elkin 1948: 14; figs. 10 & 11, Akerman 2009: 15) (see Figure 2a). Such figures may be regarded as at one end of the continuum in a west to east stylistic cline depicting large anthropomorphic forms.

The Waliarri figure occurs alongside other large anthropomorphs identified by Traditional Owners as Djuari (Figure 3b). Djuari are described by the Traditional Owners as 'cheeky spirits' who are recent arrivals from Gidja country in the north. In the course of their

Figure 4. Painted art showing European motifs and introduced animals at Mimbi in Gooniyandi country.

travels the Djuari created a wide 'pathway like an orchard' as they walked. These malicious looking beings are characterised by having two long ears/horns/head-dress/feathers on their heads. The relationship between these and the depictions of dangerous ghosts in the western Kimberley that Crawford (1968: 93) was told were also called Djuari is unclear.

Contact art featuring European subjects, such as people wearing clothing or introduced animals and objects, does occur in the region but is rare compared to Arnhem Land in the north (May *et al.* 2010) and parts of the Pilbara to the south (Paterson & Wilson 2009). Playford (2007: 150, fig. 8.40) records one of the few examples in Gooniyandi country near Mimbi Caves. It includes images of a camel, a horse, a carriage, car or tram, a man wearing a hat, the initials CPLE and a ship, which may be a screw steamer as it has what appears to be a trail of steam or smoke emerging from a central funnel (Figure 4). The hat in question could be a top hat but it is also very like a tall, probably felt, hat similar to that worn by an Aboriginal man in a photograph taken between 1920 and 1936 and labelled 'southern Kimberley' in the Charles Edward Flinders collection of Kimberley photographs held in the Battye Library (Album BA1459). Together the steamer, the hat and carriage/car types suggest a late nineteenth to early twentieth century date for the art.

Black dry pigment art

We recorded possible images of Europeans in Contact art executed in dry black pigment at Darrananna, a cave site in Bunuba country. Amongst drawings in dry black pigment is an image of a person wearing what appears to be a brimmed hat but may be a head decoration. The drawings are mostly diminutive, contrasting markedly with the large, bold Wanjina-style graphics that are executed in wet pigment and applied onto a matte white background. In many cases the drawn black pigment motifs are indistinct and where multiple motifs occur on a single panel they often seem to lack overall compositional structure. Black drawn motifs include scored lines and meanders (Figure 5a), amorphous shapes and anthropomorphs, some with head-dresses (Figure 5b). Hand stencils are common in the painted art but in the black drawn pigment art they are replaced with hand outlines (Figure 5c).

Another feature of this art is that it often appears to have been used in re-marking existing motifs by outlining the painted figures or highlighting or refreshing certain features of painted figures. Some Wanjinas, such as the one at Carpenter's Gap 1, have been outlined or re-marked in charcoal (Figures 6a & b). Other painted motifs have been augmented with the later addition of new features in black pigment. Figures 6c & d show varying degrees of

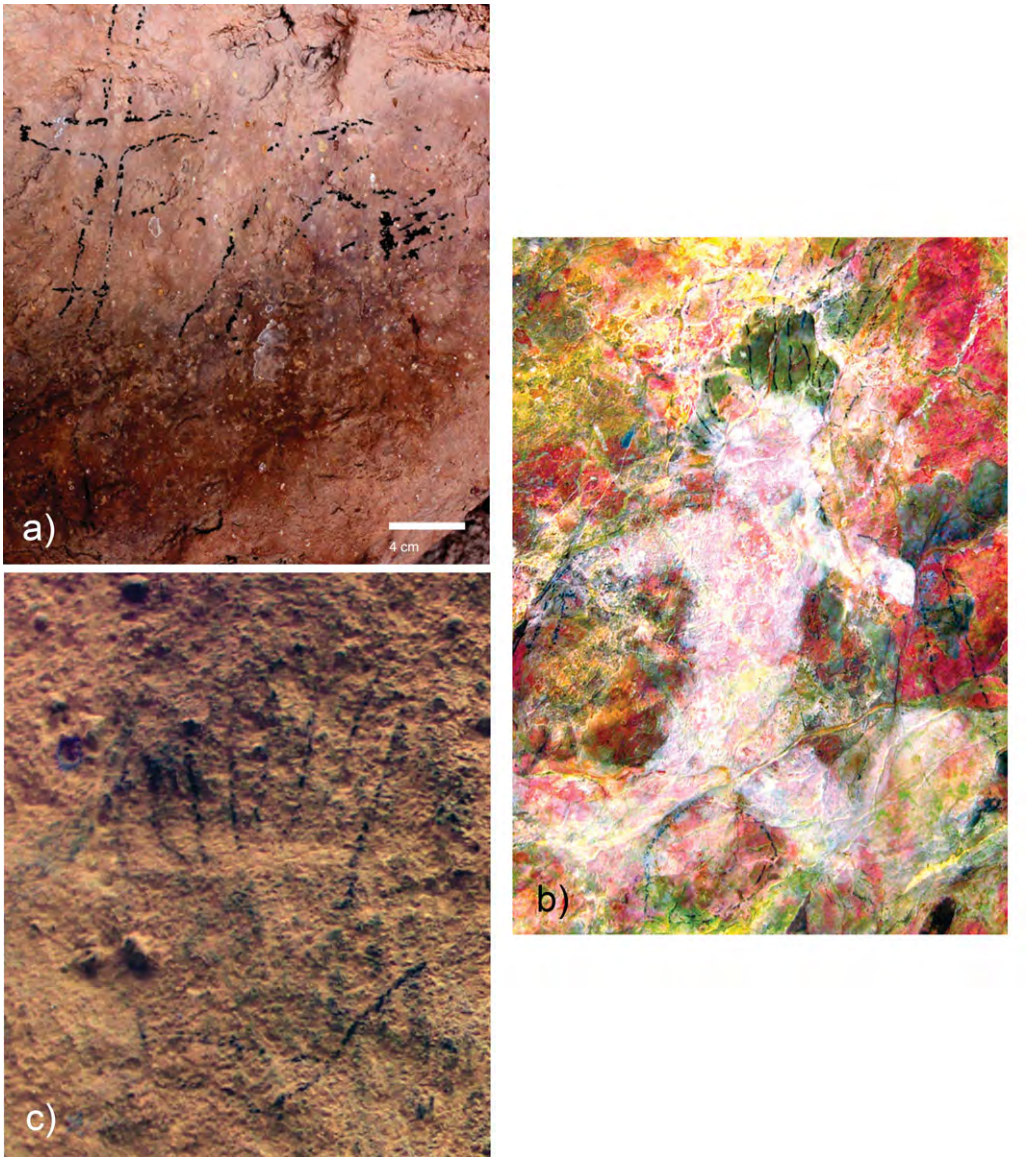

Figure 5. Dry black pigment art: (a) amorphous shapes; (b) anthropomorph; (c) hand stencil. Images (a) and (c) enhanced using Adobe Photoshop tools, and (b) using Image J/DStretch.

addition to either create a new image or refresh an existing one with drawn lines and shapes at the shelter known as Elimberrie Spring.

The addition of head-dresses in black pigment to older paintings is common. Figure 7a shows one such example at Elimberrie Spring. At another site in Bunuba country, an anthropomorph in orange pigment has drawn black pigment applied on top of existing painted pigment to highlight or refresh the facial features and to outline parts of the body (Figure 7b). A series of lines extending vertically from the top of the head does not appear

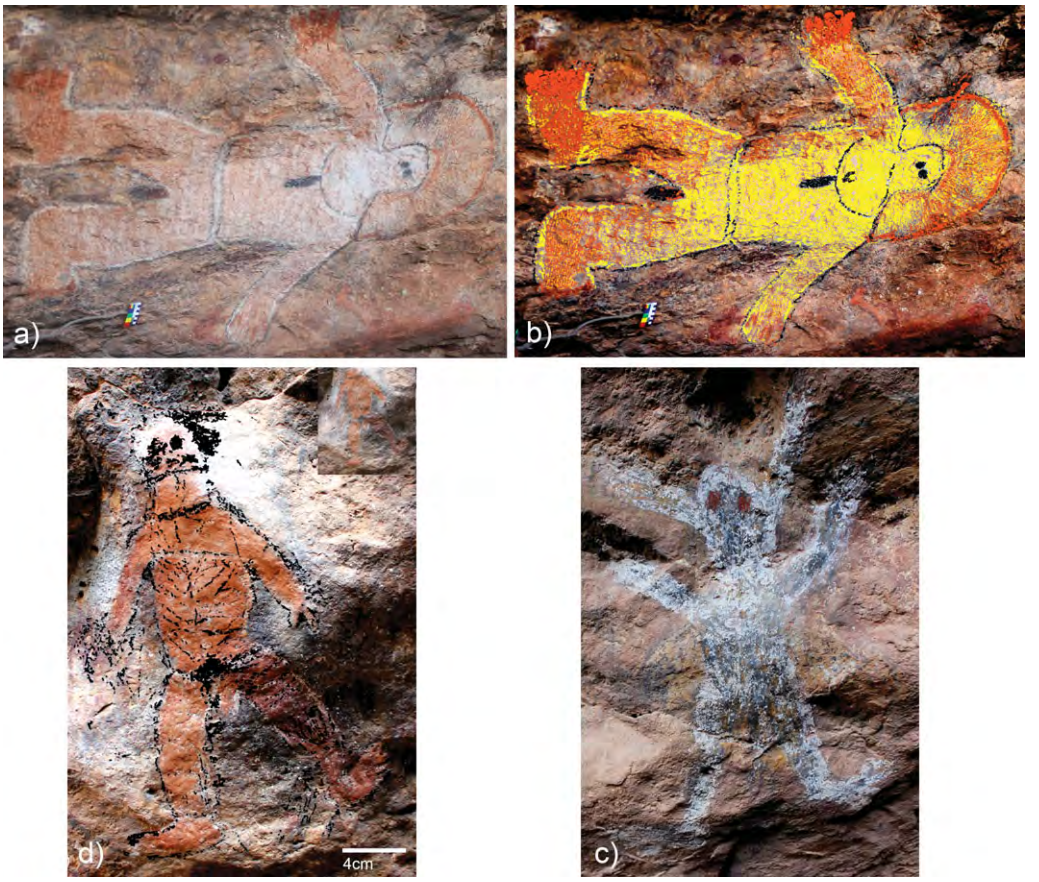

Figure 6. Dry black pigment art added to older art: (a & b) Wanjina from Carpenter's Gap 1 remarked and outlined; (c) anthropomorph with additions and highlights in black pigment; and (d) with internal features on the body added, outline and rayed head-dress drawn in narrow lines of black pigment on figures at Elimberrie Spring. Images b, c & d are enhanced, and drawn black lines highlighted, using Adobe Photoshop layers and tools.

to superimpose any previous such lines and suggest the later addition of a head-dress similar to the rayed head-dresses of Wanjinas. The arrangement of the facial features of this figure also suggests similarity to the Wanjina-style figures found in Bunuba country, with two large solid-fill circle variants joined by an upward opening arc.

A few of the dry pigment anthropomorphs have heads haloed with rayed head-dresses which also seem to reference those depicted on the wet pigment Wanjinas in this region. Figure 7c, for example, shows a small full-frontal black drawn anthropomorph with head-dress. In Figure 7d, a Wanjina-style figure has been drawn in charcoal over an existing red pigment lizard/crocodile.

While the scratched and black pigment art seems to be the most recent art of the area, in some places it is evident that painting using ochres is either contemporary with, or more recent than, the black drawn figures. For example at Elimberrie Spring, a 22cm high anthropomorph has been drawn with a small hat, or head-dress, to the left of two arced lines and indeterminate black drawn shapes that may at one time have formed another

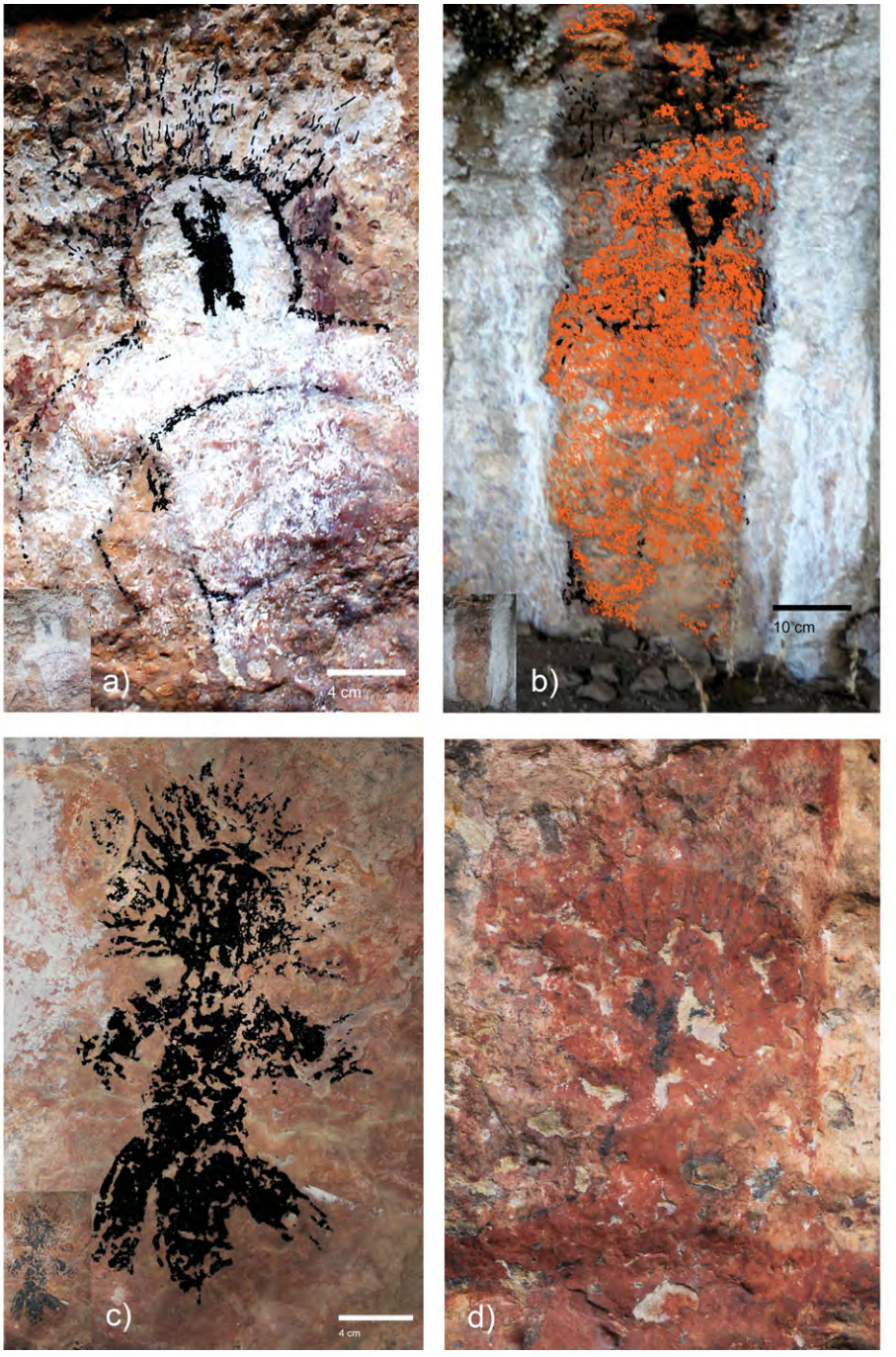

Figure 7. Dry black pigment art used to add head-dresses to older art: (a) anthropomorph at Elimberrie Spring; (b) anthropomorph at an unnamed site in Bunuba country; (c) anthropomorph at a rockshelter close to Tunnel Creek; (d) detail of drawn Wanjina superimposed on large red ochre crocodile south-west of Tunnel Creek. All images enhanced using layers and tools in Adobe Photoshop.

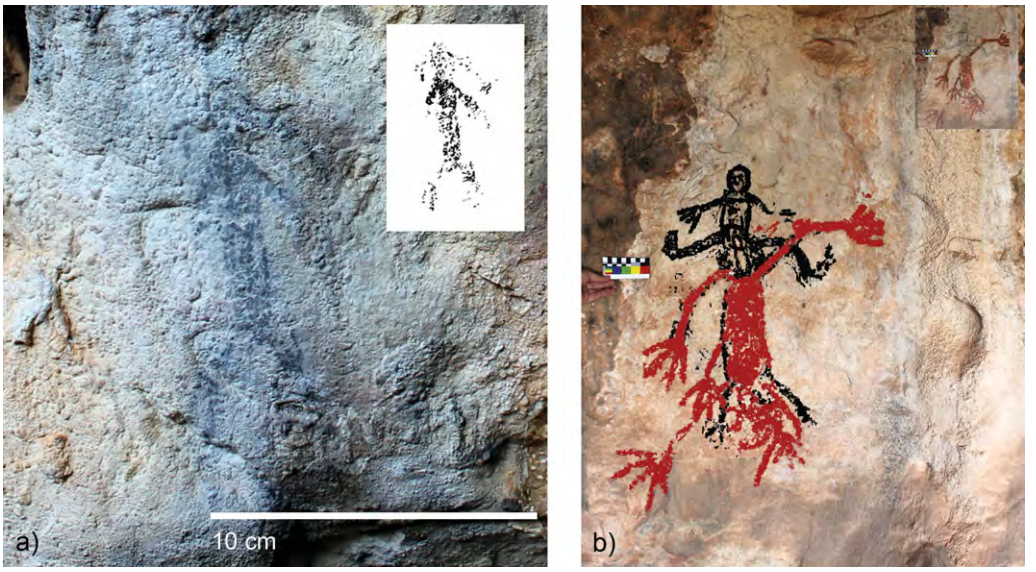

Figure 8. Painted art superimposed on black pigment drawn art at (a) Elimberrie Spring and (b) Tunnel Creek. Both images enhanced using layers and tools in Adobe Photoshop.

figure (Figure 8a). The indeterminate markings are drawn over remnants of a red pigment motif that shows through the gaps in the drawing. These markings are representative of a number of drawings at this site where red, white and orange figures are interspersed with and superimposed on one another and on black drawn figures. Figure 8b shows a black drawn anthropomorph superimposed by a red figure.

Fine scratch-work art

Scratch-work art has been created by incising the limestone surfaces, but the incisions are fine and the depth minimal, suggesting that they were created by scratching the surface with a hard sharp object. Although the incisions are shallow, by removing the dark grey weathered surface of the limestone to expose the underlying white stone, the artists have managed to create contrast without depth. Because many of the scratches are narrow with sharp acute angles at their edges with the parent rock, it is likely that they were made with metal tools such as screwdrivers, fencing wire or knife blades. As discussed below, this is consistent with information given to one of the authors (S.O.) in 1993 by senior Traditional Owners (now deceased) of this country, who had been employed as stockmen.

Examples of scratch-work art identified during the 2011 survey include the small cave designated as Stumpy's Soak 1. This site contains many scratched motifs including three anthropomorphs (Figures 9a & b) with conical head-dresses (or dressed hair arrangements) shown holding implements or weapons, birds that resemble emus, and other motifs that may be plants or ceremonial regalia. About 0.2m to the right of these are some scratch-work figures that superimpose an ochre painting of an anthropomorph. Close examination suggests that they resemble grass trees (*Xanthorrhoea*) or a stylised boab (*Adansonia gregorii*);

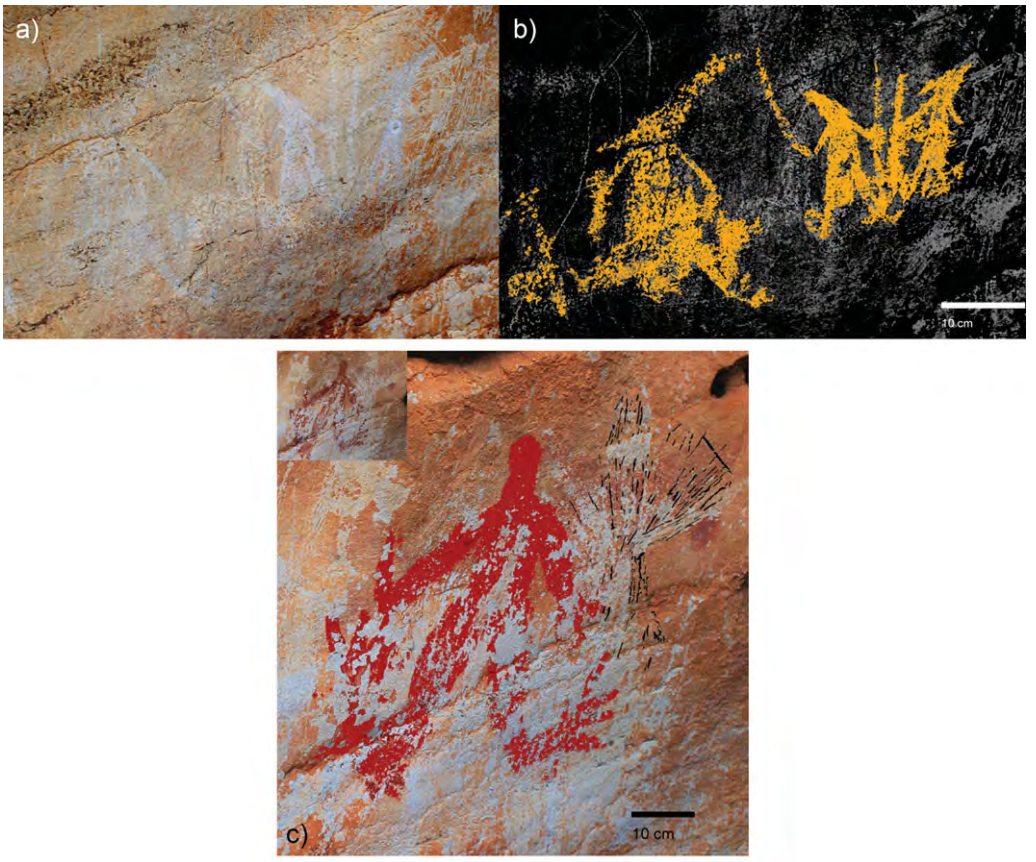

Figure 9. Scratch-work art from Stumpy's Soak 1, Bunuba country: (a & b) anthropomorphs with conical head-dresses or dressed hair arrangements; (c) rays and infilled shapes that superimpose an ochre painting of an anthropomorph. Images b & c enhanced using layers and tools in Adobe Photoshop.

the latter are prolific in the area (Figure 9c). In all cases where painted motifs and scratch-work overlap, the scratch-work images are executed over the painted art. The fact that the scratch-work anthropomorphs are clearly superimposed over red painted figures but appear to reproduce the subject and posture of the painted anthropomorphs indicates they were created after the painted art but reference the same stylistic and symbolic system. Information from the Traditional Owners present when this cave was visited suggested that it was not a habitation site but a place where people came to cool down in the heat of the day while engaged in 'cattle work' on the pastoral station from the late nineteenth century.

Elimberrie shelter also has a large body of light scratch-work art. Figure 10a shows many light and narrow scratched lines that combine to form a figure, possibly a Wanjina-style figure. The enhanced image in Figure 10b shows what appears to be a cockatoo feather emerging from the head-dress, referencing those shown in Figure 2a. The base of the figure forms the body of the anthropomorph with vertical lines forming a rounded wide torso, and one deeper discontinuous line creating a chest-like division similar to those seen on the torso of painted Wanjinas. The figure is partially superimposed by a white ochre anthropomorph,

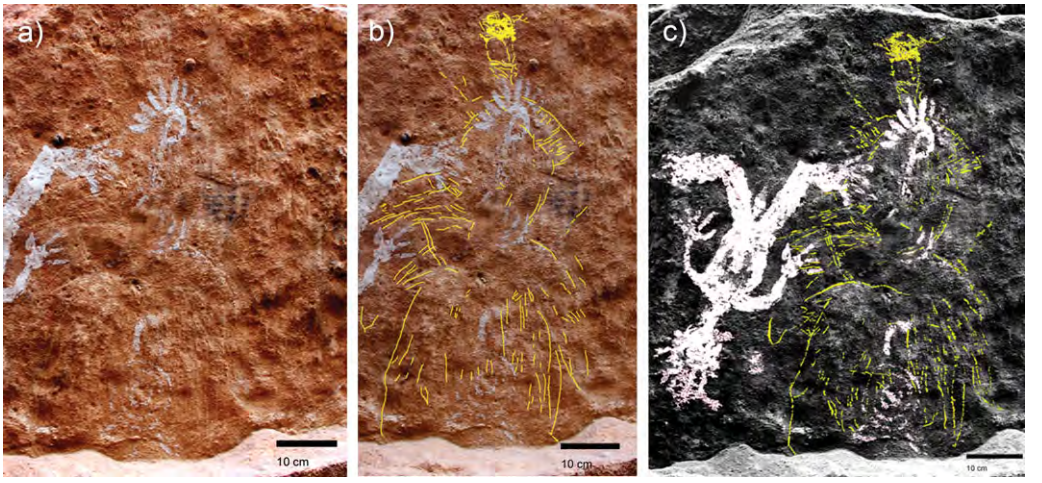

Figure 10. Scratch-work art from Elimberrie Spring: (a) Wanjina-style anthropomorph; (b) scratch-work in 10a highlighted using magic wand and infill tools in Adobe Photoshop; (c) white painted anthropomorph partially superimposed over scratch-work anthropomorph with head-dress.

with vertical extensions that may be interpreted as a head-dress (Figure 10c). The ochre anthropomorph is inverted, which may indicate a deceased person or spirit according to Bunuba Traditional Owners.

Context

The superimposition of the black pigment and scratch-work art indicates that it is some of the most recent art of the region, and contemporary information suggests that at least some, if not all, may relate to the Contact period. The Contact period in the Kimberley, especially the southern Kimberley, was particularly violent. The first British expedition into the Kimberley was led by George Grey and began in 1837, some 10 years after the first British settlement in Western Australia at King George Sound. He describes poor relations with the Aboriginal people, and on February 11 reported a skirmish in which he was wounded and an Aboriginal man killed (Grey 1841)—violence that was to mark early European expansion into the Kimberley. European expansion into the south-central part of the Kimberley began after Alexander Forrest's favourable reports following his 1879 expedition south of the Leopold Range and adjacent to the Fitzroy River. Large tracts of land were taken up very quickly after land was released for settlement in 1881. Durack and Emanuel claimed a holding of a million acres on the Fitzroy River in 1882 (Taylor 1984: 160). In Bunuba country, William Forrester established Lillimooloora, a one million acre property stocked with 60 000 sheep, in 1884. In the space of a few short years the Aboriginal people of this area lost control of their land and resources.

The period of European contact from first settlement to about 1920 is often referred to by Kimberley Aboriginal people as the "killing times" (Kimberley Language Resource Centre 1996), and the first recorded casualty of the south-central region occurred in 1882, almost immediately after settlement (Pedersen & Woorunmurra 1995). Despite the difficulty of

keeping records of killings, many have been recorded and the stories remain in oral traditions today (Ross 1989; Pedersen & Woorunmurra 1995; Kimberley Language Resource Centre 1996; Blundell & Woolagoodja 2005). Most of these killings were as reprisals for killing Europeans or stock, or for killing European men who were involved with Aboriginal women. Oral traditions are often substantiated by government records. For example, the murder of people in Gooniyandi country in the Margaret River region is a well-known story told by Gooniyandi people today (Rosemary Nuggett *pers. comm.*). It is supported by the State Records of the Police Department for 1895, which record the shootings of nine individuals (SROWA, AN5/1, Police Department Acc 430, 1808/1895, cited in Clement 2010: 13).

Violent acts against Aboriginal people were sanctioned as "giving them a lesson" (Owen 2003: 109) and at the turn of the century there was a tendency for the police not to report incidents when warning shots accidently hit people (Gill 1977: 21). When Aboriginal people were not killed in reprisals by pastoralists they were dealt with severely by the law. A Nyikina man who speared the Mt Anderson station manager in 1882 for sexually interfering with his wife was subjected to a public trial in Perth and hanged at Rottnest Island (Pedersen & Woorunmurra 1995: 25).

Despite the violence during the years of conflict, Aboriginal people were also becoming incorporated in the Fitzroy Valley stations (Bolton & Pedersen 1980) where they worked as shepherds to the west and stockmen to the east (Bolton 1954). Payment for this work was largely in rations and the people who worked on the stations camped there with their families while they were working. The Kalgoorlie gold rush of the 1890s made white labour even scarcer and Aboriginal labour more attractive (Rowse 1987: 85). Many Indigenous people resisted the draw of the stations and remained as 'outsiders' (Rowse 1987) until as late as the 1950s (Kimberley Language Resource Centre 1996).

Contemporary information indicates a continuing currency for the dry pigment and scratch-work art. During a survey on Leopold Downs Station in 1993 with one of the senior Traditional Owners, Billy Oscar, author S.O. noted a number of black dry pigment and scratched anthropomorphs. While visually dualistic, these images portrayed similar themes, and some small scratched figures seemed to have head-dresses that referenced the rayed halos surrounding the heads of painted Wanjinas. Billy Oscar noted that these images had been created by Bunuba men while they were engaged in cattle droving and were unable to access their traditional ochre sources. He stated that they were undertaken by Traditional Owners who were fulfilling their ritual obligations to the country and their roles as senior law men. In 2011, when visiting the cave Darrananna, Mona Oscar similarly recalled black charcoal drawings having been made by her own family members when they took holidays from station work and visited the site.

Discussion

In her discussion of the black dry pigment art in the Watarrka NP assemblage, Frederick notes a formal shift in "media and technique of art production and corresponding changes in the structuring of graphics and in the frequency of production" (1999: 140). Although the Watarrka black pigment art is not dominated by exotic or introduced objects/subjects,

Figure 11. Aboriginal people of the 'southern Kimberley' dressed for ceremony with conical head-dresses. Photograph taken between 1920 and 1936; from the Charles Edward Flinders collection of Kimberley photographs held in the Battye Library (Album BA1459).

Frederick argues that they were produced in the Contact period and therefore record a general process of change associated with the arrival of Europeans. She suggests that the change in graphic systems may have resulted from a number of causes such as change in the use of landscape due to changing access to resources caused by the impingement of colonial forces or other constraints imposed by contact (1999: 141). She notes that this change in the graphic system may not be unique to the Watarrka region but may occur throughout central Australia. Our preliminary survey extends this observation and suggests that these changes may be even more widespread.

In the south-central Kimberley a shift in media and technique associated with the Contact period seems to be towards a greater use of black pigment and scratch-work instead of ochres. However, rather than new motifs representing European objects or people, artists here emphasised traditions of older art, as indicated by animals, a range of plants and anthropomorphs, often with geometric markings and head-dresses. The head-dresses are of the same conical style documented for this area at Contact (Figure 11).

In Arnhem Land, where hundreds of images marking contact between Indigenous people and Southeast Asian boat crews occur (Taçon *et al.* 2010), there is good historical documentation to show that this relationship was one where Indigenous people benefited through the provision of Asian and European goods in exchange for access to trepang and other resources which held no value for them. Additionally, while the settlers of the central Kimberley plains came to stay and usurped the land, the Macassans camped only for a part of the year and brought many of their own staples to exchange.

In contrast, it seems likely that the Bunuba were less attracted by the Europeans and by the objects that were the instruments of their control, perhaps associating these symbols with raids, death, theft of land and the despoilment of their sacred sites. Both those in hiding and those living and working on pastoral stations would have had only limited access

to supplies of ochre and other materials needed for ritual and artistic production, and the ceremonial responsibilities played out in painting would have been curtailed.

Conclusion

Although black drawn art and scratch-work are not found in all sites, they are found throughout a broad region. We believe that these graphic systems have been overlooked due to the visual dominance of Wanjina-style graphics or mistaken for graffiti, and that comprehensive survey will uncover many more dry black pigment and scratch-work motifs. Although further work and dating is needed to be certain, it appears that at least some examples of these graphics are contemporary with, or post-date, Wanjina art.

The particularly violent settlement and rapid land usurpation that affected Aboriginal people's free movement probably reduced access to resources that may have led to the greater use of more abundant and accessible materials—in this case charcoal and techniques that did not require pigment. In this context, people's emphasis on maintenance of pre-European motifs, including ceremonial dress, suggests that social cohesion and identity was important at this time of dramatic and violent change. The newly recorded graphic systems of the southern Kimberley form coherent bodies of art that clearly require further documentation.

Acknowledgements

The fieldwork for this paper was carried out in 2011 and was funded by the Australian Research Council Linkage Grant LP100200415 with contributions from the Kimberley Foundation Australia (KFA) and the Department of Sustainability, Water, Populations and Communities (SEWPAC). Two earlier fieldtrips in 2009 and 2010 to discuss the research proposal with Bunuba and Gooniyandi Traditional Owners before submitting the Linkage application were funded by the KFA.

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Appendix 2

Unpublished Source Material : Jones 2010

This document was provided to me for use in this thesis and viewing by the thesis examiners. It is not available for public viewing in this version of my thesis.

If the reader wishes to read Dr Jones' Masters Thesis please contact her at the University of Sydney (as at 2025).

Appendix 3
Unpublished source material: Pannell 2000

This report was provided to me on condition that it was used as a source for this thesis, and would not be made available publicly.

If the reader wishes to read the report please contact the author.

Appendix 4 Data Recording

2011 Field Recording

KIMBERLEY ROCK ART RECORDING FORM 2011 (SITE)

Site #:	Site Name:	Date:	Recorder/s:
GPS: Y/N	Make/Model:	Grid Ref:	Others Present:

Site Description

Site Type		**Site/rock art damage**	
☐ Rockshelter ☐ Cave ☐ Exposed rockface ☐ Boulder ☐ Boulder Outcrop		☐ % RA exp to sun ☐ % RA direct drip/ water run off ☐ % RA exp to rain ☐ lichen/fungus ☐ breakage/collapse	☐ vegetation ☐ water ☐ salt ☐ animal damage ☐ water damage ☐ Insect nests ☐ other

Other cultural items (surface)	☐ stone tools/debitage ☐ shell ☐ bone ☐ charcoal ☐ glass ☐ other organic matter ☐ other (specify)	
Excavation: ☐ YES ☐ NO	Proximity to rock art (distance, aspect, angle):	

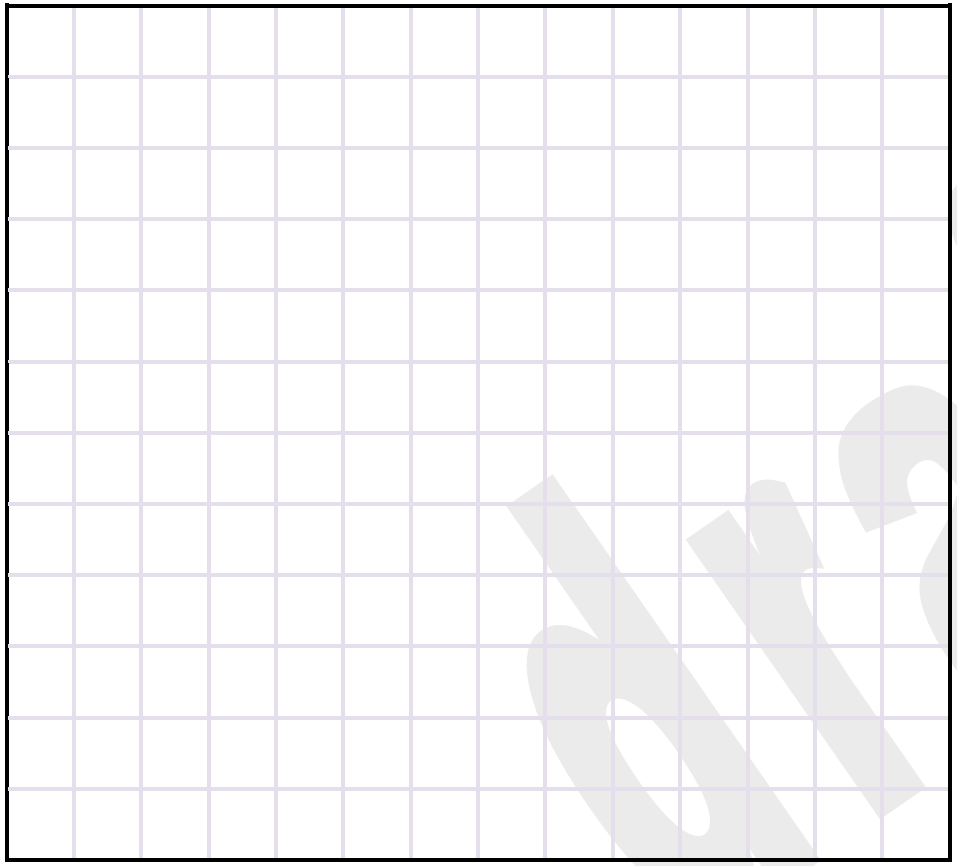
Rock art description

☐ Painting ☐ Drawing ☐ Stencil ☐ Print ☐ Engraving ☐ Grooves ☐ Panel/s ☐ Single image		☐ Calcite skin ☐ Silica skin ☐ Beeswax ☐ Other covering on rock art ☐ Dating Sample

Panel	# of motifs	Photograph #	Drawing Y/N	Colour/Engraving Technique	Condition	Superimposition	Stylistic attributes	Height/Width	Motif/Transcript	TO interpretation

Colour: M=mulberry; R=red; O=orange; W=white; N=black; Y=yellow; B=blue; U=unclear. **Engraving Technique**: P=pecked; A=abraded; I=incised; S=scratched; PO-pounded; PIG=includes pigment/charcoal. **Condition**: G=clear, bright & distinct from background; M=faded to lighter colour, missing parts and inconsistent colour coverage; P=highly faded, colour difficult to distinguish, coverage and/or patterns inconsistent; VP=image and/or colour so indistinct that identification of image not clear. **Superimposition**: 1=highest visible layer. **Stylistic attributes**: O=outlined; S=solid; I=solid infill; P=patterned infill; G=geometric; HI=historical inscription B=prepared background.

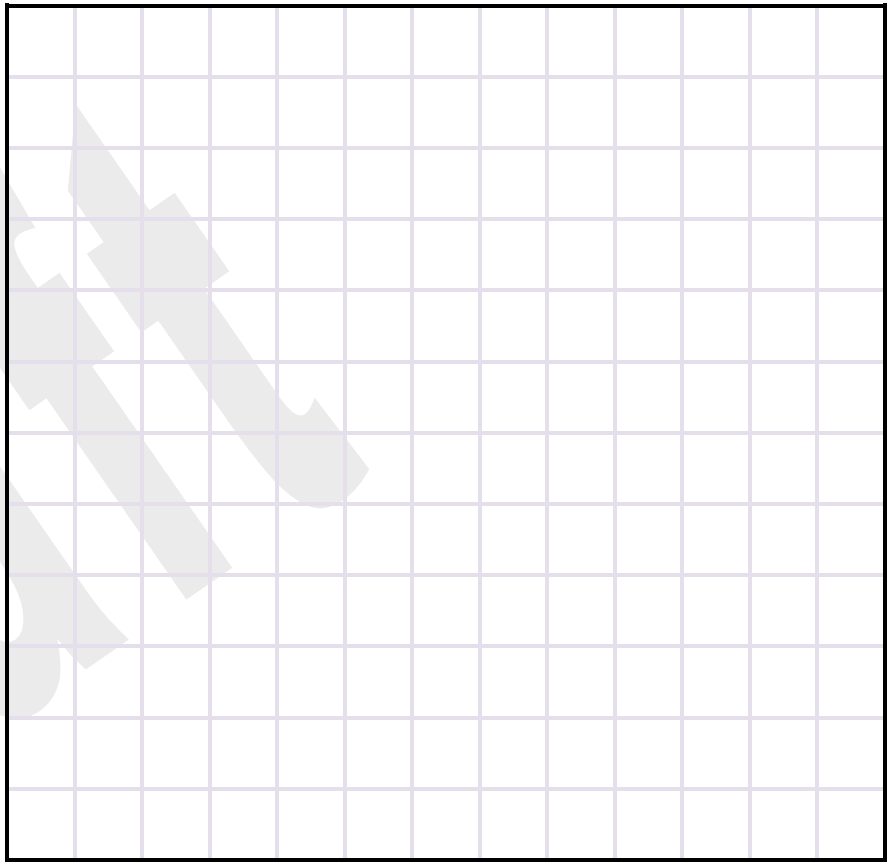
PLAN



Note: Include Way Point Numbers for GPS on this Plan where appropriate.

N

SITE CROSS SECTION



N

Additional Cultural Information: ☐ Bunuba ☐ Gooniyandi ☐ Other (specify)

DRAWINGS/ATTACHMENTS										
PANEL										
MOTIF										

KIMBERLEY ROCK ART: OSCAR NAPIER RANGES

MOTIF LOG 2011 ***PAGE:***

DATE	MOTIF #	PANEL #	SITE	DESCRIPTION	RELATED PHOTOGRAPHS

KIMBERLEY ROCK ART: OSCAR NAPIER RANGES

PANEL LOG 2011 ***PAGE:***

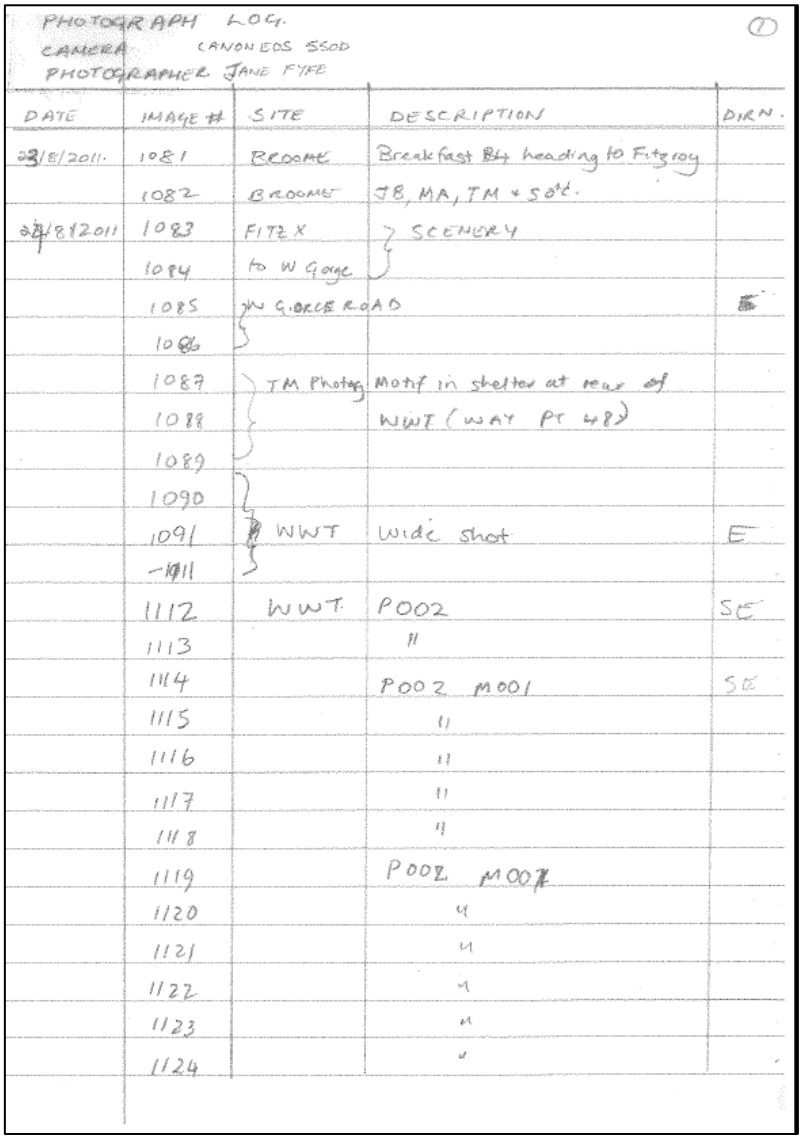
DATE	PANEL #	SITE	DESCRIPTION	RELATED PHOTOGRAPHS

KIMBERLEY ROCK ART: OSCAR NAPIER RANGES

PHOTOGRAPHIC RECORD 2011

CAMERA:	*PHOTOGRAPHER:*	*PAGE:*

DATE	IMAGE #	SITE	DESCRIPTION	DIRECTION FACING



PHOTOGRAPH LOG. ①
CAMERA CANON EOS 550D
PHOTOGRAPHER JANE FYFE

DATE	IMAGE #	SITE	DESCRIPTION	DIRN.
23/8/2011.	1081	BROOME	Breakfast B4 heading to Fitzroy	
	1082	BROOME	JB, MA, TM + SOPC.	
24/8/2011	1083	FITZ X	SCENERY	
	1084	to W Gorge		
	1085	W GORGE ROAD		E
	1086			
	1087	TM Photog	Motif in shelter at rear of	
	1088		WWT (WAY Pt 48)	
	1089			
	1090			
	1091	WWT	Wide shot	E
	1111			
	1112	WWT	P002	SE
	1113		"	
	1114		P002 M001	SE
	1115		"	
	1116		"	
	1117		"	
	1118		"	
	1119		P002 M002	
	1120		"	
	1121		"	
	1122		"	
	1123		"	
	1124		"	

FIGURE 1 PHOTOGRAPH LOG (SAMPLE)

GARMIN GPS60 1/8
UWA ARCHAEOLOGY.

WAY POINT LOG

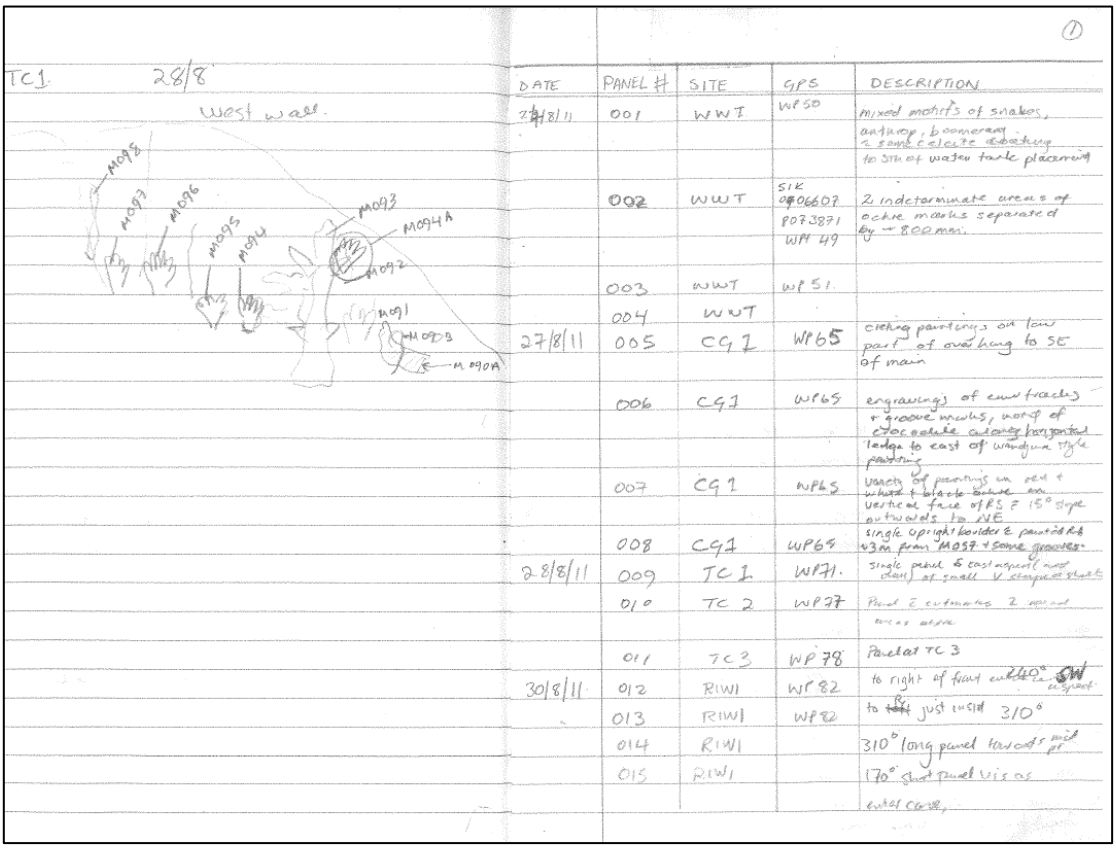
DATE	WP #	UTM	DESCRIPTION
23/8/11	47	51K/706604/	Windjana Gorge Water
		8073980	Tank RA site
	48	51K 706594	
		8073861	
	49	51K 706607	
		8073871	
	50	51K 706617	
		8073887	
	51	51K 706608	
		8073887	
25/8/11	52	51K 741756	Possible RA sites on W. Gorge
		8017513	Road.
25/8/11	53	51K/725332/	Turn off ~~to~~ Fairfield
		8051237	Station to Tunnel Ck/Elimberrie
25/8/11	54	51K/718052/	2nd gate to Tunnel Ck/
		8052970	Elimberrie
	55	51K/717800/	Possible crossing to Elimberrie
		8051380	- too damaged to cross
	56	51K 725352	Another possible crossing to
		8051130	Elimberrie - not accessible
	57	51K 725332	Gate to turn off back of
		8051237	Fairfield to back of Tunnel Ck.
	58	51K 719474	Turn off to Fairfield
		8056563 6	
	59	51K 719351	gate to turn off to back
		8055599	of Tunnel Creek

FIGURE 2 WAYPOINT LOG (SAMPLE)

JF - Jane Fyfe
MS - Min (Moya) Smith ①

DATE	DRAWING #	PANEL/MOTIF #	DESCRIPTION	BY
30/8/11	D 0001	P 017	RIW1 Panel 017 & motifs	JF
		P 018	Panel 018 "	JF
3	D 0002	P 014	RIW1 & motifs	JF
	D 0003	P 015	RIW1 & motifs	
	D0004	P012 - P020	RIW1 - site plan & identification of Panels	JF
	D0005		RIW1 Site Profile (in here - Sites page 4)	JF
	D0006	P 019	RIW1 & motif placement	JF
3/9/11	D0007		JF Tunnel Creek 4 Site Plan & RA location	JF
	D0008		JF Tunnel Creek 4 Site Profile	JF
	D0009	M300 - 324	JF Tunnel Creek 4 Panel & motifs	MS
	D0010	~~M351 - 354~~	JF Tunnel Creek 4 Upper level site plan & motif loc"	JF
3/9/11	D0011		JF Tunnel Creek 5, Site Plan & Profile (Sites in this book page 6)	JF

FIGURE 3 DRAWING LOG (SAMPLE)



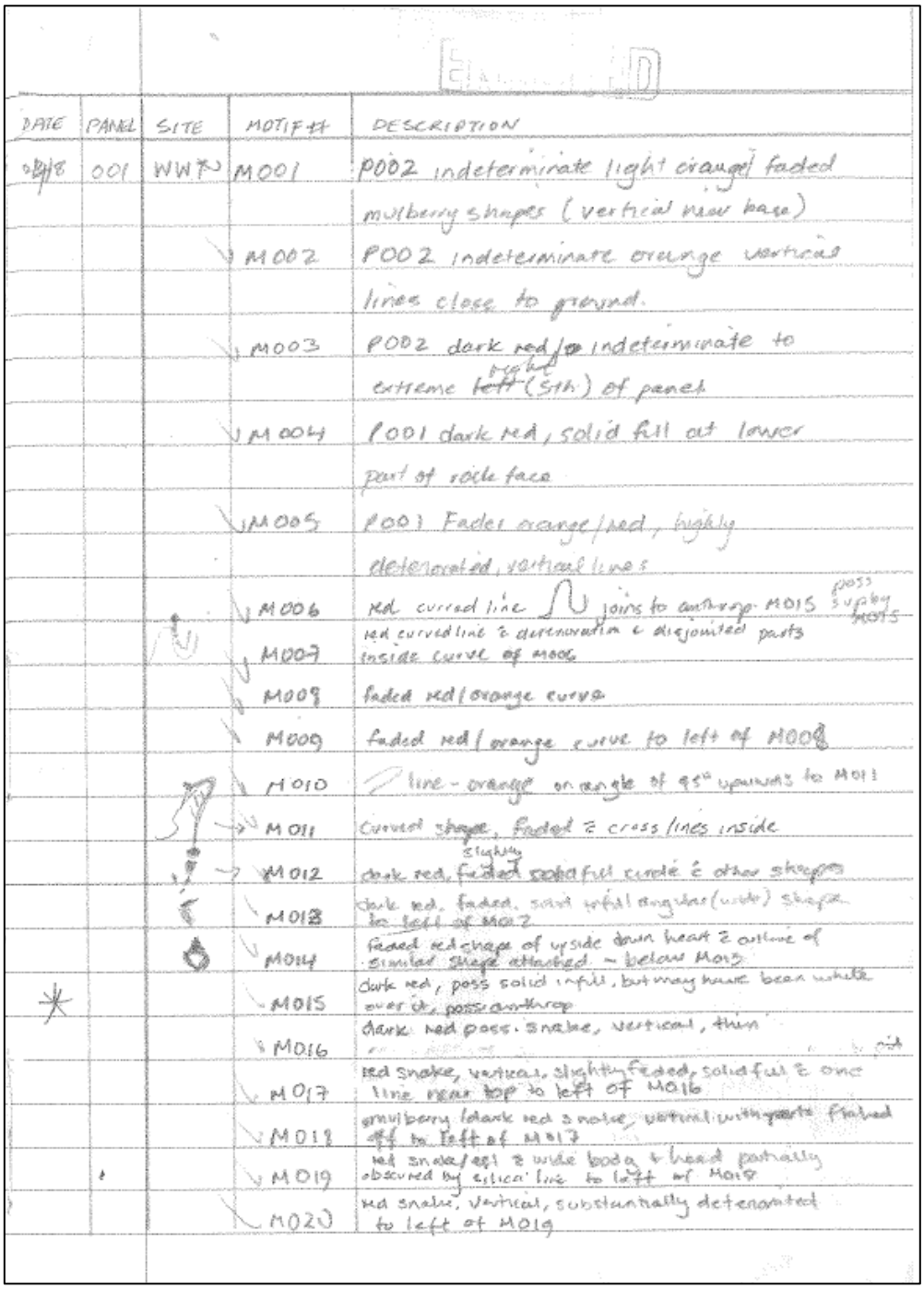
TC1 28/8

West wall.

M098 M097 M096 M095 M094 M093 M094A M092 M091 M090B M090A

DATE	PANEL #	SITE	GPS	DESCRIPTION
27/8/11	001	WWT	WP50	mixed motifs of snakes, anthrop, boomerang + some circular elements to SW of water tank placement
	002	WWT	SIK 0906607 8073871 WP49	2 indeterminate areas of ochre marks separated by ~800 mm.
	003	WWT	WP51.	
	004	WWT		
	005	CG1	WP65	circling pecked lines on low part of overhang to SE of main
	006	CG1	WP65	engravings of emu tracks + groove marks, west of circular cutaway/horizontal ledge to east of Windjana style panels
	007	CG1	WP65	Usually pecked on vert + where + black colour on vertical face of RS ? 15° slope outwards to NE
	008	CG1	WP64	single upright boulder & painted RA ~3m from M097 + some grooves
28/8/11	009	TC1	WP71.	single panel & east aspect with clust of small V stamped motifs
	010	TC2	WP77	Panel 2 extends 2 m and ends above
	011	TC3	WP78	Panel at TC3
30/8/11	012	RIW1	WP82	to right of front entry 240° SW aspect
	013	RIW1	WP82	to just inside 310°
	014	RIW1		310° long panel towards back
	015	RIW1		170° short panel vis as entry ceases,

FIGURE 4 PANEL LOG (SAMPLE)



DATE	PANEL	SITE	MOTIF #	DESCRIPTION
08/18	001	WWTN	M001	P002 indeterminate light orange/ faded mulberry shapes (vertical near base)
			M002	P002 indeterminate orange vertical lines close to ground.
			M003	P002 dark red/ indeterminate to extreme ~~left~~ right (SHR) of panel
			M004	P001 dark red, solid full at lower part of circle face
			M005	P001 Faded orange/red, highly deteriorated, vertical lines
			M006	red curved line ∩ joins to anthrop. M015 poss subsidiary parts
			M007	red curved line & deterioration & disjointed parts inside curve of M006
			M008	faded red/orange curve
			M009	faded red/orange curve to left of M008
			M010	line - orange on angle of 95° upwards to M011
			M011	curved shape, faded & cross lines inside
			M012	dark red, slightly faded solid full circle & other shapes
			M013	dark red, faded, small total angular (wide) shape to left of M012
			M014	faded red shape of upside down heart & outline of similar shape attached - below M013
*			M015	dark red, poss solid infill, but may have been white over it, poss anthrop
			M016	dark red poss. snake, vertical, thin
			M017	red snake, vertical, slightly faded, solid full & one line near top to left of M016
			M018	mulberry/dark red snake, vertical with parts faded off to left of M017
			M019	red snake/eel & wide body & head partially obscured by cliff line to left of M018
			M020	red snake, vertical, substantially deteriorated to left of M019

FIGURE 5 MOTIF LOG (SAMPLE

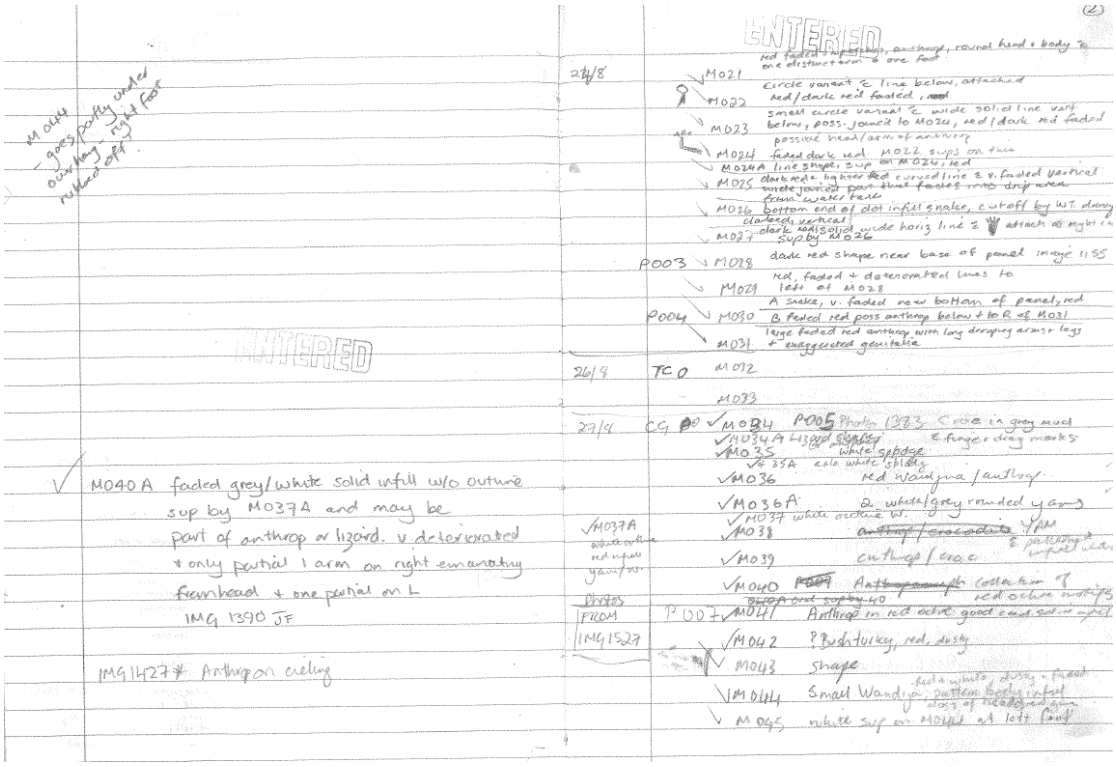


FIGURE 6 MOTIF LOG (SAMPLE)

2012 Field Recording

Lifeways of the First Australians 2012

Site Recording Form: Rock Art

DATE		**RECORDER/S**	
Site Name:			Site Code:
Dimensions (cm)	W:	H:	D:
Aspect		Panels (#s):	Motifs (#s):
Site Description			
GPS	**Z** 51K/52K **E**		**N**

Landscape

Water Sources:	***Topography:***	***Geology:***
☐ Rockhole/waterhole ☐ Spring ☐ Well ☐ Seepage ☐ Freshwater Creek ☐ Other ☐ Reliable/permanent ☐ Ephemeral	☐ Escarpment ☐ Outcrop ☐ Valley ☐ Ridge ☐ Cliff ☐	☐ Limestone ☐ Sandstone ☐ Granite ☐ Conglomerate ☐ Quartzite ☐ Other
Vegetation (within xx m of site): ☐ Boab ☐ Other Trees ……. ☐ Shrubs ☐ Grassland ☐ Water lilies ☐ Yam ☐ Other edible …….	***Site Type:*** ☐ Rockshelter ☐ Cave ☐ Boulder outcrop ☐ Exposed rockface ☐ Single boulder	**Art Surface**: ☐ Vertical ☐ Horizontal ☐ Ceiling ☐ Overhang ☐ Other (eg sloped, in niche)

Site Condition

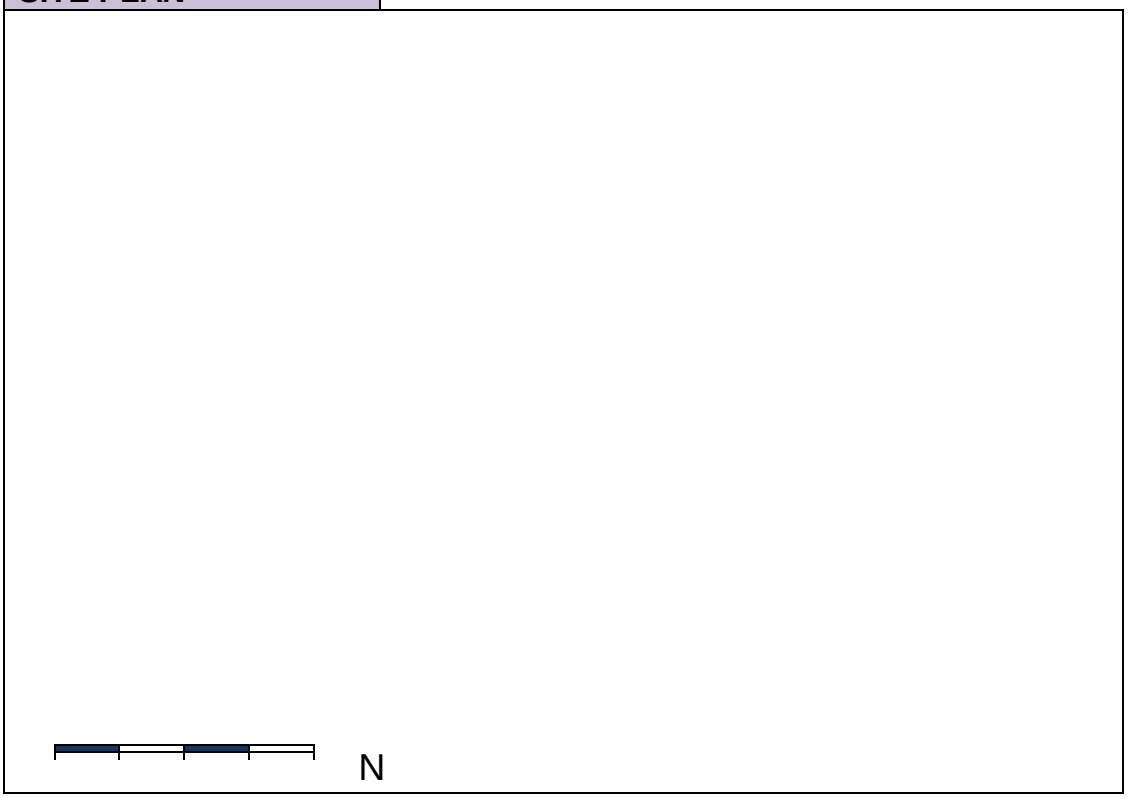
Art:	***Art Surface:***	***Site Floor:***
☐ Vandalism ☐ Graffiti ☐ Foot Traffic ☐ Smoke ☐ Animal traffic/activity ☐ Plant/lichen/tree roots ☐ Superimposition ☐ Refreshing/renewal ☐ Water/Calcite ☐ Other ☐ No visible damage	☐ Human interference (eg silicon line) ☐ Sheared rock surface ☐ Fracturing ☐ Exfoliation ☐ Wind ☐ Plant/lichen/tree roots ☐ Salt ☐ Water ☐ Insect nests ☐ Other ☐ No visible damage	☐ Undisturbed ☐ Human activity ☐ Plant intrusion (eg trees, tree roots) ☐ Disturbed deposit (animal) ☐ Contemporary rubbish ☐ Geological disturbance (eg rock fall/deposit) ☐ Water course ☐ Other

Other Archaeological features

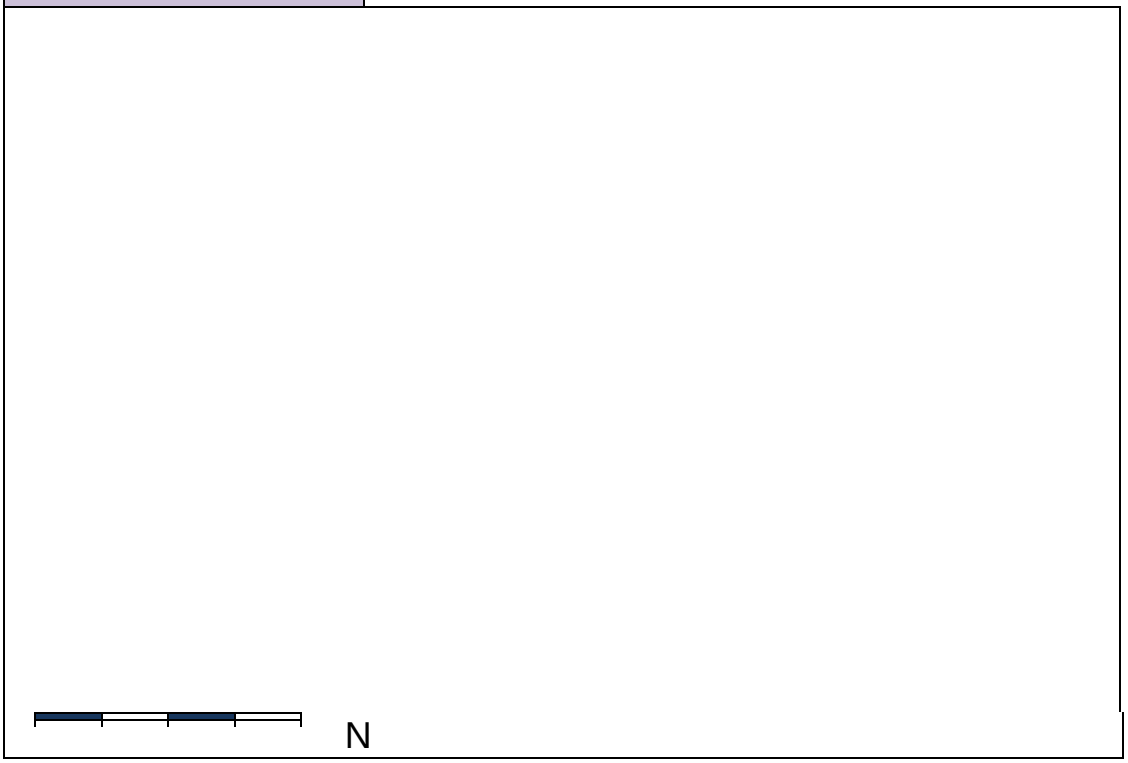
☐ Stone tools …….. ☐ Glass/Glass tools ☐ Bone ☐ Other organic ……

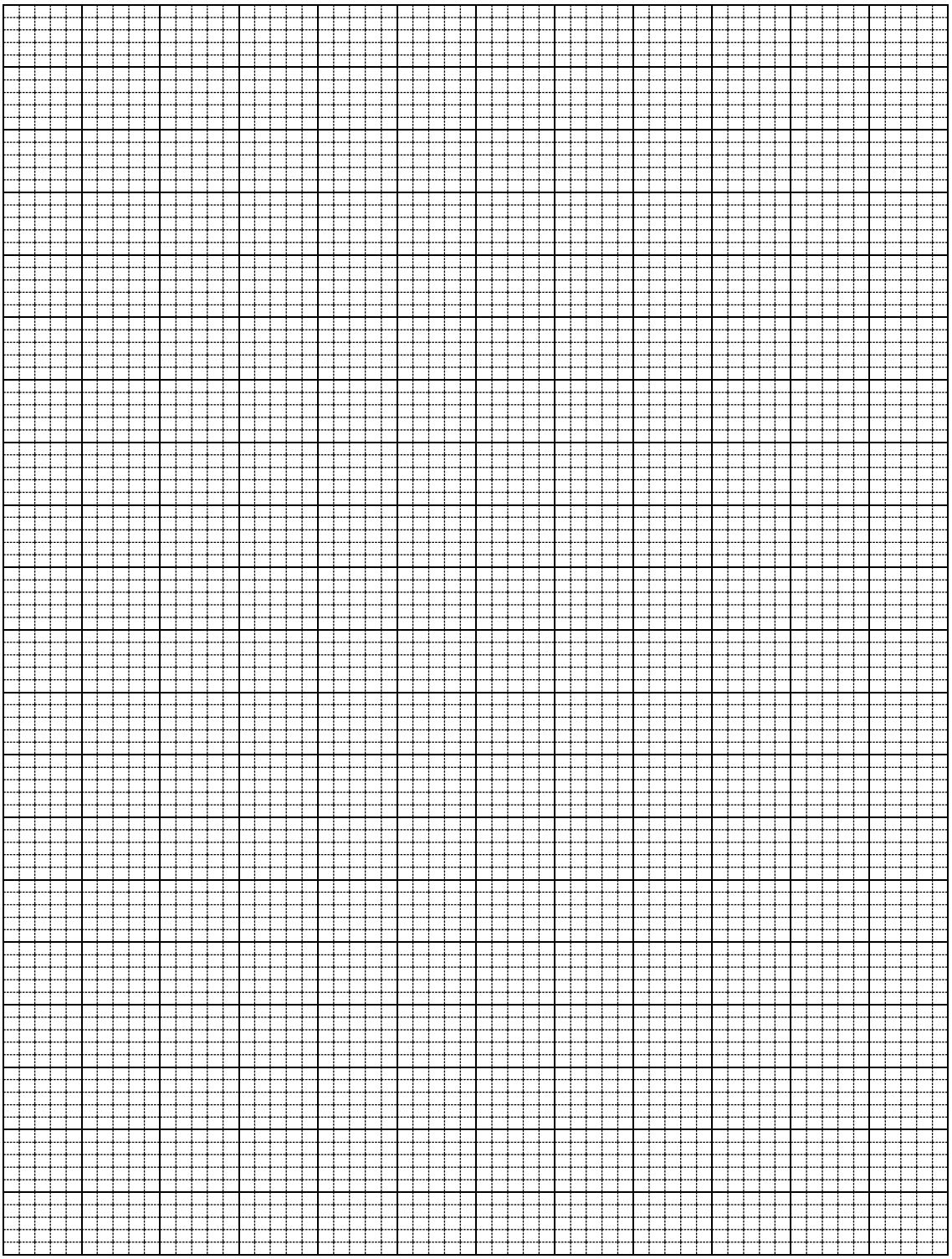
☐ Shell ☐ Charcoal deposit/hearth ☐ Other ……

SITE PLAN



SITE PROFILE





2mm grid

Dating Potential	
	Motif Numbers
☐ Charcoal	
☐ Crust (type	
☐ Desert Varnish	
☐ Insect nest	
☐ Other	

Cultural Associations		
☐ Bunuba ☐ Gooniyandi ☐ Bunuba & Gooniyandi ☐ Historical ☐ Other Traditional Owner Informants	☐ Creation stories ☐ Identity stories ☐ Historical events ☐ Meeting place ☐ Occupation site ☐ Men's business ☐ Women's business	☐ Birthing ☐ Initiation ☐ Law ☐ Fertility ☐ Aggregation ☐ Other

Identified Motifs (#s & names)		
DIA Registered: Y/N	Registration requested: Y/N	Included in ILUA/Native Title Application/Determination: Y/N

Accompanying documentation					
Drawings	Map to get to site (incl GPS Waypoints) Y/N				D ……
	Site plan with location of panels Y/N				D ……
	Site plan with location of motifs Y/N				D ……
	Site Profile Y/N				D ……
	Panel Plan with motif locations Y/N				D ……
Photographs CAMERA: EOS 450D/ Powershot G12	Context (face out) Y/N				IMG_
	Context (face in) Y/N				IMG_
	Profile (all directions) Y/N				IMG_
	Panels Y/N				IMG_
	Motifs Y/N				IMG_
	Other Y/N				IMG_
Stories	Digital	Y/N	Transcribed	Y/N	File/Location:
	Written	Y/N	File/Location:		
	Published	Y/N	References:		
Motifs	Motif Drawings		Y/N		M……- …… D……- ……..
	Motif Records		Y/N		M ……..

Lifeways 2012: **Rock Art Motif Record**

DATE	**SITE CODE**	**PANEL #**	**RECORDER/S**		
MOTIF #: M	**DIMENSIONS (CM)** H: W: FROM FLOOR:		**ASPECT:**	**PHOTOS:**	**DRAWINGS:**

Motif Description	

Characteristics

☐ Complete ☐ Incomplete ☐ Single image on panel/site ☐ Multiple images on panel/site (#) ☐ Determinate ☐ Indeterminate	***Dating Potential*** Y/N Type ……	***Surface*** ☐ Vertical ☐ Horizontal ☐ Ceiling ☐ Overhang ☐ Boulder ☐ Shelf ☐ Other	**Colour** ☐ Mulberry ☐ Red ☐ Orange ☐ Yellow ☐ White ☐ Black ☐ Blue ☐ Not Clear ☐ No colour	***Superimposition*** ☐ No Superimposition ☐ Layer 1 / 2/ 3 / 4 / 5 ☐ Layer …….. ☐ Superimposition, layer not clear ☐ Refreshed/Renewed Motif #s above …… Motif #s below ……	***Condition*** ☐ Rubbed ☐ Faded ☐ Erasures ☐ Water damage ☐ Wind/sand ☐ Vegetation ☐ Insect nests ☐ Smoke ☐ Vandalism/Graffiti ☐ No damage	***Technique*** ☐ Painted ☐ Finger Painted ☐ Finger dotted ☐ Stencil ☐ Print ☐ Drawn ☐ Painted & Drawn ☐ Incised ☐ Abraded ☐ Pecked ☐ Pounded ☐ Scratched ☐ Other engraved ☐ Unclear

Classification	**Attributes**		**Sketch**
☐ Anthropomorph ☐ Zoomorph ☐ Mythological Being ☐ Landscape Feature ☐ Vegetation ☐ Objects ☐ Other Figurative ☐ Geometric ☐ Linear ☐ Historical Inscription ☐ Other Non Figurative ☐ Other *Specify sub classification and named being*	***Outline*** ☐ ☐ ☐ ***Infill*** ☐ ☐ ☐ ***Body*** ☐ ☐ ☐ ***Headdress*** ☐ ☐ ☐	***Limbs*** ☐ ☐ ☐ ***Genitalia*** ☐ ☐ ☐ ***Objects*** ☐ ☐ ☐ ***Other*** ☐ ☐ ☐	

Photographic Log

TABLE 1 EXCERPT FROM PHOTOGRAPHIC LOG 2012 ON EXCEL SPREADSHEET (MXXX REFERS TO UNIQUE MOTIF NUMBERS).

Canon EOS 550D Photographer: Jane Fyfe

Date	Site	Image Numbers	Description
5-Jul	CG3	5723	CG3 Profile east
		5724	Profile west
		5725	view north centre with flash
		5726	view north west
		5728-5732	Panel 039 west to east
		5733	panel 038 edge west
		5734	panel 038 -main panel oblique west
		5735	panel 038 north edge centre
		5736-5738	panel 038 centre
		5739	panel 038 north edge centre
		5740-5742	PANEL 038 oblique
		5743-5744	north edge east
		5745-5748	oblique
		5749	Jenna taking notes at panel 038
		5750-5751	panel 038 east - oblique
		5752	panel 038 oblique standing at west
		5753-5773	Panel 038 west to east
		5774	Panel 038 taken on first ledge lying flat and looking upwards
		5775-5880	Panel 038 west to east of main panel for stitching
		5881-5885	M1001
		5886-5892	M1002
		5893-5897	M1003
		5898	M1005
		5899-5905	M1004
		5906-5910	M1005
		5911-5912	Jenna Le May being an archaeology assistant
		5913-5930	Casual archaeology field shots
7-Jul	CG3	5930-5932	M1034
		5933-5934	M1009, 1010
		5935	M1009, 1008, 1007
		5936-5938	M1011
		5939	M1012
		5940	M1012, 1014,1015
		5941	M1021
		5942	M1022
		5943	M1021, 1022
		5944	M1024
		5945	M1024, 1023

Completed Records

Lifeways of the First Australians 2012

Site Recording Form: Rock Art

DATE	20 July	RECORDER/S	JF
Site Name:	Bunuba Roadside Caves 1	Site Code:	BR1
Dimensions (cm)	W:	H:	D:
Aspect	NW	Panels (#s):	Motifs (#s): M1701 – 1719.
Site Description	2 small roadside caves with R, W + Y artwork. V. dusty as less than 3m from road + traffic is constant. Cave 1 - small cave that has a narrow entrance. + only space for 1 person to sit, not possible to stand + not space to lie down. Images in red, white, yellow & black on top of some. Much deteriorated + dust covered. Cave 2 – more like a small open RShelter + RA totally obscured by dust		
GPS	Z51K/52K (1)E ± 6m 0741774	N 8017593	WP 035

Landscape

Water Sources:	Topography:	Geology:
☐ Rockhole/waterhole	☐ Escarpment	☑ Limestone
☐ Spring	☑ Outcrop	☐ Sandstone
☐ Well	☐ Valley	☐ Granite
☐ Seepage	☐ Ridge	☐ Conglomerate
☐ Freshwater Creek	☐ Cliff	☐ Quartzite
☐ Other	☐	☐ Other
☐ Reliable/permanent		
☐ Ephemeral		

Vegetation (within xxm of site):	Site Type:	Art Surface:
☑ Boab	☐ Rockshelter	☑ Vertical
☑ Other Trees	☑ Cave	☐ Horizontal
☑ Shrubs	☐ Boulder outcrop	☐ Ceiling
☑ Grassland	☐ Exposed rockface	☐ Overhang
☐ Water lilies	☐ Single boulder	☐ Other (eg sloped, in niche)
☐ Yam		
☐ Other edible		

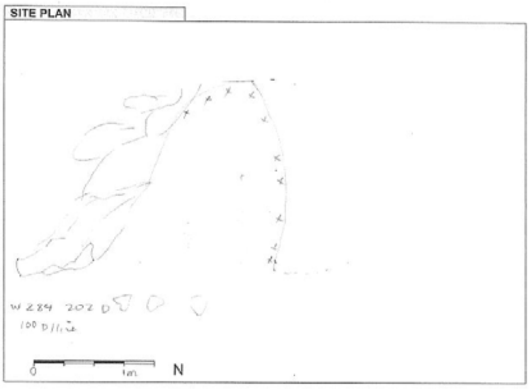
Site Condition

Art:	Art Surface:	Site Floor:
☐ Vandalism	☐ Human interference (eg silicon line)	☐ Undisturbed
☐ Graffiti	☐ Sheared rock surface	☐ Human activity
☐ Foot Traffic	☐ Fracturing	☑ Plant intrusion (eg trees, tree roots) Small tree in corner ...
☐ Smoke	☐ Exfoliation	☐ Disturbed deposit (animal)
☑ Animal traffic/activity Ants	☐ Wind	☐ Contemporary rubbish
☑ Plant/lichen/tree roots	☑ Plant/lichen/tree roots	☐ Geological disturbance (eg rock fall/deposit)
☑ Superimposition	☐ Salt	☐ Water course
☐ Refreshing/renewal	☑ Water	☐ Other
☐ Water/Calcite	☑ Insect nests	
☑ Other road dust	☐ Other	
☐ No visible damage	☐ No visible damage	

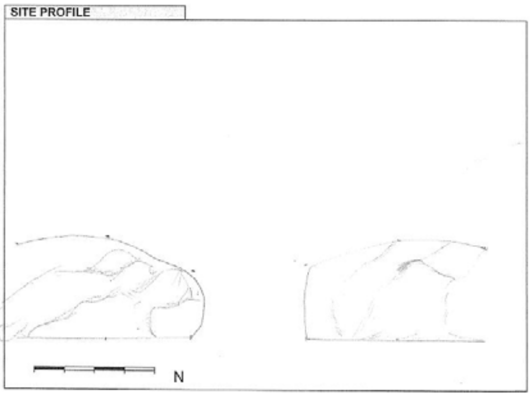
Other Archaeological features

☐ Stone tools .... ☐ Glass/Glass tools ☐ Bone ☐ Other organic ....
☐ Shell ☐ Charcoal deposit/hearth ☐ Other ....

SITE PLAN



SITE PROFILE



Dating Potential

	Motif Numbers
☐ Charcoal	
☐ Crust (type ....)	
☐ Desert Varnish	
☐ Insect nest	
☐ Other	

Cultural Associations

☑ Bunuba	☐ Creation stories	☐ Birthing
☐ Gooniyandi	☐ Identity stories	☐ Initiation
☐ Bunuba & Gooniyandi	☐ Historical events	☐ Law
☐ Historical	☐ Meeting place	☐ Fertility
☐ Other	☐ Occupation site	☐ Aggregation
	☐ Men's business	☐ Other
Traditional Owner Informants	☐ Women's business	

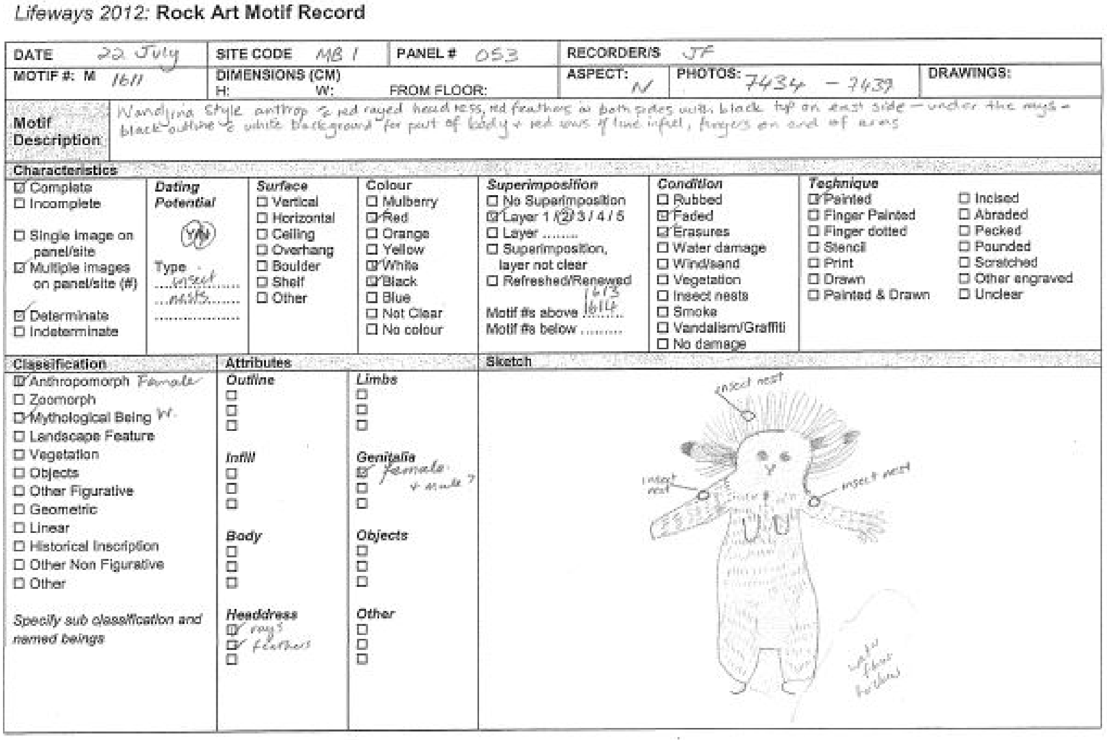
Identified Motifs (#s & names)

DIA Registered: Y/N Not known by 9/8.?	Registration requested: Y/N	Included in ILUA/Native Title Application/Determination: Y/N

Accompanying documentation

Drawings	Map to get to site (incl GPS Waypoints)	Y/N	D ....
	Site plan with location of panels	Y/N	D 046 ....
	Site plan with location of motifs	(Y)/N	D 047 ....
	Site Profile	Y/N	D ......see inside of record
	Panel Plan with motif locations	(Y)/N	D 047
Photographs CAMERA: EOS 450D Powershot G12	Context (face out)	(Y)/N	IMG_ 7256 – 7259
	Context (face in)	Y/N	IMG_ 7260 – 7269, 7254 – 7255
	Profile (all directions)	Y/N	IMG_
	Panels	Y/N	IMG_
	Motifs	Y/N	IMG_ 7270 – 7346
	Other	Y/N	IMG_
Stories	Digital Y/N	Transcribed Y/N	File/Location:
	Written Y/N		File/Location:
	Published Y/N		References:
Motifs	Motif Drawings	Y/N	M......- .... D......- .... motif records
	Motif Records	(Y)/N	M .... 1701 – 1719 paper + scanned.

FIGURE 7 SAMPLE OF COMPLETED SITE RECORD FORMS FROM BUNUBA ROADSIDE CAVES 1.



Lifeways 2012: **Rock Art Motif Record**

DATE 22 July	SITE CODE MB 1	PANEL # 053	RECORDER/S JF
MOTIF #: M 1611	DIMENSIONS (CM) H: W: FROM FLOOR:	ASPECT: N	PHOTOS: 7434 – 7439 / DRAWINGS:

Motif Description: Wandjina style anthrop ... red rayed head ... red feathers in both sides with black top on east side – under the rays – black outline ... white background for part of body + red rows of line infill, fingers on end of arms

Characteristics: ☑ Complete ☐ Incomplete ☐ Single image on panel/site ☑ Multiple images on panel/site (#) ☑ Determinate ☐ Indeterminate

Dating Potential: (Y/N) Type: insect nests

Surface: ☐ Vertical ☐ Horizontal ☐ Ceiling ☐ Overhang ☐ Boulder ☐ Shelf ☐ Other

Colour: ☐ Mulberry ☑ Red ☐ Orange ☐ Yellow ☑ White ☑ Black ☐ Blue ☐ Not Clear ☐ No colour

Superimposition: ☐ No Superimposition ☑ Layer 1 /(2)/ 3 / 4 / 5 ☐ Layer …… ☐ Superimposition, layer not clear ☐ Refreshed/Renewed. Motif #s above 1613 1614 Motif #s below ………

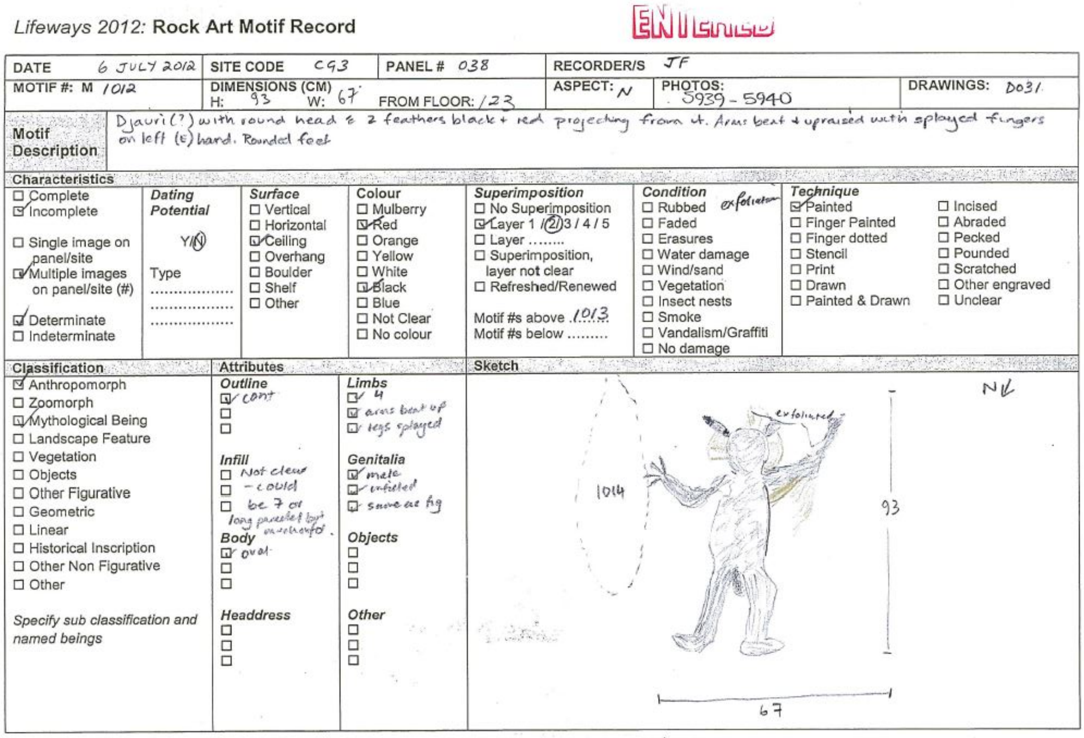
Condition: ☐ Rubbed ☑ Faded ☑ Erasures ☐ Water damage ☐ Wind/sand ☐ Vegetation ☐ Insect nests ☐ Smoke ☐ Vandalism/Graffiti ☐ No damage

Technique: ☑ Painted ☐ Finger Painted ☐ Finger dotted ☐ Stencil ☐ Print ☐ Drawn ☐ Painted & Drawn ☐ Incised ☐ Abraded ☐ Pecked ☐ Pounded ☐ Scratched ☐ Other engraved ☐ Unclear

Classification: ☑ Anthropomorph Female ☐ Zoomorph ☑ Mythological Being W. ☐ Landscape Feature ☐ Vegetation ☐ Objects ☐ Other Figurative ☐ Geometric ☐ Linear ☐ Historical Inscription ☐ Other Non Figurative ☐ Other. *Specify sub classification and named beings*

Attributes: *Outline* ☐ ☐ ☐ *Infill* ☐ ☐ ☐ *Body* ☐ ☐ ☐ *Headdress* ☑ rays ☑ feathers ☐ — *Limbs* ☐ ☐ ☐ *Genitalia* ☑ female + male ? ☐ ☐ *Objects* ☐ ☐ ☐ *Other* ☐ ☐ ☐

Sketch



Lifeways 2012: **Rock Art Motif Record** ENTERED

DATE 6 JULY 2012	SITE CODE CG3	PANEL # 038	RECORDER/S JF
MOTIF #: M 1012	DIMENSIONS (CM) H: 93 W: 67 FROM FLOOR: /23	ASPECT: N	PHOTOS: 5939 – 5940 / DRAWINGS: D031.

Motif Description: Djauri (?) with round head & 2 feathers black + red projecting from it. Arms bent + upraised with splayed fingers on left (E) hand. Rounded feet

Characteristics: ☐ Complete ☑ Incomplete ☐ Single image on panel/site ☑ Multiple images on panel/site (#) ☑ Determinate ☐ Indeterminate

Dating Potential: Y/(N) Type ………

Surface: ☐ Vertical ☐ Horizontal ☑ Ceiling ☐ Overhang ☐ Boulder ☐ Shelf ☐ Other

Colour: ☐ Mulberry ☑ Red ☐ Orange ☐ Yellow ☐ White ☑ Black ☐ Blue ☐ Not Clear ☐ No colour

Superimposition: ☐ No Superimposition ☑ Layer 1 /(2)/ 3 / 4 / 5 ☐ Layer …… ☐ Superimposition, layer not clear ☐ Refreshed/Renewed. Motif #s above 1013 Motif #s below ………

Condition: ☐ Rubbed exfoliation ☐ Faded ☐ Erasures ☐ Water damage ☐ Wind/sand ☐ Vegetation ☐ Insect nests ☐ Smoke ☐ Vandalism/Graffiti ☐ No damage

Technique: ☑ Painted ☐ Finger Painted ☐ Finger dotted ☐ Stencil ☐ Print ☐ Drawn ☐ Painted & Drawn ☐ Incised ☐ Abraded ☐ Pecked ☐ Pounded ☐ Scratched ☐ Other engraved ☐ Unclear

Classification: ☑ Anthropomorph ☐ Zoomorph ☑ Mythological Being ☐ Landscape Feature ☐ Vegetation ☐ Objects ☐ Other Figurative ☐ Geometric ☐ Linear ☐ Historical Inscription ☐ Other Non Figurative ☐ Other. *Specify sub classification and named beings*

Attributes: *Outline* ☑ cont ☐ ☐ *Infill* ☐ Not clear – could be 7 or long parallel by overhead. *Body* ☑ oval ☐ ☐ *Headdress* ☐ ☐ ☐ — *Limbs* ☑ 4 ☑ arms bent up ☑ legs splayed *Genitalia* ☑ male ☑ infilled ☐ same as fig *Objects* ☐ ☐ ☐ *Other* ☐ ☐ ☐

Sketch

FIGURE 8 SAMPLE OF COMPLETED MOTIFS RECORDS FROM MOUNT BEHN 1 (ABOVE) AND LANGURMURRU (BELOW).

Equipment

Digital images

There were a number of key pieces of hardware and software used to record the rock art in the Oscar Napier Ranges for this study. They are listed in the table below.

TABLE 2 EQUIPMENT USED TO CREATE, MANAGE AND ENHANCE DIGITAL PHOTOGRAPHS

Item	Specifications/Description	Use
Digital Camera	**Canon EOS 550D** Digital SLR, AF/AE camera with built in flash (and hot shoe and remote flash capability). CMOS sensor with 18 megapixels and 3:2 aspect ratio. **Lenses** Canon 28-80mm and 80-200mm automatic/manual focus lenses with UV filter. Sigma EX 10-20mm Automatic/manual focus lens with UV filter **SD memory cards, various capacities** **Canon PowerShot** Digital camera with DStretch programmed SD cards Jobi	Used with various settings to record all rock art. Images saved as JPEGS at largest setting 17.9 megapixels (5184x3456) using RGB histogram and auto lighting optimiser. Use with landscape, portrait and sport settings for initial views of rock art using DStretch© setting to review and follow up with additional shots on Conon EOS550D.
Supporting camera equipment	Tripod IFRAO rock art recording colour and scale Spirit level Measuring Tapes Bosch electronic distance laser measure Jobi portable LED lights with magnetic flexible tripod (medium)	Positioning cameras to take wide shots and multiple shots for stitching to create panoramas. Measuring scale using consistent colour and measuring devices (IFRAO scale)
Computer hardware & software	Toshiba Lap Top Microsoft Access IBM SPSS Adobe Photoshop & Illustrator DStretch (and ImageJ) External hard drive USB flash drive & external hard drives ARCGIS and QGIS mapping software	Given the climactic conditions in the Kimberley it was necessary to ensure that the photographs were safely stored, so as well as downloading the photographs to the laptop computer, they were backed up both on an external hard drive and a USB.
Paperwork	Rock art recording form Photograph master list	All paperwork was transported to site and stored in sealed sample bags to protect from moisture, dirt and animal/insect damage.

Digital sound recording

TABLE 3 EQUIPMENT USED FOR SOUND RECORDING

Item	Specifications/Description	Use
Sounder Recorder	Olympus digital sound reorder Microsoft media player	Recording stories and information from Traditional Owners when permitted.

Site locations, plans and profiles

TABLE 4 EQUIPMENT USED TO CREATE SITE PLANS AND PROFILES AND LOCATION MAPS IN THIS STUDY

Item	Specifications/Description	Use
Drawing	A4 & A3 graph paper Transparent paper Pencils and rulers Electronic Measure Tapes (30 m and 8 m) Spirit Level	Site plans Panel plans Sketches of rock art in context
Digital Drawing	Toshiba Laptop PDF Scanner Adobe Photoshop Adobe Illustrator Bamboo pen	Digitising drawings CAD for site plans
Location positioning	Garmin hand held GPS & Garmin BaseCamp Microsoft Access Microsoft Excel ArcGIS mapping software QGIS mapping software	All Maps
Data recording & classification	Toshiba Laptop Microsoft Access SPSS software ArcEd harris Matrix Software ImageJ with DStretch plugin Adobe Photoshop	Image analysis and recording fine details Creational of relational database and entering all data Statistical analysis Development of potential chronologies/sequences

Munsell® Colour Matching

Within each colour there is some variation and the Munsell colour system was used to gain more precise colour information. The Munsell soil colour book (Munsell Color 2009) and Munsell DG (v1.05), an iPad application, were used in the field and in post field analysis to record the range of hues and saturation that are found in each of the colours.

There are other colour systems that might be applicable but they are limiting in that they have often been developed for specific palettes. Among those considered were the Natural Colour System from the USA (www.ncscolorusa.com/Products.html) and the UK government palette (http://alphagov.github/design/gov.uk.colours), but they were costly and lacked the practical application of the Munsell soil matching books (e.g. overlay sheets with gaps for comparisons).

Eight colours were used in field recording. The colours were identified as likely to occur in the field in preliminary research examining the photographs and negatives from the Crawford Collection and publications (Crawford 1964, 1964 & 1968, 1968). The first season of survey and recording confirmed most of the colours, with grey and cream added.

Table 5 shows the colour name used in the first column, with the site at which the colour is defined in each hue within the range, the Munsell Codes and the RGB codes for each of those and a sample generated using the Microsoft Word for Windows colour fill process.

A cautionary approach is taken with colour matching, due to the fading and environmental deterioration with pigments. There is not always homogeneity in the colours even in a small area, and the amount of light may also be a factor in perception both in the field and in post filed analysis (Wesley et al. 2014), as well as superimposition and melding of colours (Gunn et al. 2010). Greater potential to differentiate colours is possible with the use of PXRF (Huntley et al. 2014) and the synchrotron (Huntley et al. 2015), but this was not available in the field in this project. For consistency in colour perception, I undertook all of the colour classification myself.

TABLE 5 COLOUR RANGE FOR FIGURES IN THE RESEARCH

Colour name used in the motif records (Reference sites for colour definition)	Munsell Color: RGB coding	Sample colour (MS Word colour generated using RGB coding)
Red (REF CG3 & MB1)	10R 2/12: R-118 G-0 B-4 2.5YR 2/6: R-87 G-31 B-19 10R 3/12: R-147 G-12 B-0	
Mulberry (REF TC5)	10R 1/4: R-56 G-13 B-19 10R 3/10: R-138 G-32 B-19	
Black (REF MB1, EG5)	N1: R-25 G-25 B-25	
White (REF MB1, FF2, EG 5)	N10: R-255 G-255 B-255	
Cream (REF MB1)	10YR 9/2: R-249 G-224 B-211 2.5Y 9/2: R-246 G-226 B-208	
Grey (REF EG5 M4415)	N6: R-153 G-153 B-153	
Orange (REF FF1 M1190)	2.5YR 6/8: R-211 G-127 B-93 2.5YR 7/8: R-241 G-153 B-118	
Yellow (REF MB1, CG3)	10YR 7/8: R-223 G-164 B-86	

Image Enhancement

Images were adjusted using two software programs. All digital images adjusted using either of the two products have the adjustment indicated in the image figure caption

Increasing brightness, contrast and adjusting histograms to reflect true colours was undertaken using Adobe PhotoShop. This was used primarily for reproduction within the thesis to improve visibility, and in most images the adjustment was brightness and contrast, which were not always strong in the lighting conditions within caves and rockshelters.

To further investigate motifs, superimposition, colour contrasts and enhance the outlines and attributes of motifs, as well as to identify motifs where they were not visible with the human eye, I used the DStretch© Plug in with the image ImageJ graphics program. The DStretch plug in allows the user to saturate the image with combinations of colours. For example, there are red saturations which allow the red ochres to stand out from the surrounding rock, and some of the combinations can be used to discern one red from another with greater clarity, which is of great assistance in confirming superimpositions observed in the field. The scale of the saturation can be controlled, and there are a wide range of standard combinations from which to choose. Images are used in this thesis with adjustments made post field work primarily to improve clarity of motifs for the reader that were present in field observations, but not in photographic images.

In addition, SD cards programmed by DStretch© developer John Harman were used with the Canon PowerShot camera in the field, to assist with motif identification and superimposition. This allows the digital images in the camera to be viewed with a range of hue saturation combinations and was of considerable assistance in identifying figures in the field.

Measuring Digital Images

It was not always possible to measure rock art in situ due to both physical and time limitations. However, where a scale is used for reference, it is possible to extrapolate measurements using inbuilt measuring tools in Computer software, and I used the Adobe PhotoShop tools for this purpose in post field analysis. Measuring rock art as total images will always involve an element of judgement. A decision must be made on where the edges of the images are defined.

Limitations

Setting up the measurement tool on Adobe Photoshop is not as accurate as measuring an image in situ. There are a number of limitations to measuring a digital image:

- the slope, indents and texture of the image are not measurable in a two-dimensional image, therefore there are likely to be some variations,
- the positioning of each end of the measuring tool is based on the judgement and eye of the measurer (as it is in the field), therefore, while the measurement is in millimetres it should not be regarded as a precise measurement, but a close estimate,
- there is the potential for some distortion in the scale in the base photograph from which the measurement is calculations because of slope, angle of photography, focus and lighting.

Using the Adobe Photoshop Measuring Tool

The icon for the measuring tool is located on the toolbar and contains an image of a ruler. (Figure 9). Before starting it is important to have a scale against which you can set the measurement parameters. In archaeologically recorded images there will usually be a standard scale (e.g. IFRAO Colour Chart with measurement Scale). To prepare to set the measurement parameters the measurement tool is stretched along one of the increments of the scale (Figure 10).

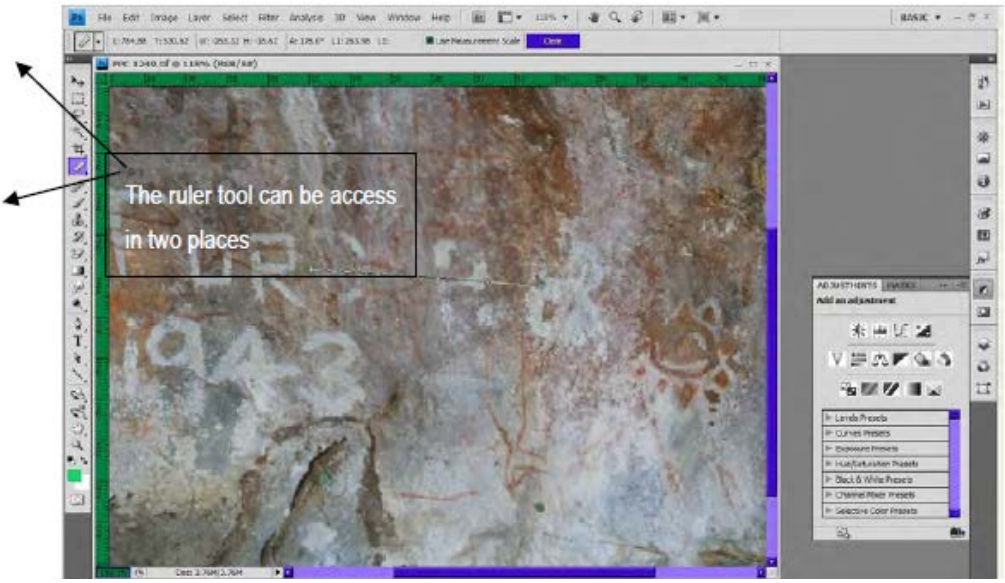


FIGURE 9 LOCATING THE TOOLS FOR MEASURING IN ADOBE PHOTOSHOP.

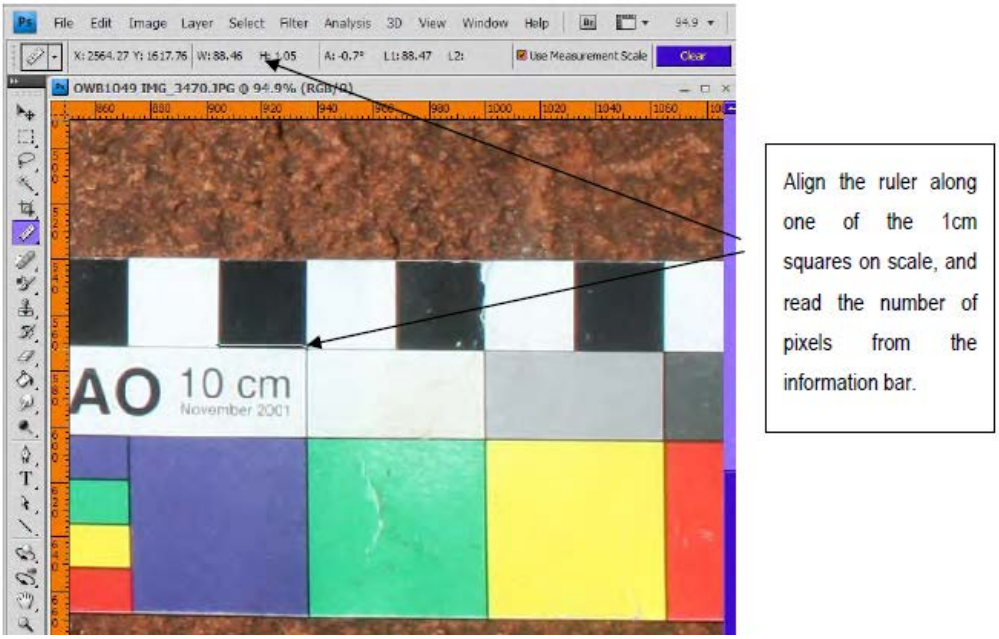


FIGURE 10 ALIGNING THE RULER.

Setting the Measurement Parameters (Figure 11)

Step 1: Select the Analysis function from the menu bar.

Step 2: Choose Set Measurement Scale.

Step 3: Choose Custom from the sub menu. This leads you into the next dialogue box (Figure 12), where you set the parameters of the measurement.

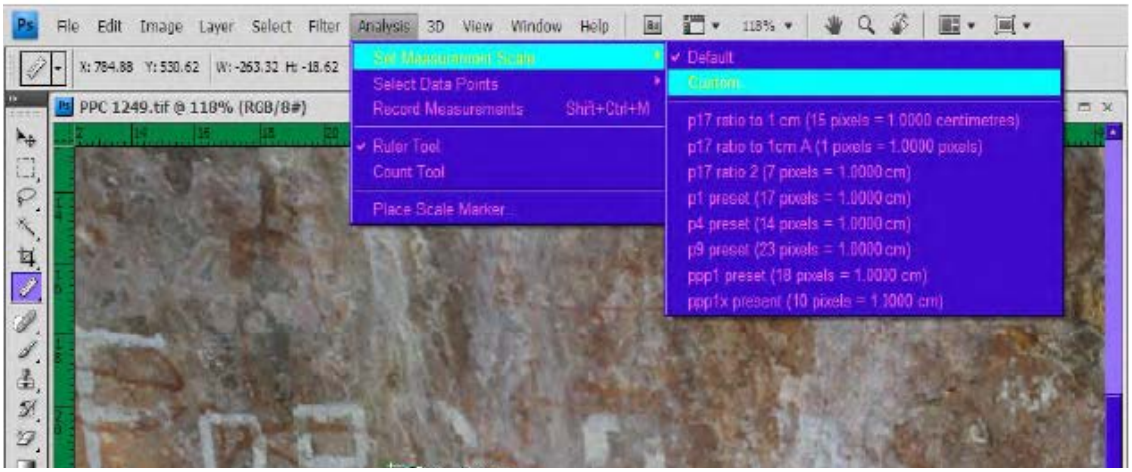


FIGURE 11 SETTING CUSTOM MEASUREMENTS.

Step 4: Set the parameters in the dialogue box. a) pixel length is read from your menu bar as shown in Figure 9. Choose height or width pixels depending on which way you set the ruler against the scale. b) Logical length is the length of the increment in the scale you have chosen (e.g. 1cm or 30cm) c) Logical Units is the measuring system you are using, centimetres, millimetres, inches.

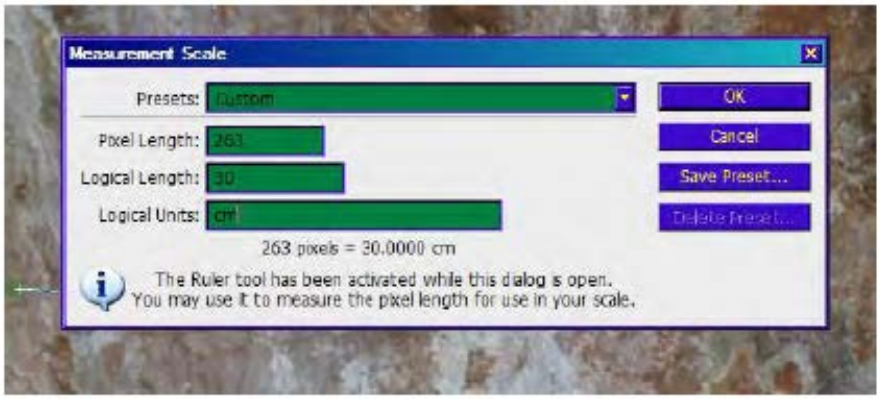


FIGURE 12 COMPLETING THE CUSTOM DIALOGUE BOX

Step 5: Measure the image using the ruler. Stretch the line created by the ruler from one point to another and read the measurement (in your chosen measurement scale) from the information bar.

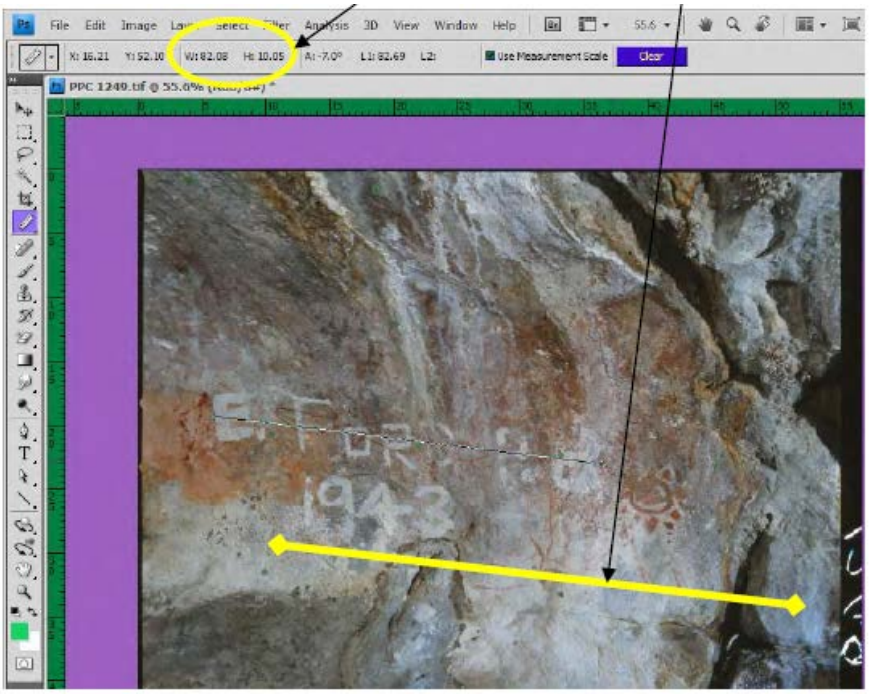


FIGURE 13 MEASURING IMAGES IN ADOBE PHOTOSHOP.

Appendix 5 The Sites

Note: This Appendix contains images of Bunuba and Gooniyandi people. They are used with permission in this thesis for the purpose of research. These images may not be reproduced or used in any form without written permission.

Introduction

Of the 43 sites at which rock art was recorded (Table 1) 24 were rockshelters and 16 caves, the remaining three may be described as exposed rockfaces without substantial shelter (Figure 1). There were sites with both cave and rockshelter features, and some that also had sections of exposed rockface.

In this appendix the details of each site are provided. Not all sites have site plans, as limits of time and photographing of the rock art by team members other than the author meant that not all details were recorded. Most site descriptions contain the following:

- Site description,
- Site location map,
- Site plan,
- A context photograph of the site, and
- General description of the rock art.

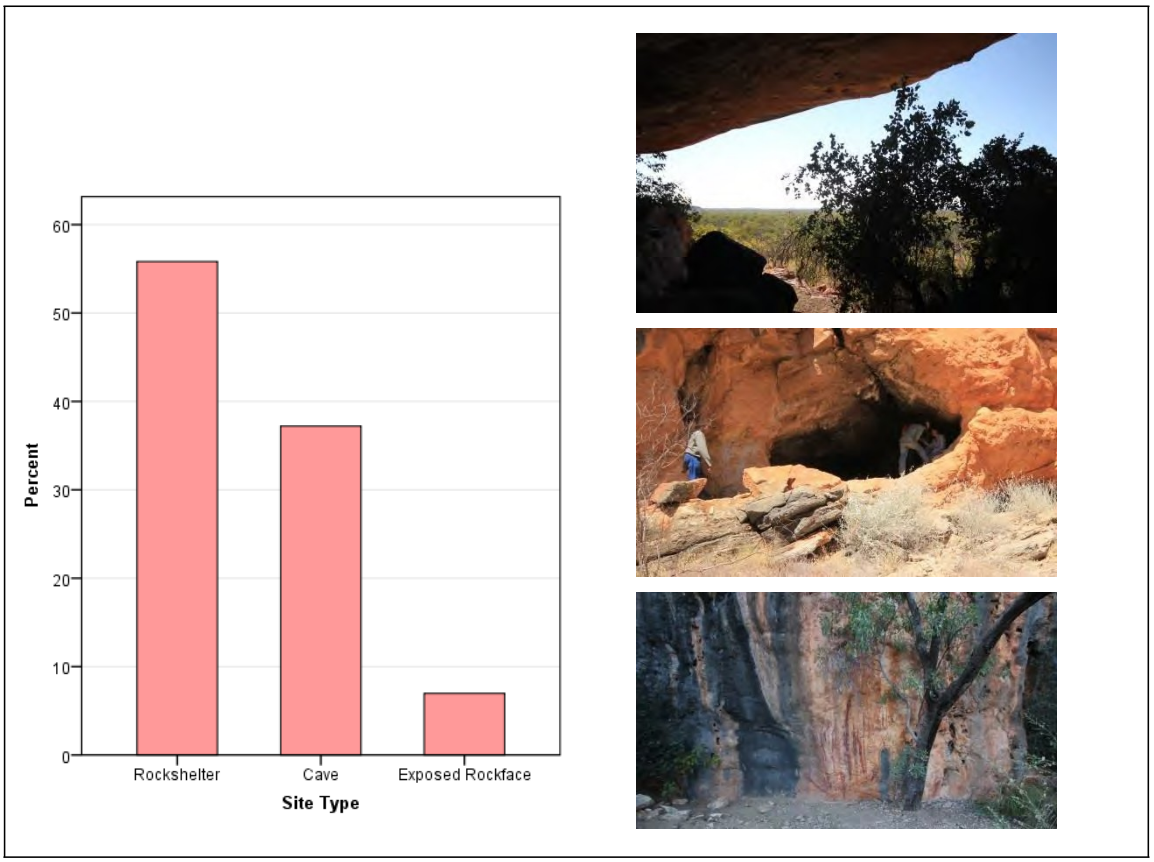


FIGURE 1 PROPORTION OF SITE TYPES IN THE STUDY AREA (LEFT) WITH IMAGES OF EACH SITE TYPE. (A) PROFILE OF THE ROCKSHELTER AT LANGURMURRU (CG3) LOOKING WEST, (B) ENTRANCE TO THE CAVE AT EMANUEL GAP 5, AND (C) AN ALMOST PERPENDICULAR ROCKFACE WITH PIGMENT ART AT THE DJURU.

TABLE 1SITE NAMES AND GPS COORDINATES RECORDED ON GARMIN60, 2011 AND 2012

Site Name	Zone	Easting	Northing	Site Name	Zone	Easting	Northing
Bunuba Roadside Cave 1	51	741749	8017562	Marawun 4	51	711916	8048723
Bunuba Roadside Cave 2	51	741771	8017566	Marawun 7-1	51	706270	8048592
Bunuba Roadside Cave 3	51	741765	8017562	Marawun 7-2	51	706270	8048592
Tangalma	51	712501	8071613	Marawun 7-3	51	706270	8048592
Tangalma A	51	712501	8071613	Mine Access Site 1	51	717406	8043205
Langurmurru	51	710175	8073449	Mine Access Site 2	51	717406	8043205
Darrananna	51	763822	8021260	Mount Behn 1	51	722268	8062434
Tarakalu 1	51	731419	8046398	Mount Behn 2	51	722398	8062507
Tarakalu 2	51	731475	8046329	Mount Behn 3	51	722264	8026383
Elimberrie Springs	51	717094	8045656	Mount Behn 4	51	722398	8062506
Emanuel Gap 1	51	800040	7964217	Moonggaroonggoo	52	204021	7977278
Emanuel Gap 2	51	7999975	7964041	Riwi	52	189996	7931320
Emanuel Gap 3	51	799975	7964041	Stumpy's Soak 1	51	728952	8027463
Emanuel Gap 4	51	799885	7962817	Tunnel Creek 1	51	727658	8052071
Emanuel Gap 5	51	799835	7962890	Tunnel Creek 2	51	727658	8052071
Fairfield 1	51	723206	8056847	Tunnel Creek 3	51	727681	8051926
Fairfield 2	51	726887	8052722	Tunnel Creek 4	51	727289	8051038
Fairfield 3	51	726994	8052623	Tunnel Creek 4A	51	727289	8051038
Lillimooloora 1	51	708849	8072542	Tunnel Creek 5	51	727378	8051422
Lillimooloora 2	51	709210	8072178	Tunnel Creek 6	51	727658	8052071
Louisa Downs 1	52	244918	7956151	Djuru East	51	706629	8073864
Marawun 1	51	708439	8048317	Djuru	51	706608	8073880

In this study the sites are arranged according to the dominant area of the site on which the rock art is placed. Langurmurru, for example, has cave, rockshelter and exposed rockface. As Figure 2 shows, at the east where the area of the site narrows there is an exposed rockface with rock art, to the east of the cave entrance, under the overhang, there is a single motif, and inside the cave high up near the ceiling is another single motif. To the west of the cave is a wide floor area, with an upper terrace and a wide and deep overhang forming a large rockshelter. The fronts of the terrace, and boulders adjacent, have remnants of pigment art, and the wall and ceiling above the upper terrace has prolific pigment art. Further to the west, there is also pigment art in a wide niche. In this example there are sections that may be described as cave and exposed rockface, but the section in which all but six of the one hundred and three identified motifs (or individual cultural markings) are visible is the rockshelter, and for this reason this site is described as a rockshelter.

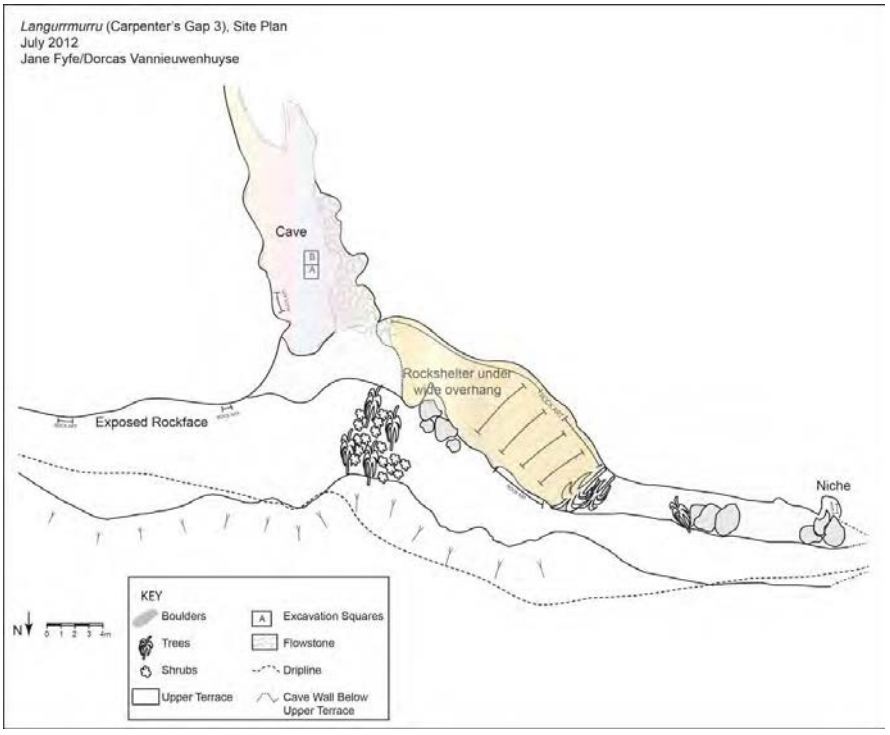


FIGURE 2 SITE PLAN WITH LOCATIONS OF ROCK ART FOR *LANGURMURRU* (CG3) IN THE DIFFERENT SECTIONS

Similarly, Mount Behn 1 has rockshelter and exposed rockface sections, with most of the art in the rock art located on the walls, ceiling and overhang or the rockshelter (Figure 3). Tunnel Creek 4 has an upper section with a large cave which has a scattering of rock art along the upper wall at either side of the cave entrance, but none in the cave itself, while the lower rockshelter has prolific pigment art and it is therefore categorised as a rockshelter. Emanuel Gap 5, on the other hand, has a covered ledge that may be

described as an adjacent rockshelter, to the north of the cave entrance, with a pigment art on the wall and ceiling; inside the cave the art is prolific and varied, making this the dominant rock art province at the site.

The sites are mainly located in, or at the base of, the limestone escarpments (81.4%) with the remaining sites in limestone outcrops. In some cases, such as the site at Riwi, the cave is in one of a series of very large outcrops around a network of creek lines. Most sites are within ten kilometres of a water source such as a freshwater creek, river or spring; with more than seventy per cent of those sources observed with water in the dry seasons during the fieldwork.

The rock art sites vary in size, from the very small Stumpy's Soak 1, with an estimated floor area of 2.8m^2, to the very wide Mount Behn 1 site, with an estimated maximum floor area of 568m^2.

This does not reflect the number of figures, or the range of art, at sites. For example, the Elimberrie Springs Rockshelter has similar dimensions to Mount Behn 1, and though both have a large assemblage of rock art, Mount Behn 1 has more than double the number of identified motifs Similarly, smaller rockshelters vary such as the 42 identified motifs at SS1, compared to five motifs at the slightly larger 5.9m^2 Bunuba Roadside Caves 2.

At all sites the rock art has been placed on whichever surfaces were available and suitable for either pigment or engraved art. While many of the sites are on the large continuous escarpments of the exposed Devonian Reefs described in Chapter 1, others are in less continuous limestone, sandstone and conglomerate formations, including large block and reefal outcrops, which are also part of the exposed reef system (see Playford 1981; Playford et al. 2009). Moonggaroonggoo (Figure 5) is a good example of a rockshelter on a large outcrop; the rock sits like a small mountain of rocks on a wide flat plain and like many of the rockshelters has mixed geology, from the finely textured, sometimes smooth limestone surfaces to the more granular sandstone. As at most sites the rock art at Moonggaroonggoo (Figure A5- 5) is on both rough and smooth surfaces, but mostly on the smooth limestone surfaces where they are available.

Three sites were excavated in 2012, Djuru East, Mount Behn 1 and Langurmurru and two test squares opened near Dimalurru/Tunnel Creek. In 2013 a single site (Riwi) was excavated. Brief descriptions of the excavation are included in this final section of this

appendix.

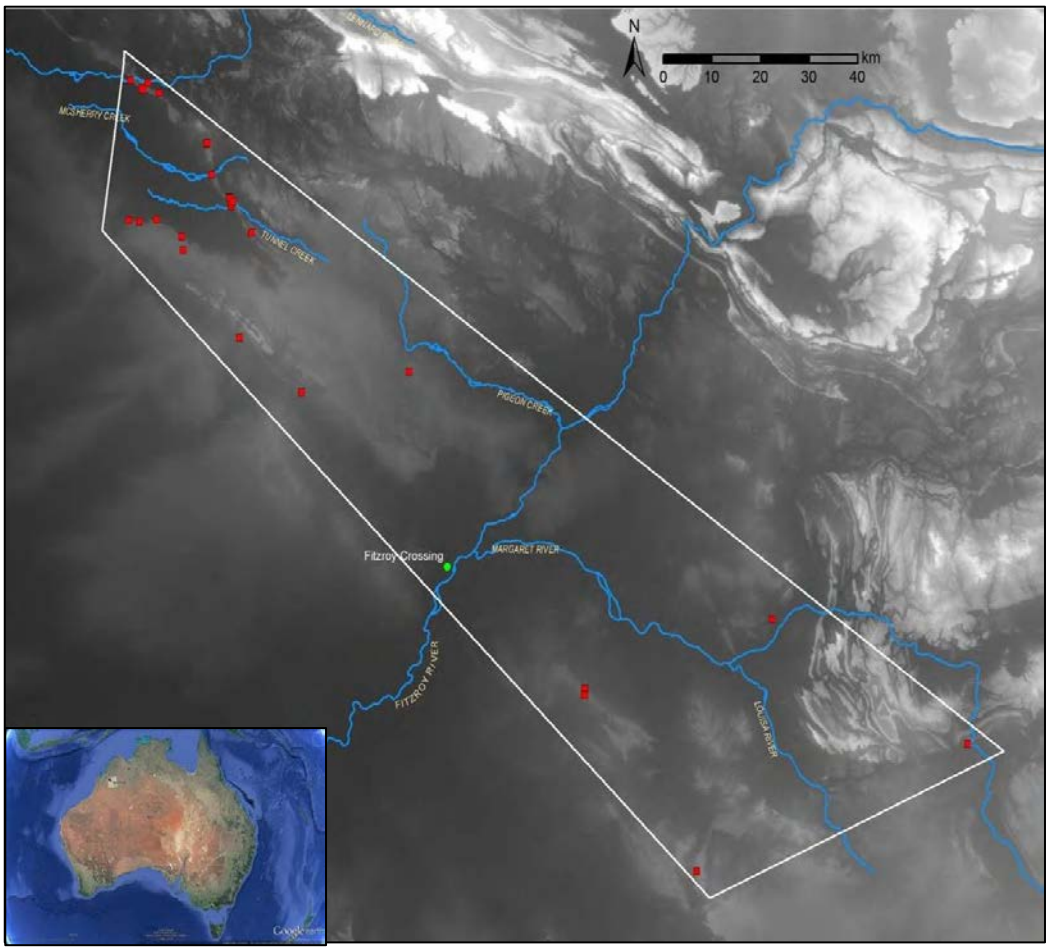


FIGURE 3 LOCATION OF THE SITES IN THE STUDY AREA.

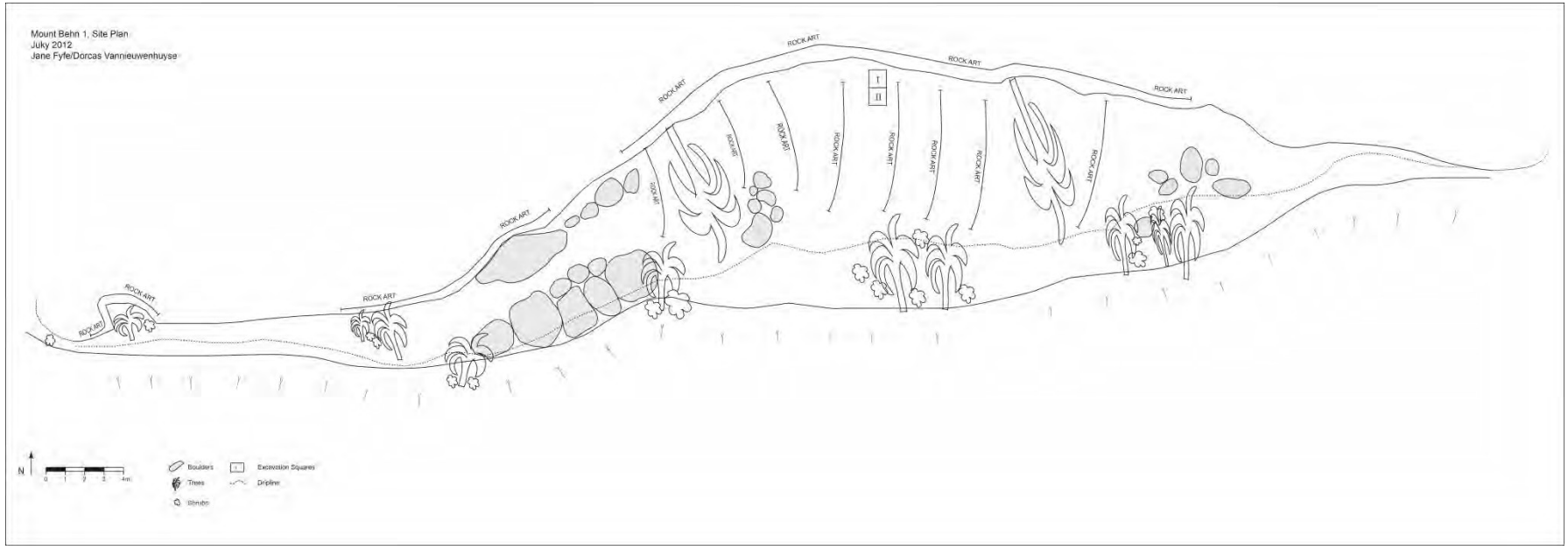


FIGURE 4 SITE PLAN WITH LOCATIONS OF ROCK ART IN THE DIFFERENT SECTIONS AT MOUNT BEHN 1 (ROCKSHELTER). ADAPTED FROM PLAN BY DORCAS VANNIEUWENHUYSE.

FIGURE 5 MOONGGAROONGGOO VIEWED FROM THE WEST; THE ROCKSHELTER (PR1) IS ON THE EAST SIDE (1 SEPTEMBER 2011).

Site Descriptions

This section provides a brief description of each site in the study area. The sites are arranged in five groupings from west to east, with six additional individual sites. The sites are grouped for their relatively close physical proximity to one another to show the distances between them that is not possible in the study area, or language group mapping used elsewhere. The individual sites are two sets of three widely separated sites to the west (over an area of approximately one hundred and seventy square kilometres, with large creeks and a substantial limestone escarpment separating two of the sites) and east (an area of approximately one thousand and sixty square kilometres, with sites separated by approximately 60km) of Fitzroy Crossing respectively. The latter are not close enough to be easily accessible in a day's walk from one another (an estimated 20km) and the differences in the sites, their geology and water sources does not suggest grouping.

Sites close to Bandilngan

The sites shown in Figure 6 are all within twenty kilometres of Bandilngan, the Bunuba name for Windjana Gorge (Kimberley Language Resource Centre 2000) which in the western part of the contemporarily defined Bunuba lands. This is a major source of water and food, with the Lennard River which runs through the gorge plentiful in shellfish, barramundi and small freshwater crocodiles, as well as eels, and the area lush with edible fruits and tubers for much of the year, as well as birds and macropods observed (and eaten) during the field work in this area.

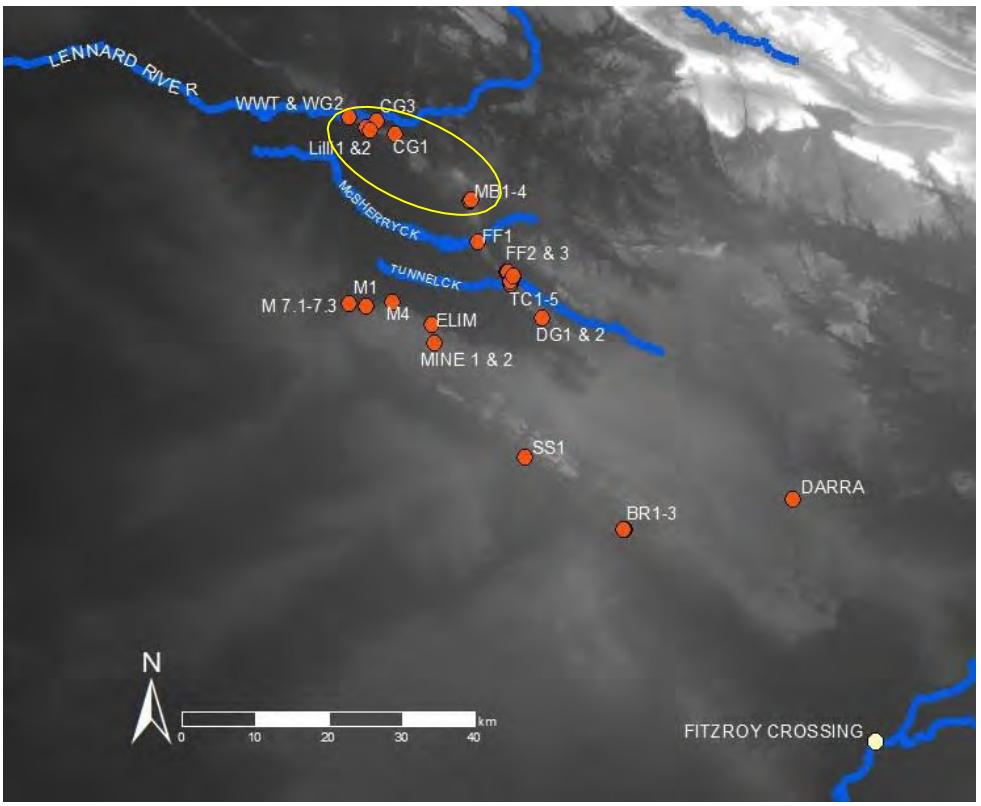


FIGURE 6 SITES LOCATIONS CLOSE TO BANDILNGAN (WINDJANA GORGE).

Djuru (Windjana Gorge Water Tank -WWT)

This site is approximately 200m to the east of the entrance of Bandilngan (Windjana Gorge), in the Windjana limestone formation of the Napier Ranges (Playford et al. 2009: Plate 6). The exposed rockface with a smooth limestone surface, punctuated with wide black deposits, a likely the result of water flow on surface, has a south westerly aspect. This site was excavated by O'Connor and Stokes in 1994 (O'Connor et al. 2008), with radiocarbon dating on charcoal showing occupation from more than 6,000 years into the historic period (O'Connor et al. 2008: 76, Table 1). The site was named for the water tank that formerly sat on a concrete base close to the rockface, obscuring much of the rock art.

The site is 20m wide, by 10m deep (between the bordering boulders and the rockface), with a height of 6.74m to the drip line on the slightly sloped surface. WWT is an exposed rockface which has a convex curve and receives the full afternoon sun. The main panel at this site has a south westerly aspect, with a further panel around the curve to the west of the main rockface with a westerly aspect. There is one large eucalypt growing close to the rockface and small shrubs, grass and trees around the site, which is partially bordered with large boulders (up to one point 5m high) to the southwest, and a conglomeration of limestone blocks to the east forming a divide between this site and Djuru East (WG2), which is approximately twenty metres to the east. The floor of the site is coarse river sand with small pebbles, falling away down a slight slope through thick grasses and smaller boulders approximately 5m to the plains below.

FIGURE 7 DJURU, LOOKING NE TOWARDS THE MAIN ROCK ART PANEL.

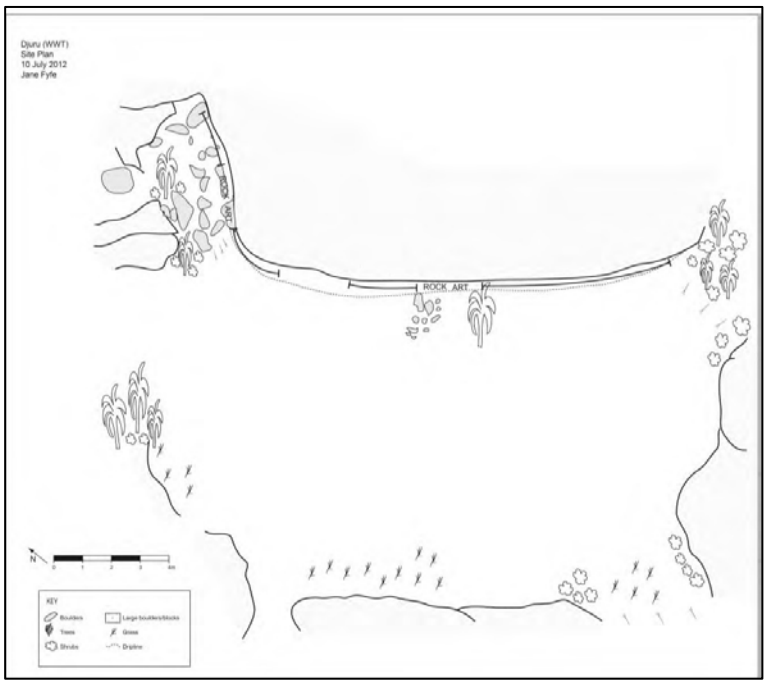


FIGURE 8 SITE PLAN DJURU SHOWING LOCATION OF ROCK ART

There are two panels with painted rock art at this site; one on the convex exposed rockface with a south westerly aspect (220º) and the other in partial shade around the curve of the rockface with a westerly aspect and accessed via a narrow passage between the surface and large boulders, over loose pebbles and small rocks. The assemblage is dominated by painted red and mulberry painted snakes and eels, with several layers of superimposition.

Djuru East (Windjana Gorge 2 - WG2)

This site is 20m to the east of WWT (above), though separated by a series of limestone blocks it is easily accessible, though not visible, from WWT. Like WWT this is an exposed Windjana limestone rockface with dark deposits on the surface, suggesting water flow. The site floor is a narrow area between the rockface and large limestone blocks with dense vegetation of trees, small shrubs and grasses. This appears to

have been a site which has been walked through many times, with the ground clear, the vegetation trampled, and the coarse sandy surface well compacted.

The site is 17.8m long, with a depth of 5.6m, and the height at the dripline of 2.14m.

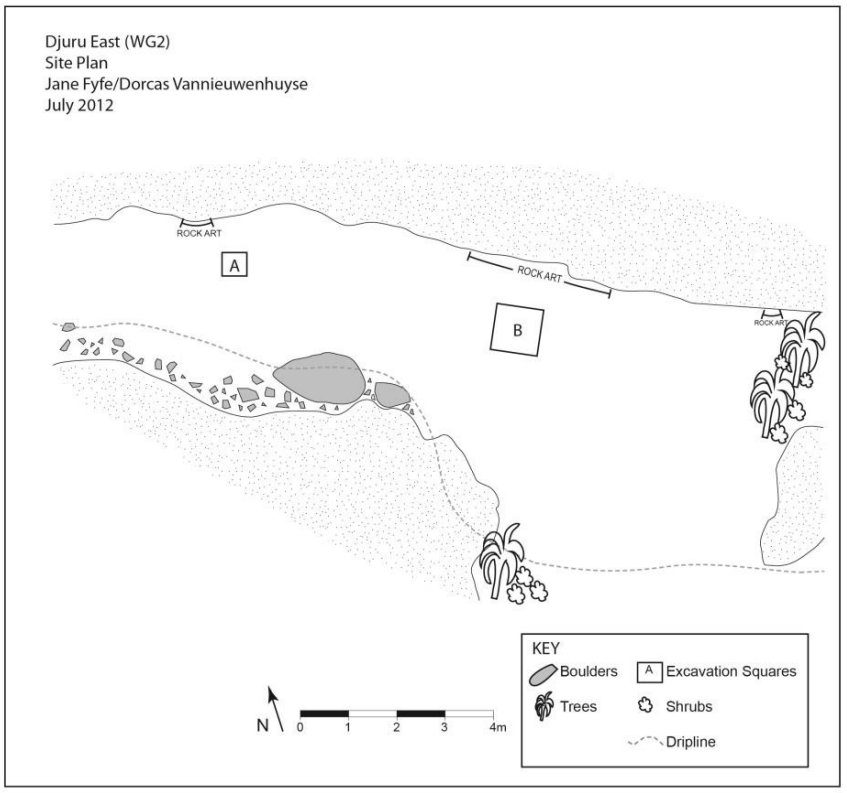


FIGURE 9 SITE PLAN FOR DJURU EAST (WINDJANA GORGE 2) SHOWING LOCATIONS OF ROCK ART

The rock art at this site is visible on the exposed rock surface, and the two panels are split by more than 6m and large black deposits on the rock surface. In this assemblage the colours vary, with white, orange, yellow, black and red all used.The motifs are dominated by snakes and eels, with several layers of superimposition.

This site was excavated in 2012. A 1mx1m metre square was excavated directly under the main rock art panel to a depth of one point two metres in two- and five-centimetre spits. Charcoal was collected from the walls and excavated materials for radiocarbon dating, cores were also taken from the walls for OSL dating and samples taken in columns from the walls of the square for detailed geoarchaeological analysis of the sediments. All of the excavated sediments were sieved and sorted for later laboratory analysis in a range of research projects, including the identification of ochre for analysis in this study.

FIGURE 10 EXCAVATION SQUARE DIRECTLY UNDER ROCK ART PANEL AT DJURU EAST (WG2).PHOTOGRAPH DORCAS VANNIEUWENHUYSE.

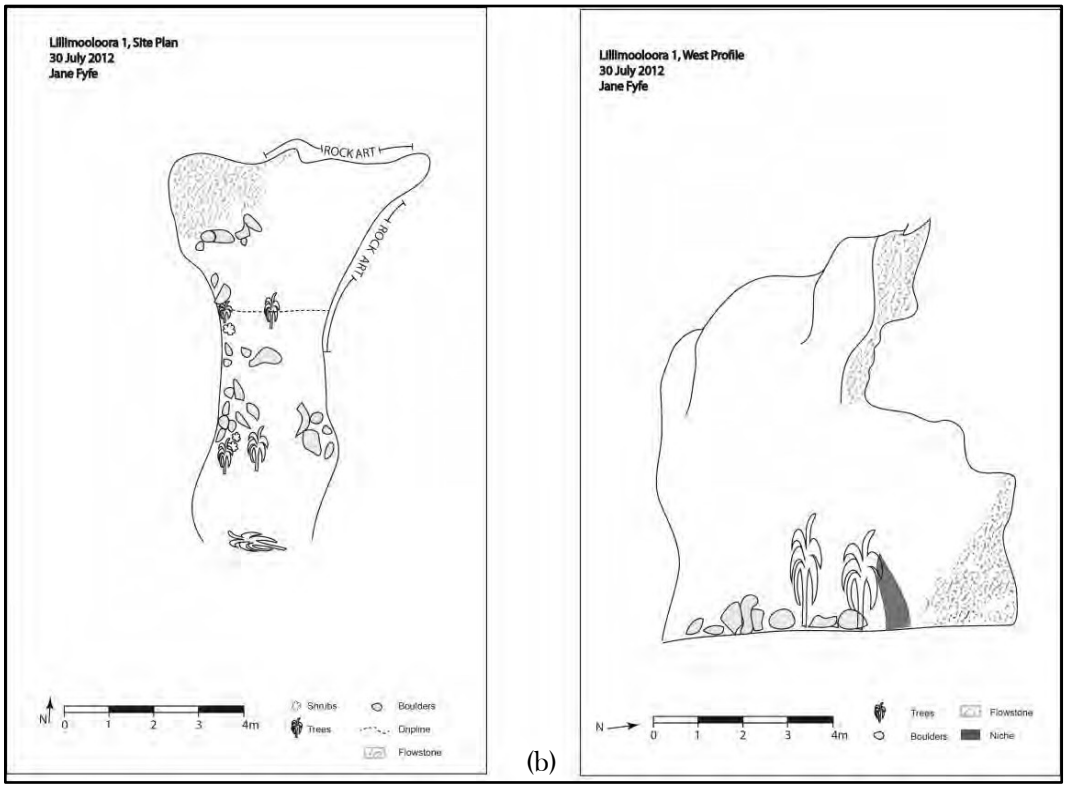
Lillimooloora 1

This cave is just over a kilometre from the entrance to Bandilngan, with a slightly different geological formation. The cave is located on the southwestern side of the Napier Ranges, to the east of Bandilngan but in an area referred to as Napier Formation. The Napier Formation is described as 'well-bedded to massive reefal-slope and fore-reef limestone' (Playford et al. 2009: Plate 6), meaning that it is primarily limestone, but with a form that has both long layers, like the shape of reasonably uniform stratigraphic layers, as well as large blocks of limestone with varying degrees of granularity. The cave itself is nestled amongst the large blocks that are part of the massive of this type of formation. The cave is named for its association with and proximity to the remains of the Lillimooloora station and homestead, 350m to the south, and close to the Leopold-Fairfield Road.

The cave is dark and cool, with evidence of use as a storeroom for meat (butcher's hooks

on the south wall near the rear of the cave) post contact, and the walls also have blackened areas suggesting water flow from the partly open ceiling.

From the remains of the homestead the cave is accessible by crossing a steep creek bed, which was dry in 2012, but the density of vegetation (particularly the previous year) suggested it would be full during the wet season. It sits approximately 2m up a slight rocky slope, through grass and low shrubs, with large trees close to the escarpment, and within the wide crevice through which the cave mouth is accessed. A cave with a freshwater spring providing enough water to make the first 5m of the creek bed into which it flowed muddy during the dry season is approximately 20m to the west of this cave, and may have been the closest source of reliable fresh water. The site has a 2.35m wide entrance, narrows towards the middle and then widens again, to 2.9m at the back wall. The height also varies from 4.98m at the drip line to 3.24m at the north wall (Figure 5-11).



(a) (b)

FIGURE 11 (A) LILLIMOOLOORA 1 SITE PLAN SHOWING LOCATION OF THE ROCK ART PANELS (B) LILLIMOOLOORA 1 PROFILE DRAWING, FACING WEST.

The floor of this site is medium grained and sandy, interspersed small rocks particularly on the western side and with a rough cobbled sloping area in the rear northwestern corner. The rock art in this cave is on two panels, on the eastern wall on which the meat hooks are hung and on the rear wall around a small niche. The colours used are red, black and white and the most prominent motif is of a dingo in black with a white outline.

Lillimooloora 2

Less than 600m from Lillimooloora 1, this low ceilinged cave is also in the Napier Formation limestone, and is nestled at the base of a series of large blocks of limestone forming the steep slope to the escarpment 20m to the north. The cave entrance is less than 50m from Leopold-Fairfield Road, the unsealed road which provides access to Bandilngan from the Great Northern Highway in the south and continues to the Gibb River Road in the west. There are several creek beds running along the plain between the two Lillimooloora sites, with high grasses and spinifex, interspersed with eucalypts and boab tree trees. In addition, there is at least one spring noted between the two caves that had a little water during the dry season when the site was recorded, though not sufficient to feed the nearby creek.

The painted surfaces in the cave are uneven limestone with insect nest, tracks and water deposits that appear to have dissolved some of the ochres leaving it patchy and flaking. The entrance to this site is low (1.38m at its highest point) and wide (3.79m), and the ceiling dips to 40cm at the back of the 4.61m deep site which has a small opening at the back through which it is possible to leave the cave in a snake like fashion. The floor area is dominated by large flat rocks, scattered smaller rocks and coarse sand. The rocks rise towards the centre of the cave and form a barrier creating a small narrow aperture to the back part of the cave, where the alternate entrance is located. Three is no rock art visible on surfaces in the northern part of the cave.

The rock art at this site is painted on the ceiling to the west of the entrance, on the wall to the east and on a small overhang from the ceiling in the centre of the cave that faces the south entrance. The height of the ceiling means that the art on the ceiling would have been created from a reclining position, whilst the wall and overhand from a sitting position, as the space was too low to crouch or kneel, even for a small person such as me (153cm tall). The painted art is in white and red, and includes anthropomorphic figures, snakes and a group of white anthropomorphic figures that have what may be described as feathers, or decorations hanging vertically.

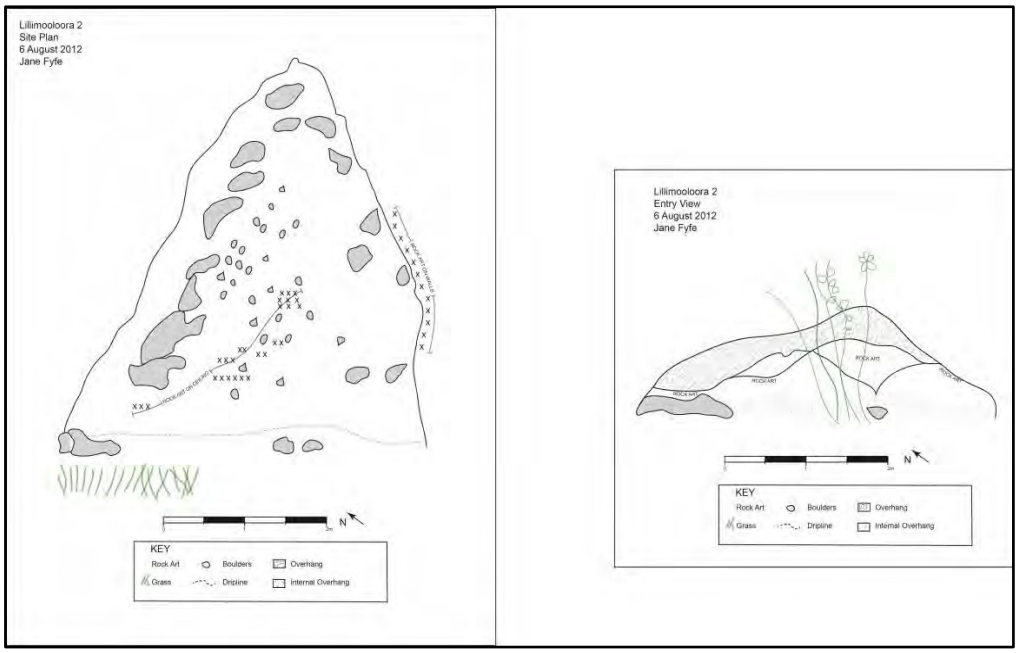


FIGURE 12 SITE PLAN FOR LILLIMOOLOORA 2 SHOWING LOCATIONS OF ROCK ART

Tangalma (Carpenter's Gap 1)

Tangalma is the Bunuba name for this site, used in publications by Playford (Playford 2007; Playford et al. 2009) and confirmed by Traditional Owners (June Oscar and Mona Oscar 2012 pers. comm., 18 August). This site has been the subject of earlier research (e.g. McConnell and O'Connor 1997; O'Connor 1995; O'Connor and Fankhauser 2001; Wallis 2001; Watchman et al. 2005; Watchman et al. 2001) and photographed by others (e.g. Crawford 1964; 1964 & 1968; 1973; Playford 2007). The rock art recording and analysis is the next stage of study at this site.

Tangalma is situated on the north side of the Napier Range, with a north easterly aspect, in a section of Pillara limestone, surrounded by Napier Formation (Playford et al. 2009: Plate 1). Stratigraphy places the Pillara limestone before the Napier Formation (though not uniformly), making the section in which Tangalma is located likely to be geologically older than its surrounds, and this may be part of the reason for the smooth surfaces on which much of the rock art is preserved and visible.

Tangalma is a large open rockshelter with a deep overhang. It is accessible up a steep, rocky slope with a well-worn pathway in parts, as it is a popular site for cultural tourism. The rockshelter is approximately 40m wide, with a depth up to 12m. It is in three distinct parts, the first and most visible when entering the shelter is a sloping wall with wide overhanging ceiling bordered by large blocks. The distance between this wall and the ceiling is less than 5m, and the wall itself does not finish at the floor level, but ends approximately 1.1m above it, sloping down to join the floor at the rear of the overhang.

This section has a sandy floor, with pebble inclusions. Five 1 x 1m squares were excavated in this section of the site (Figure 13), with radiocarbon dates from the excavation suggesting human occupation at more than 40,000BP (McConnell and O'Connor 1997; O'Connor and Veth 2008). A slab of limestone with ochre on one side, broken from the ceiling of the rockshelter, found in a dated context in the excavation also suggests that at that time people were also engaged in the production of rock art (O'Connor and Fankhauser 2001), and more recent analysis suggests that this has continued into the contact period (O'Connor et al. 2013).

The overhang created where the wall ends has a deep (close to 8m at its furthest point) rounded almost triangular rough sandy floor with a low sloping ceiling, which is as wide as the walled part of the rockshelter. The ceiling of the overhang is a rough, uneven surface with sharp protrusions in places, and has a range of painted rock art in white and red pigments, with many of the images representing phytomorphs, though there are also anthropomorphic figures present. Most of the rock art is painted on the ceiling which is currently only 0.6m above the sandy floor.

To the east of the main wall is an open area with a long ledge that is protected by the slope of the ceiling during the morning and exposed to the full sun in the afternoon. The floor area of this part of the site is a combination of rough loose pebbles in a mix of sand and partially exposed rough rock. The ledge is 0.84m high and 4.5m long; covered with deeply incised bird tracks and cuts, both on the horizontal rockface and the front vertical surface, with a 2.4m long crocodile at the eastern end. The east of this section of the site has a spectacular honeycombed exposed rockface which has both bee and bird nests, and no evidence of engraved or pigment art. In this site there is also pigment art, incisions and cupules on the large boulders which border the floor area opposite the vertical painted wall.

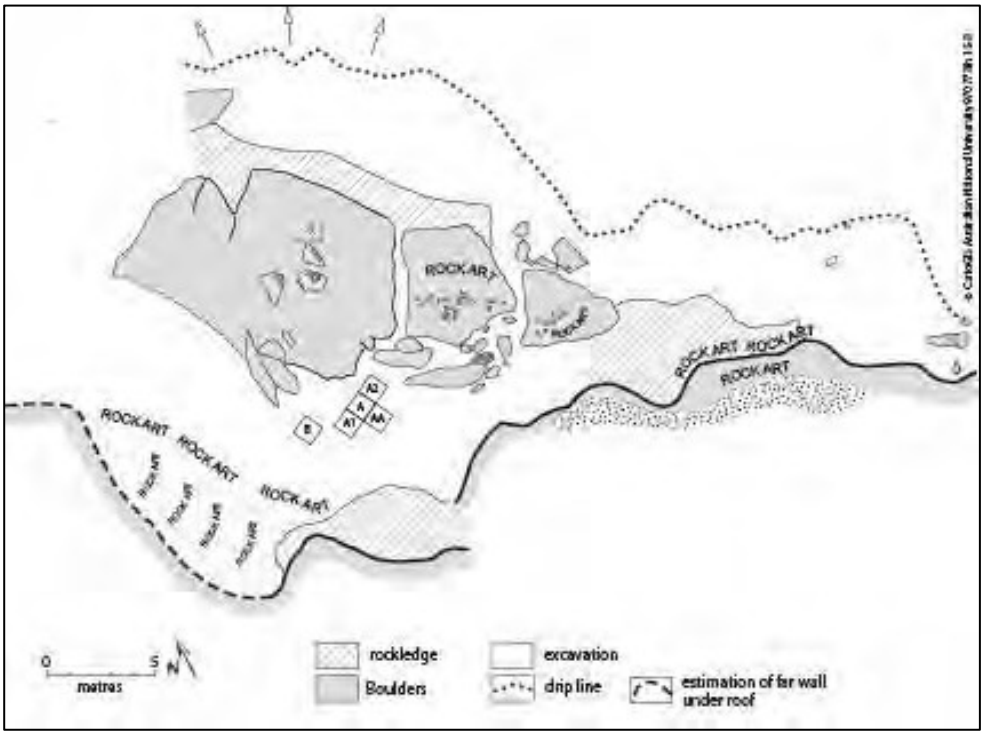


FIGURE 13 SITE PLAN FOR TANGALMA SHOWING THE APPROXIMATE LOCATION OF THE ROCK ART AND 1990S EXCAVATION (ADAPTED SITE PLAN FROM (MCCONNELL AND O'CONNOR 1997) CAD COURTESY OF TIM MALONEY, ANU).

TangalmaA (Carpenter's Gap 1A - CG1A)

This site is to the west of, and adjacent to, Tangalma. It is separated from Tangalma by less than 5m and large boulders and protrusions of rock. It was recorded separately, firstly, because the condition of the rock art meant that it was not obvious on first inspection of the site and, secondly, because previous publications (see O'Connor 1995; O'Connor and Fankhauser 2001) and photographs (Crawford 1964; Crawford 1964 & 1968; 1973; Smith 2006) did not provide any information of an extension of the site to the west, so it was initially overlooked; however, given the proximity to Tangalma, it is likely to be part of the same site.

The site is comprised of a 20m long ledge, with a shallow vertical wall above and a sharply sloping ceiling. Midway along the ledge (at 8m from the east) is a deeper niche. The ledge is up to 2m deep and approximately 70cm high with a rough, uneven surface. The floor is rough and sandy, with large pebbles and small rocks scattered around, and small shrubs and grasses growing close to some of the larger boulders, and within 2m of the ledge.

At the west of the ledge is a large wide opening that may be described as a cave, it has a very rough rocky floor, with small areas of sandy deposit that do not provide space for

sitting. The cave area is damp with some vegetation and blackened walls. At the western end of the rockshelter are steeply piled boulders and blocks of limestone with smooth water worn areas and dense lush trees and small shrubs during the dry, suggesting the presence of a spring nearby.

The pigment art at TanglamaA is in red, yellow and white and is placed on the wall above the main ledge, and is intermittent along the uneven surface, with two large, patterned snakes above the opening to the cave area and deep incisions at the western end of the ledge

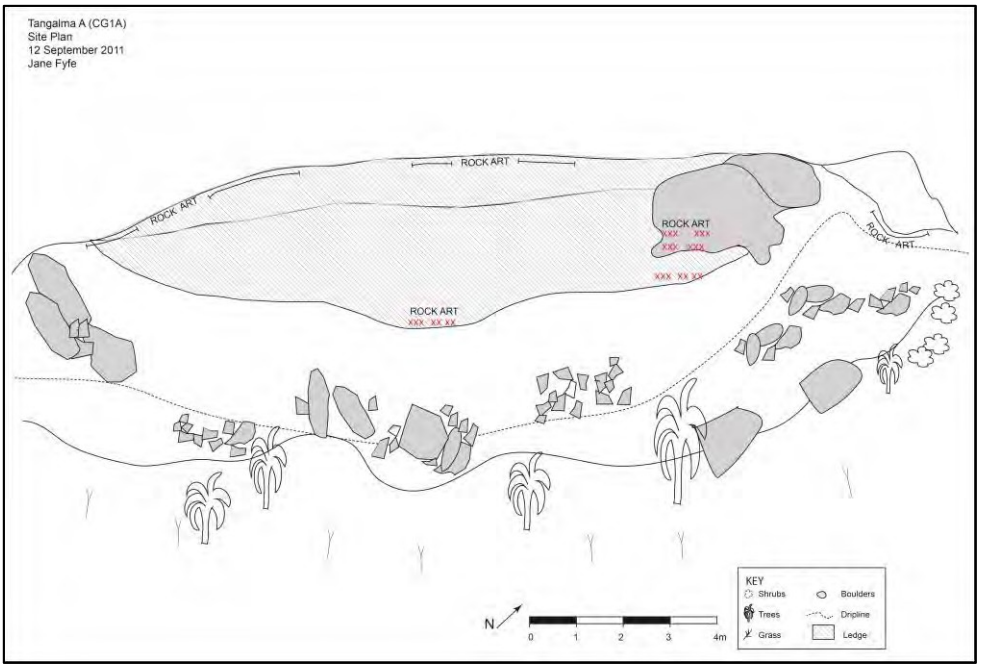


FIGURE 14 SITE PLAN FOR TANGALMA A SHOWING LOCATION OF ROCK ART.

Langurmurru (Carpenter's Gap 3 - CG3)

Langurmurru is the Bunuba name for this site. Similar names with slight spelling variations have previously been used in publication; this form of the name given to me by Traditional Owners, and the written version confirmed during fieldwork in 2012 (June Oscar & Mona Oscar, 2012 pers. comm. 18 August). This complex site is in the upper part of the Pillara Limestone formation of 'back-reef and lesser reef- flat subfacies' (Playford et al. 2009: Plate 6) of the northern face of the exposed Devonian Reef. This type of limestone was formed in the Frasnian, which is geologically earlier than the limestone at the nearby sites of close to Bandilngan. Like Tangalma, this site has also been studied previously including excavation (O'Connor and Veth 2008: 35), and some (but not all) of the rock art has been photographed on many occasions,

Langurmurru is a multipart site, with three main components; an exposed rockface with a wide apron (to the east), a high-ceilinged cave with long narrow chambers (towards the centre of the site), and a long rockshelter with a wide apron and an upper terrace (to the west) all of which is protected by a high and wide overhang. The site also has a small niche to the west that is included in the overall site because is on the same opening in the escarpment, is accessible on the same level as the upper terrace and has pigment art on the walls. The floor areas of the site vary, with the areas outside the cave has a combination of sand and exposed slabs of limestone, interspersed with large boulders, pebbles and low scrub and grasses. The cave entrance has large slabs of limestone and sand that form steps down to the coarse sandy floor, with some small, scattered rocks. Along the edge of the rockshelter are boab tree trees (*adansonia gregorii*) and eucalypts, the latter of which are also growing on the upper terrace and close to the cave entrance.

As Figure 2 shows, the cave is 15m long, with two narrow chambers at either side of the back wall. Within the cave O'Connor had excavated a square in the 1990s, and this was re-excavated in 2012, with an additional adjacent square excavated to bedrock at 2.3m. The excavation and the results of radiocarbon and OSL dating are described in Chapter 8. The cave ceiling is high, and the whole cave is visible from the stone bridge from the upper rockshelter terrace which frames the entrance. There is a large apron of exposed rock in front of the cave, and to the west it becomes sandy with dense tree and shrub growth, forming a partial barrier to both the edge of the steep rockface and the rockshelter. The cave has only 2 visible rock art motifs, a long, painted snake high on the east wall, accessible and visible from the rock bridge over the cave entrance. An additional small white painted bird is on the wall above a sitting height ledge approximately one metre to the east of the cave entrance.

At the east of the cave the rockface is exposed to the harsh afternoon sun and wind, and only two small white painted motifs are visible on that surface, close to the end of the rockshelter where the floor ends in sharp point and a vertical drop of several metres.

The main rockshelter to the west is in two parts, with a lower floor area and an upper terrace easily accessed through a gap in the limestone block formation, on which there are remnant very faded red pigment markings. The upper terrace is 21.04m metres long and 5.78m deep and the floor of the terrace forms the bridge over the cave entrance. The terrace also has a shallow ledge 0.93m high and spanning from the

western end, where flowstone forms the western edge of the cave above the stone bridge. The wall at the rear of the upper terrace and its wide, high sharply sloping ceiling is where most of the rock art at this site is located. The art is all pigment art, with a range of anthropomorphic and zoomorphic figures and hand stencils and prints. A single yellow painted motif of a thylacine (*thylacinus cynocephalus*) is present at the site and is the only instance of this motif in the assemblage.

Further to the west, and on the same level as the terrace is a small niche, tightly ensconced between large blocks of limestone, and with a smooth sloping wall on the west side and an uneven wall on the east that meet in a triangular formation at a small crevice that is too small for an adult to access. The floor of the rockshelter becomes narrower as it peters out a few metres past this niche to the west.

Mount Behn 1 (MB1)

Mount Behn 1 is a large rockshelter across the plain from Mount Behn. Geologically it is in the Windjana Limestone belt of the Napier Ranges, similar in composition to the sites closest to Bandilngan. Like other large sites MB1 has a number of different areas that are likely to have been occupied (see Figure 3), as suggested by the presence of rock art, stone tools and the close proximity of a permanent freshwater stream (less than 50m from the shelter). This site has the largest assemblage of rock art in the study area, with a range of anthropomorphs, zoomorphs along with many hand stencils. The rock art painted and drawn in reds, orange, yellow, black, white and grey, and scratched and incised. There are also cut marks and cupules on the rocks both in and around this large site.

The rock art was one of the factors in the decision to excavate at this site. As far as is known the site has not previously been excavated, and this was expected to add to the knowledge about continuity of occupation in the southern Kimberley and responses to climatic changes, as well as the potential to discover absolute dates for the creation of the rock art that would place the relative chronologies in real time. Two 1x1m squares were excavated, one close to the wall on which there is a great density of rock art, with a number of layers of superimposition visible (Figure 15).

FIGURE 15 TIM MALONEY AND BUNUBA RANGER JUANITA EXCAVATING THE SQUARE CLOSEST TO THE ROCKSHELTER WALL AT MB1, 24 JULY 2012.

Mount Behn 1 has been visited and photographed in the past (e.g. Donaldson 2012; Donaldson and Kenneally 2007), though neither the large assemblage of rock art beyond some large and distinct motifs, or the site itself is mentioned in scholarly works. The site is not close to roads or established tracks and is accessible through difficult terrain, including deep creeks, sharp rocky ground and dense vegetation.

Mount Behn 1 is a long wide rockshelter with exposed outer areas on both sides. The rockshelter sits less than 20m above flat plains, and the slope is gentle with loose rocks and scrub. The shelter is well shaded all around by large trees and shrubs. Inside there are two large eucalypts growing out from the wall, obscuring, and continuing to damage, pigment art. The site is 71m long, with a northerly aspect, and up to 7m deep under the wide overhang that forms the ceiling of the central covered area.

The area to the west of the main shelter is exposed to the sun and wind for most of the day, with a wide sandy floor, covered in low scrub and small rocks. The rockface is mostly vertical, with long and wide blackened areas from water flow. The area on top of this part of the escarpment is well covered with soil and grasses, shrubs and trees which were green and lush well into the dry seasons in 2011 and 2012. There is no visible rock art in this part of the rockshelter.

To the east of the shelter area the site continues in a long, narrow area of sun and wind

exposed vertical and semi vertical rockface, bordered by large boulders and trees. The rock art is prolific in this area, though appears in clustered groups, rather than spread across the rockface continuously. The rock art in this area is all pigment art in red, mulberry and white, with some lines patterning or outlining motifs drawn in black. The figures are mostly anthropomorphic and zoomorphic, with two distinct groups of numerous small round and oval bodied anthropomorphs in white ochre. This most easterly section of this area is in a wide niche almost filled with a tree. All of the walls in this niche have pigment art in red and white, with a large dingo the dominant motif.

Mount Behn 2 (MB2)

Mount Behn 2 is a large open rockshelter approximately 200m to the northeast of Mount Behn 1 and separated by two small freshwater creeks. It is 13.9m wide, with a depth up to 4.3m and a 5.8m high dripline (Figure 16). The walls of the rockshelter are rough and uneven with both black and white deposits that appear to be the result of water flow, and slope outwards at a shallow angle providing protection from morning sun. The floor of the rockshelter is coarse sand with small rocks and boulders scattered over the surface, some grasses and small shrubs are on the site floor and larger trees at the northern edge. The slope to the site is steep in parts (greater than 30º) because of the large boulders on the upper parts of the slope.

The rock art at this site is all pigment art, in black, white, red and mulberry, with more hand stencils and prints than any other motif type.

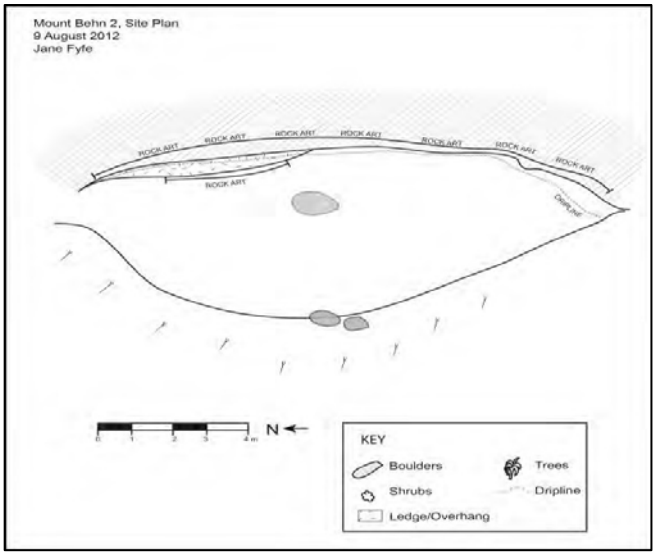


FIGURE 16 SITE PLAN OF MOUNT BEHN 2, SHOWING LOCATION OF ROCK ART.

Mount Behn 3 (MB3)

This site is a small open rockshelter approximately 20m northeast of MB1 as the crow flies, across a freshwater creek, with a nearby waterhole. It is surrounded by trees, which grow close to the rockface in places and the slope from it to the creek bed is steep and rocky with dense spinifex. It is 11m at its widest and 3.5m deep. The wall slopes at approximately 15º to a dripline at 3.5m. The cave floor is compact and sandy. There is one pigment motif at this well shaded site, with substantial black deposit from water flow over much of the rock surface.

Mount Behn 4 (MB4)

This small cave is close to MB2, around a curve in the rock, with a direct westerly aspect from the cave entrance. The site is well protected by large boulders and trees, up a steep spinifex and loose rocky slope. It has a loose sandy floor, densely covered with small rocks; and kangaroo bones at one side. The cave has a maximum width of 2.6m (at the entrance) and is 4.7m deep. The ceiling is low at the entrance (1.2m) and becomes lower inside the cave (Figure 17). It is on the ceiling that the one highly deteriorated white ochre marking at this site is placed.

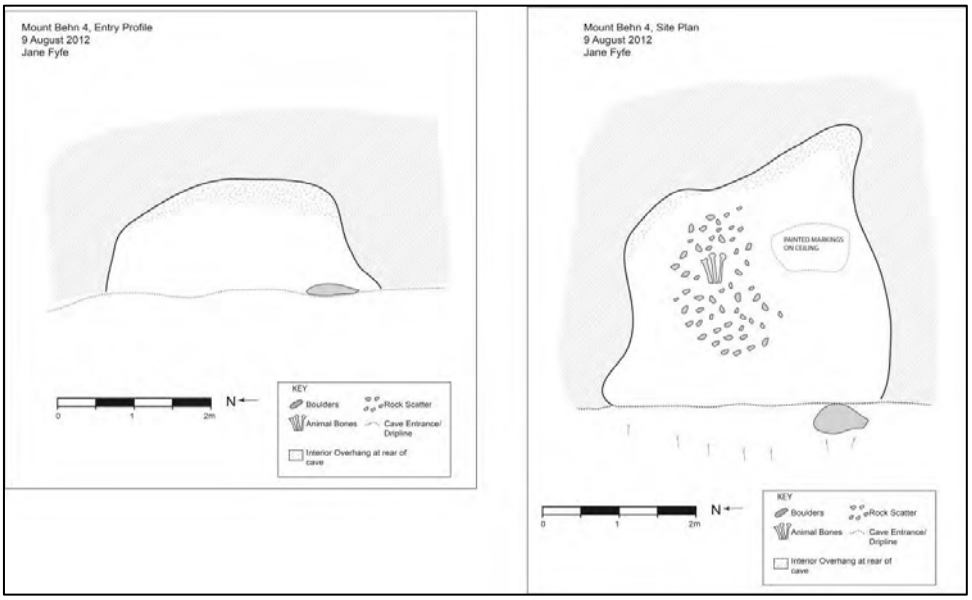


FIGURE 17 FRONT ENTRANCE AND SITE PLAN FOR MOUNT BEHN 4, SHOWING LOCATION OF ROCK ART AND ANIMAL REMAINS.

TABLE 2 SUMMARY OF WATER SOURCES, GEOLOGY AND VEGETATION RECORDED FOR SITES IN THE SITES NEAR TO BANDILNGAN

SITE	WATER SOURCE	GEOLOGICAL FORMATION	VEGETATION	PUBLISHED ARCHAEOLOGICAL RESEARCH
Djuru Djuru East	Lennard River	Windjana Gorge Limestone	Boab, Eucalyptus, low scrub	Maloney et al. 2014 O'Connor et al. 2008
Lillimooloora 1 Lillimooloora 2	Lennard River	Napier Formation	Boab, Eucalyptus, low scrub	
Tangalma Tangalma A	Lennard River	Pillara Limestone surrounded by Napier Formation	Boab, Eucalyptus, low scrub	McConnell 1998 McConnell & O'Connor 1997 O'Connor 1995 O'Connor & Fankhauser 2001 O'Connor & Veth 2008 Watchman et al. 2005 Watchman et al. 2001
Langurmurru	Lennard River	Pillara Limestone	Boab, Eucalyptus, low scrub	Maloney et al. 2014 O'Connor et al. 2013 O'Connor et al 2014 O'Connor & Veth 2008
Mount Behn 1 Mount Behn 2 Mount Behn 3 Mount Behn 4	Unnamed freshwater creek and Lennard River	Windjana Limestone	Boab, Eucalyptus, low scrub	Maloney et al. 2014

Sites on and around the Marawun Escarpment

This group of sites lie on both the northern and southern sides (Figure 18) of a long escarpment in the northern part of the Oscar Ranges that Playford et al. (2009: 332) describe as Windjana Limestone with a face of long 'vertical karren form by modern karst erosion' (see Figure 19). The escarpment is estimated at 70m high (Playford et al. 2009: 332) and the section on which this group of sites lies extends for approximately 15km, with many creeks, springs and water holes in the valleys. To the north is a wide plain interspersed with creeks, largely grassed with low scrub and eucalypts. Boab tree trees stand sentinel along the plain close to the escarpment, and in the valleys. The Marawun sites on the northern side were recorded in one day, and the southern sites on another day, both of which were spent with Traditional Owners (men and women on the respective sides) both days including exhaustive searches for sites. There was sufficient time at each site to record the rock art only, and no site plans were possible.

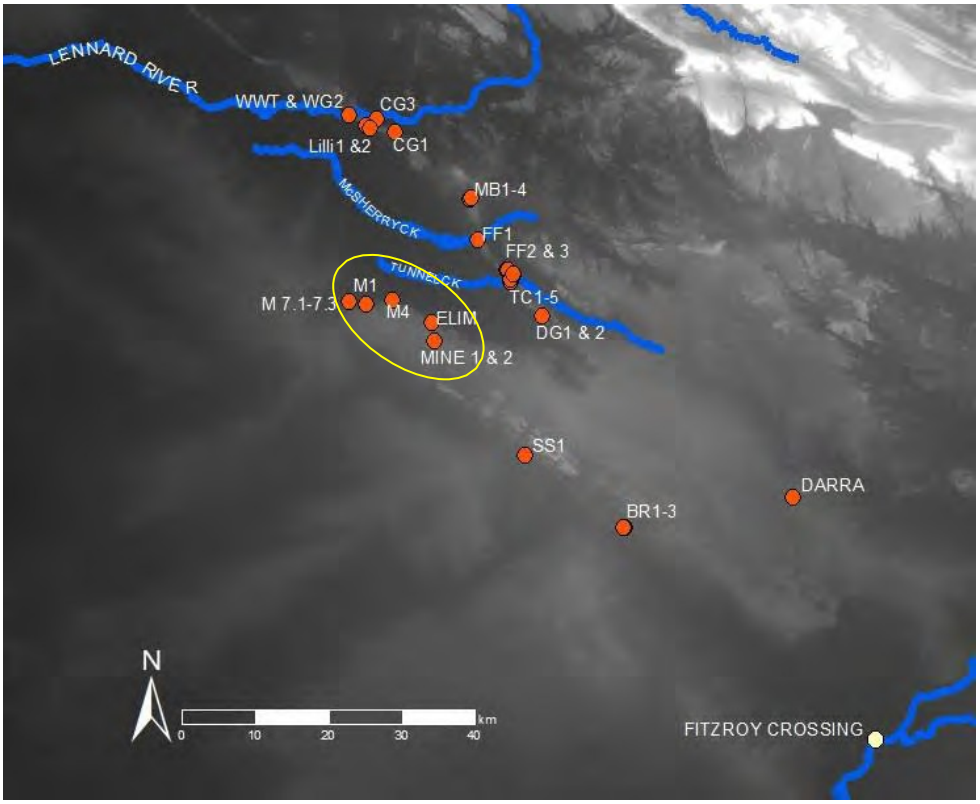


FIGURE 18 LOCATION OF SITES ALONG AND ADJACENT TO THE MARAWUN ESCARPMENT.

FIGURE 19 A VIEW FROM THE PLAIN OF NORTHERN SIDE OF THE MARAWUN ESCARPMENT (PHOTOGRAPH COURTESY OF JANE BALME, 15 AUGUST 2012).

Marawun 1(M1)

Marawun 1 is a long open rockshelter at the base of the Marawun escarpment (Figure 20). The floor of the rockshelter is coarse sand with grasses growing close to the wide slabs of rock that form wide low ledges at the base of the rockface, with small loose rocks scattered along the area. The rockface is highly exposed to the sun and wind, though the many creases in the walls provide some shade and shelter.

The rockshelter is approximately 40m wide, with slightly sloped walls that have large sections of flat, smooth surfaces on which a there is a prolific assemblage of pigment art in red, white, black, orange and yellow. There are also some areas with deposits from water flow at the eastern more exposed end of the shelter. The dominant motifs at this site are anthropomorphs, with zoomorphs and phytomorphs also well represented, with substantial superimposition of motifs in some parts of the shelter.

FIGURE 20 MARAWUN 1 ROCKSHELTER AT THE BASE OF THE ESCARPMENT.

Marawun 4 (M4)

Marawun 4 is a cave at the base of the escarpment with two chambers and an open area (2.5m wide) forming the main entrance, between the chambers. The open area is well sheltered and has a low slab which slopes up into a ledge that leads to a narrow curving passage about two and a half metres long, through which the main chamber of the northern cave is accessed (Figure 21). The passage is low (~1m high) with a rough floor with sand and small loose rocks, and opens out to a wide chamber (approximately 3mx3m) with similar sandy floor. There are two further exits possible from the chamber, one to the north and one to the west, though both with steep (close to 90º) slopes 2.5m above the plain. The chamber to the south of the main entrance is shaped more like a niche in the rockface and is not fully enclosed. It is accessed along the sloping ledge and framed by a pillar of rock that divides it from the entrance.

Marawun 4 has prolific, well preserved pigment art in bright red, orange, white, yellow and black. The dominant figures in the open part of the rock shelter are intertwined snakes and eels. Anthropomorphs are present (see Figure 22), as are other zoomorphs and handprints in both chambers. Incisions are prolific on the higher part of the ledge at the entrance to the cave.

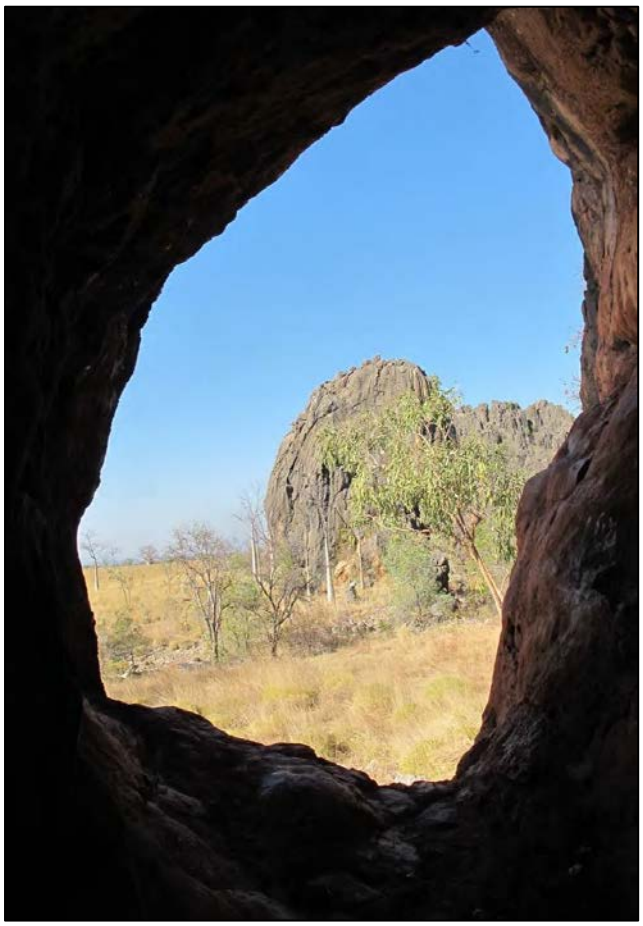


FIGURE 21 THE VIEW FROM INSIDE THE HIGHER CHAMBER AT MARAWUN 4.

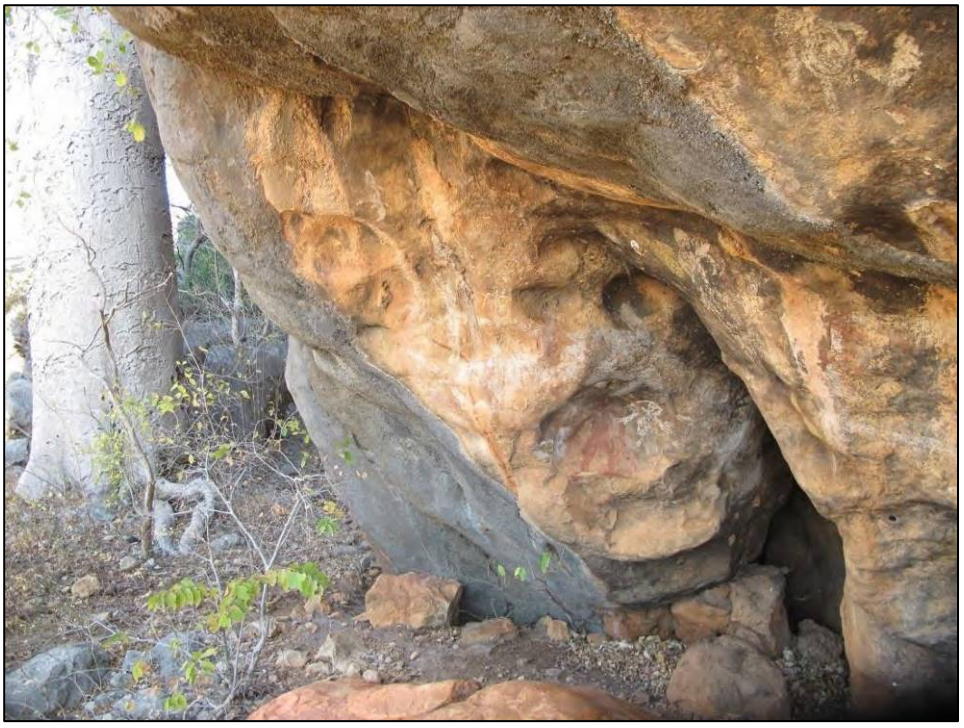


FIGURE 22 THE ENTRANCE TO THE LOWER CHAMBER OF MARAWUN 4, FROM THE BOULDERS WHERE GROUPS OF DEEP INCISIONS ARE PROLIFIC.

Marawun 7-1 (M7-1)

This is one of three small caves close together at the western end of the escarpment. It is a narrow cave with a high pointed ceiling forming a triangular type opening (Figure 23). The cave entrance at the base is 1.5m wide, narrowing to a point at 6m inside. The high point at the cave entrance was measured at 5.6m. The floor of the cave sandy, with some loose rocks and the incursion of grasses at the edge. Spinifex grows up close to the cave entrance.

The walls of the cave are varied in slope and smoothness and have rock art motifs painted and drawn on the vertical or sloped surfaces and on the ceiling near the entrance. There has been water flow in this cave in the past, evidenced by lines smudged and dripping through painted rock art. The pigments are red, mulberry, white and black and there are also incisions on the curve of the walls near at the cave entrance. Snakes are the dominant motif at this site, though there are also anthropomorphs and other zoomorphs present, and there are several levels of superimposition both of pigment and engraved art.

Marawun 7-2 (M7-2)

Marawun 7-2 is 10m to the east of Marawun 7-1 and has a similar shaped entrance which narrows to a point. The triangular entrance to this cave is 0.8m wide and 3m high. The walls of the cave have deposits from water flow, and only one visible motif in white ochre near the entrance (Figure 24.).

Marawun 7-3 (M7-3)

Marawun 7-3 is 15m to the east of Marawun 7-2, with a crescent shaped entrance 1.2m high and 1.3m from the ground and only accessible by climbing the boulder in front of the entrance (Figure 25). The small cave has one main chamber with an uneven, rocky floor and widens to approximately two metres. A single painted motif was visible on the rough surface of the rear wall of this small cave.

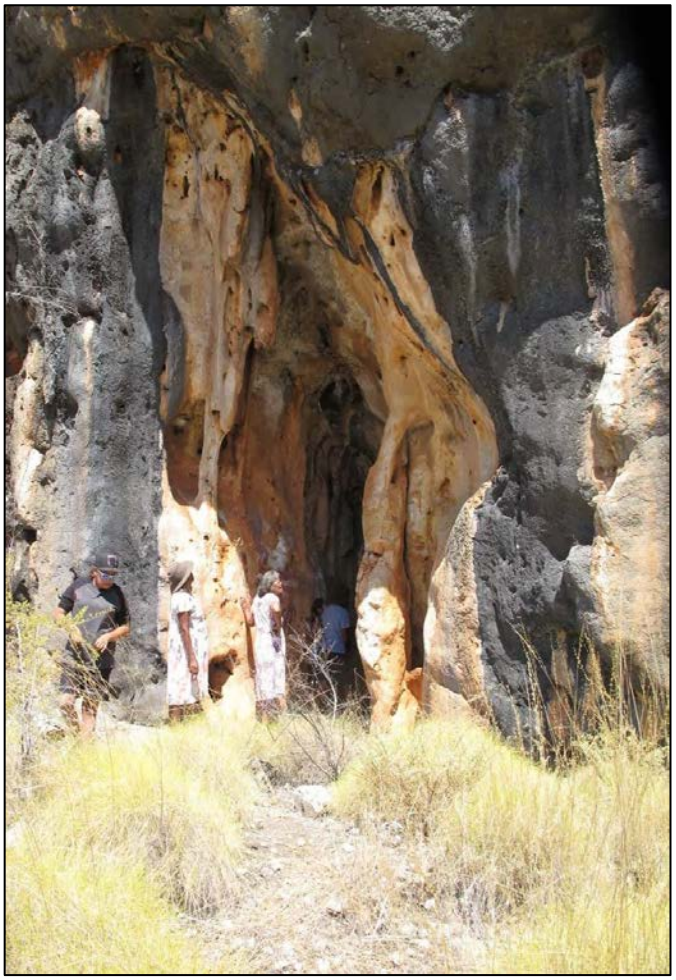


FIGURE 23 ENTRANCE TO MARAWUN 7-1.

FIGURE 24 ROCK ART AT MARAWUN 7-2.

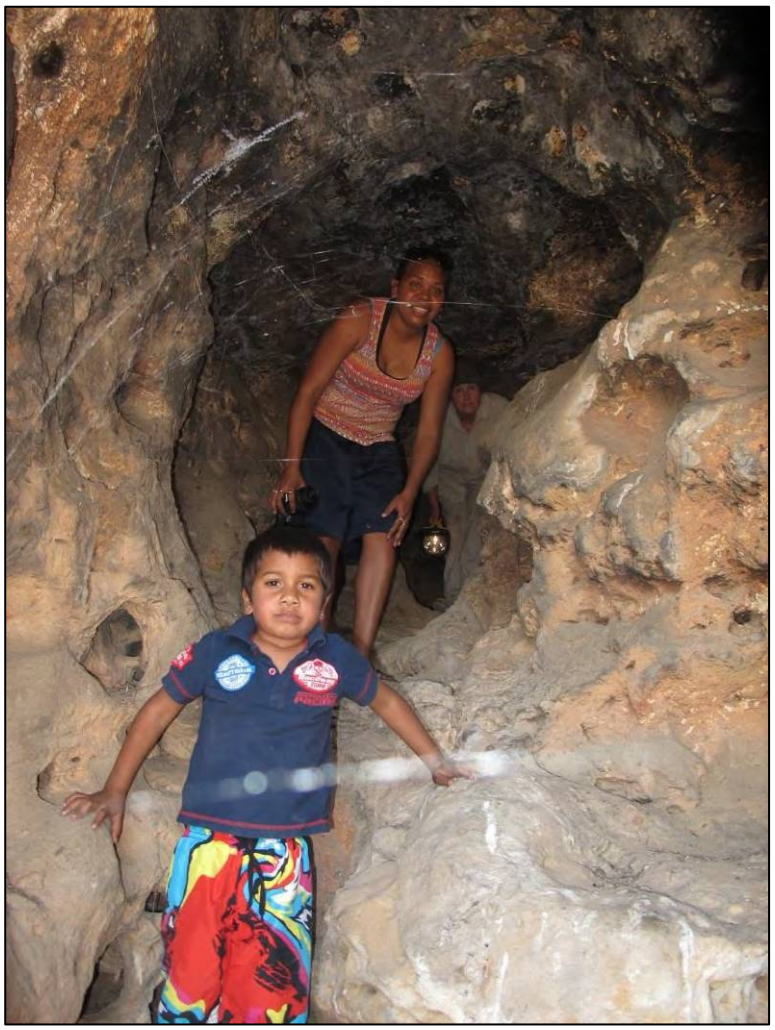


FIGURE 25 CLIMBING OUT OF MARAWUN 7-3.

Mine Access Site 1 (MINE1)

Traditional Owners did not know names for these sites, so the names used in this study were allocated on the basis of how the sites were accessed, through the Ellendale Diamond Mine, via an access agreement between the mine operators and the Bunuba Traditional Owners.

This site is located at the ground level of one of many large outcrops on the southern side of the escarpment, where the limestone is of the Frasnian level of Napier Formation Limestone, which has both large blocks and flows of limestone forming the well bedded reef slopes, and may also include sandstone and conglomerate (Playford et al. 2009: 470, Plate 7). The long grasses of the plain grow up to the entrance of the cave, and the plain and valleys between the outcrops are dotted with low scrub, eucalypts and boab tree trees. Both dry and damp creek beds run along the valleys, and lush, dense

vegetation surrounds the springs and waterholes that were observed to retain water through the dry season.

This small low-ceilinged cave has a 1.5m high entrance which rapidly lowers to forty centimetres at the back wall. The cave is two metres wide by two and a half metres deep. The walls are uneven with many rock holes and water marks, and the floor is compact sand with loose small rocks on the surface.

The cave has pigment art on both the walls and ceiling in red and white, with the distinctive long curving lines emanating from a central point that were only found at this site and MB1 (Figure 26).

Mine Access Site 2 (MINE2)

This site is approximately 25m to the east of MINE1, in the same outcrop. The entrance to the cave is 1.6m wide at the base (Figure 27), and 2m high; the cave opens into an irregularly shaped chamber with large rockholes, overhangs, crevices and small ledges extending 6m from the opening. The floor of this cave has loose sand, areas of flowstone and smooth slabs of rock, and the walls are a combination of rough and smooth surfaces, with areas of flowstone forming ledges and irregular slopes within the cave. The interior of the cave is dark and damp and artificial lighting was needed to examine the surfaces, which were water and insect damaged. The water damage had eroded some of the limestone to form pillars within the cave and there were many black and white deposits from the water flow on the walls and ceiling.

Rock art is present in all parts of the cave, around the entrance, on the curved walls, on the ceiling and within some of the crevices in red, white, orange and black pigments. Anthropomorphs and snakes were dominant at this site.

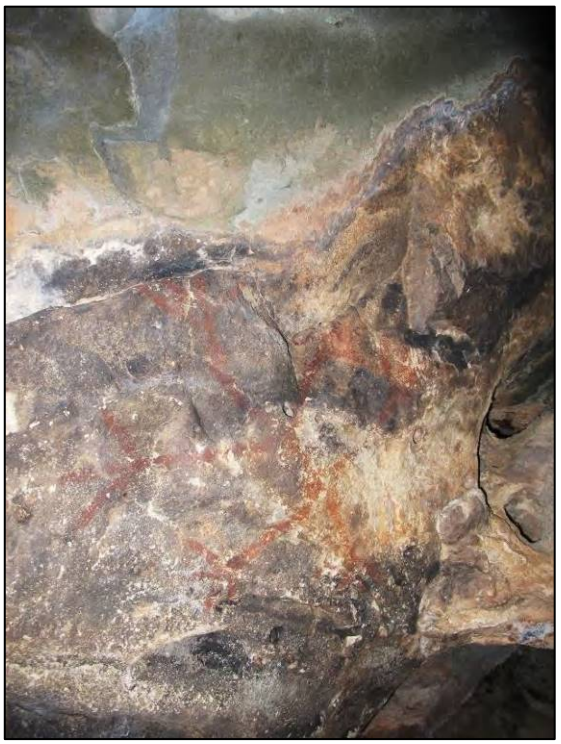


FIGURE 26 ONE OF THE DISTINCTIVE 'STARBURST/LIGHTNING' MOTIFS AT MINE ACCESS SITE 1.

FIGURE 27 ENTRANCE TO MINE ACCESS SITE 2 ALONG THE SOUTHERN SIDE OF THE MARAWUN ESCARPMENT.

Elimberrie Springs (ELIM)

Elimberrie Springs is a large rockshelter close to freshwater springs, approximately 6km to the east of the nearest of the Marawun sites (M4). Like the sites MINE1 and MINE2 Elimberrie is of the Napier Formation limestone, though of a slightly different composition, at the transition between the Frasnian and Famennian, with likely deep water bioherms suggesting a more mound like structure than the reef like structures of the westerly and

southern sites in this group.

The multi-story rockshelter is approximately 75m wide, with high deep overhang providing shade over the whole rockshelter (Figure 28). The floor in the lower part of the rockshelters is sandy, with small loose rocks and with large blocks of limestone that form an edge that drops two metres to the slightly sloped plain below. Trees and grasses grow up to the edge of the large blocks and extend inside the rockshelter at the western end. The rockshelter has an upper terrace (approximately 1.5m above the floor at the western end) with wide smooth rock slab and flowstone forming the floor area and walls sloping into the overhang that forms the ceiling. The rockshelter and surrounds is also rich with lithic artefacts, including flakes and small cores in quartz, and bifacial flakes in both quartz and chert (Tim Maloney 2011, pers. comm., 2 September).

The rock art at this site is prolific. Pigment art appears on the walls of the lower rockshelter, the slab floor of the upper terrace, the walls and ceiling of the upper terrace and on the limestone blocks which surround the shelter. Scratched and incised art appears mostly on the limestone blocks. The pigment art is in white, red, mulberry, orange, yellow and black. While large anthropomorphs are the most visible and dominant there is also a range of zoomorphs and tracks at this site. There is some superimposition of motifs at this site, but less complexity than at other sites with similar size assemblages.

FIGURE 28 VIEW TO ELIMBERRIE SPRINGS ROCKSHELTER FROM APPROXIMATELY 100M. PHOTOGRAPH COURTESY OF JANE BALME & SUE O'CONNOR.

The rock art at this rockshelter was recorded by colleagues and a site plan was not completed.

Sites between Wulambu and Tarakalu (McSherry's Gap to Dingo Gap)

This group of sites stretches along a line of approximately 14km from the northwest at Wulambu to Tarakalu at the south east (Figure 29). The sites are geologically of Napier Formation limestone, as described earlier, though at different levels within it, Windjana Limestone and Pillara Limestone. All the sites are less than 20km from Tunnel Creek, a permanent freshwater creek well stocked with cherubim, fish and small freshwater crocodiles, and close to smaller seasonal and ephemeral creeks. The sites on the northeastern side of the escarpment overlook a wide plain and Traditional Owners described some of these rockshelters (Fairfield 2 and Fairfield 3) as places in which they sheltered from the sun, and looked over the plains where they hunted and harvested sugarbags, fruit and yams (June Oscar, Patsy Bedford 2012, pers. comm., 14 August). The plains are well vegetated, with grasses, prolific spinifex, eucalypts and boab tree trees. Macropods, lizards, snakes and birds were observed frequently in the surrounding slopes and valleys.

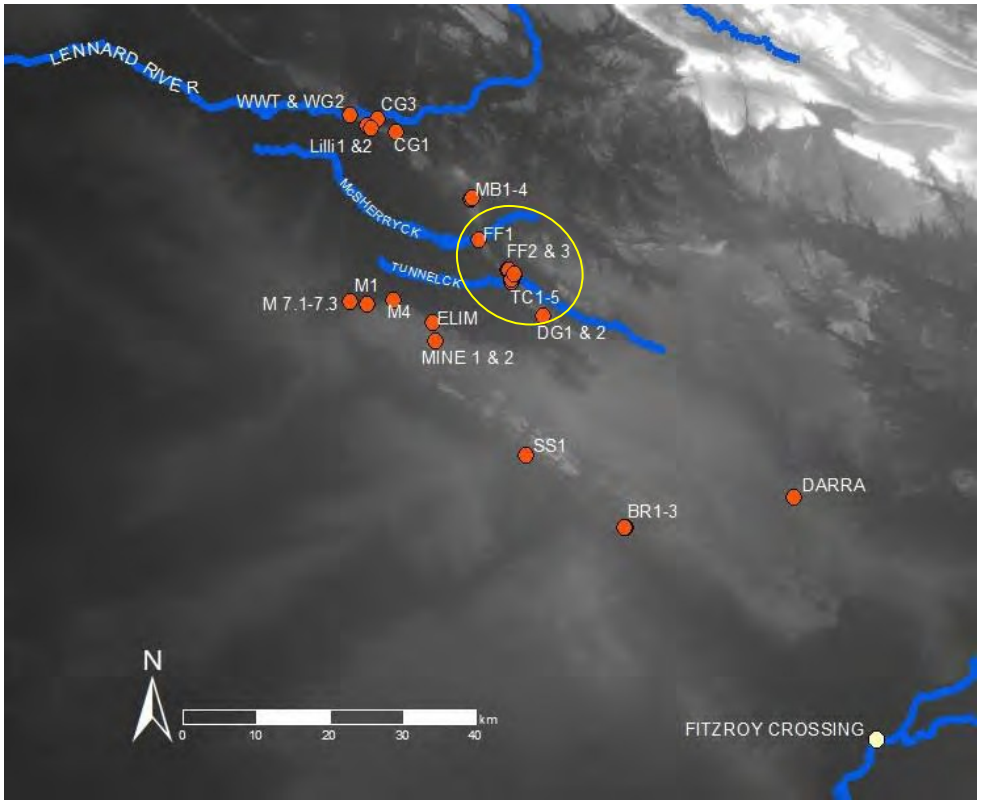


FIGURE 29 MAP SHOWING THE LOCATION OF THE SITES BETWEEN WULAMBU TO TARAKALU.

Fairfield 1 (FF1)

This site was so named as it was the first shelter with rock art located to the east of Fairfield Station, and Traditional Owners did not know of an alternate name, so this locational name is used throughout this study, as are the other names in this grouping. It is located on the north of the southern edge of Wulambu (McSherry's Gap) side of the Napier Range, in a long band of Napier Formation limestone at the lowest of the Frasnian levels, in the Kalmanyi group. It is up a moderate slope (approximately a 30º incline) with thick spinifex and small shrubs, eucalypts and boab tree trees on the slope and at the rockshelter. It is within 100m of the unsealed Leopold- Fairfield Road running from the Great Northern Highway to the Gibb River Road.

The rockshelter is bordered by large boulders close to the edge of the slope and features large trees at that edge and one close to the wall of the shelter (Figure 30). It is 17m wide, and 4.42m deep, with a 40º sloped ceiling providing afternoon shade. The floor of the rockshelter is sandy, with small loose rocks. The walls of this rockshelter are stained with a range of dark brown, black and yellow hues, and the surface looking and feeling oily to the touch; this may be related to the deposits from water flow over the limestone in other parts of the cave. The slope around the rockshelter has a scattering of small quartz flakes, though no cores or other tools were identified.

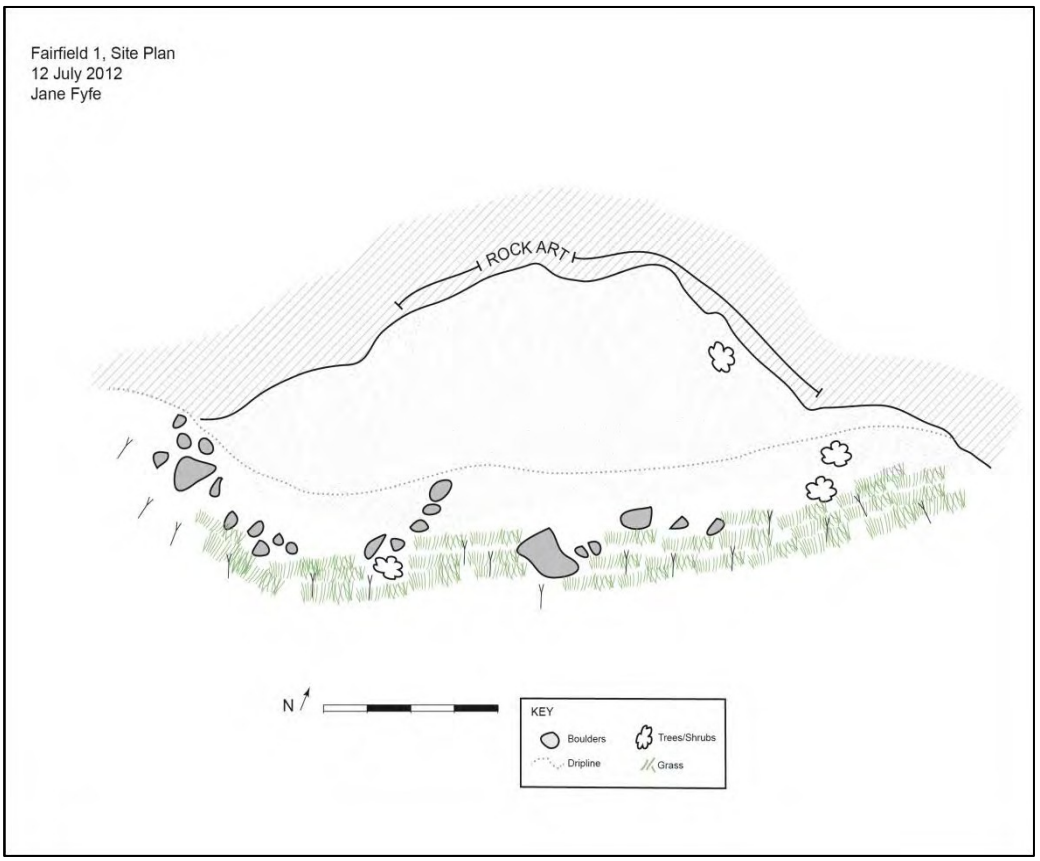


FIGURE 30 SITE PLAN SHOWING LOCATION OF THE ROCK ART AT FAIRFIELD 1.

Rock art at this site is on the walls and the lower part of the ceiling and painted in red, white, orange and black pigments, with a range of motifs including anthropomorphs, zoomorphs and hand stencils.

Fairfield 2 (FF2)

Fairfield 2 is located on the same stretch of the limestone escarpment as Fairfield 1, approximately 5.5km to the southeast. The 63.4m wide rockshelter is at an elevation of 184m (±11m) with a north easterly aspect (Figure 31). The slope from the plain below is sharp with sections of greater than 45º incline; however, access is possible following winding pathways through the boulders, spinifex and trees. The site is characterised by numerous fallen boulders that are well worn and form a barrier at the edge of the slope, and the floor area of the rockshelter is mixed coarse sand with small rocks, trees and shrubs that grow close to the rockface near the centre of the shelter. In the rockshelter and surrounds there are dense lithic scatters, mostly of milky white quartz flakes, and some glassy quartzite.

The rockshelter has several alcoves and rock holes, with human skeletal remains (skull and thigh or femur were visible) in a rockhole 140cm from the floor at the western end. The skull had remnants of orange ochre, but was not moved or touched for cultural reasons following discussion with the Bunuba rangers assisting with recording at the site (Natalie Davey, Kamika Oscar, Rory and Nigel). It was photographed but no photographs are included in the data set and were only provided to the Traditional Owners via the Bunuba Rangers. The vertical wall around the rockhole is densely painted, particularly with small white rounded bodied anthropomorphs.

This site has only painted surfaces, with white, yellow, red and orange the dominant colours. There may be some black used but not possible to distinguish it from water damaged red colouring. Motifs include boab nuts, anthropomorphs and a large dingo surrounded by snakes, and there are instances of superimposition of motifs.

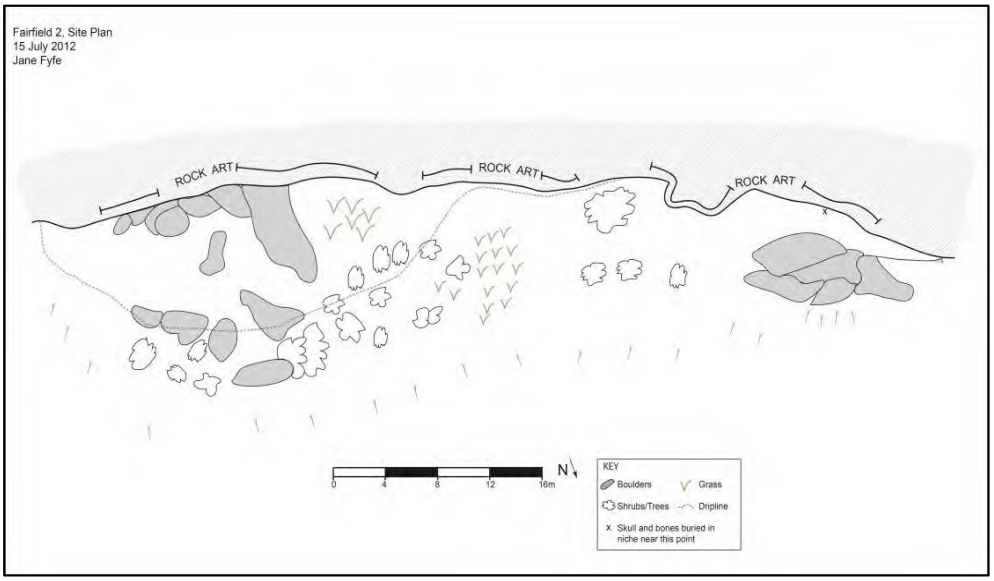


FIGURE 31 SITE PLAN FOR FAIRFIELD 2, SHOWING THE LOCATION OF THE ROCK ART.

Fairfield 3 (FF3)

Fairfield 3 is approximately 250m to the east of FF2, and less than 1km west of Tunnel Creek. It is a small narrow site, 10m wide and 1m deep with an overhang providing some shelter that is 2m high at its maximum. In the approach to the rockshelter there were small scatters of quartz flakes, with none observed within the rockshelter.

Rock art at this site is all pigment art, and along the rear wall of the shelter which has some deposits from water flow, and some of the damage to the rock art appears to have been by water flowing through the motifs. The motifs are painted in red, white and black and include anthropomorphs, zoomorphs and phytomorphs (particularly yams) as well as stencils of hands.

The rock art at this site was recorded by a colleague who did not complete a site plan or take context photographs of the site. Time restrictions did not permit revisiting the site myself to complete these tasks.

Tunnel Creek 1 (TC1)

The area at the entrance to Tunnel Creek, where this site and TC2 and TC 6 are located, is of Pillara Limestone, which occurs in patches along the escarpment. Tunnel Creek 1 is a single panel on the north side of a narrow passageway between two vertical rockfaces, three metres wide at the opening, and extending five metres into the crevice between the two vertical walls (Figure 32). It is accessed following the path from the tourist car park at Tunnel Creek to the creek entrance, and climbing a small mound of large and small boulders southwest of the path. It is not on the public pathway to the

creek. The floor is sandy and with large rock and pebbles, and the only vegetation are well trodden grasses, and trees along the pathway.

The pigment art at this site is red, white and black, and includes a crocodile and hand stencils. The motifs are closely clustered with some superimposition.

Tunnel Creek 2 (TC2)

This shelter is approximately 15m wide and forms one side of the passage between a tumble of large and small boulders leading down from TC1 and the rockface (Figure 32). It has a westerly aspect and the wall slopes approximately 30º, forming a slight shelter. The floor is sandy and much trodden by tourists. This pathway is used as the entrance to those seeking to walk through the Tunnel when the water is low at Tunnel Creek; it is approximately 20m from the tunnel entrance. The only motifs at this site are two sets of cut marks.

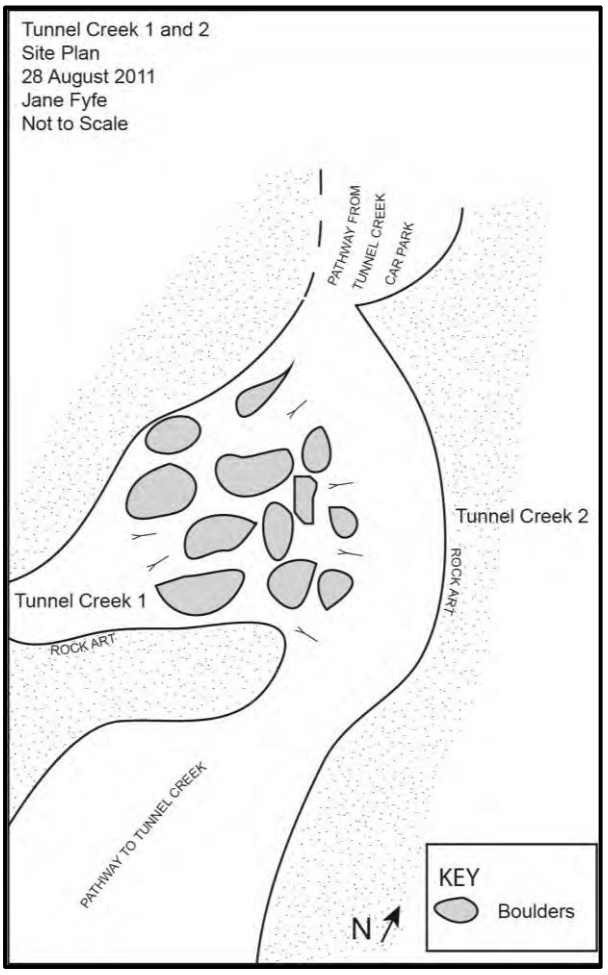


FIGURE 32 SITE PLAN FOR TUNNEL CREEK 1 AND TUNNEL CREEK 2, SHOWING LOCATIONS OF ROCK ART.

Tunnel Creek 3 (TC3)

Tunnel Creek 3, 4 and 5 are all on the southwestern side of the escarpment through which Tunnel Creek flows, and the geology of this section is slightly different from that at the entrance on the north side. Geological survey identifies the limestone in this part of the escarpment as Napier Formation, particularly Kalmanyi member, which is 'Frasnian well-bedded massive reefal slope and forreef limestone [including] blocks and debris flow' (Playford et al. 2009: 465, Plate 2), and potentially contemporary with the Pillara Limestone at the creek entrance.

Tunnel Creek 3 is a narrow rockshelter with a wide overhang to the left (south) of the western opening of Tunnel Creek (Figure 33). The sandy rocky floor is well eroded, suggesting regular water flow, and narrows towards the base, making passage precarious at times (Figure 34). The site may also be accessed in a less direct manner, around and over large limestone blocks and through dense tree growth at the south side of the creek. The wall of this shelter has deposits from water flow emanating from large rockholes, which obscures some detail of pigment art.

There is one large rockface on which most of the art is visible at approximately 3m above a ledge, 0.4m wide and 1.2m from the rock floor. To the south of the main rockface the surface curves to form wide niche, and there are painted markings around a rockhole at 1.3m from the floor. Red and white are the only colours used for the remaining art at this site.

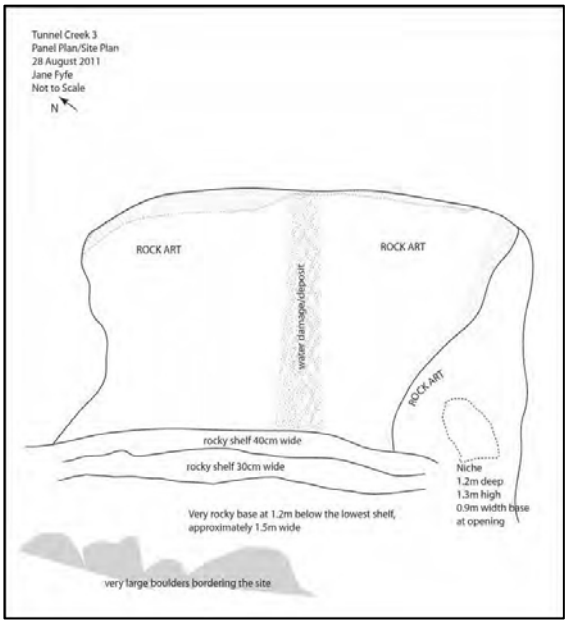


FIGURE 33 SKETCH OF PAINTED WALL ABOVE THE LEDGE AT TUNNEL CREEK 3, FACING NORTHEAST.

FIGURE 34 PROFILE LOOKING NW OF THE ROCKY LEDGES AT TUNNEL CREEK 3.

Tunnel Creek 4 (TC4)

Tunnel Creek 4 is in two parts, the lower part is a 13.9m wide rockshelter with a depth of 6.23m and a ceiling height of 3.53m at the outer edge of the overhang, which is at an average 30 º angle from the back wall. The rockshelter has large blocks of limestone at the east end which enclose a deep, triangular shaped cave (10m deep by 15m at its widest point); this can only be accessed by climbing the limestone boulders or crawling through a low narrow passage at the eastern side (Figures 35 and 36). Skeletal remains were observed on a high rock shelf at the rear of the cave, but were too high to be examined to determine if they were human or animal.

TC4 is approximately 20m above the plain to the south of Tunnel Creek with a slight rocky slope, densely vegetated with spinifex, grasses, shrubs and trees. The exposed rock slab floor has a partial covering of silty grey sand with small loose rocks, and some larger rocks close to the walls. The rockshelter has a north aspect and areas of smooth wall with deposits from water flow in grey, white and black, flowing through and obscuring some of the pigment art. Inside the cave the walls are more uneven, with sharp and porous surfaces (Figure 37 and Figure 38).

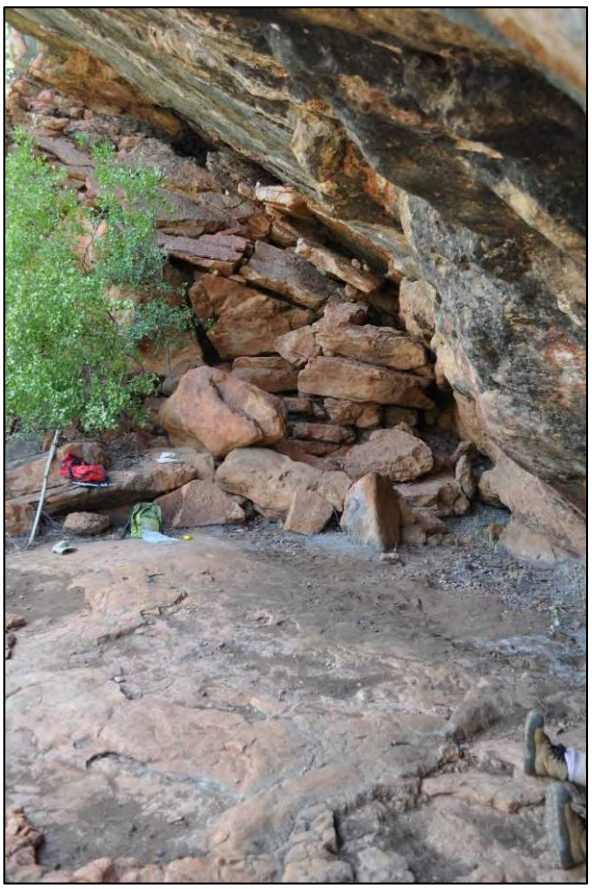


FIGURE 35 TUNNEL CREEK 4, SHOWING THE BOULDERS LEADING TO THE UPPER CHAMBER (28 AUGUST 2011).

FIGURE 36 VIEW FROM INSIDE THE CAVE AT TUNNEL CREEK 4, LOOKING NORTH.

The art at this site is pigment art, with one instance of scratched work, in red, mulberry, black, white and orange painted and drawn on the smoother walls of the rockshelter and on the rougher walls close to the ceiling of the entrance to the cave. The motifs include anthropomorphs and zoomorphs, with some superimposition of motifs on the wall of the rockshelter.

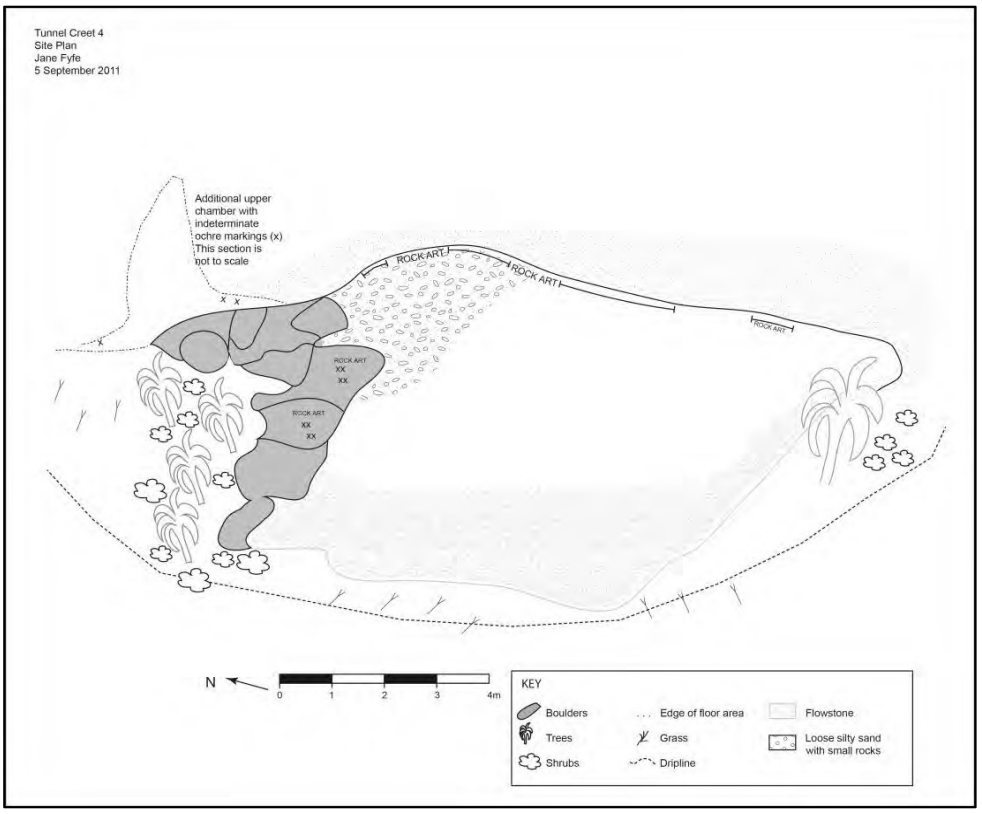


FIGURE 37 SITE PLAN FOR TUNNEL CREEK 4, SHOWING LOCATION OF ROCK ART.

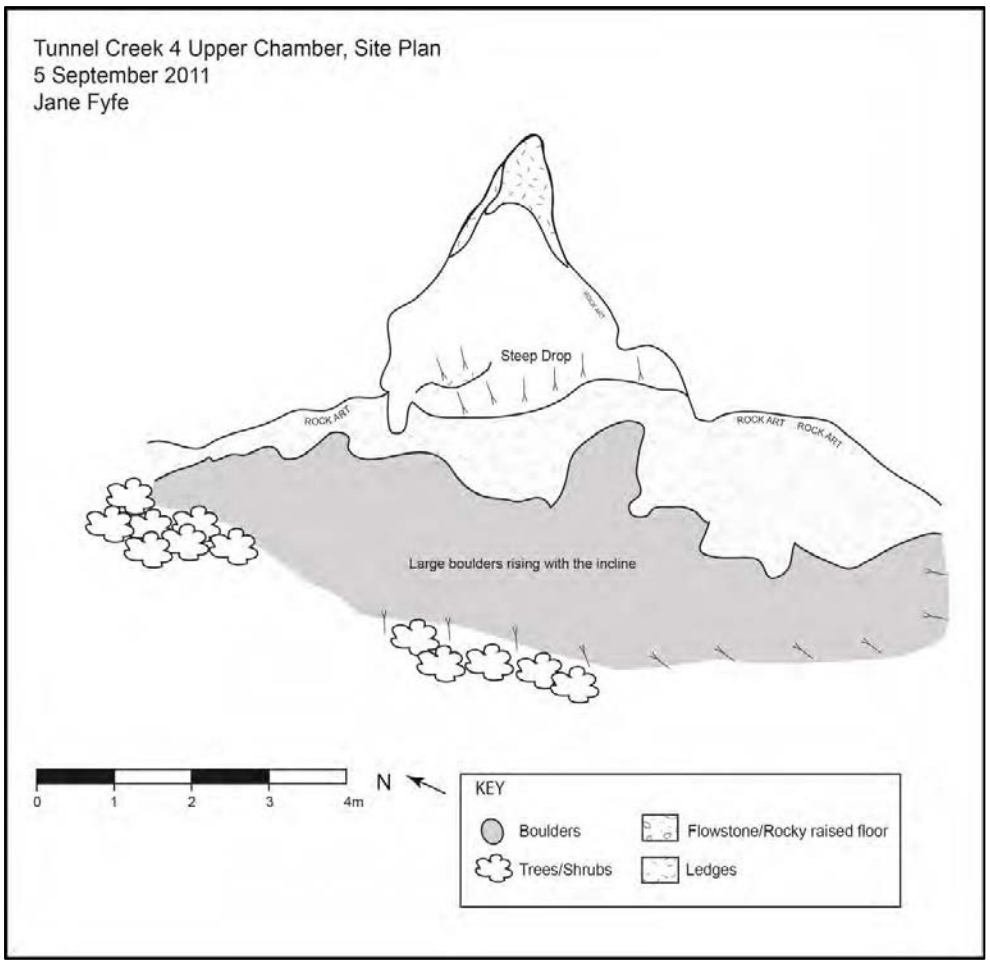


FIGURE 38 SITE PLAN FOR UPPER CHAMBER AT TUNNEL CREEK 4.

Tunnel Creek 5 (TC5)

Tunnel Creek 5 is a small rockshelter 20m wide by 5m deep, with a maximum height of 2.15m. It is located approximately 30m from the exit of the tunnel and located on a sandy bank two metres above, and 10m from the water's edge on the north side of Tunnel Creek. The site is shaded by large trees both above and around the shelter, with tree roots from above growing through to the rockshelter floor at the northern end (Figure 39 and Figure 40) of the site.

The rock art is painted on the sloping overhang shown in Figure 39, in black, white, red and mulberry and is mostly monochrome anthropomorphs and zoomorphs. There are markings on other surfaces, but it is not possible to determine if these were cultural or the result of animal activity, or water or vegetation damage.

FIGURE 39 RECORDING THE ROCK ART WITH THE TREE ROOTS FRAMING THE NORTHERN END OF TUNNEL CREEK 5 (PHOTOGRAPH MOYA SMITH, 28 AUGUST 2011).

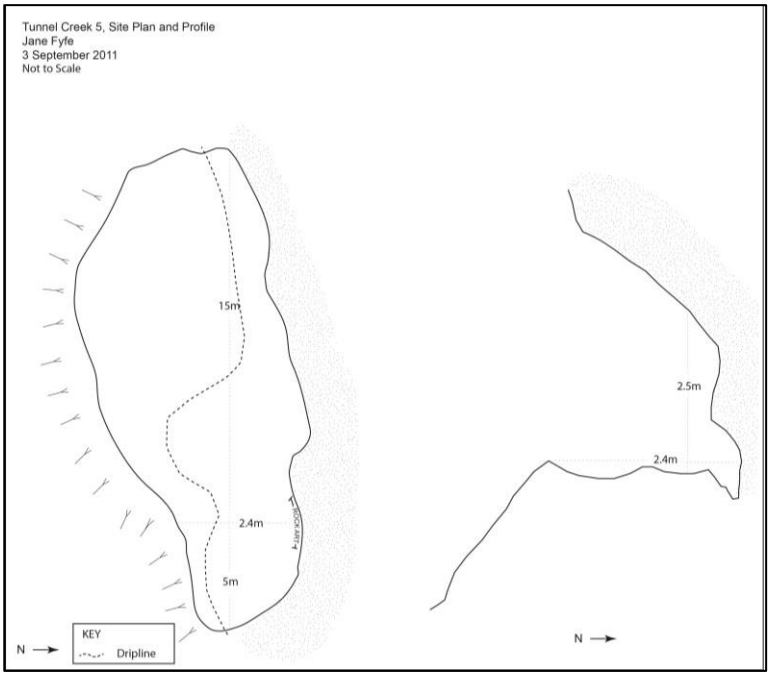


FIGURE 40 SITE PLAN FOR TUNNEL CREEK 5, SHOWING LOCATION OF THE ROCK ART.

Tunnel Creek 6 (TC6)

Tunnel Creek 6 is a small cave above the entrance to Tunnel Creek associated with Bunuba rebel Jandamarra. It was suggested (Kaylene Marr 2011, pers. comm., 14 August) that this was the cave in which Bunuba hero Jandamarra hid, and from which he shot at police constables chasing him for misdemeanours including the shooting of Constable Richardson in 1894. The cave is well hidden and only accessible now by climbing over the escarpment, or through a collapsed section of the Tunnel Creek tunnel.

This cave has walls smoothed by water flow and there is rock art painted over the

deposit, as well as rougher, more uneven areas. The largest motifs are painted on the rear wall of the cave where the widest grey/white deposit occurs, and others are painted on the smoother surfaces at the entrance to the cave. The pigments used are black, red and white, and there is some superimposition of motifs at this site. This was photographed by colleague on the Lifeways team and a site plan was not completed.

Tarakalu (DG1)

Tarakalu 1 and 2 rockshelters are both located on the Windjana Limestone (Playford et al. 2009: 465, Plate 2) escarpment on the south side of Tarakalu. Tarakalu 1 is a rockshelter with a low overhang (two metres) approximately 100m from the Tarakalu track, and accessed up a rocky, spinifex covered slope. It is 11m wide and 4m deep, with a sandy, silty floor with large boulders at the south end with cupules, and larger boulders at the north end with engravings (Figure 41). The shelter has pigment art on the rear wall of the rockshelter, on the ceiling and in a niche to the south divided from the main rockshelter by large fallen boulders. Pigments are red, yellow and white, and the motifs include both anthropomorphs and zoomorphs, unusually, this site has no hand stencils or prints, but other tracks, mainly bird tracks. The shelter also has evidence of contemporary human activity with a tin can, rusted and crushed on the rockshelter floor.

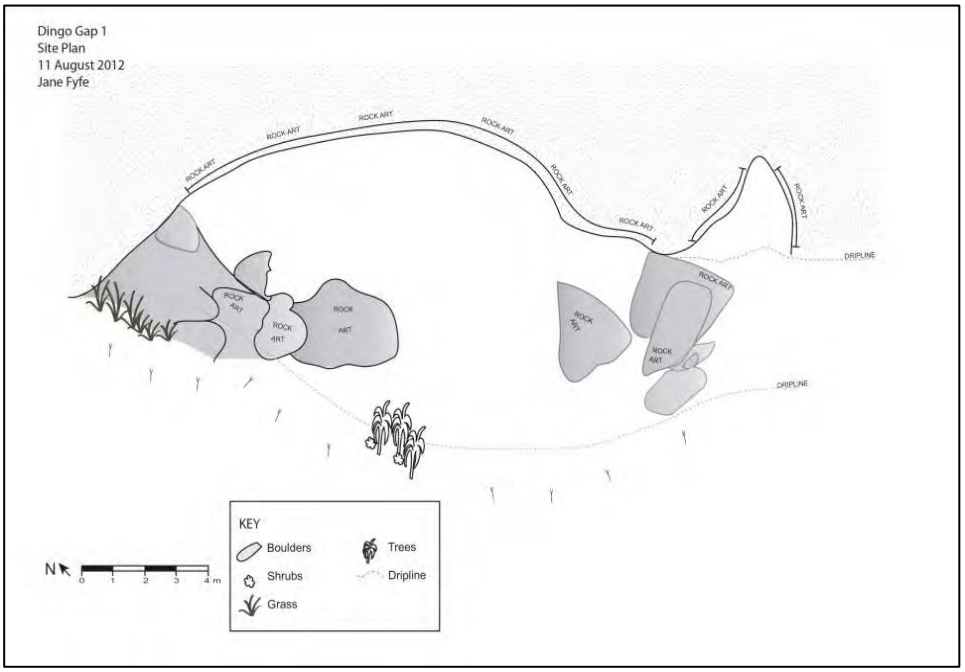


FIGURE 41 SITE PLAN FOR TARAKALU 1, SHOWING LOCATIONS OF THE ROCK ART.

Tarakalu 2 (DG2)

A rockshelter eighty metres to the east of DG1. The rockshelter is 7m deep and 11.9m wide (Figure 42 and Figure 43) under the sharply sloping overhang (less than a 20º

angle from the back wall of the shelter to the 2.4m high dripline). The floor area is silty sand with small rocks and grasses. The site is surrounded by trees and small shrubs, and is low on the same escarpment as DG1, sitting approximately 5m from the valley floor.

The rock art at this site is both engraved and pigment art, with identifiable tracks (birds), deep cut marks and cupules, as well as red ochre lines and zoomorphs. This site has no visible superimposition of motifs.

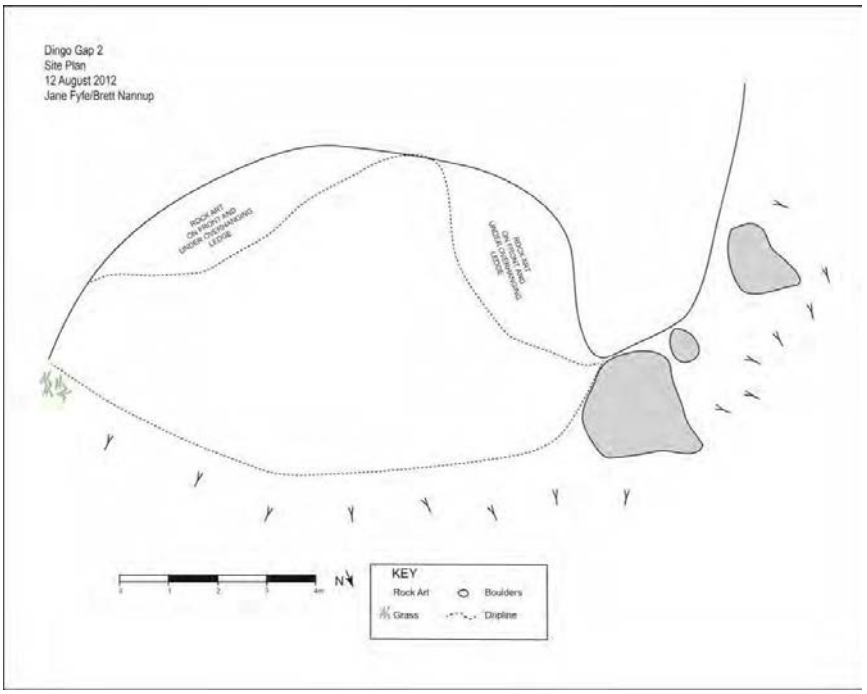


FIGURE 42 SITE PLAN FOR TARAKALU 2, SHOWING LOCATION OF THE ROCK ART ON THE CEILING OF THE ROCKSHELTER.

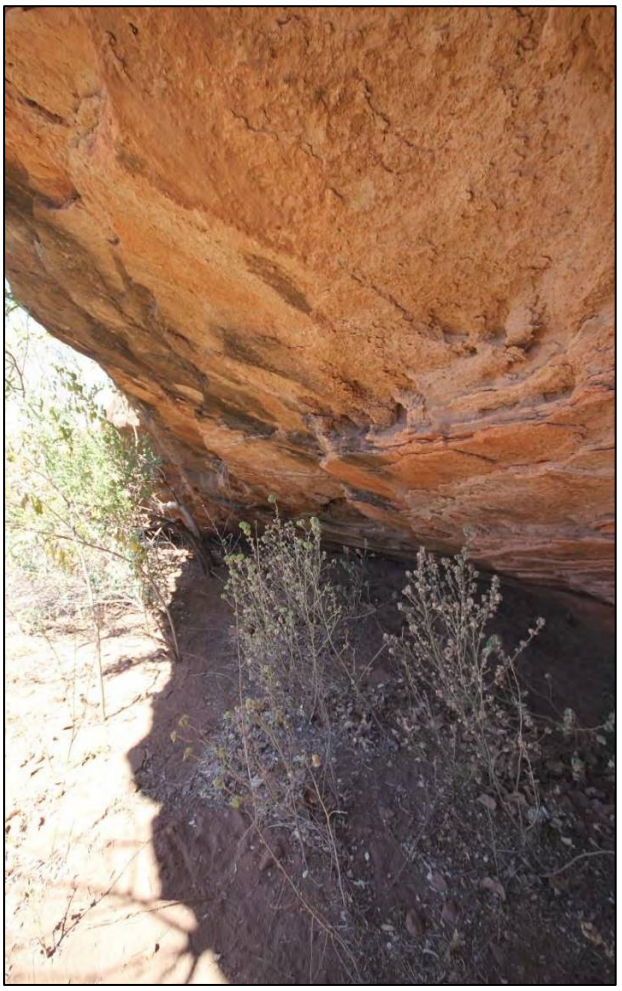


FIGURE 43 PROFILE OF TARAKALU 2 LOOKING SOUTHWEST

Sites in Emanuel Gap

The group of sites is located either side of a gap in the Pillara Range approximately 36km to the south east of Fitzroy Crossing (Figure 44). The sites are in the contemporarily defined Gooniyandi country. The Gap has also been referred to as Menyous Gap, and one site is registered with the Department of Aboriginal Affairs under that name. Emanuel Gap is used in this study as that is how the Traditional Owners who guided us to the sites (Lorraine Shandly, Maxine Shandly, Jimmy and Joy Shandly, Thomas Dick and Frank Burns) referred to the locality. The sites are dotted along the 2km gap in the range, and all are in the area that is geologically designated as Pillara Limestone (Playford et al. 2009: 470, Plate 7). The valley along the gap varies from 50m to 130m wide, is flat with dense vegetation close to the rockface, and scrub and grass closer to the track that runs through the centre. Two of the sites (EG1 and EG4) are rockshelters on are on the west side of the gap at the base of the escarpment, and with the other three sites on the east (EG2, EG3 and EG5) at varying heights above the level of the valley floor.

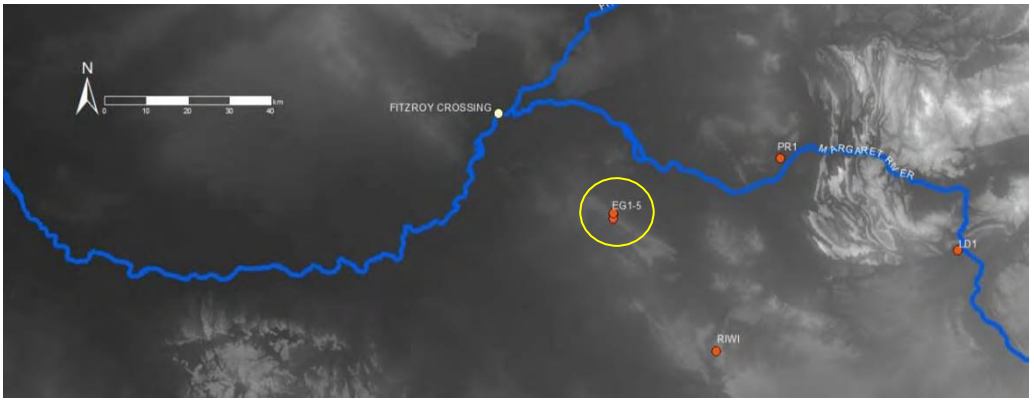


FIGURE 44 LOCATION OF EMANUEL GAP SITES EAST OF FITZROY CROSSING.

Emanuel Gap 1 (EG1)

This site is a rockshelter with wide, low sloping roof close to the northern entrance to Emmanuel Gap, 150m from where the Emanuel Bore is located. The rockshelter is well hidden and shaded by honey trees. The site is approximately 15m wide, and with a compact, sandy floor that has vegetation (mostly saplings) growing close to the rockface (Figure 45). Also on the floor were two rusted tin cans, the only other direct visible evidence of human presence at the site. The ceiling is a long sloping overhang, and most of the rock art is painted or drawn on this relatively smooth surface, that is covered with insect tracks and the fibrous remnants of vegetation that has grown across the surface. Black and grey areas on the rockface and the ceiling appear to be from both water deposits and possible smoke damage, with some rock art over these on the ceiling, but not on the walls.

FIGURE 45 ARCHAEOLOGISTS DISCUSS THE ROCK ART WITH GOONIYANDI TRADITIONAL OWNERS AT EMANUEL GAP 1.

A wide range of painted art, with some layers of superimposition, is visible on the walls and ceiling, including anthropomorphs, goanna and fish in red, white and black pigments, the latter of which Traditional Owners attributed to the 'river people' who visited, and moved to, their country (Thomas Dick 2012, pers. comm., 23 August). Limited time at this site meant completing a site plan was not possible.

Emanuel Gap 2 (EG2)

Emanuel Gap 2 is approximately 250m south of EG1, on the east side of the valley. It is a cave accessed by a steep boulder step and forming a semi-circle approximately 1.8m above the ground level, up a slight incline of loose rocks (Figure 46). The cave has several large rockholes around which, and partially in, painted rock art is visible (Figure 47). The walls of the cave are curving and provide relatively smooth surfaces on which to paint and draw. The ceiling and walls have insect nests and trails and there are some small deposits from water flow spotted about the ceiling.

The rock art is in red, white and black pigments on the walls and the ceiling, with a both anthropomorphs and zoomorphs identifiable, and interspersed with painted boomerangs. There is evidence of human activity with flakes scattered on the surface and grinding cupules and patches on boulders nearby.

FIGURE 46 EMANUEL GAP 2 VIEWED FROM PART OF THE WAY UP THE SLOPE TO ITS ENTRANCE. EMANUEL GAP 3 IS ONLY A FEW METRES TO THE RIGHT OF THIS PHOTOGRAPH IN THE FOREGROUND (23 AUGUST 2012).

FIGURE 47 EXAMINING THE ROCK ART WITHIN THE NICHE AT EMANUEL GAP 2 (PHOTOGRAPH COURTESY OF DORCAS VANNIEUWENHUYSE).

Emanuel Gap 3 (EG3)

This site is an open rockface with bordering boulders on which there are cupules with red and white ochre around and in them. The site is approximately 12m wide, with a slight slope to the rockface that provides some shade in the morning, and a gently sloping ledge forming a floor that ranges from a metre to a metre and a half wide, and ending approximately 2m above the ground (Figure 48). As well as the lithic scatters mentioned above, the site also has scatters of marine fossils, remnants of the Devonian Reef of which these ranges from the northern edge (see Playford 1981; Playford et al. 2009).

The rock art at this site is painted on the vertical rockface above the ledge and includes a single anthropomorph and a small number of zoomorphs in red, white and black. This site also includes scratched historical inscriptions.

FIGURE 48 GOONIYANDI TRADITIONAL OWNERS DISCUSSING GROUND SCATTER IN FRONT OF THE LEDGE AND ROCKSHELTER THAT FORM EMANUEL GAP 3.

Emanuel Gap 4 (EG4)

Emanuel Gap 4 is on the west side of the valley, at ground level, with a slight downward incline from the valley floor to the shelter, which is surrounded by dense foliage and large blocks and boulders at the southern end. It is approximately 900m south of EG3. This wide (~30m) rockshelter has a wide overhang shown in Figure 49 (~6m deep to the back wall from the outer edge of the overhang) and a mostly vertical rear wall. The wall and ceiling have long white and black deposits from water flow, that are visible high up on the escarpment and flowing from rockholes in the shelter. The floor is of sand and grass, with some bush tobacco growing close to the rockface and the incursion of many other grasses and shrubs in the shelter. Close to the north end of the rockshelter as the overhang narrows there is a barbed wire fence joins a post at the wall, with the trees and shrubs also very close to the wall at this point (see Figure 50).

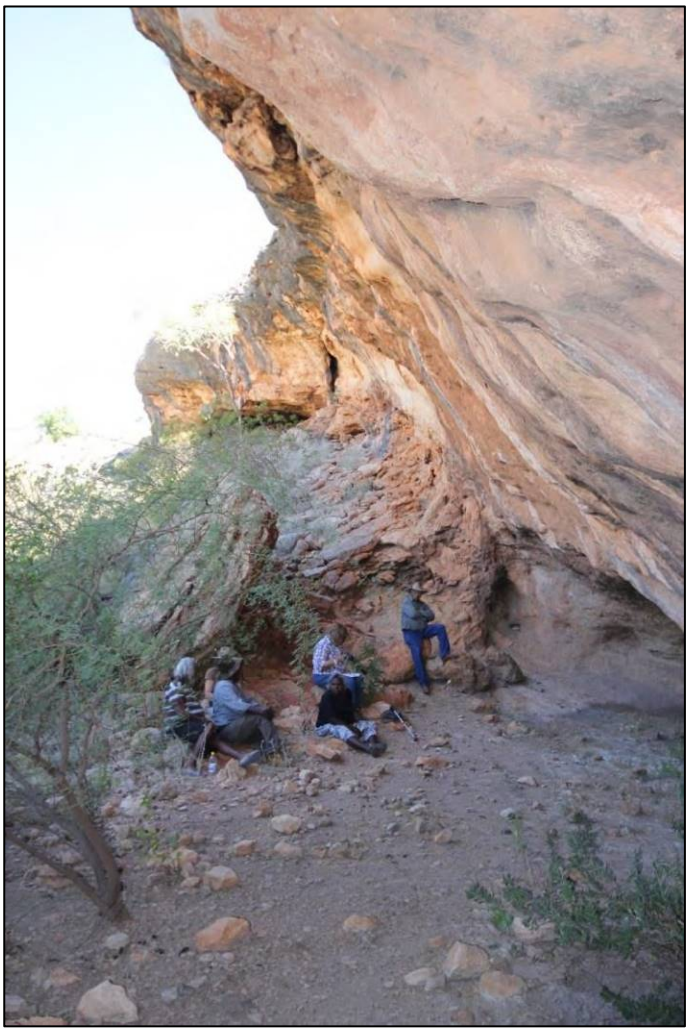


FIGURE 49 PROFILE AT SOUTH OF EMANUEL GAP 4, SHOWING THE SLOPE OF THE ROCKSHELTER AND FLOOR AREA.

Where the fence post touches the wall there is dense rock art in red, white and black, particularly anthropomorphs with complex superimposition. Along the length of the rockshelter on the back wall, on the ceiling and the outer edge of the overhang is a wide range of monochrome, bichrome and polychrome pigment art, using white, black, orange and red. Motifs include anthropomorphs and marine and terrestrial zoomorphs, with layers of superimposition.

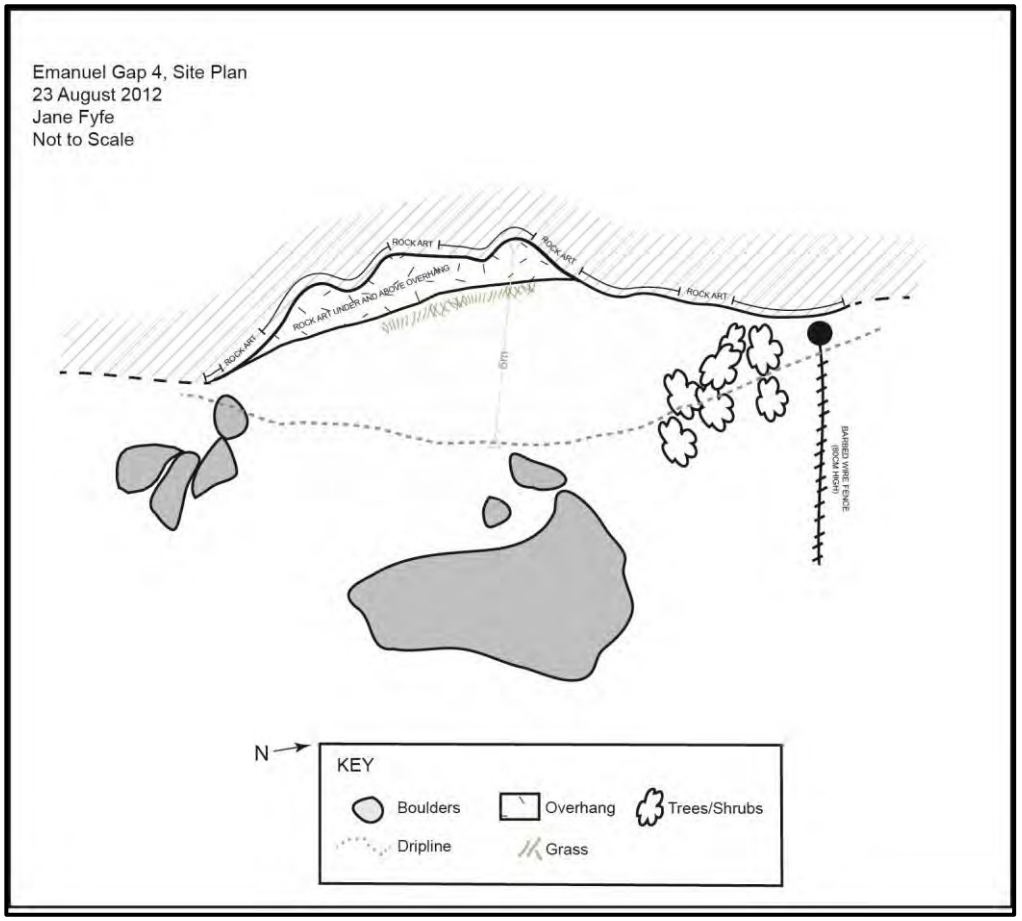


FIGURE 50 SITE PLAN SKETCH FOR EMANUEL GAP 4, SHOWING LOCATION OF ROCK ART.

Emanuel Gap 5 (EG5)

Emanuel Gap 5 is the most southerly of the sites recorded in this group, 300m south and on the other side of the valley (which is close to 100m wide at that point) from EG4. EG5 is a multi-chambered cave accessed by climbing along a 1.3m high ledge which has an overhang. The ledge is 1.5m at its widest and the overhang above it ranges from 0.4m to 2.5m above the entrance to the cave 1.7m at its peak (see Figure 51) The cave has a wide entrance which widens out still further into a main chamber with curving walls and a low ceiling (1.6m at its highest, though mostly around 1m or less). The walls of the cave are smooth and dark, below a rougher ceiling and a soft sandy floor with scatters of small loose rocks. There are both white and dark deposits on the rock

faces, particularly in the rear of the cave, some of which is the from water flow, while other circular marks are less certain. There are also insect nests in the cave, and areas that resemble flow stone in the corners at the rear of the cave. The three chambers are not separated by passages but open out from one another.

FIGURE 51 LOOKING EAST TO THE ENTRANCE TO EG5. THE LEDGE LEADING TO THE CAVE ENTRANCE IS ACCESSIBLE TO THE LEFT, WHERE THE CEILING AND WALLS ALSO HAVE ROCK ART PRESENT (23 AUGUST 2012).

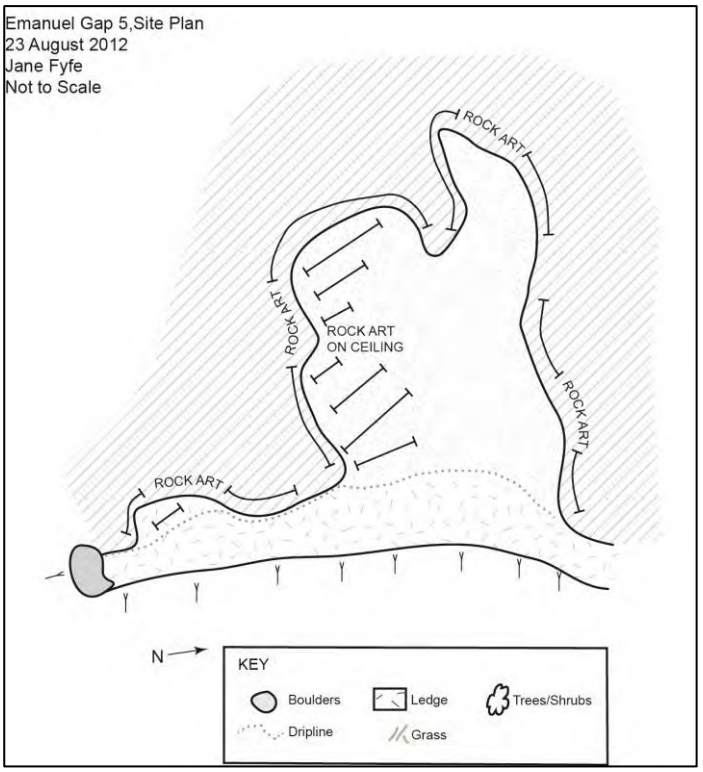


FIGURE 52 SITE PLAN SKETCH OF EMANUEL GAP 5 SHOWING THE LOCATION OF THE ROCK ART.

The rock art at this site is prolific, from the ceiling and walls of the ledge leading into the cave, to the walls and ceiling of the cave itself. There are very large anthropomorphs and zoomorphs intersperse with smaller figures. Black and white motifs dominate, but there are also red, cream, grey and orange motifs in this assemblage which has complex superimpositions.

Remaining Sites to the West of Fitzroy Crossing

The five sites west of Fitzroy Crossing are in Bunuba country. The closest of those sites are the three Bunuba Roadside Caves, 41km from the town as the crow flies, but closer to fifty by road. The sites are described from west to east as shown in Figure 53.

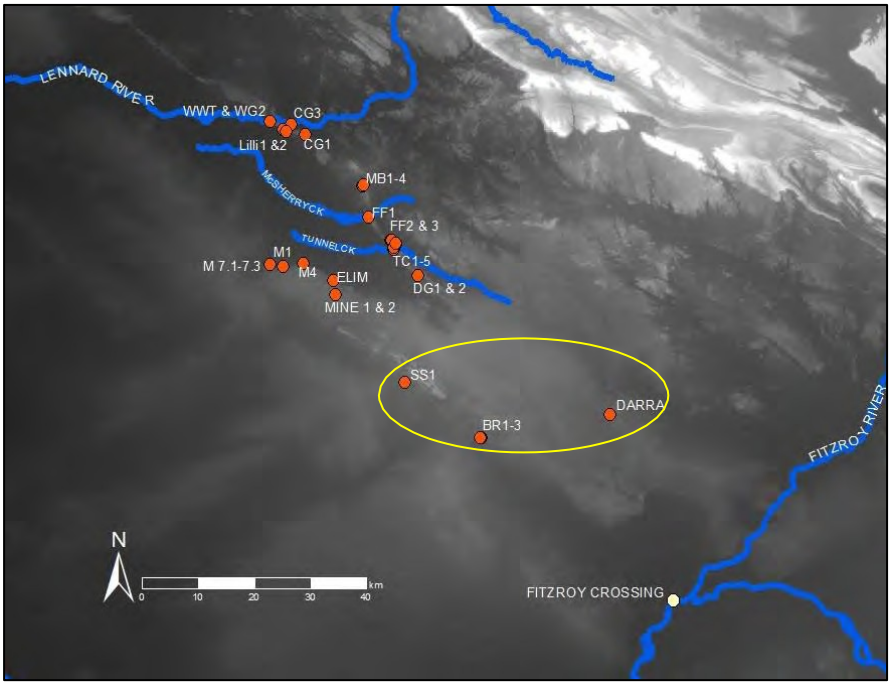


FIGURE 53 LOCATION OF FIVE NON GROUPED SITES TO THE WEST OF FITZROY CROSSING IN BUNUBA COUNTRY.

Stumpy's Soak 1 (SS1)

This site is geologically in the Napier formation and is located in an outcrop in the southern part of the Oscar Ranges. A small opening with a lip to step over is the opening to this narrow cave that the Traditional Owners say was a place that station hands came to seek shelter from the sun when they were not busy (Mona Oscar 2011, pers. comm., 6 September). The step over lip is 0.24m high and just inside to the right of the entrance is a 0.2m high boulder on this narrow fissure in the rock. The cave is 4.8m long and curved in an uneven boomerang shape, with its width 0.7m at the widest. At the entrance the step over lip is 0.8m wide (Figure 54 and Figure 55). At its highest point the cave is 4m and 1.2m at its lowest. The floor is silty sand, and the walls and

floors covered in spider webs. There only evidence of human activity was the rock art inside the cave.

The wall facing the entrance is smooth and has red paintings and light scratched depictions of anthropomorphs and phytomorphs. There is substantial superimposition, particularly of the scratched motifs, both on one another and on the pigment motifs.

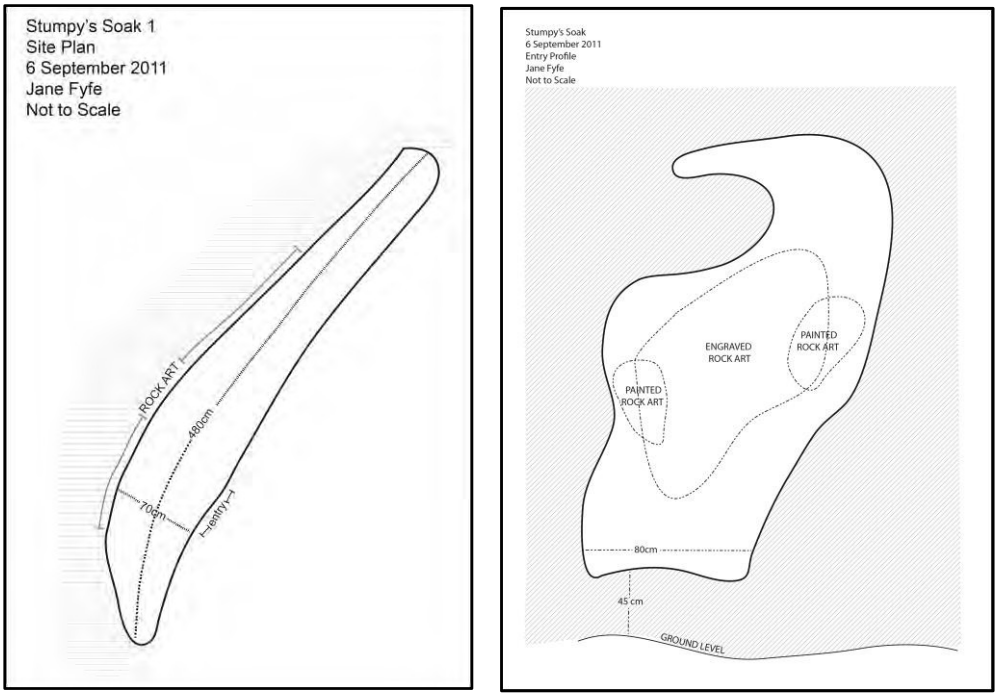


FIGURE 54 LEFT: SITE PLAN OF STUMPY'S SOAK 1, SHOWING LOCATION OF THE ROCK ART RIGHT: VIEW OF ENTRY TO STUMPY'S SOAK 1 SHOWING VIEW OF PAINTED ROCK ART.

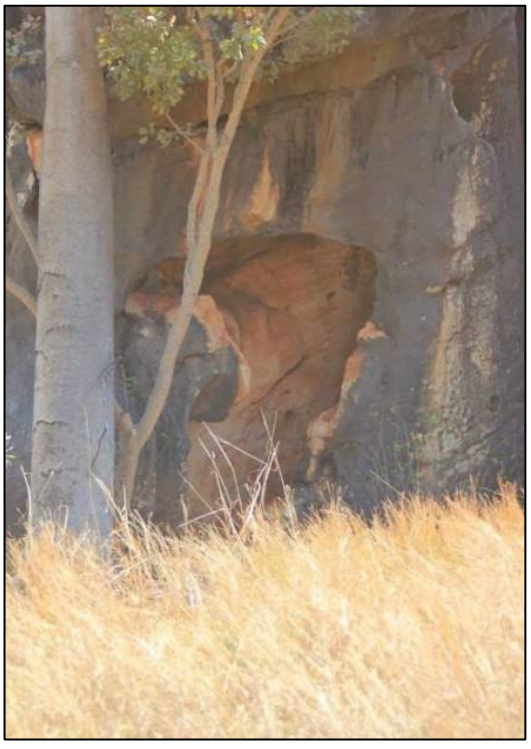


FIGURE 55 ENTRANCE TO STUMPY'S SOAK 1.

Darrananna (DARRA)

Darrananna Cave is in an area of outcrops in the southeastern Oscar Range. Geologically it is in a part of the range that is a mixture of Pillara Limestone and sedimentary rock and dolerite that is in the Proterzoic period, 1835-610Ma, predating the Devonian Reef (Playford et al. 2009: 470, Plate 7).

The cave is a keyhole shape cave with a narrow entrance accessed by climbing stepped rocks. It widens into a roughly circular shape with a ledge 0.7m from the sandy floor and continues around the south side only (Figure 56). The interior of the cave is dark, and the walls are uneven, but smooth in places. The ceiling is rounded and approximately 1.8m, with a rougher, uneven surface. The entrance (Figure 57) has evidence of burnt rocks, and one of the Traditional Owners described how she used to come to this place on holidays with her family who worked on the pastoral station when she was a child, and pointed out where they lit the fires on the large stones near the entrance to the cave (Mona Oscar 2011, pers. comm., 7 September).

This cave has rock art around all the walls and on the ceiling, including faded and deteriorated small black figures that appear to be contact motifs. Red and white ochre figures dominate the cave vertical walls, and on the ceiling only white motifs, which includes a snake and turtle.

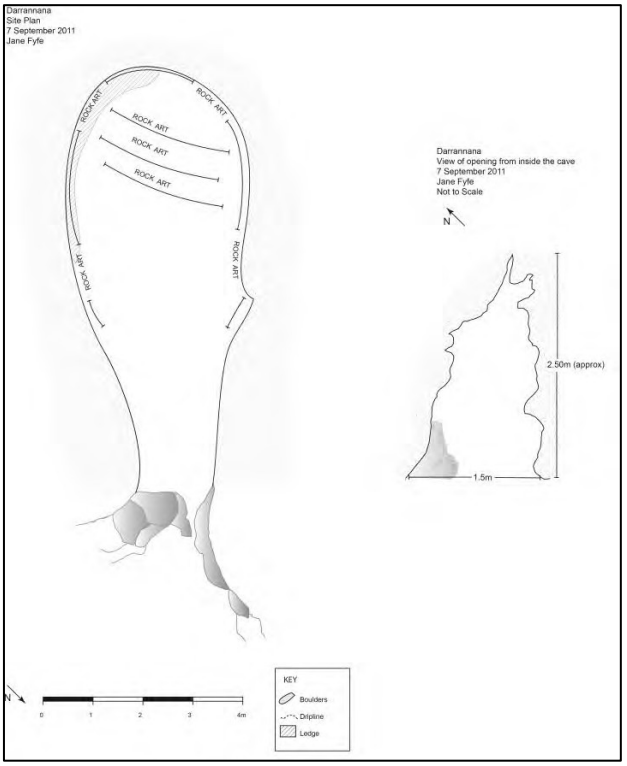


FIGURE 56 SITE PLAN OF DARRANANNA, SHOWING LOCATION OF THE ROCK ART, WITH PLAN OF CAVE ENTRANCE VIEWED FROM INSIDE, FACING NORTHEAST.

FIGURE 57 JUNE, MONA AND RAELENE OSCAR, BUNUBA TRADITIONAL OWNERS, SIT AT THE ENTRANCE TO DARRANANNA.

Bunuba Roadside Caves 1(BR1)

There are three small sites close to the Leopold-Fairfield Road, the 100km unsealed road joining the Great Northern Highway with the Gibb River Road (see Chapter 1). The sites are the closest to the Great Northern Highway recorded in contemporary Bunuba country in this study, and are named for their proximity to the road, and because this site (the first recorded) is a cave, whereas the others are rockshelters.

This site is small cave (2.84 x 2.02m at its widest points) is less than 3m from the Leopold- Fairfield Road; it has a low, narrow, entrance with space inside for one person sitting or reclining, the ceiling height is 1m at its highest. The site floor is coarse sand, with trees and grass growing right up to the cave wall (Figure 58).

The art surface is covered in thick layers of limestone and gravel road dust, as traffic is constant during the dry season. There is also black deposit on the rock art, possibly from water seepage, root damage or animal activity. The rock art is red, white, yellow and black and painted; it is also faded, features many erasures and the motifs that were identified were snakes and anthropomorphs (Figure 59).

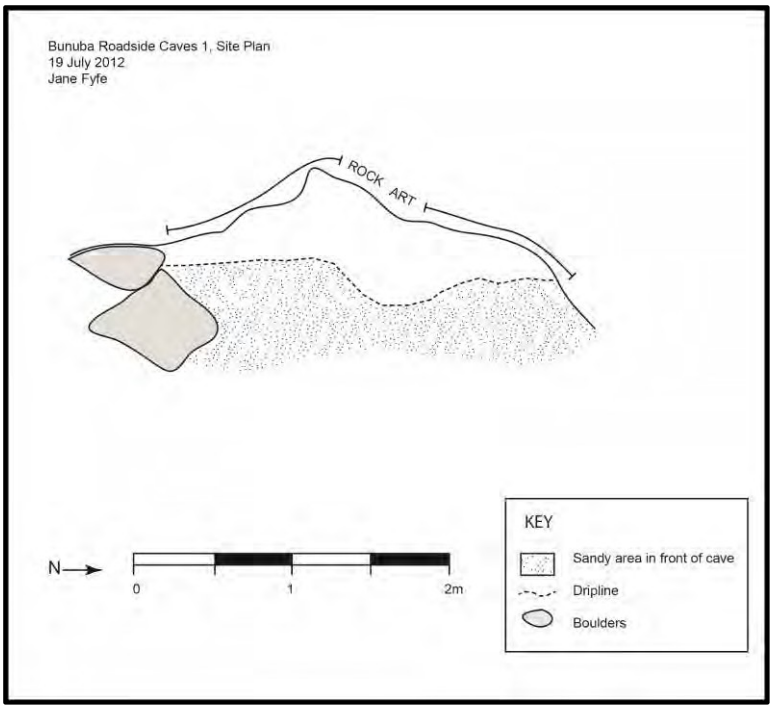


FIGURE 58 SITE PLAN FOR BUNUBA ROADSIDE CAVES 1, SHOWING LOCATION OF ROCK ART

FIGURE 59 VIEW FROM INSIDE BUNUBA ROADSIDE CAVES 1 SHOWING FADED ROCK ART. THERE IS LITTLE ROOM TO MOVE OR SIT UPRIGHT INSIDE THIS CAVE, AND WIDE SHOT PHOTOGRAPHS WITHOUT MY FEET WERE NOT POSSIBLE!

Bunuba Roadside Caves 2 (BR2)

This very small open rockshelter is 5.9m from the Leopold-Fairfield Road, and substantially coated in road dust. The shelter has a small ledge on the front of which there is painted rock art in black (Figure 60 and Figure 61). The rock art is so obscured and damaged by the dust it was not possible to identify any determinate motifs from five at this small shelter.

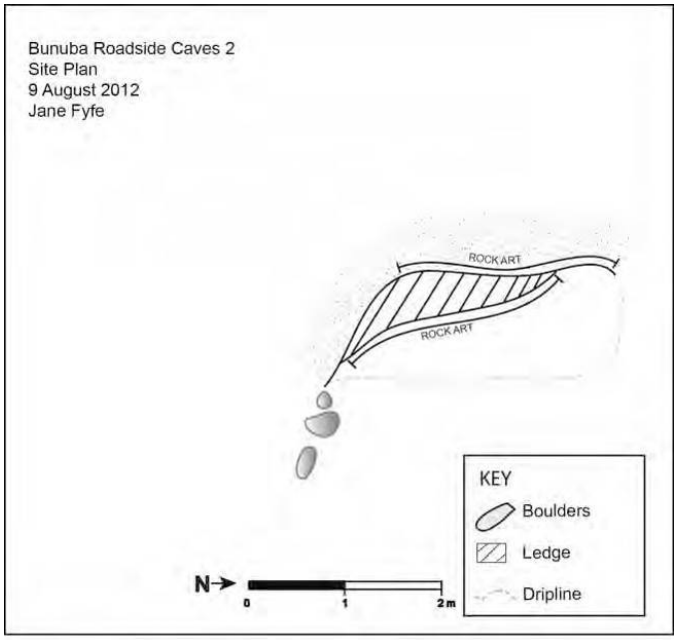


FIGURE 60 SITE PLAN FOR BUNUBA ROADSIDE CAVES 2, SHOWING LOCATION OF ROCK ART

FIGURE 61 LOOKING TOWARDS BUNUBA ROADSIDE CAVES 2 FROM THE EAST.

Bunuba Roadside Caves 3 (BR3)

BR3 is a small open rockshelter 3.5m from eastern edge of the Leopold-Fairfield Road. The shelter has a ledge, above which is a smooth rockface and a small overhang providing shade.

The vertical wall below the overhang has some grey and white deposit from water flow. The rockshelter floor has grass growing up to the base of the ledge, with roadbase pebbles interspersed (Figure 62 and Figure 63).

Rock art at this shelter is in red, white and black pigments on the vertical wall above the ledge. The motifs identified included anthropomorphs, zoomorphs and a single hand stencil, with a collection of red painted vertical lines.

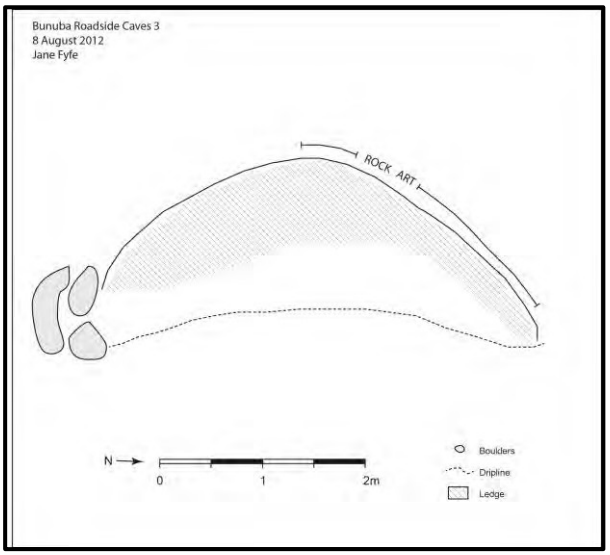


FIGURE 62 SITE PLAN FOR BUNUBA ROADSIDE CAVES 3, SHOWING LOCATION OF ROCK ART

FIGURE 63 PROFILE VIEW OF BUNUBA ROADSIDE CAVES LOOKING ACROSS THE FAIRFIELD- LEOPOLD DOWNS ROAD TO THE WEST OF THE SITE.

Remaining Sites to the East of Fitzroy Crossing

East of Fitzroy Crossing are three sites in contemporary Gooniyandi lands. The closest of the three to the town is PR1, which is approximately 65km as the crow flies, although Riwi at 75km is closer by road (Figure 64).

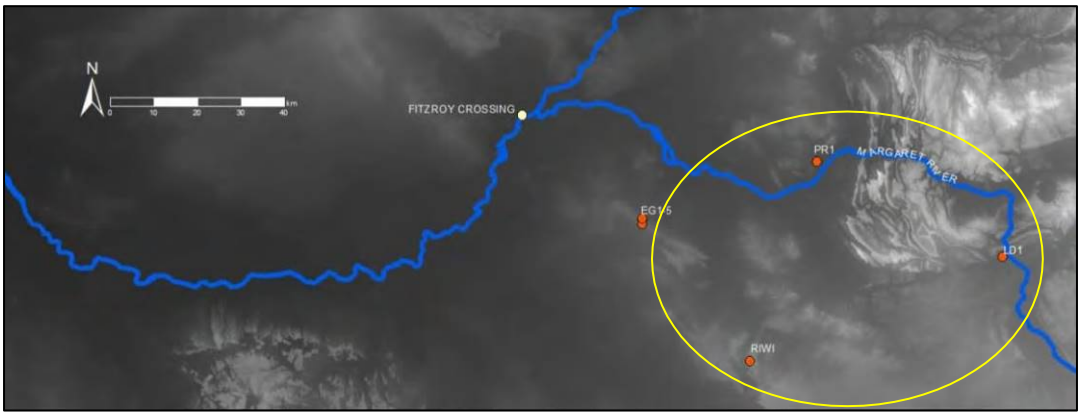


FIGURE 64 LOCATION OF THE THREE REMAINING SITES RECORDED IN GOONIYANDI LANDS TO THE EAST OF FITZROY CROSSING.

Moonggaroonggoo (PR1)

This site is also known as Painted Rocks 1, but the Gooniyandi Traditional Owners call it Moonggaroonggoo. Located on the southeast of a large outcrop of Sadler Limestone near the Guppy Hills between the Horseshoe and Hull Ranges (Playford et al. 2009: 470, Plate 7) in Gooniyandi Country this rockshelter is accessed up a gentle slope scattered with lithic flakes and cores. At the western end of the rockshelter are highly polished and steep blocks, which form one side of the narrowing passage that extends along the northern wall of the rockshelter. The site is approximately 14m wide and 5m deep. The ceiling of the shelter is formed by the wall which curves into the overhang.

The main rockface on the northern side of the rockshelter is a series of high curved surfaces extending a total of 12.4m. The floor is sandy with several boulders between 2.6m and 3m from the rock face, with most around 0.8m high (Figure 65 and Figure 66).

The sloping wall/ceiling has a diverse assemblage of painted rock art, in red, mulberry, black and white, with large anthropomorphs and phytomorphs visually dominating the rockshelter, and including a range of zoomorphs. There is rock art on the large slabs, and boulders around the rock shelter, including both red pigment art and cut marks. There are multiple superimpositions of motifs at this site.

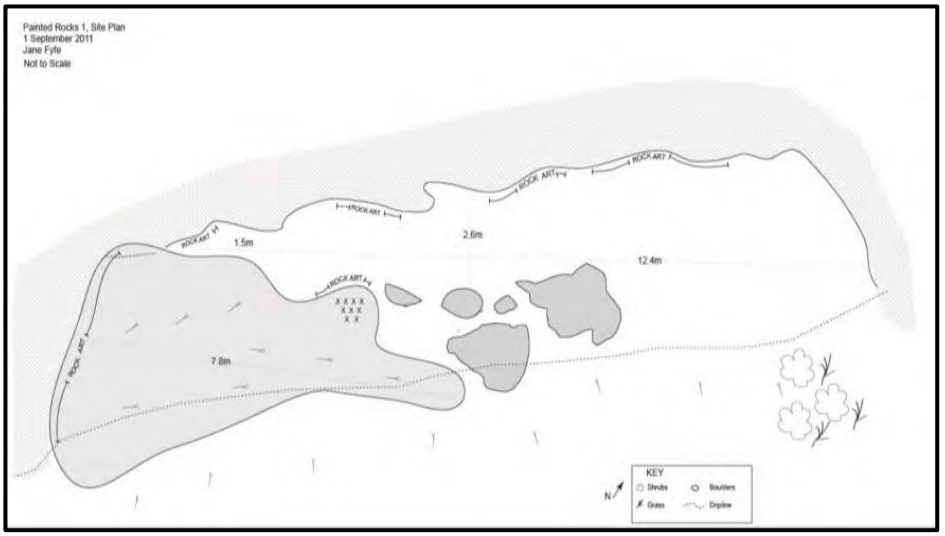


FIGURE 65 SITE PLAN FOR MOONGGAROONGGOO, SHOWING LOCATION OF ROCK ART

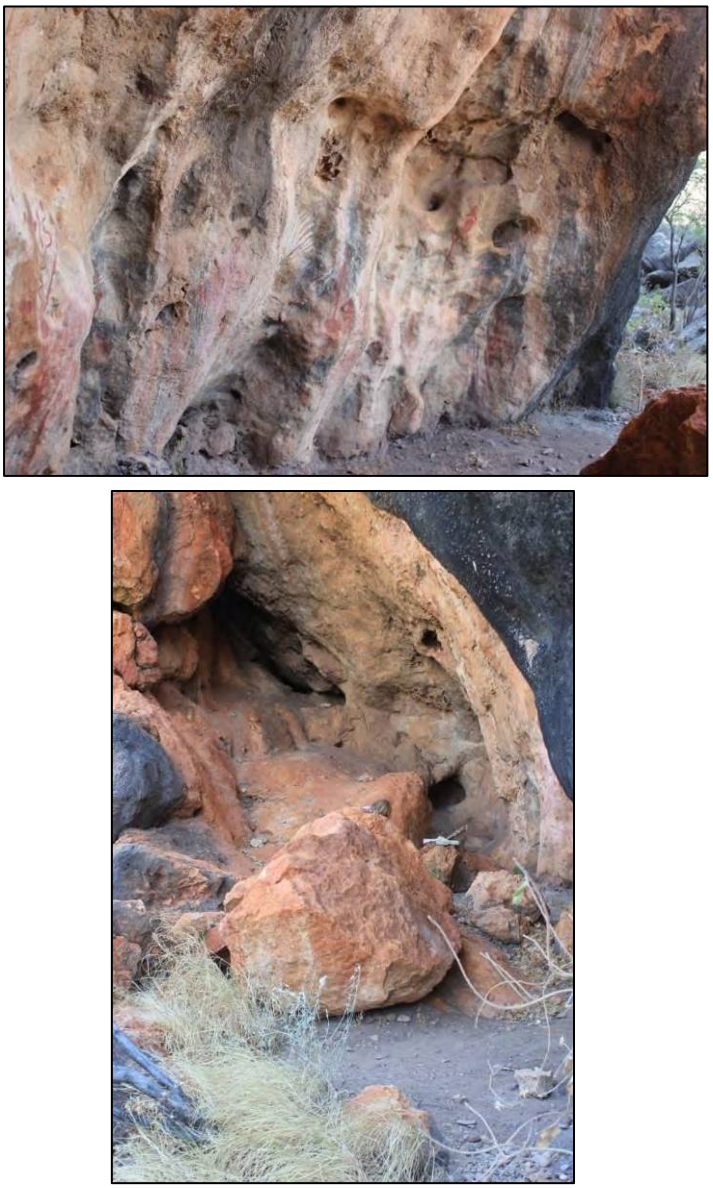


FIGURE 66 NORTH EAST (TOP) AND SOUTH WEST (BOTTOM) PROFILES OF MOONGGAROONGGOO.

Riwi

This cave is in one of the large outcrops on the western side of the South Lawford Ranges, geologically it is Pillara limestone (Playford et al. 2009: 467, Plate 4). Riwi is large cave with three distinct parts, a wide front chamber, with an 8.6m wide entry and 16.79m deep. The second chamber is smaller and low, 3m at its widest and 6.94m deep, with a 1.4m high ceiling. The furthest chamber is where the cave narrows to a point, extending the depth of the cave a further 5.7m, and the height cannot be easily determined, as it disappears to a point well above five metres (Figure 67).

Only the front chamber walls and ledges, and the walls at the entrance to Riwi have visible rock art. The rock art on the walls takes many forms including anthropomorphs in groups, or singly, snakes, boomerangs and turtles. The pigment art uses black, red, mulberry, yellow and white and there are many superimposition relationships between motifs at this site. Riwi also has cut marks on the horizontal ledges close to the entrance, as well as pigment art. Historical inscriptions are scratched on a vertical rockface at the entrance one was identified by one of the Traditional Owners as made by one of her sons (Dorothy Surprise 2011, pers. comm., 30 August).

Louisa Downs 1(LD1)

This site is a series of small galleries in a large blocky quartzite rockshelter facing east and overlooking the Margaret River (Figure 68 and Figure 69). It is the most easterly of the sites recorded, and while all the rock art was photographed the site was not recorded in the same way as the other sites in the study (an injury sustained changing a tyre prevented me from visiting the site and the rock art is recorded from photographs taken by Jane Balme and Sue O'Connor).

The rock art at this site is faded pigment art in black, white and reds. The small assemblage is mostly zoomorphs in black, with thick white outlines.

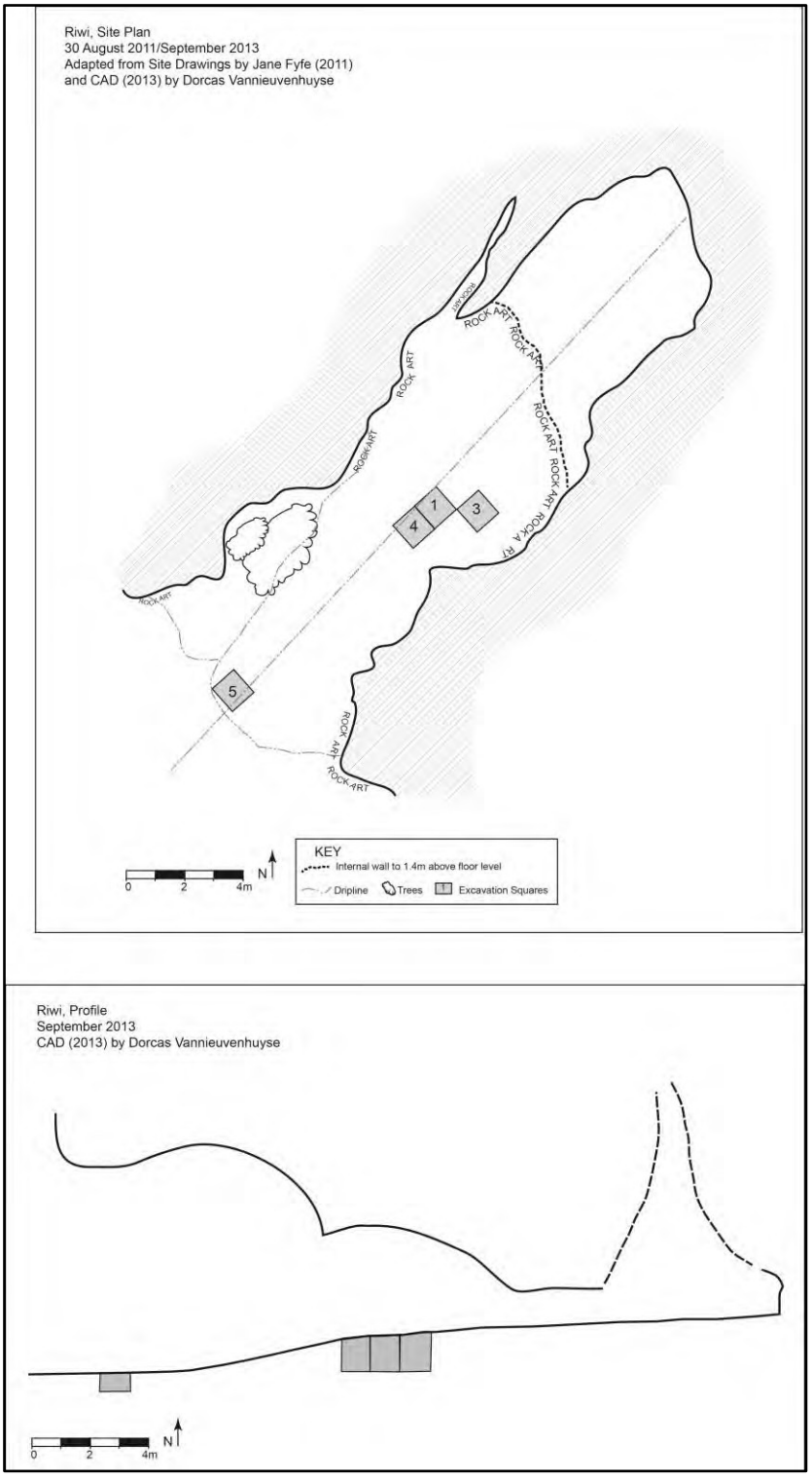


FIGURE 67 TOP: SITE PLAN FOR RIWI, SHOWING LOCATION OF ROCK ART (ADAPTED FROM ORIGINAL PLAN BY DORCAS VANNIEUWENHUYSE) BOTTOM: PROFILE FOR RIWI.

FIGURE 68 VIEW OVER THE MARGARET RIVER FROM LOUISA DOWNS 1 ROCKSHELTER (PHOTOGRAPH COURTESY OF JANE BALME & SUE O'CONNOR).

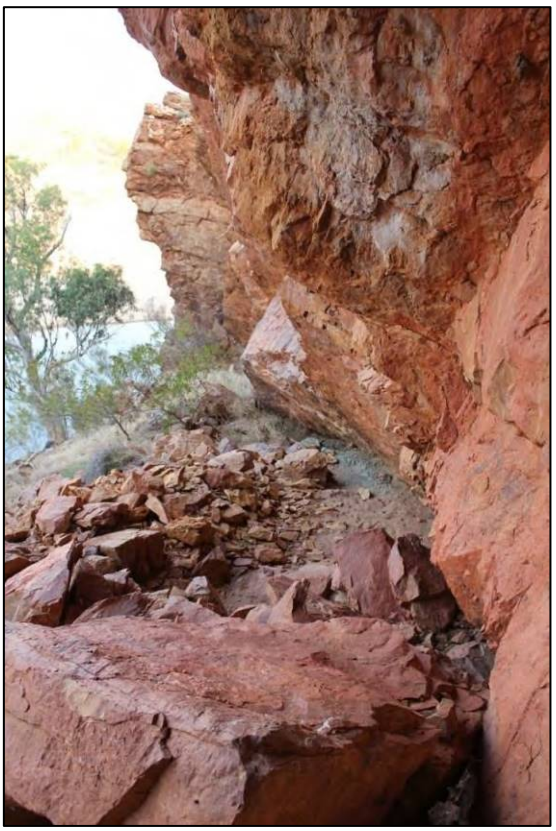


FIGURE 69 PROFILE OF LOUISA DOWNS 1 ROCKSHELTER LOOKING APPROXIMATELY SOUTH.

Excavated Sites

Djuru (Windjana Gorge 2/Windjana Gorge Water Tank)

See the following publications.

Maloney, T., S. O'Connor, D. Vannieuwenhuyse, J. Balme & J. Fyfe 2016 Re-excavation of Djuru, a Holocene rockshelter in the Southern Kimberley, North Western Australia. *Australian Archaeology* 82(1):80-85.

O'Connor, S., K. Aplin & S. Collins 2008 A small salvage excavation in Windjana Gorge, Kimberley, Western Australia. *Archaeology in Oceania* 43(2):75-81.

FIGURE 70 COMPLETED EXCAVATION SQUARE CLOSE TO ONE OF TWO ROCK ART PANELS AT DJURU IN 2012 SHOWING STRATIGRAPHIC LAYERS.

Langurmurru (Carpenter's Gap 3)

See the following publications for a reporting on this excavation.

Dilkes-Hall, I.E., S. O'Connor & J. Balme 2019 People-plant interaction and economic botany over 47,000 years of occupation at Carpenter's Gap 1, south central Kimberley. *Australian Archaeology* 85(1):30-47.

O'Connor, S., T. Maloney, D. Vannieuwenhuyse, J. Balme & R. Wood 2014 Occupation at Carpenters Gap 3, Windjana Gorge, Kimberley, Western Australia. *Australian Archaeology* 78:10-23.

Maloney, T., S. O'Connor & J. Balme 2014 New dates for point technology in the Kimberley. *Archaeology in Oceania* 49(3):137-147.

Maloney, T., S. O'Connor & J. Balme 2017 The effect of retouch intensity on mid to late Holocene unifacial and bifacial points from the Kimberley. *Australian Archaeology* 83(1):42-55.

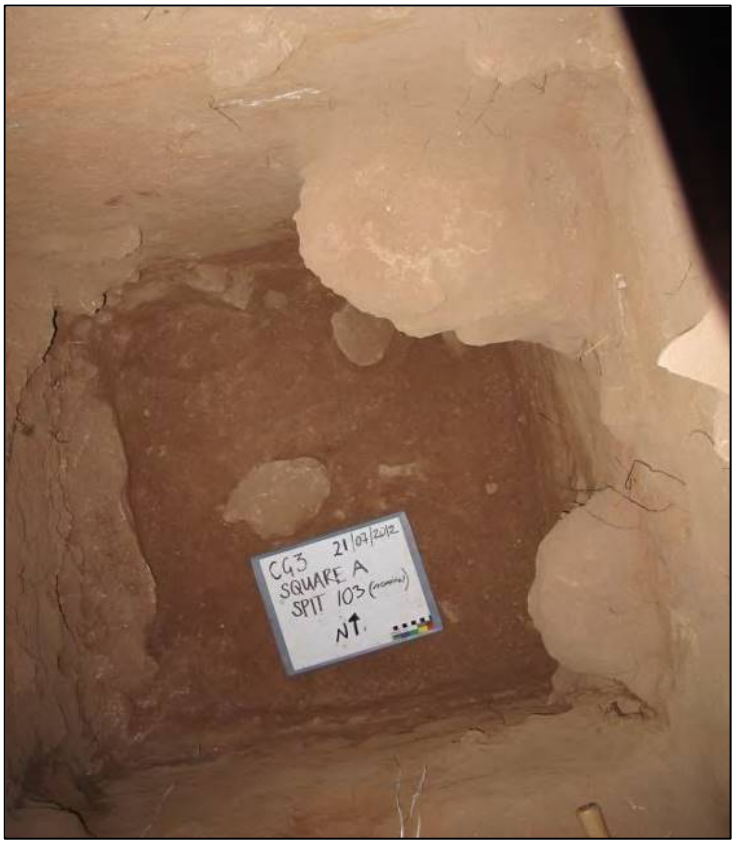


FIGURE 71 SUBSTANTIAL CONCRETIONS WERE EXCAVATED THROUGH BEFORE THE DEPOSIT BECAME STERILE IN THE LANGURMURRU EXCAVATION.

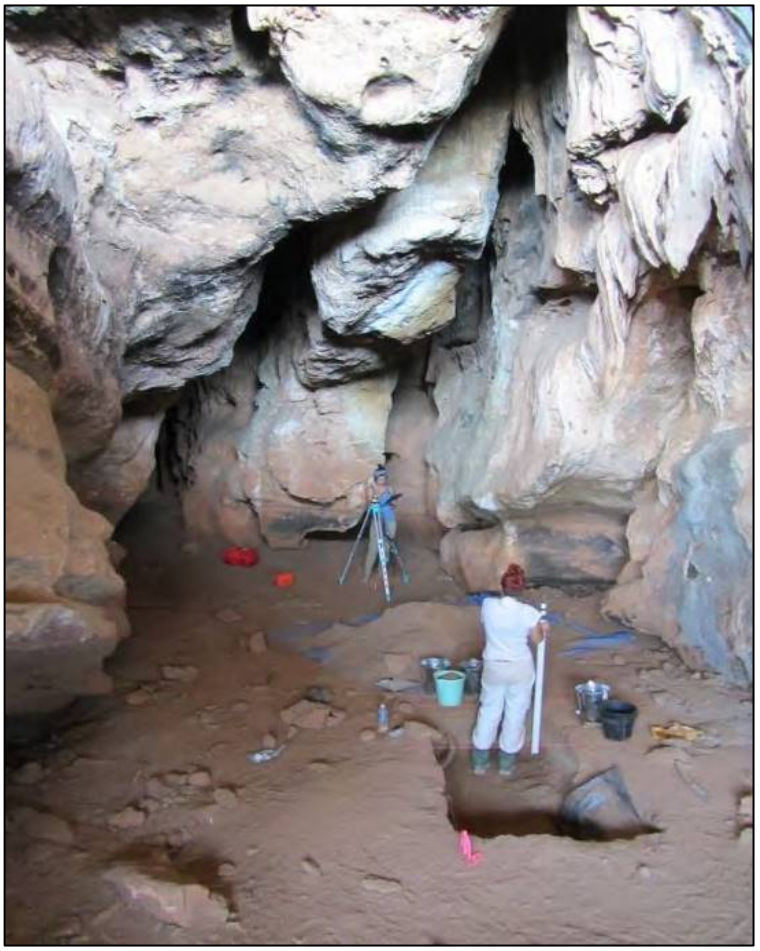


FIGURE 72 THE INTERIOR OF THE CAVE AT LANGURMURRU. DEPTH MEASUREMENT DURING THE EARLY STAGES OF EXCAVATING THE SECOND SQUARE.

Mount Behn 1

A full report on the excavation for this site is yet to be published, but it is one of the key sites in the following publications:

Maloney, T., S. O'Connor & J. Balme 2014 New dates for point technology in the Kimberley. *Archaeology in Oceania* 49(3):137-147.

Whitau, R., I.E. Dilkes-Hall, D. Vannieuwenhuyse, S. O'Connor & J. Balme 2018 The curious case of Proteaceae: macrobotanical investigations at Mount Behn rockshelter, Bunuba country, Western Australia. *Australian Archaeology* DOI: 10.1/03122417.2018.1454656.

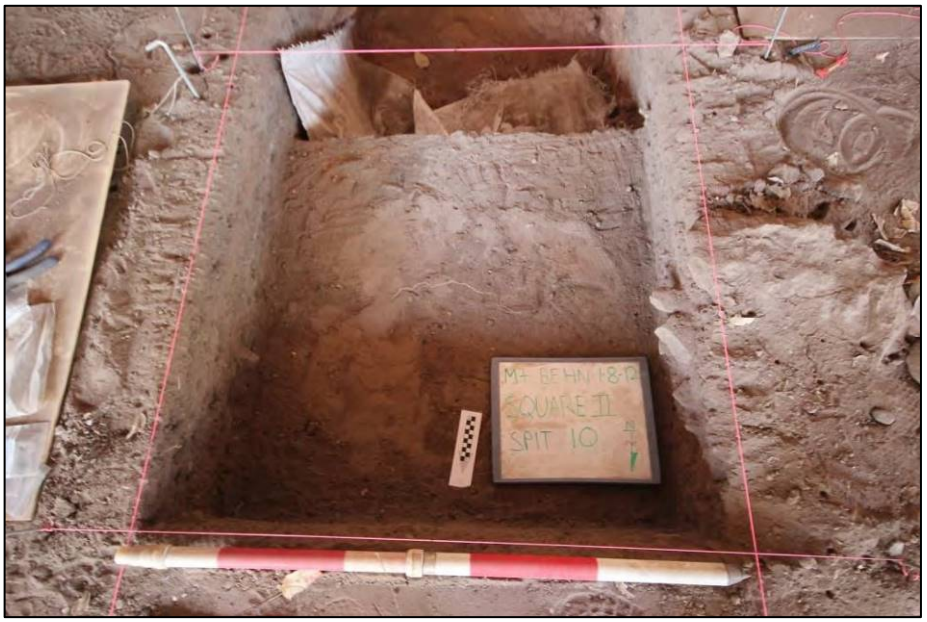


FIGURE 73 FINAL SPIT OF THE EXCAVATION OF THE SECOND SQUARE AT MOUNT BEHN 1, WITH THE FIRST SQUARE CLOSER TO THE ROCKFACE IN THE BACKGROUND.

Riwi

See the following publications for the 1999 excavations.

Balme, J. 2000 Excavations revealing 40,000 years of occupation at Mimbi Caves, south central Kimberley, Western Australia. *Australian Archaeology* 51:1-5.

Balme, J. & K. Morse 2006 Shell beads and social behaviour in Pleistocene Australia. *Antiquity*80(310):799-811.

See the following publications for the 2013 excavations.

Balme, J., S. O'Connor, T. Maloney, K. Akerman, B. Keaney & I.E. Dilkes-Hall 2022 Fibre technologies in Indigenous Australia: Evidence from archaeological excavations in the Kimberley region. *Australian Archaeology*.

Balme, J., S. O'Connor, T. Maloney, D. Vannieuwenhuyse, K. Aplin & I.E. Dilkes-Hall 2018 Long-term occupation on the edge of the desert: Riwi Cave in the southern Kimberley, Western Australia. *Archaeology in Oceania* 54(1):35-52.

Dilkes-Hall, I.E., J. Balme, S. O'Connor & E. Dotte-Sarout 2020 Archaeobotany of Aboriginal plant foods during the Holocene at Riwi, south central Kimberley, Western Australia. *Vegetation History and Archaeobotany* 29(3):309-325.

Langley, M., I.E. Dilkes-Hall, J. Balme & S. O'Connor 2016 A 600-year-old Boomerang fragment from Riwi Cave (South Central Kimberley, Western Australia). *Australian Archaeology* 82(2):106-122.

Vannieuwenhuyse, D., S. O'Connor & J. Balme 2016 Settling in Sahul: Investigating environmental and human history interactions through micromorphological analyses in semi-arid north-west Australia. *Journal of Archaeological Science* 2016:22.

Whitau, R., J. Balme, S. O'Connor & R. Wood 2016 Wood charcoal analysis at Riwi cave, Gooniyandi country, Western Australia. *Quaternary International*(9/2016):551-558.

Whitau, R., I.E. Dilkes-Hall, E. Dotte-Sarout, M. Langley, J. Balme & S. O'Connor 2016 X-ray computed microtomography and the identification of wood taxa for selected archaeological artefact manufacture: Rare examples from Australian contexts. *Journal of Archaeological Science* 6:536-546.

Whitau, R., D. Vannieuwenhuyse, E. Dotte-Sarout, J. Balme & S. O'Connor 2017 Home is where the hearth is: Anthracological and microstratigraphic analyses of Pleistocene and Holocene Combustion Features, Riwi Cave (Kimberley, Western Australia). *Journal of Archaeological Method and Theory* 25(3):739-776.

Wood, R., Z. Jacobs, D. Vannieuwenhuyse, J. Balme, S. O'Connor & R. Whitau 2016 Towards an accurate and precise chronology for the colonization of Australia: The example of Riwi, Kimberley, Western Australia. *PLoS One* 11(9):1-25.

Wood, R., Z. Jacobs, D. Vannieuwenhuyse, J. Balme, S. O'Connor & R. Whitau 2016 Towards an accurate and precise chronology for the colonization of Australia: The example of Riwi, Kimberley, Western Australia. *PLoS One* 11(9):1-25.

Vannieuwenhuyse, D., S. O'Connor & J. Balme 2016 Settling in Sahul: Investigating environmental and human history interactions through micromorphological analyses in semi-arid north-west Australia. *Journal of Archaeological Science* 2016:22.

Moonggaroonggoo

A follow up excavation was conducted at this site, and two others within the rocky outcrop. Results are published in this article.

Maloney, T., I.E. Dilkes-Hall & J. Davis 2017 Indigenous led archaeological excavation at Moonggaroonggoo, Gooniyandi country, Western Australia, reveals late Holocene occupation. *Australian Archaeology* 83(3):178-184.

Tangalma (CG1)

Excavations were conducted at this site in the 1990s, and a number of publications have resulted, as listed below. The excavations at this site were also re-excavated and new samples obtained from cleaned excavation walls.

Lifeways Project publications relating to Tangalma

Hiscock, P., S. O'Connor, J. Balme & T. Maloney 2016. World's earliest ground-edge axe production coincides with human colonisation of Australia. *Australian Archaeology,* 82(1): 2-11.

Maloney, T., S. O'Connor, R. Wood, K. Aplin & J. Balme 2018. Carpenters Gap 1: A 47,000 year old record of Indigenous adaptation and innovation. *Quaternary Science Reviews,* 191(204-228.

Earlier Publications

Frawley, S. & S. O'Connor 2010 A 40,000 year wood charcoal record from Carpenter's Gap 1: new insights into palaeovegetation change and indigenous foraging strategies in the Kimberley, Western Australia. In S. Haberle, J. Stevenson & M. Prebble (eds), *Altered Ecologies: Fire, climate and human influence on terrestrial landscapes*. Canberra: ANU ePress.

Hiscock, P., S. O'Connor, J. Balme & T. Maloney 2016 World's earliest ground-edge axe production coincides with human colonisation of Australia. *Australian Archaeology* 8 (1):2-11.

O'Connor, S. 1995 Carpenter's Gap rockshelter 1: 40,000 years of Aboriginal occupation in the Napier Ranges, Kimberley, WA. *Australian Archaeology* 40:58-59.

O'Connor, S. & B. Fankhauser 2001 Art at 40,000 BP? One step closer: an ochre covered rock from Carpenter's Gap Shelter 1, Kimberley Region, Western Australia. In A. Anderson, I. Lilley & S. O'Connor (eds), *Histories of old ages: essays in honour of Rhys Jones*, pp.287-300. Canberra: Pandanus Books.

Maloney, T., I.E. Dilkes-Hall & J. Davis 2017 Indigenous led archaeological excavation at Moonggaroonggoo, Gooniyandi country, Western Australia, reveals late Holocene occupation. *Australian Archaeology* 83(3):178-184.

McConnell, K. & S. O'Connor 1997 40,000 year record of food plants in the southern Kimberley Ranges, Western Australia. *Australian Archaeology* 45:20-31.

Appendix 6

Motifs, Definitions and Attributes

Introduction

The overall structure of the classification system is shown in Figure 1.

Table 1 details the general descriptions of each of the 9 rock art classes identified in this research in Chapter 5. It should be noted that all of the descriptions of these classes is informed by advice and shared knowledge from Bunuba and Gooniyandi Traditional Owners during and after field work.

The remaining tables in this appendix provide the detailed descriptions of the sub-classes, with examples where they have been recorded in this study.

Classification System

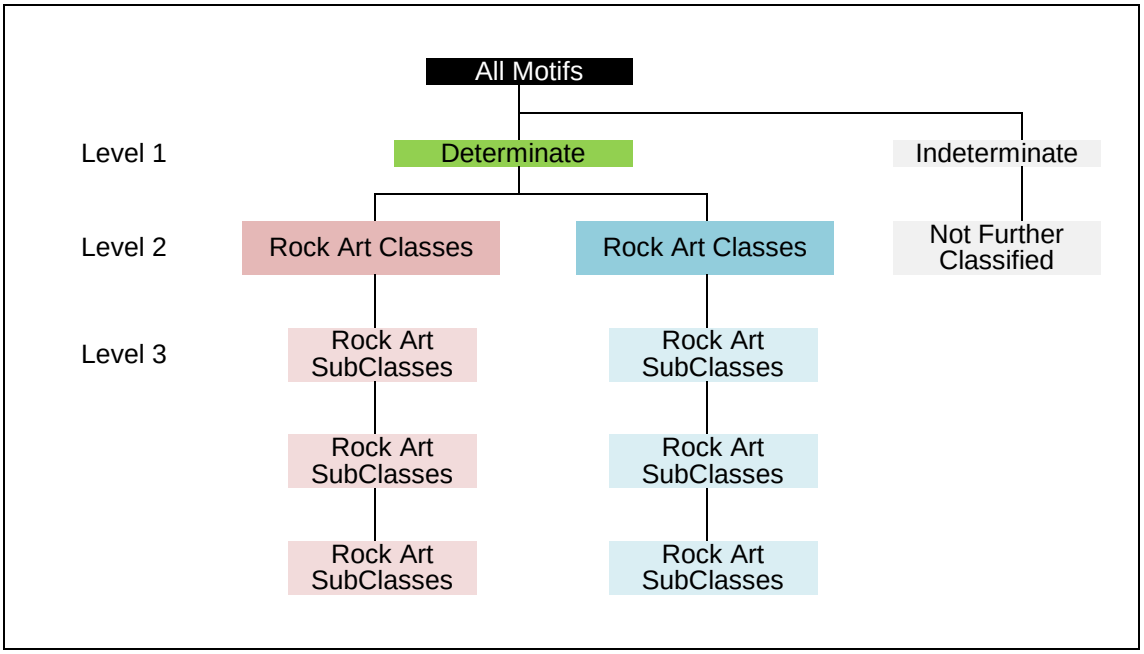
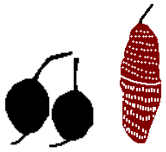


FIGURE 1 MOTIF CLASSIFICATION OUTLINE

Rock Art Classes and SubClasses: Level 2 and 3

TABLE 1 ROCK ART CLASSES: DESCRIPTIONS.

Motif Type	Descriptor
Anthropomorph 	Figures resembling or with recognisable human attributes. This includes body parts that are definable as human, such as painted, drawn or engraved hands or feet, digits, heads, facial features, bodies, limbs with human musculature, genitalia, hair. This does not include stencilled human hands or feet, which are classified as tracks.

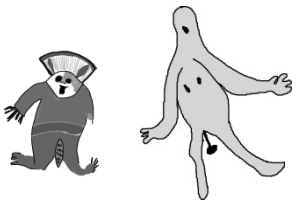
Zoomorph 	Figures resembling or with recognisable animal attributes, such as feathers, animal head shapes, tails, digits, bodies, limbs, ears. This includes complete and incomplete figures which are recognisable to the researchers or Traditional Owners as representing animals.
Phytomorph 	Motifs recognisable as realistic or representative of plants, trees, seeds or other vegetation, with attributes such as seed/ pod shape, stems, roots, foliage, flowers.
Material Culture 	Motifs which are recognisable or representative as items which people would use in a range of activities such as hunting, food preparation, digging, making tools. This includes items such as boomerangs, spears, bags, axes in rock art in the Kimberley, Western Australia.
Tracks 	Recognisable symbols that are real or represent prints or tracks observed in rock art, such as animal tracks, foot or hand stencils and prints. Stencils of human hands and feet are included in this category because they denote the presence of actual humans, rather than as a representation. Whilst the placement of the stencils may be for cultural, cultural or ceremonial reasons they are interpreted to represent the tracks of human activity at the site, in the same way that the depictions of animal tracks are placed to suggest that the birds and other creatures have walked through the site.
Geometric 	Complete and incomplete recognisable shapes and variants of shapes, lines and groups of lines that cannot be reliably interpreted as representing a figurative motif. For example, a solid infill circle may represent a moon, a lake, a meeting place, but without context or information that this is the case from Traditional Owners then it has too many possibilities and it is only possible to record and classify it as a circle.
Historical 	Writing, dates and associated punctuation and lines or enclosing shapes that may only have been created by those with written language. Whilst this could include contact with people from Asia with written language there is yet to be any inscriptions recorded in the Kimberley other than those using English constructs and lettering.
Other 	Motifs that appear to be figurative but are not recognisable as specific types of motifs in other figurative categories. These motifs have distinctive form, but what they are meant to be, represent, or interpreted to be is either unknown or moot.

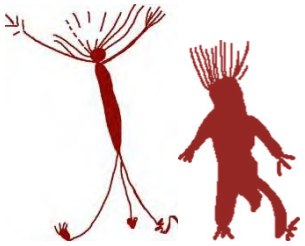
Other non-figurative 	Cultural, intentional marking of rock surfaces not elsewhere described such as cupules, finger flutings, grinding patches and deeply incised cut marks singly or in groups, or abraded grooves. These are too non-specific to be recognisable or known as any specific type, form or style of motif.

TABLE 2 ANTHROPOMORPH SUBCLASS DESCRIPTIONS.

Anthropomorph

Figures resembling or with recognisable human attributes. This includes body parts that are definable as human, such as hands or feet, digits, heads, facial features, bodies, limbs with human musculature, genitalia, hair. This does not include stencilled human hands or feet, which are classified as tracks.

Level 3a Anthropomorph	Description
Female 	Anthropomorphs with distinct female genitalia, in particular breasts, but also including vulvae, either in proportion to body size or exaggerated. The characteristic genitalia in rock art is informed by the observations and descriptions of Traditional Owners. The breasts can occur both painted/engraved on the body or to the side of the body under the arms. The example shown has breasts painted on the body.
Male 	Anthropomorphs with distinct male genitalia, either in proportion to body size or exaggerated forms. The forms of genitalia in rock art are informed by the observations and descriptions of Traditional Owners. Genitalia will usually include a penis as the minimum marker. Testicles are also present in some cases, and in others there is a combination penis-testicle/s, sometimes shown as an exaggerated round addition at the end of the penis.
Non Gender Specific 	A figure that has the attributes that make it recognisable as human but no markers that distinguish it as a specific gender. Most of the anthropomorphs in this study belong in this category.
Female + Male	A figure with both male and female genitalia as described above. No examples of this were recorded in this research.

Level 3b Anthropomorph	Description
Waliarri 1 (Complex)   	Polychrome anthropomorph with rayed headdress, solid+pattern infill in the body and limbs, a contrasting colour outline and internal characteristics including eyes, nose, mouth, breastplate and internal dividing lines denoting knees, elbows, wrists and ankles, or dividing parts of the body such as a curved line high on the chest creating a décolletage, or a line across the middle of the body sometime referred to as a hair belt. The arms of the Waliarri 1 are usually angled out from the body, with hands or digits directly attached to the arm. The legs are usually slightly splayed downward from the body, each approximately half the width of the body and with large and/or shaped feet in profile pointing outward from the legs, most often with toes. Waliarri 1 heads are usually solid white infill with large, rounded eyes (sometimes with eyelashes) in a contrasting colour. A U-shaped nose may be present, attached to the eyes. A breast plate may also be present in the centre of the chest below the diving chest line. The heads are rounded and outlined in a contrasting colour to the infill, (sometimes double outlined) with angled rays from the upper part of the head which are surrounded by an enclosing arc. Some Waliarri 1 have red feathers on either side of the upper part of the head interspersed or superimposed on the rayed headdress.
Waliarri 2 (Simple) 	This is a monochrome or bichrome version of Waliarri 1, with fewer detail characteristics. Monochrome Waliarri 2 will not have internal detail such as eyes, may have outlines in the same colour. Most Waliarri 2 will have solid infill in the body and limbs and they are not likely to have the detail in the headdresses, such as arcs, or feathers, that Waliarri 1 display. In addition, Waliarri 2 generally has narrower legs and arms, and in some cases, they are without feet.
Mamo/Djuari 	Mamo/Djuari is a monochrome or bichrome anthropomorph with rounded or oval head and large contrasting coloured eyes (the monochrome examples do not have eyes). On top of the head, angled outwards are between one and three feathers, either monochrome or red with a black tip. The body of the Mamo/Djuari is shaped like an inverted pear. The limbs of this anthropomorph are shaped, and sometimes appear highly muscled. The arms are at close to 90º to the body, with a bend upwards at the elbow and large splayed fingers are usually visible. Similarly, the legs are angled out from the body at 30º or more from the body, bent at the knees and with large feet angled away from the body, and large rounded toes.

Level 3b Anthropomorph	Description
Outline only 	This is a small category of anthropomorph (n=14 at eight sites) in undefined shapes where the only visible presence is an outline.
Round Bodies  	This is a small anthropomorph (no larger than 60cm in height) with a circular or oval body, with solid infill, a small, rounded head comparative to the body and single line narrow limbs arced up or down and out form the body. This anthropomorph has no hands, feet or digits, no internal features and is found primarily in groups in either red or white ochre.
Incomplete 	Where a body part that is distinctly anthropomorphic (e.g. legs with feet, a head with facial features or headdress) is depicted on its own, either as a single motif, or a part of a larger motif that is no longer visible.
Elongated bodies 	Monochrome anthropomorphs with solid infill and bodies that are long in relation to their heads and limbs. The bodies mostly appear as rectangular or elongated ovals. The heads on this anthropomorph are mostly small circular or oval solid infill shapes and the legs single lines with a slight outward angle from the body. Arms are also single lines and at various angles form the body, it is rare for this anthropomorph to have hands or fingers. This type of anthropomorph may have stylised feet.
Veganthrop 	A motif that shows characteristics that are both distinctly human and distinctly vegetable. For example, a depiction of a vegetable or vegetation that is clearly recognised that has an anthropomorphic head and/or arms added. Both sets of characteristics must be clear and present in the same motif to be classified in this way. In this study there are a small number of yams, with the distinct yam shape and patterning, and root fronds which have arms, heads, facial features and headdresses added.

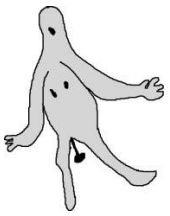
Level 3b Anthropomorph	Description
Unique anthropomorph 	A motif that has sufficient attributes to characterise it as resembling a human form, but without any in common with any other anthropomorph in the assemblage. These unique figures have their own distinctive attributes which also make them different from one another, this may be their overall form or distinctive individual characteristics. There is a wide range of anthropomorphs in this assemblage that cannot be grouped; their form and combinations of attributes are unique
Therianthrope 	A motif that shows characteristics that are both distinctly human and distinctly animal. Both sets of characteristics must be clear and present in the same motif to be classified in this way. For example, Traditional Owners relate tales of 'featheries' that display characteristics of birds (wings) and humans (body shapes, legs, heads). These may initially be perceived as birds but display clear characteristics of both forms.
Muscled Limbs 	Monochrome of bichrome figures with well-muscled legs that are dominant in their form. The legs are angled and bent, and mostly have large feet with toes pointed outward from the body. These anthropomorphs have bodies that are small relative to muscled legs and are usually in an inverted pear shape. The heads are in various forms, and the arms are frequently, though not always, painted with defined muscles and mostly have visible hands.
Contact style 	Contact style motifs show either headdresses, material culture or forms that are not present in other rock art. For example, a lightly scratched image of a woman at one site has rounded breasts interior to the body, and a hairstyle from the late 1960s (The Flip) leaves little doubt that it is not in the context of traditional Bunuba forms, and it would not contribute to identifying styles that relate to Bunuba identity over time. The form and its relative chronology also mean there is no definite way to connect such a motif to a Bunuba author.

TABLE 3 ZOOMORPH SUBCLASS DESCRIPTIONS

Zoomorph

Figures resembling or with recognisable animal attributes, such as feathers, animal head shapes, tails, digits, bodies, limbs, ears. This includes complete and incomplete figures which are recognisable to the researchers or Traditional Owners as representing animals

Zoomorph	Description
Macropod 	Motifs that display the large rear limbs and feet, short front limbs, long tails and pointed heads of kangaroos and wallabies.
Quadruped 	Motifs of four legged mammals which are painted in profile with all legs visible and attached below the body and heads with upward pointed ears and a tail at either end. At the class level they belong in Mammalia. All the quadrupeds in this assemblage are dog-like, including the possible thylacine shown at left.
Bird 	Motifs with an oval shaped body which narrows to one end (tail), and sometimes adorned with feather shapes, from which two vertical legs depend, ending in claw shapes. Necks on this motif are mostly long and curved at the opposite end from the narrowed tail, and curve into small heads that are also pointed to a beak shape.
Reptile 	Motifs that form a range of shapes of recognisable members of his class. This assemblage includes snakes, turtles, lizards and crocodiles.

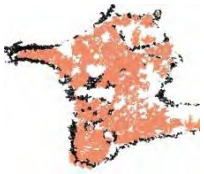
Zoomorph	Description
Fish/Sea Creature 	The motifs in this assemblage classified as fish and sea creatures come from two biological classifications. Fish may be described as gill-bearing, aquatic animals with skulls that do not have limbs or digits. In this assemblage that includes generic fish with tails and fins and eels. Sea Creatures in this classification refers to the small crustaceans that are found in the area, which are generally referred to as cherabin (a species of freshwater shrimp). Using Sea Creatures provides for the inclusion of other classes, which have been observed in rock art and contemporary art in other areas in northern Australia.
Amphibian 	In this study the motifs are all frogs. The wider grouping was used to provide for inclusion of other motifs.
Insect	The few motifs in this group all have more than 4 limbs, bodies in sections and antennae. They are not distinguishable to any finer level. None were recorded in this research.
Other 	The motifs in this group are all referred to as ‘Flying Fox’ by Traditional Owners. They do not fit with other groups, except under the class Mammalia.

TABLE 4 PHYTOMORPH SUBCLASS DESCRIPTIONS

Phytomorphs

Motifs recognisable as realistic or representations of plants, trees, seeds or other vegetation, with attributes such as seed/ pod shape, stems, roots, foliage, flowers.

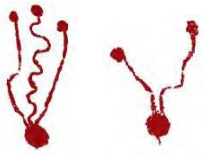
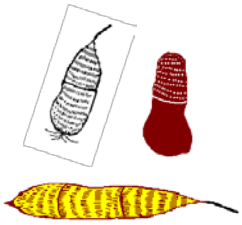
Phytomorph	Description
Boab Nuts 	Round/Oval solid infill motifs with stalks at top and base. These motifs were identified as boab nuts by Traditional Owners at the site Fairfield 2.
Grass 	Painted or engraved lines with branches/seeds extending from the lines outwards and/or upwards.
Pods 	Small solid infill circles, ovals or teardrops along a straight or curved line.
Water lily 	Solid infill circles attached to curving, straight or spiral like lines, usually joined at the other end, sometimes with another solid infill circle. These motifs were identified as water lilies by Traditional Owners at Moonggaroonggoo.
Yam 	A long oval with uneven shaping that may have solid infill or patter infill, with lines across the narrower breadth. Yams may have a single stalk at the top and fibrous fronds at the base. The motifs were identified as yams by Traditional Owners at Mount Behn 1 and Marawun 1.

TABLE 5 TRACKS SUBCLASS DESCRIPTIONS

Tracks

Recognisable symbols that are real or represent prints or tracks observed in rock art, such as animal tracks, foot or hand stencils and prints. Stencils of human hands and feet are included in this category because they denote the presence of actual humans, rather than as a representation. Whilst the placement of the stencils may be for cultural, cultural or ceremonial reasons they are interpreted to represent the tracks of human activity at the site, in the same way that the depictions of animal tracks are placed to suggest that the birds and other creatures have walked through the site.

Track	Description
Human Hands 	Stencilled, drawn or engraved images of human hands. Most of the human hands recorded in this study are stencilled in white pigment.
Quadruped 	Rounded shapes with digits emerging that resemble the tracks of a quadruped, for example the rounded pad of a dingo with claw like digits. This motif was only recorded as engraved in this study.
Bird 	Engraved or painted depictions of the tracks left by three and four toe birds. The overall form resembles an arrow for three toed bird tracks, or an arrow with the shaft extended past the point for a four toed bird. In most motifs in this study the bird tracks are recorded in groups.
Human Feet 	In this study the human foot is a stencil of a small foot in white pigment. Only one motif of this type was recorded.
Macropod 	Two long wide lines side by side either painted or engraved. This resembles the print of a macropod standing still. The motif is identified as a macropod (kangaroo or wallaby) by Traditional Owners in both the Pilbara and Kimberley regions of Western Australia.

TABLE 6 MATERIAL CULTURE SUBCLASS DESCRIPTIONS

Material Culture

Recognisable or representations of objects of material culture used or created by humans, such as boomerangs, axes or spears. Objects may appear on their own, in groups or held by, accompanying other figurative motifs. This category includes stencils of these objects.

Material Culture	Description
Axe 	A motif with a line longer than it is wide (handle) with an extended rounded rectangular or triangular like shape (axe head) at right angles attached at one end. This motif sometimes has the axe head fully attached to the vertical handle, and sometimes in more of a triangular shape with the narrow end crossing the handle. Axes are recorded both solid infill and patterned infill in this assemblage.
Bag	A drooping oval shape usually attached to the arm of an anthropomorphic figure. No bags were recorded in this study.
Boomerang 	Painted, engraved or stencilled motif depicting the shape of a boomerang. A boomerang can be described as the point of a triangle with reducing thickness along each side which narrows to a rounded point at each end. Painted and stencilled boomerang motifs were recorded in this study.
Spear/Stick 	Spears are identified by their attachment to either anthropomorphs or zoomorphs, the latter in either proximity to them or embedded in the zoomorph as a hunting tool, and the former being wielded by the anthropomorph in a hunting pose. A long narrow stick is indistinguishable from a spear if it is held upright by an anthropomorph, and may be part of a ceremonial pose, rather than for the purposes of hunting. For this reason, these motifs, which have the same overall form are grouped, as only in one motif in this study is the stick used as a spear embedded in a zoomorph.
Club 	Long tear inverted drop shapes with both ends rounded, and no additional features. The overall form of the club is even and mostly symmetrical. These are recorded in this assemblage with solid infill. In a pair they may resemble a macropod track, however all recorded pairs of clubs are at least 40cm long and are not close to the same length as one another as are the macropod tracks.
Shield	A long oval or similar shape attached to the arm of an anthropomorph. Shields can be solid infill or patterned and have been recorded in other parts of the Kimberley, but not in this study.

TABLE 7 GEOMETRIC SUBCLASS DESCRIPTIONS

Geometric

Complete and incomplete recognisable shapes and variants of shapes, lines and groups of lines that cannot be reliably interpreted as representing a figurative motif. For example, a solid infill circle may represent a moon, a lake, a meeting place, but without context or information that this is the case from Traditional Owners then it has too many possibilities and it is only possible to record and classify it as a circle.

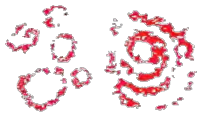
Geometric	Description
Circle/Circle Variant 	A circular shape with varying types of infill. Variants on this shape include lines emanating from the circle, lines through the circle, multiple circles intertwined and circles joined by a line that appear to form a barbell type shape. A variant may also be described as a series of concentric circles, or a spiral.
Oval/Oval Variant 	An oval shape with varying types of infill. Variants on this shape include lines emanating from the oval, or more elongated oval shapes that do not form any other identifiable figurative motif.
Arc/Arc Variant 	One or more shapes where painted or engraved motif is a rounded shape that forms the outer edge of half or less of a circle. Variants include lines emanating or attached to arcs.
Parallel lines 	Groups of 2 or more lines either engraved or painted. Most of the parallel lines in this study are engraved, using a deep incision technique.
Rectangles 	Painted or engraved rectangle shapes (two vertical and two horizontal lines joining at their ends to enclose a space, where the vertical lines are longer than the horizontal lines or vice versa).
Incomplete Geometric 	Partial circles or oval shapes. Where these are outline only to be an incomplete oval or circle the lines must form more than half of the shape. Incomplete spiral shapes Partial remnants of any other identifiable geometric shape.
Other linear 	Painted or engraved motif that is clearly made up of lines and/or other shapes that form a geometric or linear image, without a clear overall form.

TABLE 8 HISTORICAL INSCRIPTIONS SUBCLASS DESCRIPTIONS

Historical Inscriptions

Writing, dates and associated punctuation and lines or enclosing shapes that may only have been created by those with written language. Whilst this could include contact with people from Asia with written language there is yet to be any inscriptions recorded in the Kimberley other than those using English constructs.

Historical Inscription	Description
Composite Inscription 	An inscription that is composed of shapes, lines, letters and numbers to form a whole. For example, a name and a date would form a composite inscription, as would a name or number with a line below it or a box around it.
Initials 	Two or more Capital letters with or without a dot between them.
Numbers 	One or more numbers. Numbers can be separated by a dot or slanting line to form a date.
Names 	One or more complete names of a person or place.
Writing/Letters 	Letters that do not form any discernible overall inscription, for example a series of non-capitalised letters with spaces between that do not form any known or recognisable words or names, or single letters.

TABLE 9 OTHER SUBCLASS DESCRIPTIONS

Other

Motifs that appear to be figurative but are not recognisable as specific types of motifs in other figurative categories. These motifs have distinctive form, but what they are meant to be, represent, or interpreted to be is either unknown or moot.

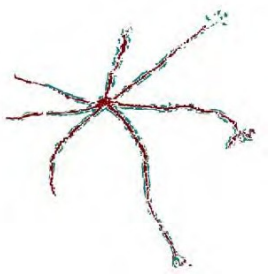
'Other'	Description
Starburst/Lightning 	A series of meandering lines, with multiple further shorter lines attached at the ends emanating from a central circle/oval. This motif is painted and is recorded in bichrome and monochrome in the study area.
Composite figure 	A figure made up of both geometric shapes and anthropomorphic parts.
Radiating lines forming oval shape 	Painted series of short lines formed into an oval shape, with no other discernible motif part.

TABLE 10 OTHER NON FIGURATIVE MARKINGS SUBCLASS DESCRIPTIONS

Other Non-Figurative	
Cultural, intentional marking of rock surfaces not elsewhere described such as cupules, finger flutings, grinding patches and deeply incised cut marks singly or in groups, or abraded grooves. Too non-specific to be recognisable or known as any specific type, form or style of motif.	
Other Non-Figurative	**Description**
Grinding Stone 	A stone used for grinding pigments or other materials. The stone is identified by the areas on it which show wear and/or residue that indicates that it has been ground against another material. This may include striations visible to the naked eye, or large areas on one or more sides which has been worn smooth and displays a varnished type of edge by grinding against another stone.
Grinding patch 	An identifiable area on a boulder or ledge that shows wear and/or residue that indicates that another stone has been ground against the surface. May contain remnants of pigment or other residue.
Cupules 	Small round indents on rock surfaces that have been shaped to resemble a small bowl or cup. These shapes appear singly and in groups, show smooth interiors that have been ground into the shape and in some cases contain residue from pigments in this study.
Abraded grooves 	Wide grooves on ledges and boulders that have been abraded to widen them from initially narrower lines. In comparison to incised lines which have a sharp narrow line, these are wide and have a rounded base, showing smoother interior surfaces, much like cupules. Abraded grooves are recorded both singly and in groups in this study, and mostly on front vertical surface of ledges.

Appendix 7

Database and Statistics

Database

For this study I developed a relational database using Microsoft Access. The following figures show the database layout and components. A large number of specific queries and cross- tabulations were developed in this database to provide both the statistical data reported, and to be exported to other programs for statistical and spatial analysis. This included recording details and developing data coding for the production of tables, graphs and statistical tests in Microsoft Excel, Microsoft Word and SPSS, overview maps and distribution and density maps in ArcGIS.

Layout and relationships in the Access Relational Database

The database contains many tables to ensure that as much data as possible is available for analysis. The main table in this database is the **Sites** table, from which all other relationships of data begin. Each site is individually characterised with a number of fields, but the Primary Key record (Site Table ID) is the record which makes it unique. This means it is not duplicated elsewhere and all of the information in that record is unique to that site.

As the main table, all relationships with other data (contained in other tables) is relative to the unique site record. In this database the **Sites** table has a one-to-many relationship with the **Image** table (motifs), from which other relationships are defined (Figure 1).

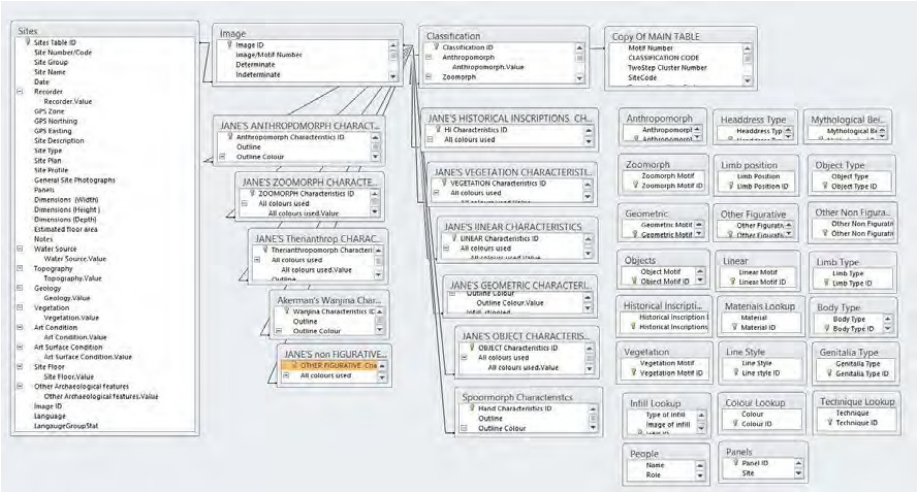


FIGURE 1 LAYOUT OF MICROSOFT ACCESS RELATIONAL DATABASE FOR THIS PROJECT.

Site to Motif Relationships

This shows a one-to-many relationship between each site and the motifs (Sites-Image) recorded at the site (Figure 2). The process is to duplicate the site record ID (Site Table ID), which is a Primary Key record in the site, as a variable record in the Image (motif) Table. This means that each motif will be directly related to the site at which it is recorded, and not to any other site.

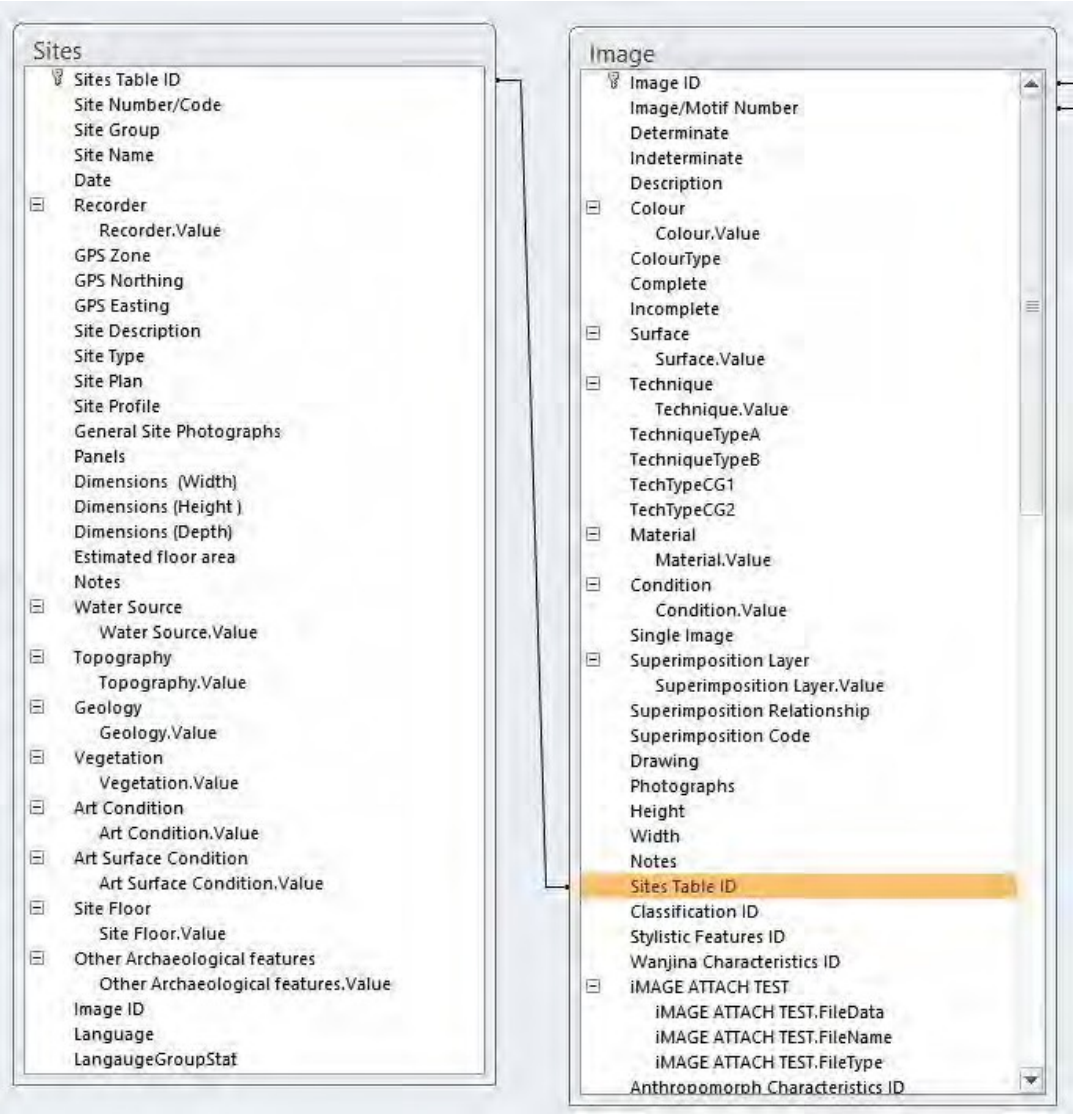


FIGURE 2 SITE RELATIONSHIP WITH THE MOTIFS (IMAGE TABLE).

Motif to classification relationships

Each motif recorded in the **Image** table has a relationship with a classification (Figure 3), as described in the Classification system in Chapter 4. This has been created as a one-to-many relationship to allow for more than a single classification for some conglomerate motifs, for example an anthropomorphic motif with boomerang in one hand and a stick or spear in another would be described as a single motif, but would be able to be classified as both an anthropomorph and as two items of material culture.

Note that the table for Classification contains terminology not used in the final classification structure, or in this thesis, as the database was developed at an early stage of data gathering and classification following the first field season in 2011. For translation purposes in this thesis the following applies.

- Mythological Beings. Not defined separately, as this applies to anthropomorphs and zoomorphs and therianthropes; those were identified by Traditional Owners as such beings.
- Landscape Features. No motifs recorded depicting this, so it is not in the classification structure.
- Vegetation. Changed to Phytomorphs for consistency in terminology.
- Objects. Changed to Material Culture in keeping with standard rock art use.
- Linear. Absorbed into Geometric as there was insufficient differentiation between the two as geometric type motifs.
- Spoormorph. Changed to Tracks for clarity and paucity of researchers usin the spoormorph terminology.

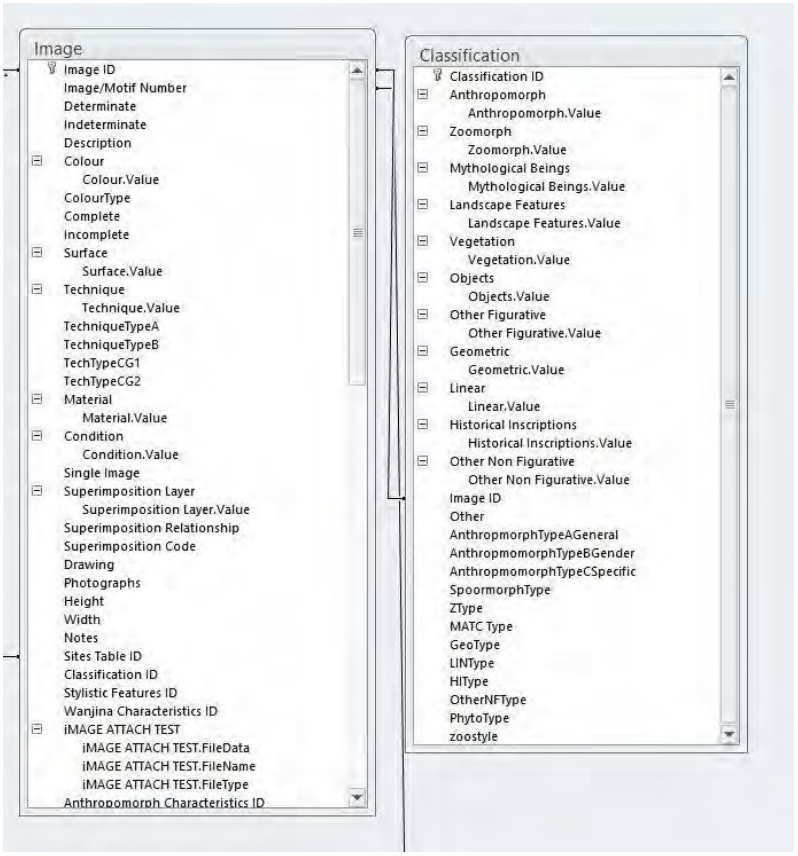


FIGURE 3 GRAPHIC SHOWING THE ONE-TO-MANY RELATIONSHIP BETWEEN THE MOTIF (IMAGE TABLE) AND THE CLASSIFICATION OF MOTIFS.

The individual characteristics of each motif were also recorded in this database, and that is shown in the one-to-many relationships between the Images table (motifs) and the range of tables shown on the left in Figure 4.

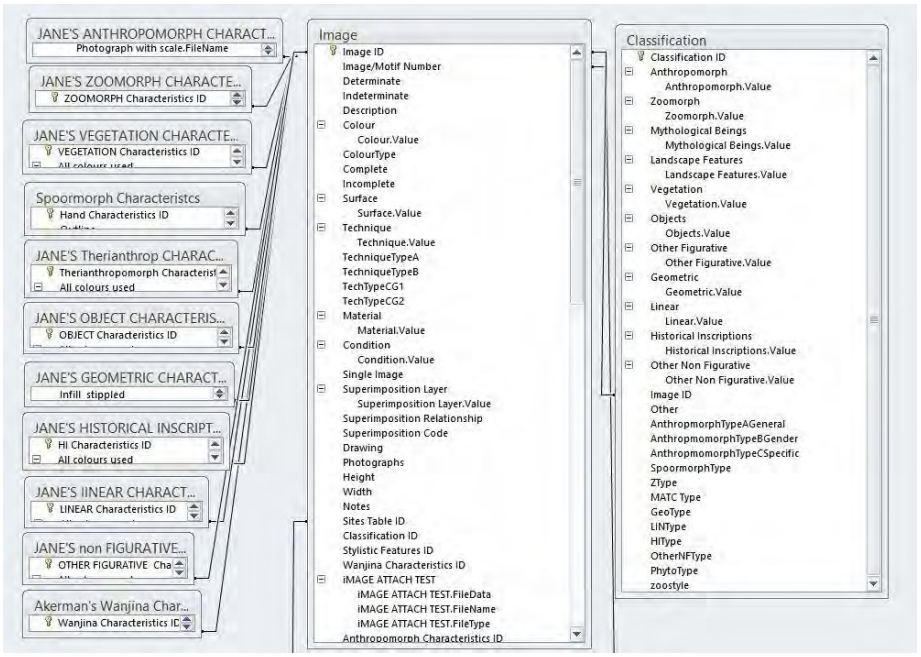


FIGURE 4 RELATIONSHIPS BETWEEN THE IMAGES TABLE AND INDIVIDUAL MOTIF CHARACTERISTICS BY CLASSIFICATION.

Other tables in the Database

As shown in Figure 1 there are a range of other tables in the database that do not have defined relationships to one another as indicated by the joining lines. These tables are all described as ‘Lookup’ tables, for the purposes of ensuring that the data uses predefined fields to ensure consistency in terminology and spelling, and to reduce data entry the error rate.

The tables mostly have a single Primary Key (e.g. Object ID) and a single field (Figure 5). Data is entered into the table, and the table is arranged such that it is easy to look up when entering data, in this case in alphabetical order (Figure 6).

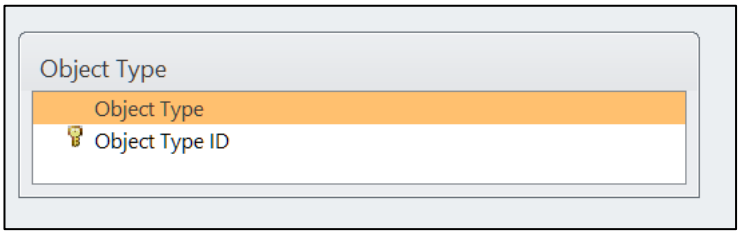


FIGURE 5 FIELDS IN THE OBJECT LOOKUP TABLE.

Object Motif	Object Motif ID
Axe	8
Bag	12
Boomerang	4
Ceremonial Implement	6
Club	11
Feather	9
Headdress	7
Other/not yet defined	10
Shell	2
Shield	5
Spear	1
Stick	3

FIGURE 6 EXCERPT FROM THE OBJECTS LOOKUP TABLE.

When the data is looked up for entry when creating new database records it appears as a drop down list, and the appropriate field is selected.

Database Coding

As described above with the different software used to undertake statistical and spatial analysis it was necessary to develop a coding system that was usable across different programs. Table 1 lists all of the codes (numbers in the left column next to each description) used in this study.

TABLE 1 CODING USED IN THE DATABASE IN THIS STUDY

TechniqueTypeA	
1	Painted
2	Drawn
3	Stencilled
4	Incised
5	Abraded
6	Pecked
7	Abraded & Incised
8	Pounded
9	Unclear
10	Painted & Stencilled
11	Painted & Drawn
12	Printed
13	Abraded & Pounded
14	Abraded & Scratched
15	Dotted & Painted
16	Dotted, Painted & Scratched
17	Incised& Pecked
18	Incised & Scratched
19	Painted & Scratched
20	Scratched
21	Dotted, Pained & Drawn
22	Painted & Pecked
23	Painted & Printed

SuperimpositionCode	
13	No Superimposition
1	Layer 1
2	Layer 2
3	Layer 3
4	Layer 4
5	Layer 5
6	Layer 6
7	Layer 7
8	Layer 8
9	Layer 9
10	Layer 10
11	Layer 11
12	Layer uncertain/unclear

TechniqueTypeB	
1	Single Technique
2	Two Techniques
3	Three or more Techniques
4	Technique not clear

TechTypeCG2	
1	Additive
2	Subtractive
3	Additive & Subtractive
4	Technique uncertain

WaterCode1	
1	Reliable
2	Ephemeral
3	Not Known

WaterCode2	
1	Freshwater River/Creek
2	Spring
3	Seepage
4	Not known

SurfaceCode	
1	Wall
2	Ceiling
3	Boulder
4	Ledge/Horizontal
5	Overhang
6	Multiple Surfaces
7	Portable Rocks

TechTypeCG1	
1	Painted
2	Drawn
3	Stencilled
4	Engraved
5	Two or more techniques
6	Technique not clear
7	Printed

Level2Classification	
1	Anthropomorph
2	Zooomorph
3	Tracks
4	Material Culture
5	Phytomorph
6	Geometric
8	Other Non Figurative
9	Other
10	Historical Inscriptions
11	*Anthropomorph with Material Culture*
12	*Indeterminate*

ZType	
1	Bird
2	Bush Turkey
3	Crab/Crustacean
4	Crocodile
5	Dingo
6	Eel
7	Emu
8	Fish
9	Flying Fox
10	Lizard
11	Frog
12	Insect
13	Macropod
14	Quadruped
15	Snake
16	Thylacine
17	Turtle

ZooStyle	
1	Solid Infill/No Outline
2	Solid Infill/Narrow-Medium Outline
3	Solid Infill/Wide Outline
4	Pattern Infill/No Outline
5	Pattern Infill/Narrow-Medium Outline
6	Pattern Infill/Wide Outline
8	No Infill/Outline
9	Waliarri 1 Style (Snake)

PhytoType	
1	Boab Nuts
2	Grass
3	Pod/s
4	Water Lily
5	Yam

MatCType	
1	Axe
2	Bag
3	Boomerang
4	Spear/Stick
5	Club
6	Headdress
7	Shield

AnthropomorphTypeAGeneral	
1	Anthropomorph
2	Therianthrope
3	Veganthrop
4	Body Part

AnthropomorphTypeBGender	
1	Female
2	Male
3	Non Gendered
4	Female & Male

AnthropomorphTypeCSpecific	
1	Waliarri Type 1
2	Waliarri Type 2
3	Mamo/Djuari
4	Outline
5	Round Bodied
6	Incomplete Anthropomorph
7	Long Bodied
8	Veganthrop
9	Unique
11	Therianthrope
12	Muscled Limbs
13	Narrow Bodied
14	Contact

ZooGen	
1	Macropod
2	Quadruped
3	Bird
4	Reptile
5	Fish
6	Amphibian
7	Insect
8	Other

SpoorType [Tracks]	
1	Human Hand
2	Quadruped
3	Bird
4	Human Feet
5	Macropod

GeoType	
1	Arc
2	Arc Variant
3	Composite Geometric
4	Concentric Circles
5	Ellipse
6	Grid
7	Incomplete/Unclear
8	Oval
9	Oval Variant
10	Rectangle
12	Circle Variant
13	Circle

HIType	
1	Composite Inscription
2	Initials
3	Numbers
4	Names
5	Writing/Letters

OtherNFType	
1	Abraded Grooves
2	Cupules
3	Cut marks/Incisions
4	Grinding Patch
5	Grinding Stone

Other	
1	Starburst/Lightning
2	Radiating lines forming oval shape
3	Composite Figure

ColourCode3 [Polychrome]	
1	Black + Red + White
2	Black + Red + White + Yellow
3	Other Polychrome Combinations
4	Monochrome
5	Bichrome
6	No Colour
Outline1	
1	Present
2	Absent
3	Stencil

Outline2	
1	Absent
2	Same colour as infill
3	Contrast colour to infill
4	Present + no infill

Infill	
1	Solid
2	None
3	Dots
4	Vertical lines in rows [VL]
5	Solid + Dots
6	Solid + VL
7	Vertical lines along length [VLL]
8	Solid + VLL
9	Horizontal lines across motif [HL]
10	Solid + HL
11	Solid + HL + VL
12	Solid + VL + Dots
13	VL + HL
14	Solid + HL + Dots

Colour Code2 [Bichrome]	
1	Black + White
2	Black + Red
3	Red + White
4	Orange + White
5	Other Bichrome Combinations
6	Monochrome
7	Polychrome
8	No Colour
ColourCode1 [Monochrome]	
1	Red
2	Black
3	White
4	Yellow
5	Mulberry
6	Grey
7	Orange
8	No Colour
9	Bichrome
10	Polychrome
ColourType	
1	Monochrome
2	Bichrome
3	Polychrome (3)
4	Polychrome (>3)
5	No Colour

Outline4 [colour]	
1	White
2	Black
3	Red
4	Orange
5	Yellow
6	No outline
7	Engraved
8	Mulberry
9	Colour not clear

InfillA	
1	Solid
2	None
3	Solid + Pattern
4	Pattern Only

>1 Foot	
1	Present
2	Absent
Eyes	
1	Present
2	Absent
Eyelashes	
1	Present
2	Absent

Genitalia	
1	Male
2	Female
3	None Present
4	Male + Female
5	Not applicable
AnthropomorphSizeCategories [Height]	
1	0-30 cm
2	31-60 cm
3	61-90 cm
4	91-120 cm
5	121-150 cm
6	151-180 cm
7	181-210 cm
8	>210 cm
9	No Scale/Not Measured
10	Not Anthropomorph

Nose	
1	Present
2	Absent

Arms	
1	Present
2	Absent
Hands	
1	Present
2	Absent
Fingers	
1	Present
2	Absent

Handedness [Hand Stencils, Prints & Outlines]	
1	Left
2	Right
3	Not Clear

Headdress	
1	Rays
2	Rays + Arc
3	Arc
4	Feather
5	>1 Feather
6	Cockatoo Feather
7	>1 Cockatoo Feather
8	Hairlike
9	Feather + Hairlike
10	Rays + Feathers
11	Rays + Feathers + Arc
12	Rays + Cockatoo Feathers
13	Rays + Cockatoo Feathers + Arc
14	Other Head Adornment
15	Arc + Feathers
16	Conical
17	Hat
18	None

Mouth	
1	Present
2	Absent

Internal Divisions	
1	Present
2	Absent

Legs	
1	Present
2	Absent

Foot	
1	Present
2	Absent

White painted background	
1	Present
2	Absent

Toes	
1	Present
2	Absent

Style V2	
AA-1	Small round bodied anthropomorphs in monochrome with no outline in groups of four or more
XA-1	Monochrome and bichrome anthropomorphs with solid infill with and without outlines
XA-2	Waliarri 2 type anthropomorphs and zoomorphs and therianthropes. Monochrome and bichrome Waliarri form with and without outlines without internal detail and contrasts
AA-2	Solid infill monochrome anthropomorphs with shaped or muscled limes with and without outlines
XE1	Polychrome and bichrome solid and pattern infill with and without outlines. Waliarri 1 style
N1	Bichrome solid/patterned with outline not elsewhere classified
AP-1	Water lilies
MT-1	Drawn hand outlines
WZ	Monochrome motifs not elsewhere classified
Q	Engraved not elsewhere classified
Style V Final	
1	Waliarri 1
2	Waliarri 2
3	Mamo/Djuari
4	Bichrome black solid infill with white outline
5	Monochrome outline only
6	Monochrome stencil
7	Engraved tracks
8	Abraded/scratched solid infill
9	Round bodied anthropomorphs in groups
10	Generic monochrome
11	Generic bichrome
12	Cupules, incisions and historical inscriptions not elsewhere allocated
13	No enough information to allocate to a style

Style V1	
A	Monochrome and solid infill with no outline
B	Bichrome and solid infill and no outline
C	Bichrome and solid infill and outline (except black and white)
D	Bichrome and solid infill (black) with white outline
E	Polychrome with solid and/or pattern infill and outline
F	Monochrome and pattern infill and outline
G	Monochrome and solid infill and outline
H	Monochrome and no infill and outline
I	Monochrome hand stencils
J	Engraved bird and macropod tracks
K	Bichrome and pattern infill and no outline
L	Bichrome and no infill and outline
M	Bichrome and solid and pattern infill and no outline
N	Polychrome nec
O	Monochrome and pattern infill and no outline
P	Stencils nec
Q	Cut marks and other engraved cultural marks nec
R	Engraved motifs nec
S	Bichrome and outline and pattern

Selected Frequency Tables

The following are samples of frequency tables developed in this study. All data was recorded in Microsoft Access, with tables and cross tabulations developed in that program. Additional tables and cross tabulations were developed in SPSS and Microsoft Excel, with all graphs and scatter plots created in Microsoft Excel. These are examples only of the types of data that was used in this study, and I will provide specific data on request for research purposes only, in consultation with Traditional Owners in the relevant country.

TABLE 2 DETERMINATE/INDETERMINATE MOTIFS BY SITE FOR BUNUBA AREA.

Site Name	Bunuba			
	Determinate		Indeterminate	
	Number of Motifs	Percent of site total	Number of motifs	Percent of site total
Bunuba Roadside Caves	9	53	8	47
Bunuba Roadside Caves	0	0	5	100
Bunuba Roadside Caves	7	47	8	53
Tangalma	145	90	17	10
Tangalma A	14	58	10	42
Langurmurru	78	76	25	24
Darrananna	30	56	24	44
Tarakalu 1	5	63	3	37
Tarakalu 2	13	81	3	19
Elimberrie Springs	168	62	104	38
Fairfield 1	38	49	39	51
Fairfield 2	69	62	43	38
Fairfield 3	29	54	22	46
Lillimooloora 1	7	33	14	67
Lillimooloora 2	23	85	4	15
Marawun 1	153	66	78	34
Marawun 4	93	62	57	38
Marawun 7-1	26	51	25	49
Marawun 7-2	1	100	0	0
Marawun 7-3	3	60	2	40
Mine Access Site 1	10	77	3	23
Mine Access Site 2	28	57	21	43
Mount Behn 1	446	72	170	28
Mount Behn 2	12	92	1	8
Mount Behn 3	1	100	0	0
Mount Behn 4	0	0	1	100
Stumpy's Soak 1	18	43	24	57
Tunnel Creek 1	16	84	3	16
Tunnel Creek 2	2	100	0	0
Tunnel Creek 3	12	71	5	29
Tunnel Creek 4	26	47	29	53
Tunnel Creek 5	26	55	21	45
Tunnel Creek 6	11	52	10	48
Djuru East	28	70	12	30
Djuru	25	54	21	46

TABLE 3 DETERMINATE/INDETERMINATE MOTIFS BY SITE FOR GOONIYANDI AREA

Site Name	Gooni			
	Determinate		Indeterminate	
	Number of Motifs	Percent of site of site total	Number of motifs	Percent
Emmanuel Gap 1	28	61	18	39
Emmanuel Gap 2	48	65	26	35
Emmanuel Gap 3	10	45	12	55
Emmanuel Gap 4	51	48	55	52
Emmanuel Gap 5	65	72	25	28
Louisa Downs Rockshelter	8	44	10	56
Moonggaroonggoo	85	58	61	42
Riwi	55	50	54	50

.

Cluster Analysis

TABLE 6 MOTIF TYPE BY CLUSTERS IDENTIFIED IN SPSS ANALYSIS

	C1	C2	C3	C4	C5	C6	C7	C8	Total
Anthropomorph	358	65	0	51	0	43	23	14	554
Zoomorph	369	55	0	49	1	77	29	38	618
Phytomorph	64	9	0	13	0	22	30	12	150
Tracks	34	8	253	9	88	1	0	0	393
Material Culture	11	12	7	2	0	8	0	2	42
Geometric	30	6	0	16	44	9	0	4	109
Historical Inscriptions	2	1	0	0	13	0	0	0	16
Other	3	1	0	4	0	5	0	1	14
Other Non-Figurative	1	6	1	0	17	0	0	0	25
Total	872	163	261	144	163	165	82	71	1921

TABLE 7 MOTIF SUBCLASSES (ANTHROPOMORPH, ZOOMORPH, PHYTOMORPH, TRACKS) BY CLUSTER

	C1	C2	C3	C4	C5	C6	C7	C8	Total
A1	0	22	0	1	0	3	12	4	42
A2	32	8	0	3	0	5	3	2	53
A3	43	9	0	4	0	10	1	1	68
A4	0	0	0	13	0	1	0	0	14
A5	91	0	0	2	0	1	0	0	94
A6	17	6	0	8	0	4	0	3	38
A7	59	3	0	2	0	3	0	0	67
A8	0	1	0	1	0	3	0	0	5
A9	70	8	0	13	0	7	3	1	102
A11	21	3	0	2	0	2	4	0	32
A12	10	3	0	1	0	1	0	1	16
A13	12	1	0	1	0	3	0	1	18
A14	3	1	0	0	0	0	0	1	5
A TOTAL	358	65	0	51	0	43	23	14	554
Z1	4	1	0	2	0	4	2	0	13
Z2	7	2	0	1	0	3	0	1	14
Z3	18	8	0	6	0	16	0	2	50
Z4	303	38	0	30	1	45	25	34	476
Z5	27	5	0	10	0	7	2	0	51
Z6	6	0	0	0	0	0	0	0	6
Z7	2	1	0	0	0	1	0	1	5
Z8	2	0	0	0	0	1	0	0	3
Z TOTAL	369	55	0	49	1	77	29	38	618
P1	19	0	0	1	0	1	1	0	22
P2	3	0	0	0	0	0	0	0	3
P3	1	0	0	0	0	0	0	0	1
P4	27	0	0	0	0	0	0	0	27
P5	14	9	0	12	0	21	29	12	97
P TOTAL	64	9	0	13	0	22	30	12	150
T1	24	8	252	9	1	0	0	0	294
T2	1	0	0	0	5	0	0	0	6
T3	3	0	0	0	67	1	0	0	71
T4	0	0	1	0	0	0	0	0	1
T5	6	0	0	0	15	0	0	0	21
T TOTAL	34	8	253	9	88	1	0	0	393
MC	11	12	7	2	0	8	0	2	42
G	30	6	0	16	44	9	0	4	109
HI	2	1	0	0	13	0	0	0	16
O	3	1	0	4	0	5	0	1	14
ONF	1	6	1	0	17	0	0	0	25

Selected Scatter Plots

Motifs by site size

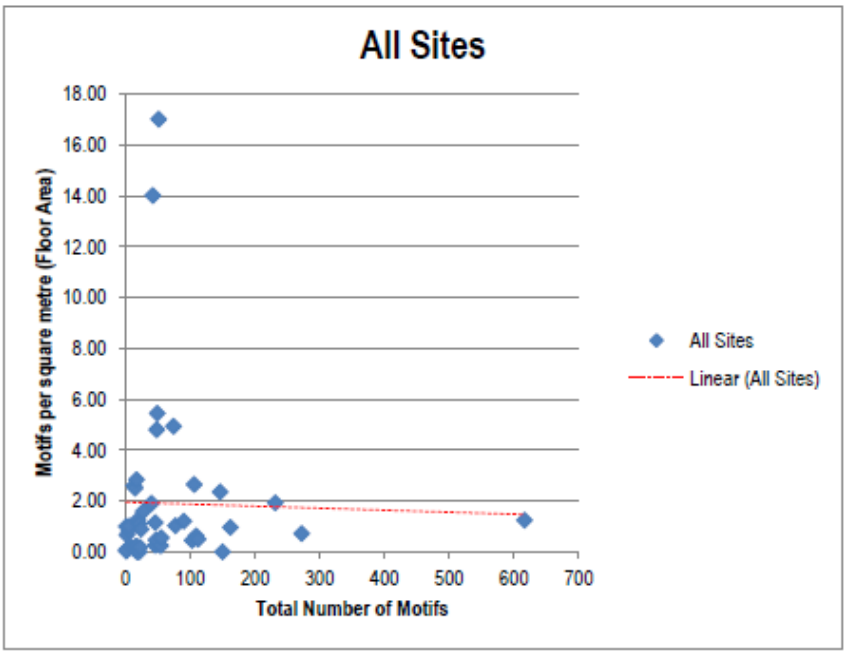


FIGURE 7 SCATTER PLOT OF FIGURES PER SQUARE METRE OF FLOOR AREA BY TOTAL NUMBER OF FIGURES, BY SITE.

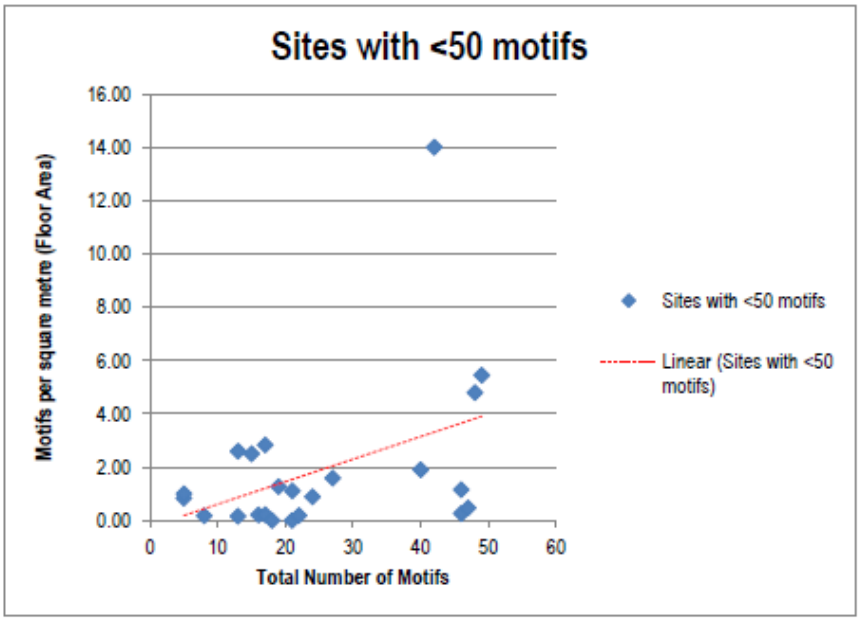


FIGURE 8 SCATTER PLOT OF FIGURES PER SQUARE METRE OF FLOOR AREA FOR SITES WITH MORE THAN 50 RECORDED FIGURES.

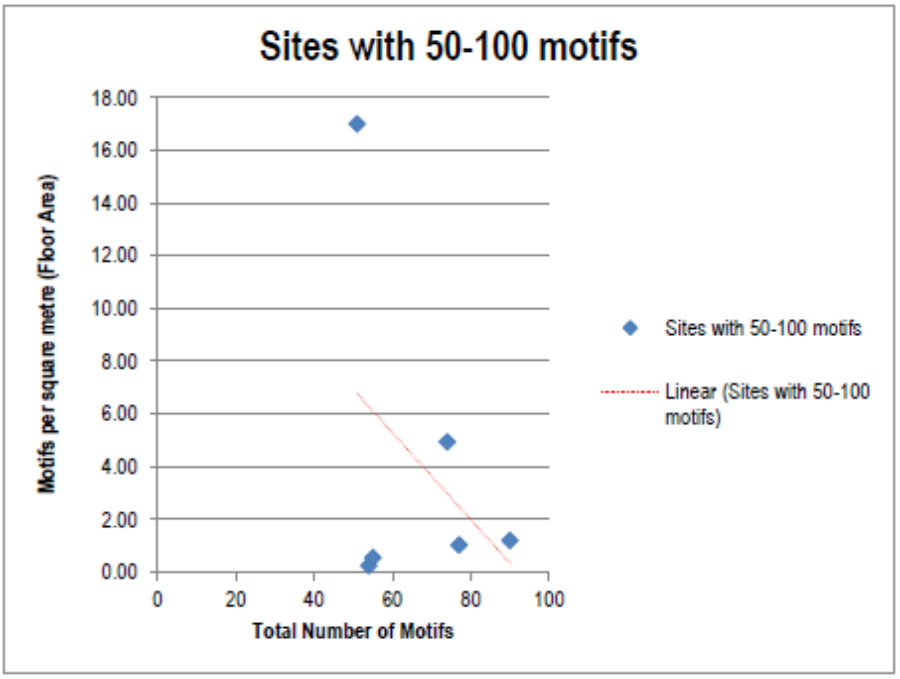


FIGURE 9 SCATTER PLOT OF FIGURES PER SQUARE METRE OF FLOOR AREA FOR SITES WITH BETWEEN 50 AND 100 RECORDED FIGURES

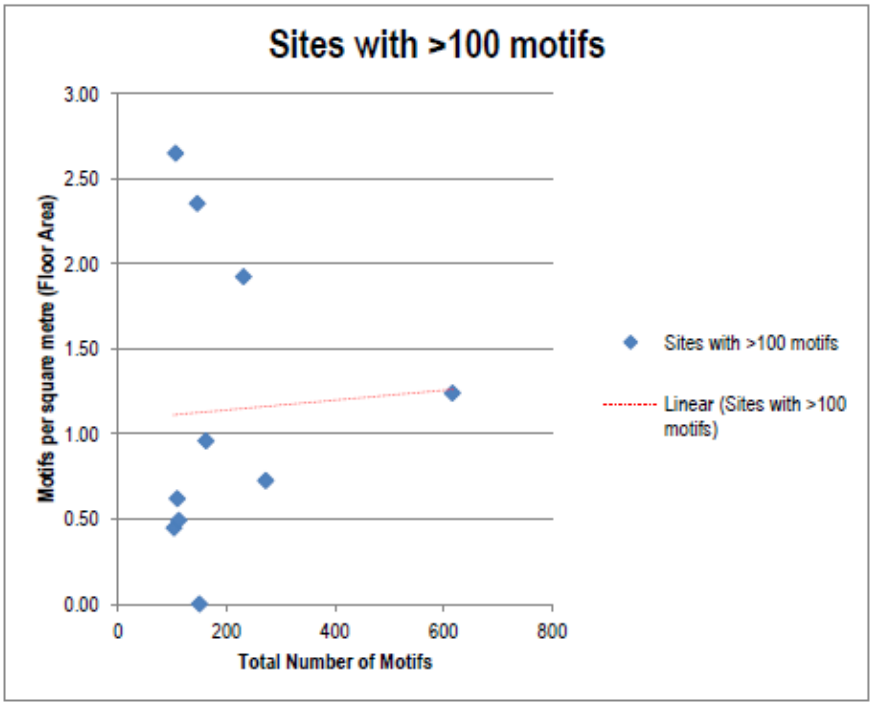


FIGURE 10 SCATTER PLOT OF FIGURES PER SQUARE METRE OF FLOOR AREA FOR SITES WITH MORE THAN 100 RECORDED FIGURES

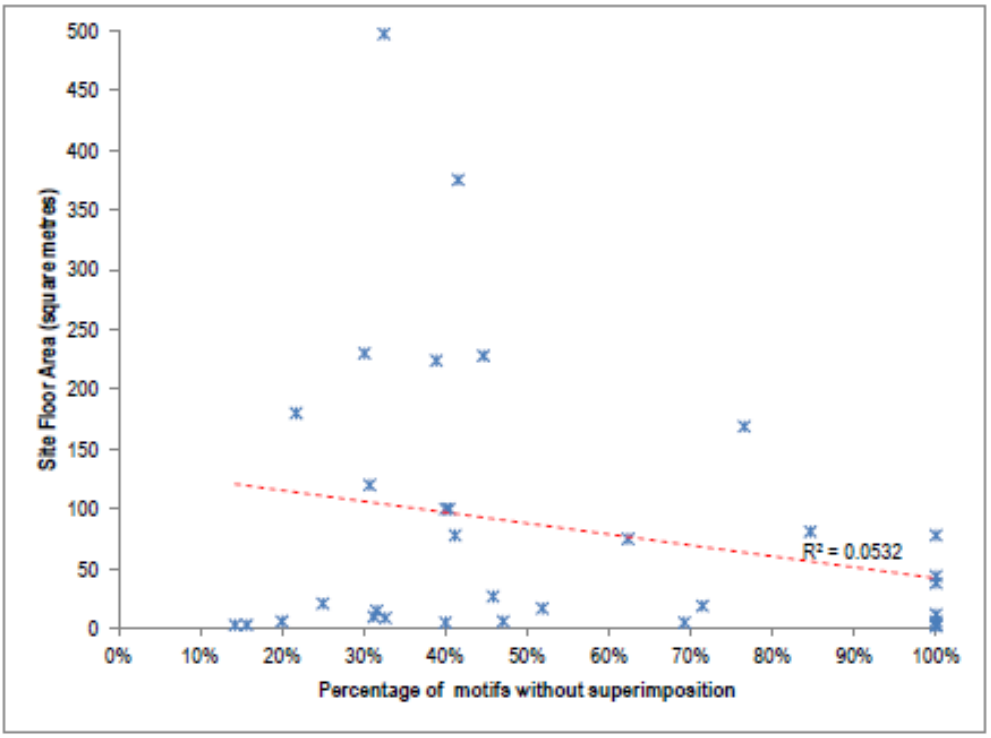


FIGURE 11 SCATTER PLOT FOR FIGURES PER SQUARE METRE OF FLOOR SPACE FOR ALL SITES IN BUNUBA COUNTRY BY PERENTAGE OF FIGURES WITHOUT SUPERIMPOSITION.

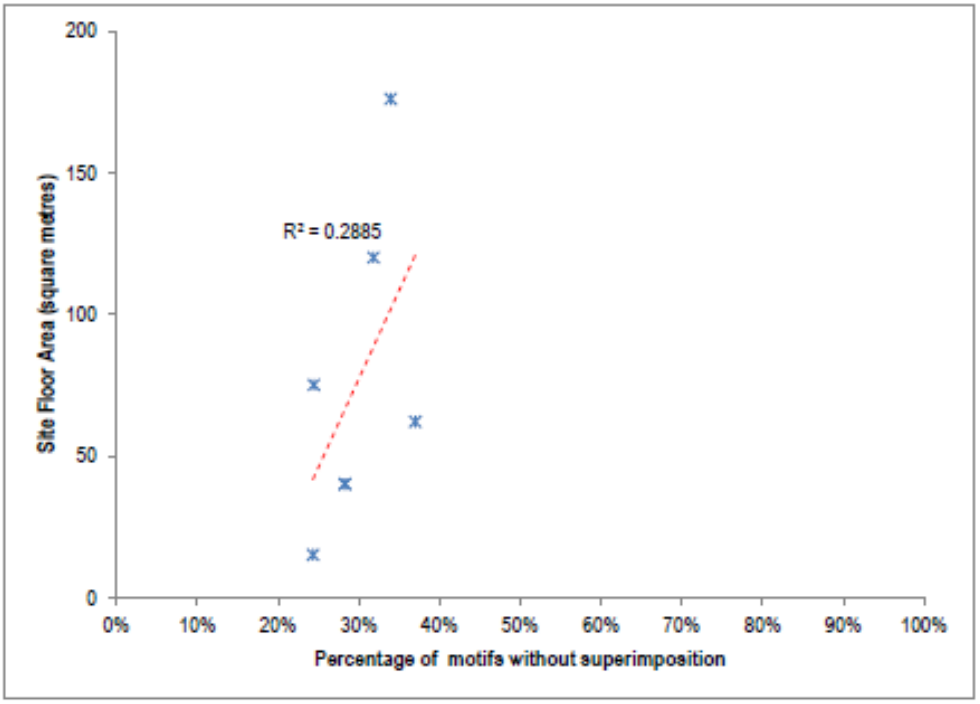


FIGURE 12 SCATTER PLOT FOR FIGURES PER SQUARE METRE OF FLOOR SPACE FOR ALL SITES IN GOONIYANDI COUNTRY BY PERENTAGE OF FIGURES WITHOUT SUPERIMPOSITION.

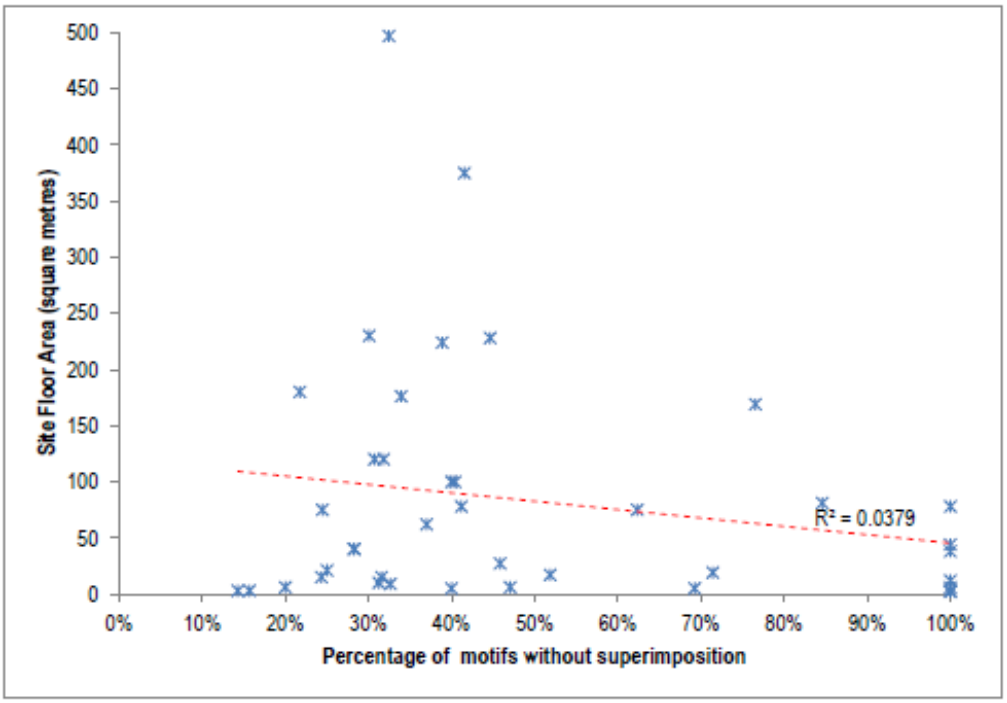


FIGURE 13 SCATTER PLOT FOR FIGURES PER SQUARE METRE OF FLOOR SPACE FOR ALL SITES IN THE STUDY AREA BY PERENTAGE OF FIGURES WITHOUT SUPERIMPOSITION.

Superimposition Correlations

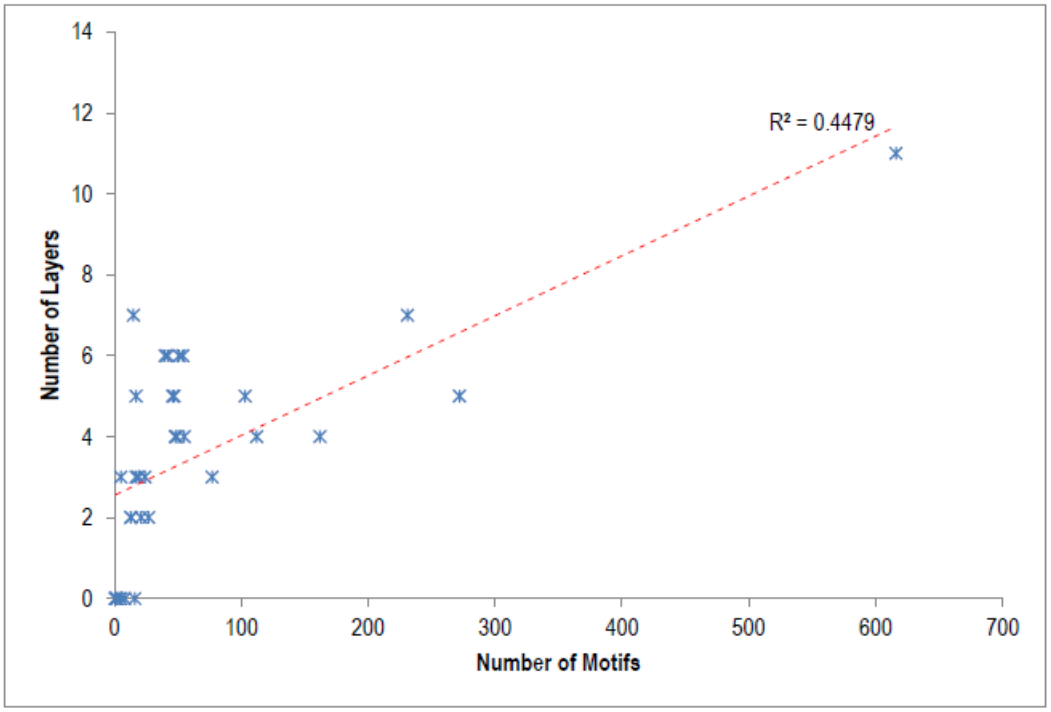


FIGURE 14 NUMBER OF FIGURES RECORDED AT SITE BY NUMBER OF LAYERS OF SUPERIMPOSITION IN BUNUBA COUNTRY.

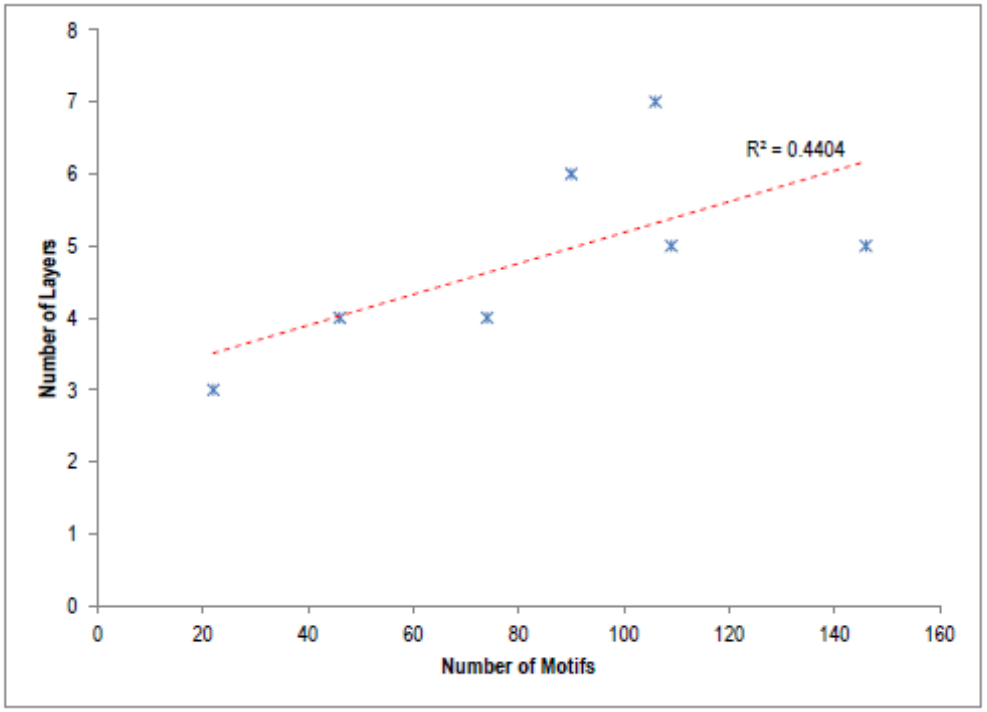


FIGURE 15 NUMBER OF FIGURES RECORDED AT SITE BY NUMBER OF LAYERS OF SUPERIMPOSITION IN GOONIYANDI COUNTRY.

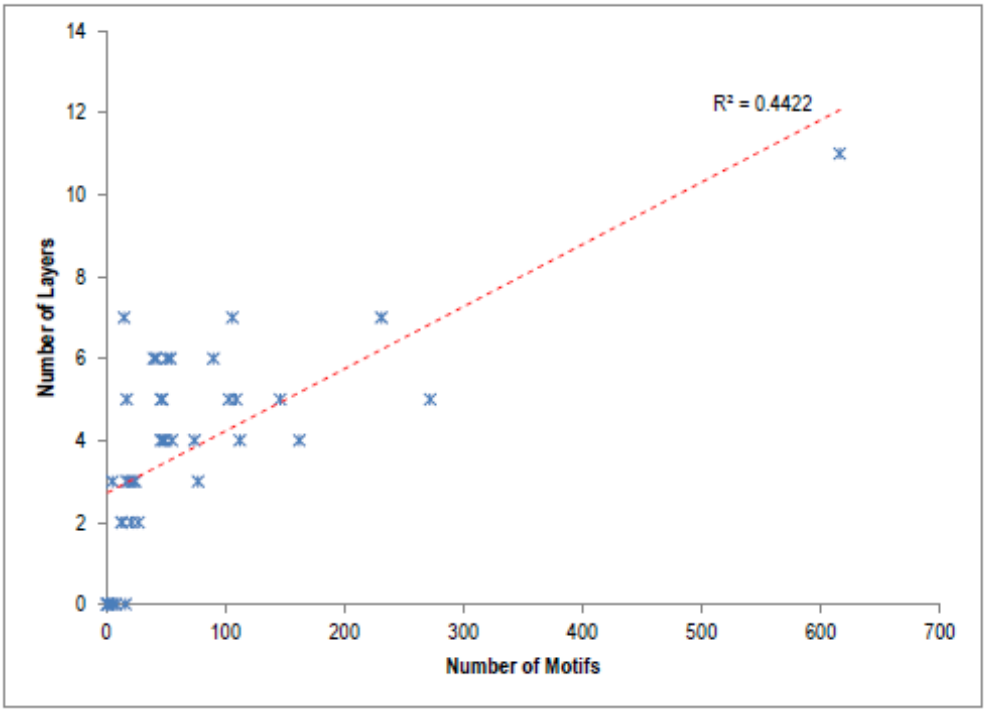


FIGURE 16 NUMBER OF FIGURES RECORDED AT SITE BY NUMBER OF LAYERS OF SUPERIMPOSITION IN THE STUDY AREA.

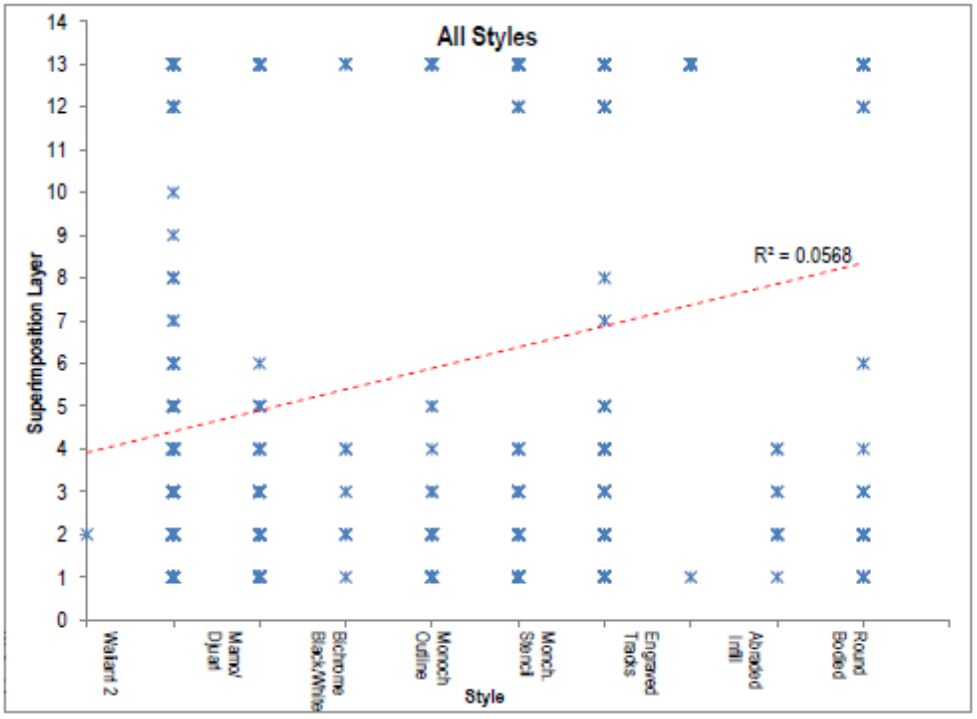


FIGURE 17 SCATTER PLOT FOR FIGURES PER SQUARE METRE OF FLOOR SPACE FOR ALL STYLES AT ALL SITES.

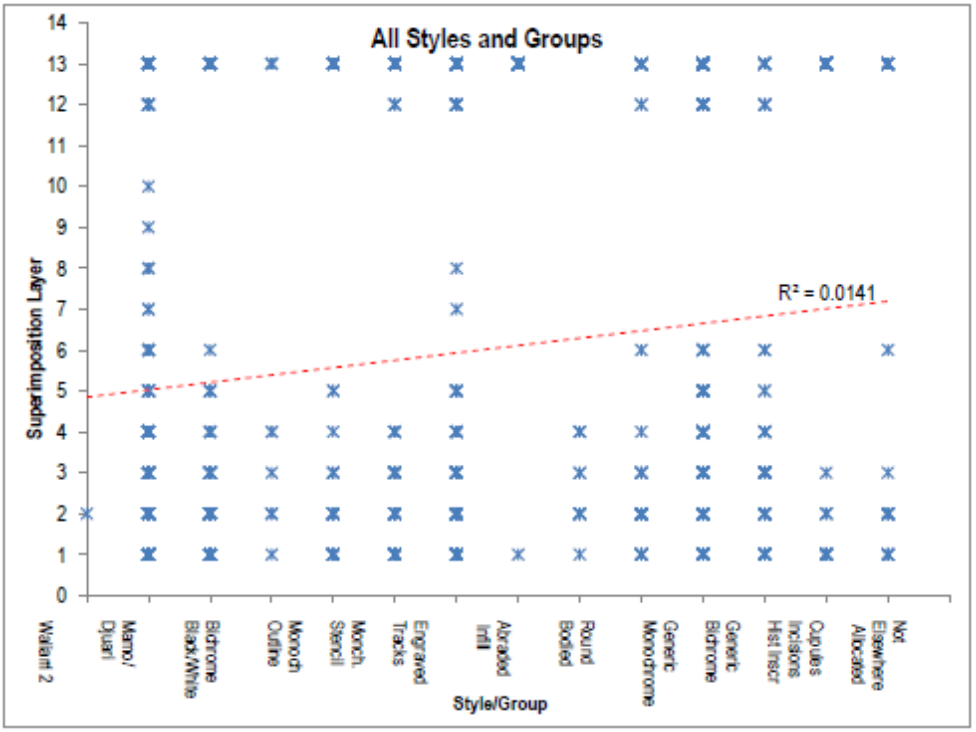


FIGURE 18 SCATTER PLOT FOR FIGURES PER SQUARE METRE OF FLOOR SPACE FOR ALL STYLES AND BRAOD GROUPS AT ALL SITES.

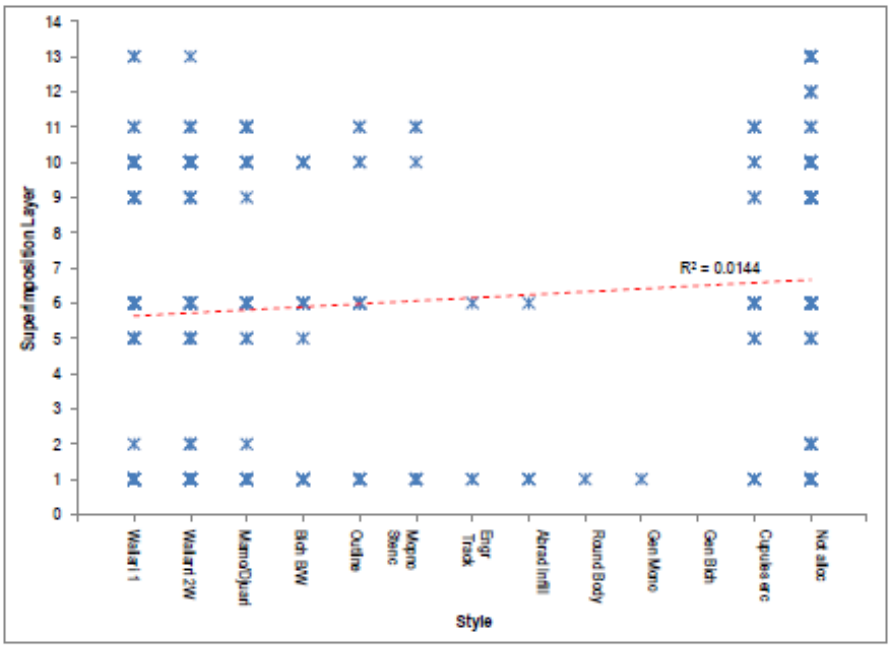


FIGURE 19 SCATTER PLOT OF SUPERIMPOSITION LAYERS AND STYLES/BRAOD GROUPS FOR ALL DETERMINATE FIGURES, MOUNT BEHN 1..

Appendix 8

Selected Kimberley Stories

Wanjina Stories

These stories are an illustration of the different experiences of the Wanjina and related anthropomorphic motifs found in shelters and caves in the Kimberley, Western Australia. They show the different roles that the Wanjina have in the spiritual beliefs of the 36 or more cultural groups in the region (see Tindale 2009). Note that there are different spellings for Wanjina, and there are different names for this umbrella term across the Kimberley.

The legend of Wodjin

Two children were playing with the bird Tumbi – they thought it was a honeysucker but it was really the owl. They did not see the difference in the eyes and they though the bird was not important.

The children maimed the bird, pulling all the feathers from his tail and head, pushing grass through his nose and blinded him. Then they mocked the bird, throwing him into the air, telling him to fly – but he could not and fell back to the earth. Then he did fly and disappeared: the boys did not know where he had gone and they did not worry about it.

Now Tumbi was not just an ordinary bird – he was the owl, the son of a Wandjina, and when he disappeared he went up to Inanunga the Wandjina in the sky and to him he complained.

The news flew to the Wandjinas who determined to punish the people. Wodjin called all the Wandjinas throughout the country together, and the bird incited them to revenge.

The Wandjinas assembled their followers – from Munja and the Calder they came, camping from time to time, fixing their spears for the fight. However, they did not know where to find the people, and the lizards and animals which they sent to scout around for them refused to tell where the people were. The animals were sorry for the people, and tried to hide them, knowing that the Wandjinas would kill them. But Wodjin produced the bicycle lizard from his penis, and the lizard saw the people and beckoned the Wandjinas on.

The Wandjinas saw the people on a wide flat near the spring at Tunbai. The Wandjinas were on the top of one of the hills which surround this flat.

They then held an initiation ceremony circumcising and subincising themselves, Wodjin saying: 'I want to be light so that I can catch p with those people if they run away.'Wodjin, however, became ill from this cutting ceremony, swelling up so that he was unable to take further part in the fight. However, he was able to bring heavy rain by stroking his beard, so that the flat was flooded.

The Wandjinas divided into two parties and attacked in a pincer movement from the top of the hill and surrounded the people. Meanwhile the Brolgas had been dancing on the wet ground and had turned it into a bog and the Wandjinas drove the people into the boggy ground where they drowned. The people tried to fight back, but they were unable to harm the Wandjinas and so they were killed.

The two boys who had harmed the bird escaped from the massacre by running away, but when the Wandjinas realised that they were gone, they set off after them. The boys were very frightened by the fight, the rain and the lightning, and when they saw a large boab tree with a split in it, they decided to hide inside. But the tree was really a Wandjina and no sooner were the boys inside than it closed on them and crushed them.

The Wandjinas had achieved their aim and revenged the injuries done to the owl. Now they met to decide their future movements. Wodjin moved to a cave, but in the process, he slipped and injured his foot. So he named the cave Wanalirri and decided that he would stay there. The others decided to go to different places, and so the Wanjinas dispersed (Crawford 1968:39-40).

The same stories are related by other authors (transcribed in Akerman 2014:Appendix 5), and there are similar stories of the battle related by Collier Bangmorra, Jack Wera and George Jomari, all from the west Kimberley, in Layton's (1992:41) synthesis, some with different details such as the Wanjina painting themselves with white paint, and one Wanjina plucking his whiskers to throw into the sky to make clouds that would bring the rain or that the spearing of the Wanjina in the fight released the water that caused the floods.

Wadana (an adolescent Wanjina)

The following story was told at Karendjin in the central Kimberley.

That little boy was playing around here, and his mother hid that Wandjina's food. He thought that it was not eaten but she had some white ants which she

left for him. When he came back from playing, he said:

'Mother, where the food, that meat?'

'Nothing" she replied.

'No, where's that food that I found here?'

He looked around everywhere, and he broke all the barks while he was looking – he did not find anything, but he broke everything. He tried the white ants, but he threw it away saying"

'That's no good! This is rubbish white ants!'

And he cried, and he cried, but nobody comforted him. So he said:

'This is my homeland – I'll leave you,' and he went down towards the west (Crawford 1968:52-53).

The story further tells the tale of how the young Wanjina travelled to the west, and left a stone arrangement that represents the mucus from a cold he caught. As he went further west he met women who fed him on fish and crocodiles they had caught, and later had an accident where he lost his testicles which are said to be at Geike Gorge in the south central Kimberley.

Bunggumunda and the Owl

Two Wandjinas left Tunbai chasing the grey owl for they wanted to keep the bird for themselves. The bird, however, kept flying along just out of reach. The Wandjinas chased the bird all around the Kimberley, but they could not quite catch it.

At this place another Wanjina, Bunggudmana, met the bird flying along and he grabbed it. The two Wandjinas, still chasing the bird came along and met him, saying:

'We are looing for the owl.'

'He's here – but he's mine.' Replied Bunggudmana, 'I can't give him back to you.'

'Never mind,' said the Wandjinas, 'You can have the bird. We are tired and will stay here now.'

The Wandjinas lay down, and they were so tired that they could hardly make the cave and that is why it is such a small one (related by Worora man Sam Woolagoodjah in Crawford 1968:49).

Sea Wanjinas

Namarali was chasing the rock cod, but he could not catch her for she kept slipping through his hands. From this corner to that corner, all around he was chasing her at the place called Langgi. He chased her into the eastern corner when his group met another group of Wandjinas. His people told him:

'They are fighting – they've taken your wife!'

Then he went into the fight and with all the strength he had, he belted the whole lot with his club. He knocked the lot down, but they put a spear into his side them.

The mob looked at him saying:

'Hello – he got speared! He's speared in a fatal place – he will die.'

Everybody cried for him then.

His group carried him away, made the tree platform where his grave is and painted him on the rocks. The people must use the burial platform because the

Wandjina used it: that fellow made the law for the dead bodies (recounted by Sam Woolagoodjah in Crawford 1968:55-56).

The Kaiara

All these Kaiaras are from the salt water – only the whirlwind was chucking them onto the mainland: the whirlwind was coming bringing the big sea, that how the Kaiara came to the land … (cited from a guide in Crawford 1968:69).

The legend tells that the Kaiara were brought to land from the north by the whirlwind. They landed at Rocky Cove and spread from there, hiding in the caves, for they, like the Aborigines, were afraid of the whirlwind. A small group hid at Chalangdal, and there they remained. Now they can bring the lightning by blinking their eyes (Crawford 1968:70).

According to legend the Wanjina made the land, and the sea and the animals who are on and in it.

Namaaraalee

The first ones lived, those of long ago.

They were the Wandjinas like this one here, Namaaraalee. The first ones, those days, shifted from place to place.

In the Dreamtime before the floods came, bird Wandjinas, crab Wandjinas carried the big rocks.

They threw them into the deep water. They piled them on the land (Sam Woolagoodja 1975, cited in Akerman 2014).

Gwion Gwion Stories

The Gwion Gwion or similarly described, variously named, motifs are not recorded in the Bunuba or Gooniyandi Country, but their neighbours to the north and north-west have many in caves and rockshelters. This is one of the rock art motifs described as an iconic Kimberley motif, along with the Wanjina, and stories of how they were created are as important as the stories of the Wanjina.

The Legend of Koion

> *The Aborigines at Kalumbaru said that the paintings were not the work of man, but were done by a small bird (Bramba-Bramba) which lives among the rocks. When the bird sees men or bush spirits, it hits its long curved beak on the rocks until it bleeds, and then paints the pictures with its blood. Sometimes it pulls a feather from its tail to use as a quill. According to another version, the bush spirits (Koion or Djimi) see the men and spirits and ask the bird to paint the sight for them* (Crawford 1968:85).

Stories of other anthropomorphic figures

The Kakadja

> *Kakadja goes around in the night, and he stands up and waits around to see if any children make noise. He waits for the children and when they cry, Kakadja grabs them. Then he takes them away, up into the mountain and Miminja gets the pounding stone and she pounces on their heads, cracks their heads open and licks their brains out. Kakadja has a penis, as long thin like a rope, and that is what he used to tie the children with and then he would take them to Miminja, his mother.*
>
> *That is how our mothers used to make us quiet: 'Kakadja might get you!' they used to tell us and we did not cry – we knew about Kakadja. And when any of those children cried, a lot of people would come and stop him. Everybody used to sing out from the camp 'Kakadja might get him!'*
>
> *Some children used to get very weak, and if they wanted food from anybody, they used to load around and would eat anything. They were sick. Well, the people believed that Kakadja had got them*(related by Worora man Albert

Barunga in Crawford 1968:92).

Warulu

> *According to Albert Barunga [Worora man], the Warulu are happy people who live in the rocky areas and spend most of their time dancing and singing. When they defecate they make yams* (Crawford 1968:94).

The Warulu have some elements in common with Waliarri 2 (Simple) figures, including the rayed headdress and facial features. The bodies and pattern infill are different and the legs are variable, with the examples in Crawford (1968:95) showing less definition of limbs than observed in Wanjina and Waliarri where limbs are present.

Munbunu the Arkula

The Arkula is one of many evil spirits that are painted or have become paintings on the walls of caves. They are not the evil spirits of the Bunuba and Gooniyandi people, but of nearby areas and serve to illustrate how the spirits appear in the rock art of the greater Kimberley region. This is the story of one.

> *Munbunu was an Arkula or Jangumara – an evil spirit. He carried a net or web (puyu) with which he enmeshed people who had become vulnerable when they broke their tribal laws. At his joints – elbows, shoulders and knees grew the poisonous fruits called Punkoy. This fruit which also eats has made him bitter, and with them he*
>
> *'shoots' his victims embittering them against other people. His hands and feet are equipped with wanti – talons with which he hooks up people. Wanti is also the name of a sharp-spined, prickly bush. Seen beside the Akula is his killing stick muntu – this is thrust, via the ears of his victims into their brains, driving them mad.*
>
> *When Munbunu travels his genitals – katu – hit the earth with a shocking crash (palpunam) of forked lightning - jantat. The lightning represents the raw, red, flesh of Numbunu's subincised urethra. As he moves about he brings darkness (ningimintama), accompanied by an atmosphere of dread and impending doom.*
>
> *Munbunu was very evil. He once went to an extremely rugged area to gather pinju (wild figs) that grew in abundance there. He gathered a large mound of fruit, which he heaped into piles at the edge of a steep cliff. He then made a*

smoke signal to bring other people to him.

People in the bush saw his smokes and called out "Warika! Warika!" – "A stranger! A stranger!" They sent out scouts to seek him. Munbunu met the scouts and invited them to bring their kinsfolk to share his fruit. The scouts returned to their clans and told them of the harvest and the intended feast. All of them decided to go and eat the pinju.

To get to the cliff top Munbunu had cut a nyuntu (ladder made from a forked tree) – and up this all the people scrambled, men, women, children and old people – everyone wished to partake of the figs. While they gorged on the fruit, the people failed to see that Munbunu had climber down the nyutu and had removed it.

After knocking the ladder away Nubunu sat a little way away from the cliff face and commenced singing.

Mari mungkala kunuwan nungu Wira mungkala kunuwan nungu. An ugly place, you might fall.

A cliffy/steep place, you might fall.

That is, the folk are in a high and dangerous place and at risk of falling.

Over and over Munbunu chanted his song. Finally the fruit had all been eaten and the people became aware that the ladder had been removed. They realised the treachery of the evil spirit Munbunu. They beseeched him to help them climb down the steep cliff face, but to no avail. They then tried to climb down unaided, but all finally slipped and fell to be dashed on the rocks below. Louder and louder rose Munbunu's chanting, keeping the wailing of the wounded and dying folk from his ears. Finally all his guests were dead.

On another occasion, Munbunu heard the wailing of a mourning burial party as they took the bones of a dead man to his Wanjina cave. The dead man had been a favourite of the tribe and the people were bemoaning the loss of his presence from their company. Munbunu tried to catch up to the party in order to accompany them to the cave but night fell and he took shelter in another cave.

In the cave he transformed himself into a painting.

The cave where this transformation occurred is on the Hunter River and is

named after the Arkula – it is called Munbunu (Akerman 2014:168-169).

Stories of Places and Things

Yilimbirri (Elimberrie Springs)

Two dogs looked after an old blind man. The brought him water and gave it to him in the shell of a boab nut. One of the dogs went hunting and brought back a kangaroo, then tore up the meat and gave it to him. The blind man ate it all.

The two dogs took him into the shade. They led him inside a cave, where he stayed. One of the dogs brought water for him and the other went hunting for game and brought back meat for him.

After that the two dogs forgot about the old man, and he died there. They came back and buried him and then they both sat down there.

The place where the dogs dug the ground is called Yilimbirri. The old man can still be seen sitting there, where the dogs left him. The two of them buried him and afterwards they left that place for good. Those two Dreamtime dogs can still be seen standing there (Molly Jalakbiya in Chingul et al. 1988: 18-20).

Wanggu (yam)

We used to tend those native yams. We grew up on yams, as well as gulumangu[1], bush plums and boab nuts. We lived on those foods when we were kids. We'd never seen flour or sugar or tea.

[1.] *A yellow bush fruit that grows on a tree. Species not identified* (Molly Jalakbiya in Chungul et al. 1988: 38).

Wajarri (boab nut)

People used to go and collect boab nuts. They picked them when the nuts were still green, efore they got ripe. We grew up on them. People put them into ground ovens and baked them. When the nuts were cooked they took them out of the fire and laid them on buches of green leaves until they were cool. After that they would lay out the food and feed the children.

When the nuts were dry they fell down from the trees. People used ot collect them and put them into a coolamon. They'd crack open the nuts and throw

away the shell, keeping only the white pith. They ground the pith on a flat stone, then they pounded it up and mixed it with water. They added honey to it. They used sugarbag from the tree – not the yellow pollen, only the sweet, clear honey. They'd mix some clear honey with the wet pith to make it sweet and then they's eat it (Chungul et al. 1988: 39-41).

Appendix 9

Kimberley Chronologies

Introduction

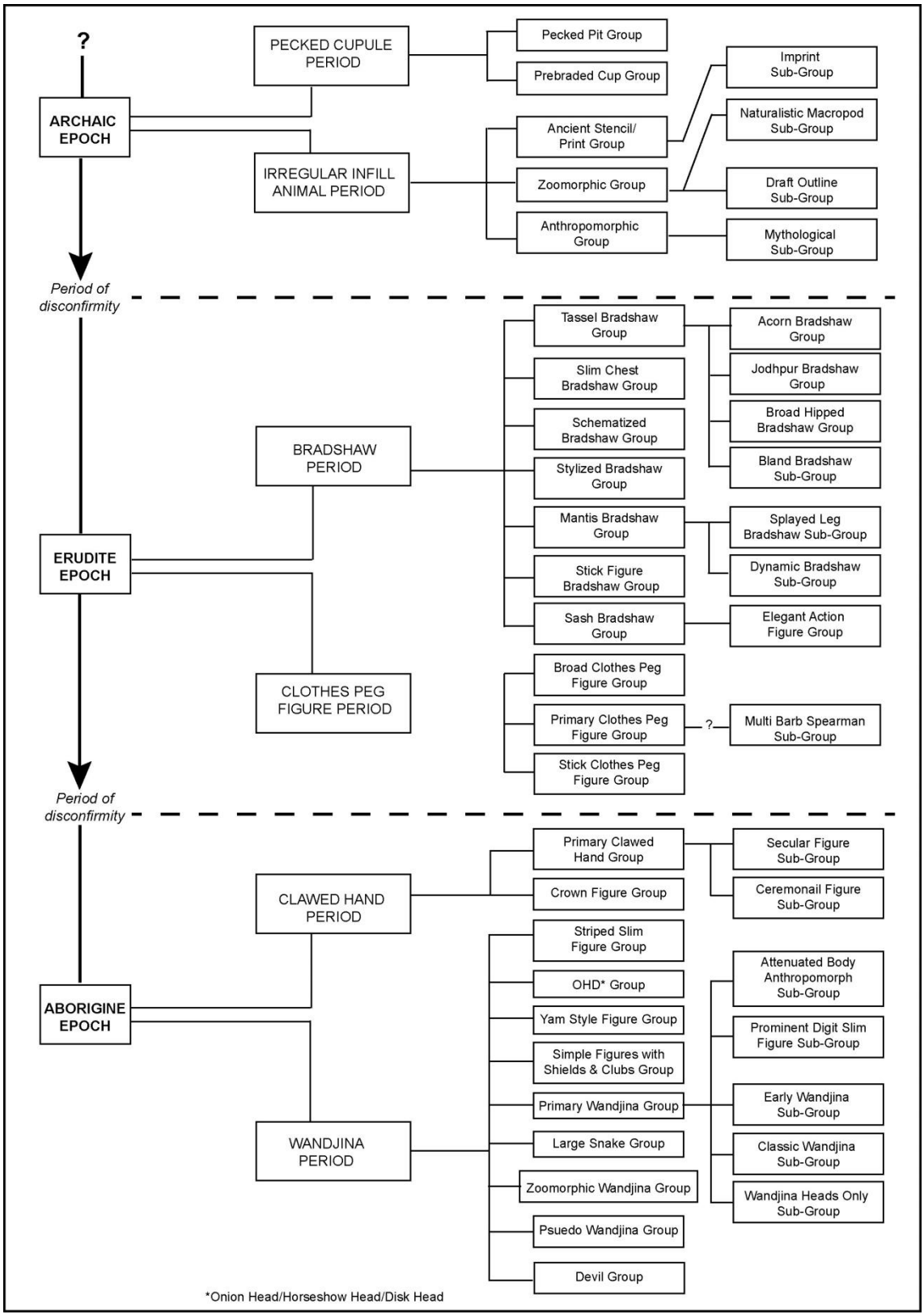
This appendix provides a snapshot of proposed chronologies for the Kimberley region, Western Australia referred to in this thesis. My thanks to all the authors and those who look after their legacies, for providing me these materials and advance prints. The Kimberley Chronology presented in the text is an amalgamation of these chronologies and Veth et al. 2021.

David Welch Kimberley Chronology

This was developed over a number of years, and is a refinement of Welch's (1993) earlier chronologies.

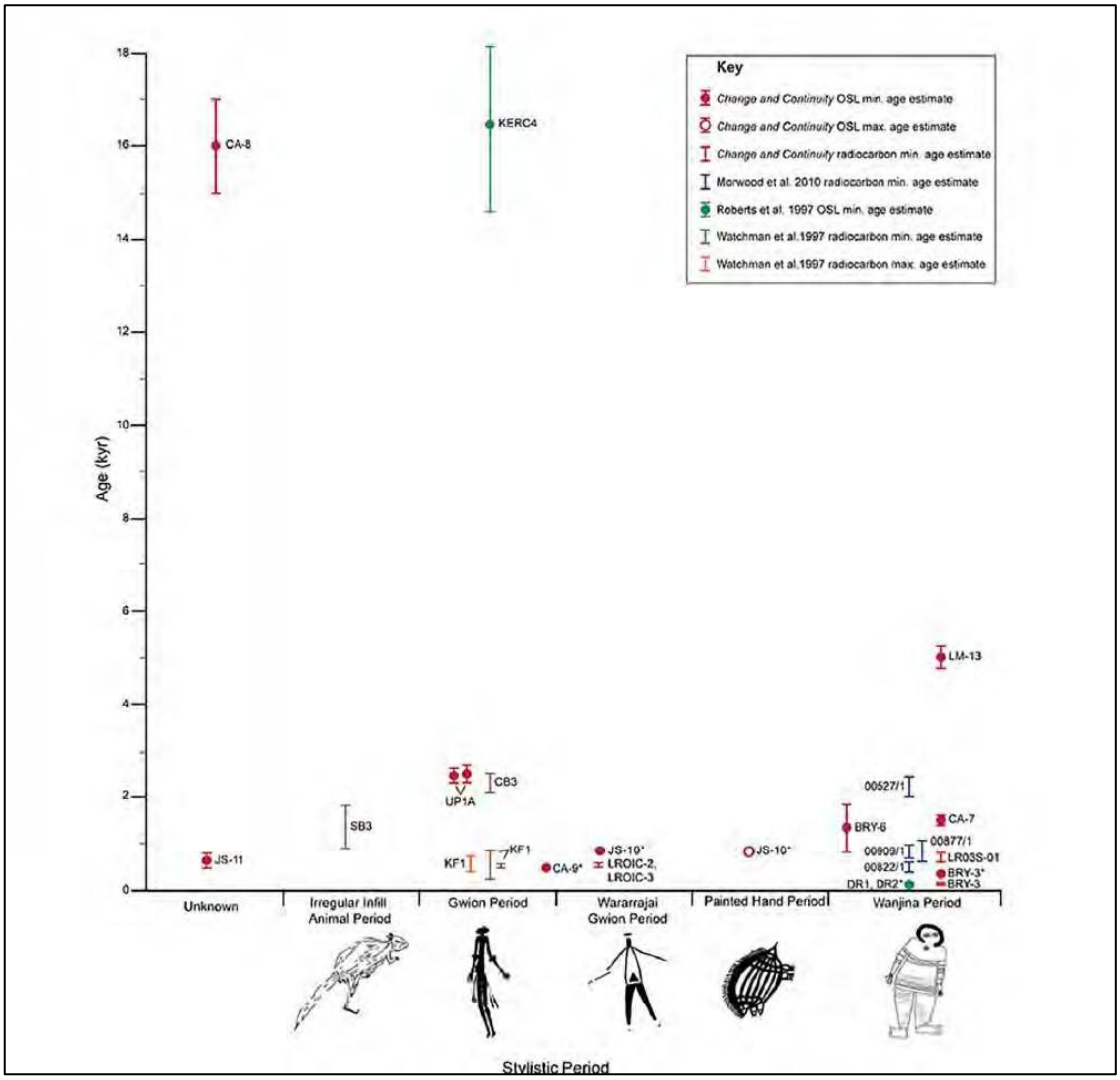
Source: Welch 2016. Included with the kind permission of David Welch.

Grahame Walsh Kimberley Chronology



Source: Walsh 1994: 18. Included with the kind permission of the Bradshaw Foundation

Ross, Westaway, Travers, Morwood and Hayward's Kimberley Chronology



Source: Ross et al. 2016:29. This is an open access publication and covered by Creative Commons 4.0. I have added this to the citation as 'This publication is Open Access and shared under Creative Commons CC by 4.0 https://creativecommons.org/licenses/by/4.0/'

Veth's Comparison of Chronologies

Welch	Walsh	Donaldson	Veth	Examples
			Cupules, markings, geometric motifs	
Archaic Period	Irregular Animal Infill	Irregular Animal Infill	Naturalistic Irregular Infill	
Tasselled Figures	Tassel Bradshaws	Mambi Gwion	Gracile Human Solid Infill	
Bent Knee Figures	Sash Bradshaws	Yowna Gwion	Gracile Human Solid Infill	
Dynamic Figures	Elegant Action Figures	Dynamic Gwion	Dynamic Human Linear	
Straight Part Figures	Clothes Peg Figures	Wararrajai Figures	Static Human Solid Infill	
Painted Hands	Clawed hand	Painted Hands	Abstract Compartment Infill	
Wandjina	Wandjina	*Wanjina*	*Wanjina*	

Source: Veth 2013: Slide 10. Provided courtesy of Peter Veth 2014.

Veth's Proposed Kimberley Chronology 2013

Phase	Years BP **Art Phase**	**A NEW MODEL FOR 'SWITCHING' IN ART** **A Long Chronology for the art which is testable**
	50,000 – 40,000 ***Rock Markings*** **Cupules + iconic art**	Carpenter's Gap, Widgingarri, Koolan Island, Riwi and Parnkupirti occupied repeatedly. Lacustral phase with forests, river gums + palms **COLONISATION MODE ART**
	40,000 – 25,000 ***Naturalistic irregular infill*** **(Switch 1)**	Emergence of Kimberley culture bloc. Development of early territoriality and homogeneous group indentifying behaviour **KIMBERLEY STYLE PROVINCE**
	25,000 – 18,000 ***Gracile human solid infill*** **(Switch 2)**	Oxygen Isotope Stage 2 – onset of aridity. Tethered use of major water catchments/range uplands. Gwions have a northern distribution **TERRITORIAL SIGNALLING INCREASES**
	18,000 – 12,500 ***Dynamic human solid infill***	Height of the Last Glacial Maximum and ACR, with intensive occupation of Kimberley plateau as deserts expand and c. 1M km^2 lost **NEW GROUP BOUNDARIES AS SEA LEVEL RISES WITH ARID PHASE**
	12,500 – 8,000 ***Static human polychrome***	Climatic amelioration after LGM: coastal plains drowned - sea rises from -130m to present. Static humans have wider W-E distribution **SMALLER TERRITORIES AS LANDS DROWNED**
	8,000 – 4,600 ***Abstract compartment infill*** **(Switch 3)**	Early Holocene Wet Phase, increasing population. ITCZ at its most southward (and hence most intense monsoons) around 7 - 5.5ka **REGIONAL VARIABILITY AS CLIMATE IMPROVES**
	4,600 – Contact ***Wanjina*** **(Switch 4)**	Consolidation of regional and extra- regional exchange networks, economic innovation, introduction of dingo, population growth. **NEW ESTATES DEVELOP WITH WANJINA**

Source: Veth 2013: Slide 49. Provided courtesy of Peter Veth 2014.

Appendix 10

Harris Matrices

Code & Colour Key

———— Superimposition relationships between motifs. The line joins motifs that are superimposed on one another. The figures at the top of the superimposition are the most recent.

◆ Indicates direction (i.e. end point) of the superimposition relationship where it is not a direct vertical line.

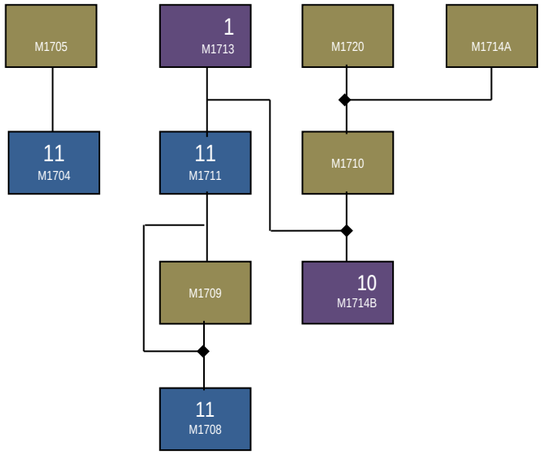
M#### Unique figure identifier

CLASSIFICATION COLOUR CODES
Anthropomorph
Zoomorph
Phytomorph
Material Culture
Tracks
Geometric
Historical Inscriptions
Other Non Figurative
Other
Indeterminate

STYLE/GROUP CODING	
1	Waliarri 1 (Complex)
2	Waliarri 2 (Simple)
3	Mamo/Djuari
4	Black & White (Bichrome Black Solid Infill with White Outlines)
5	Monochrome Outline
6	Monochrome Stencil
7	Engraved Animal Tracks
8	Abraded/Scratched Solid Infill
9	Round Bodied Grouped Anthropomorphs
10	Generic Monochrome
11	Generic Bichrome
12	Cupules, Incisions and Historical Inscriptions not elsewhere allocated
13	Insufficient information to allocate to a style or style group

Note: Style Coding only applies to determinate figures.

There is a separate Harris Matrix for each site in this study, and the sites are presented in alphabetical order in this appendix.



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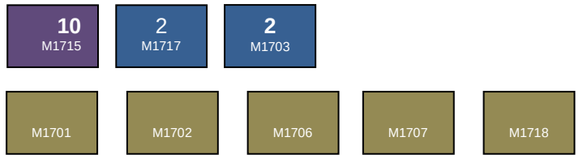

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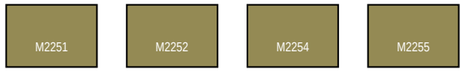

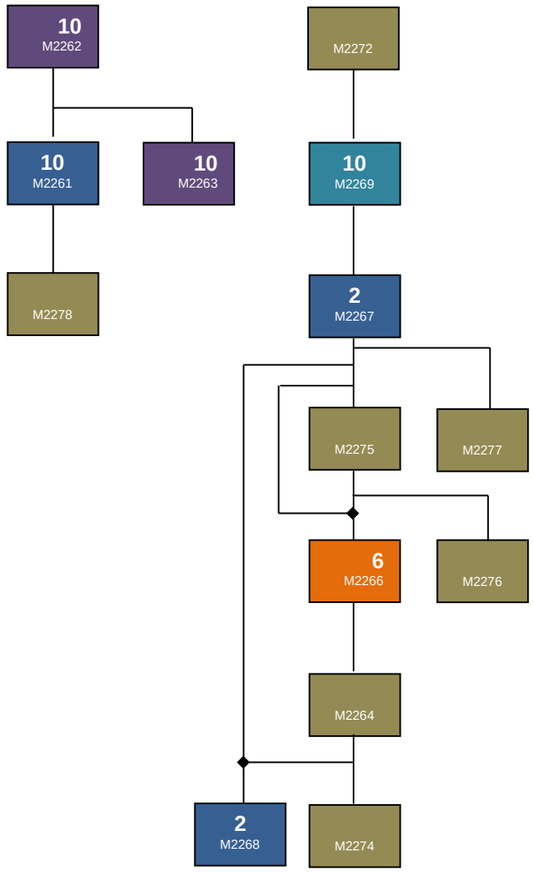

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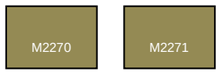

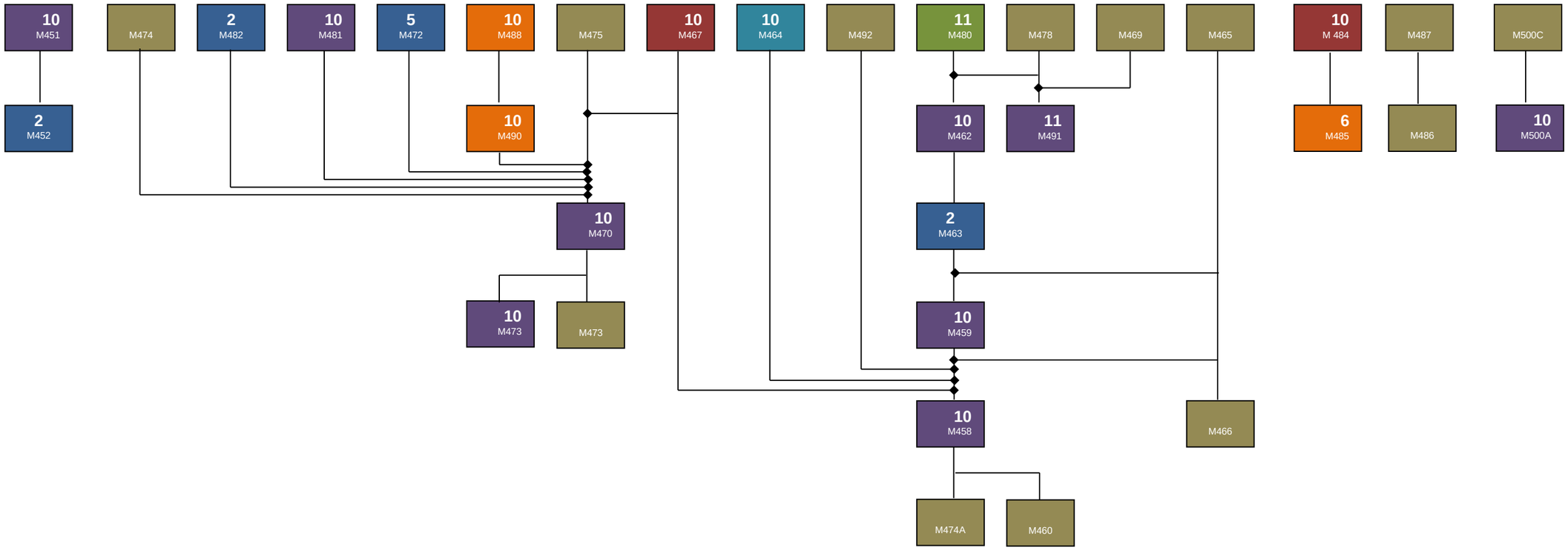

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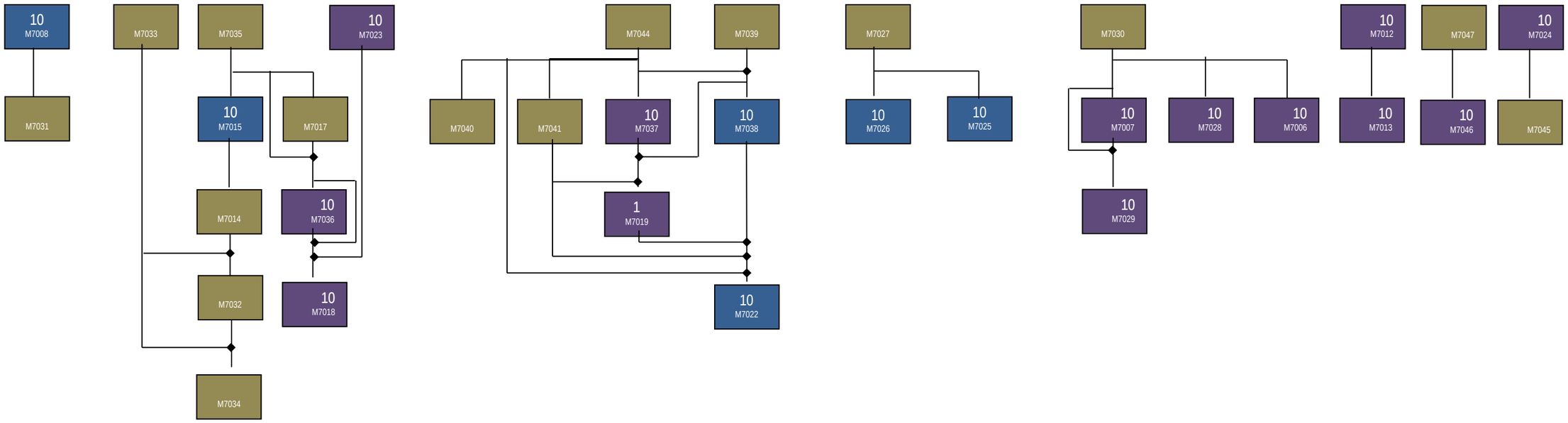

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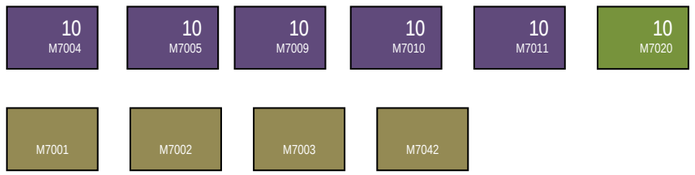

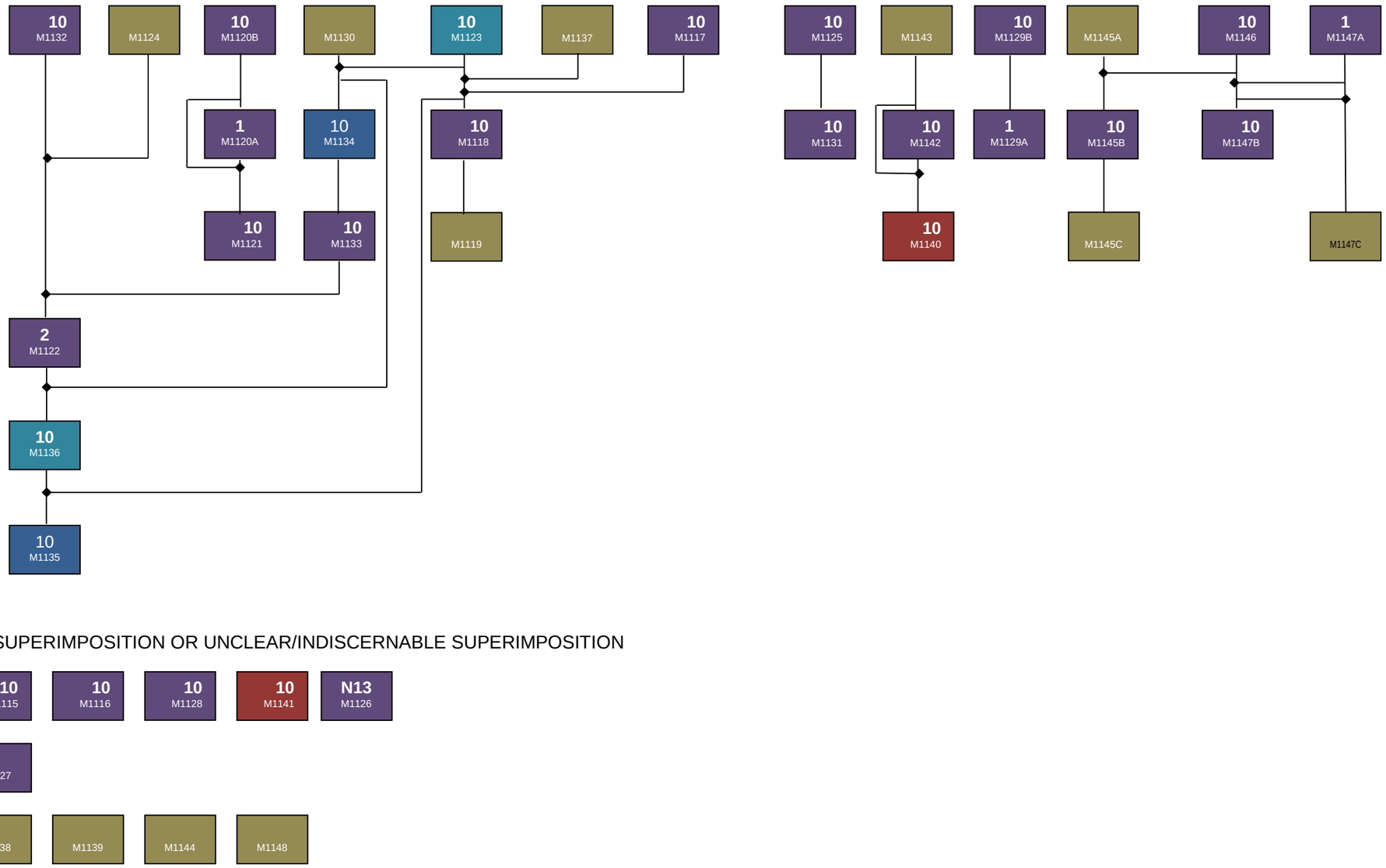

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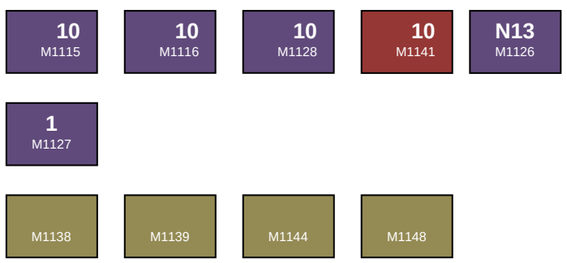

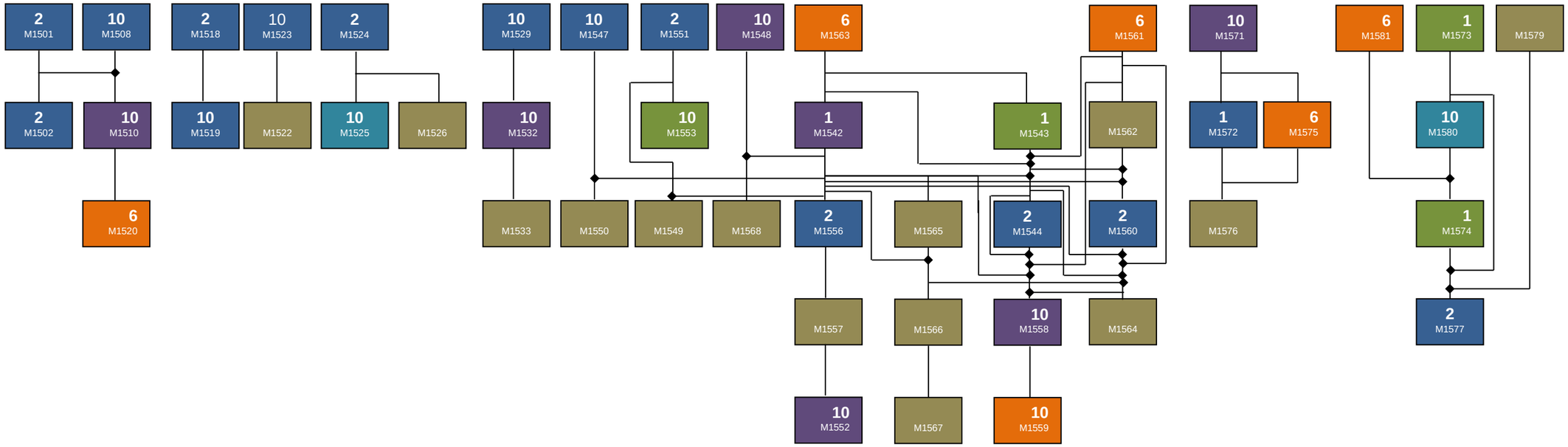
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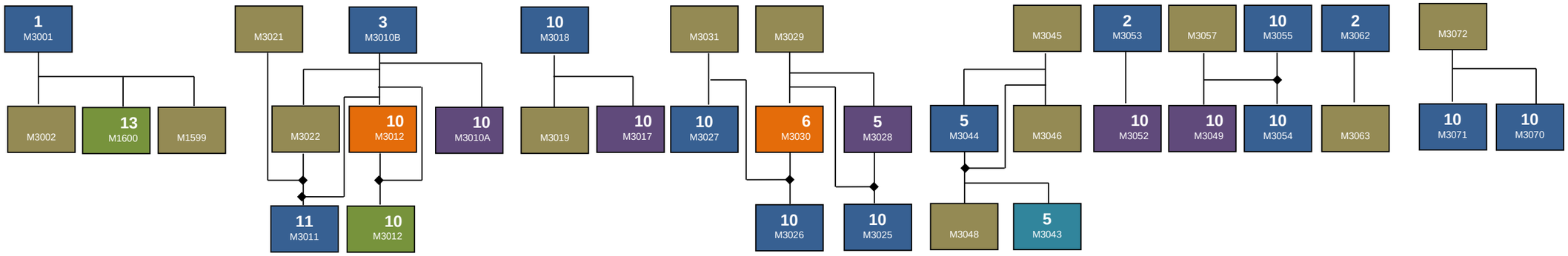
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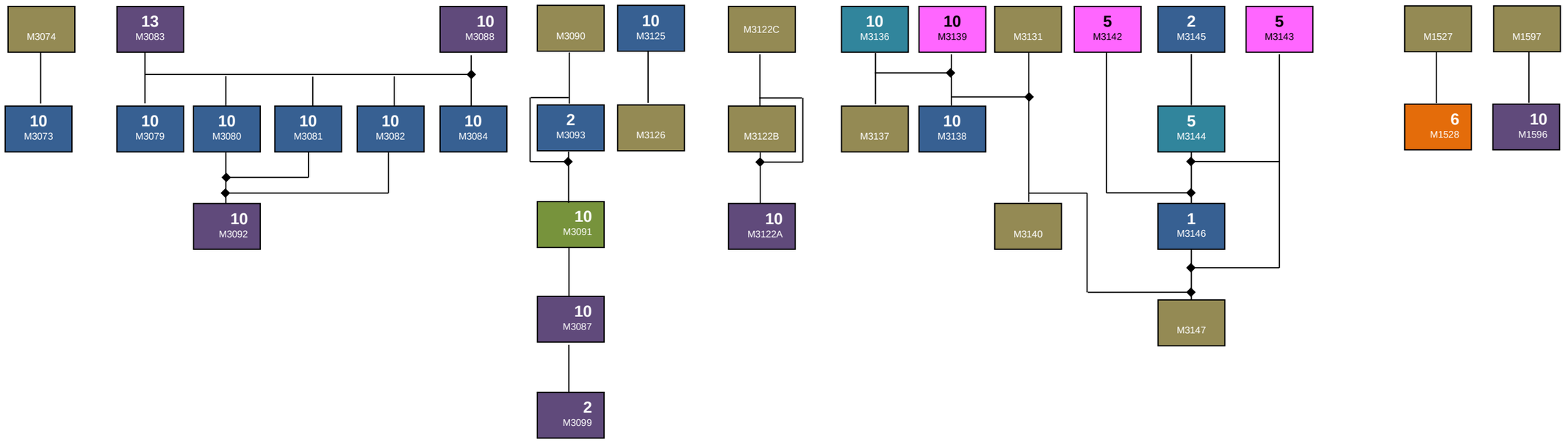
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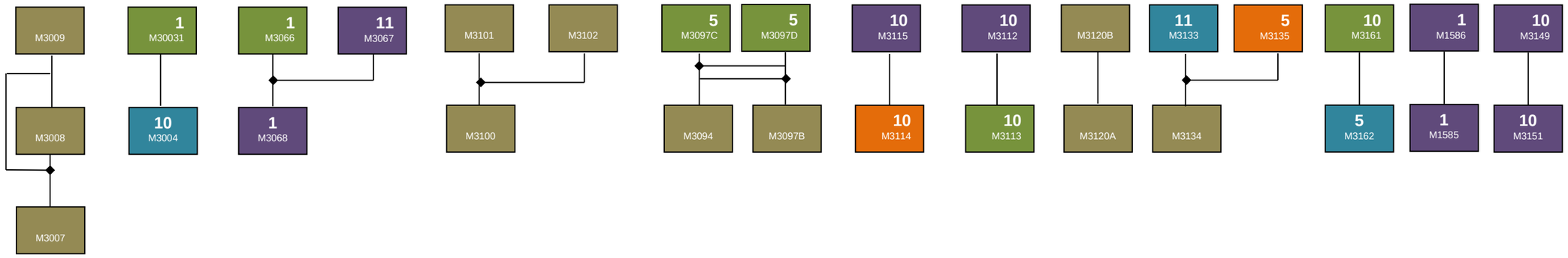

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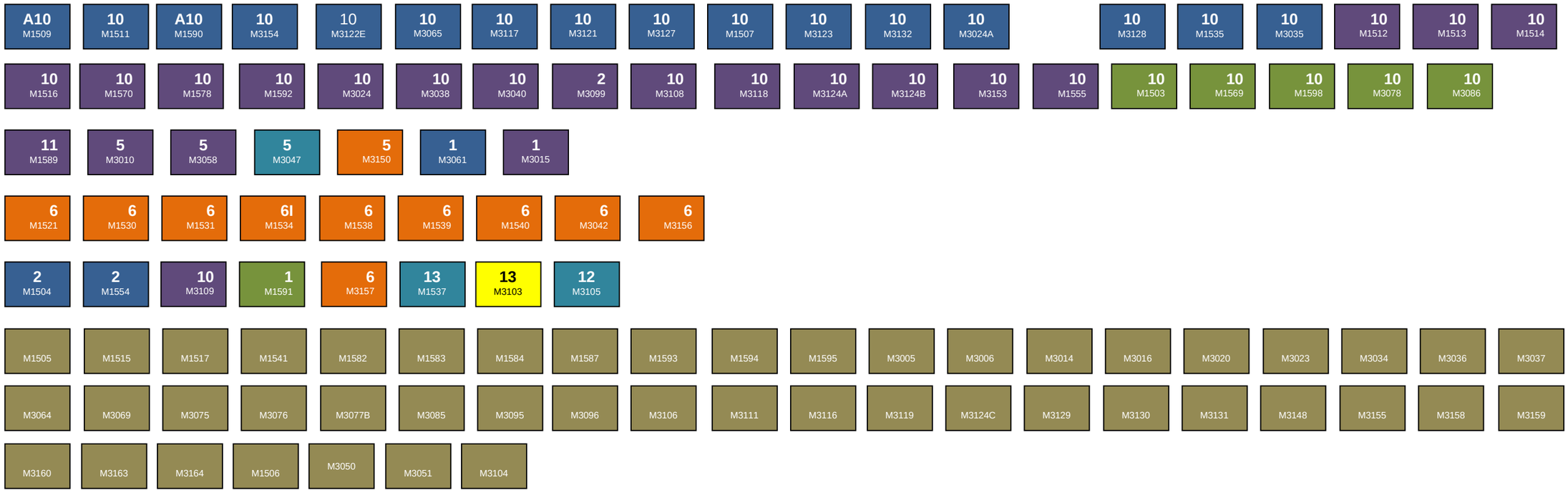

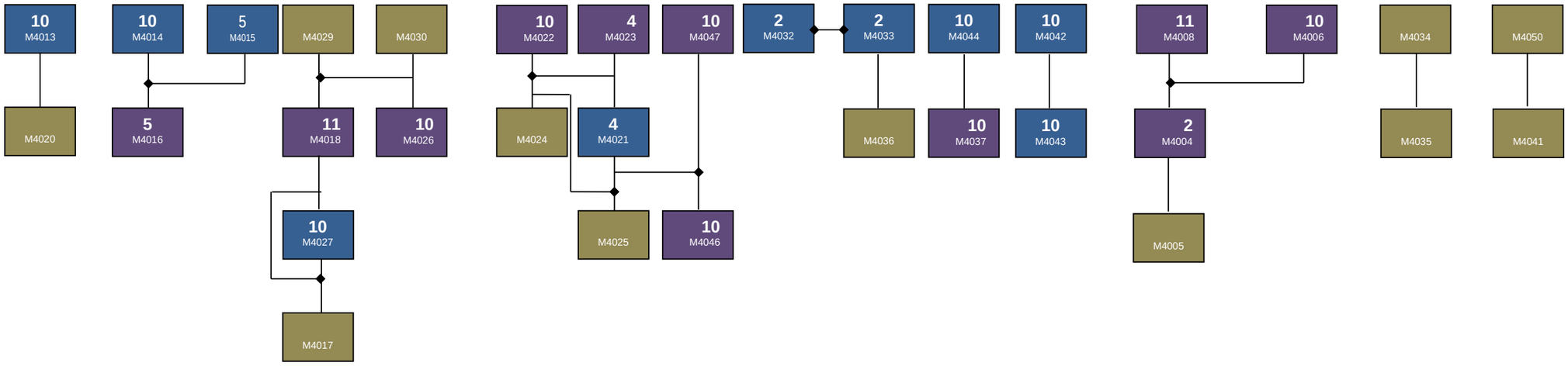

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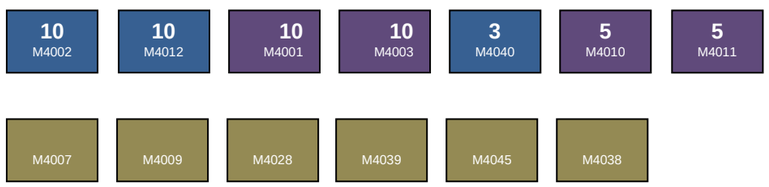

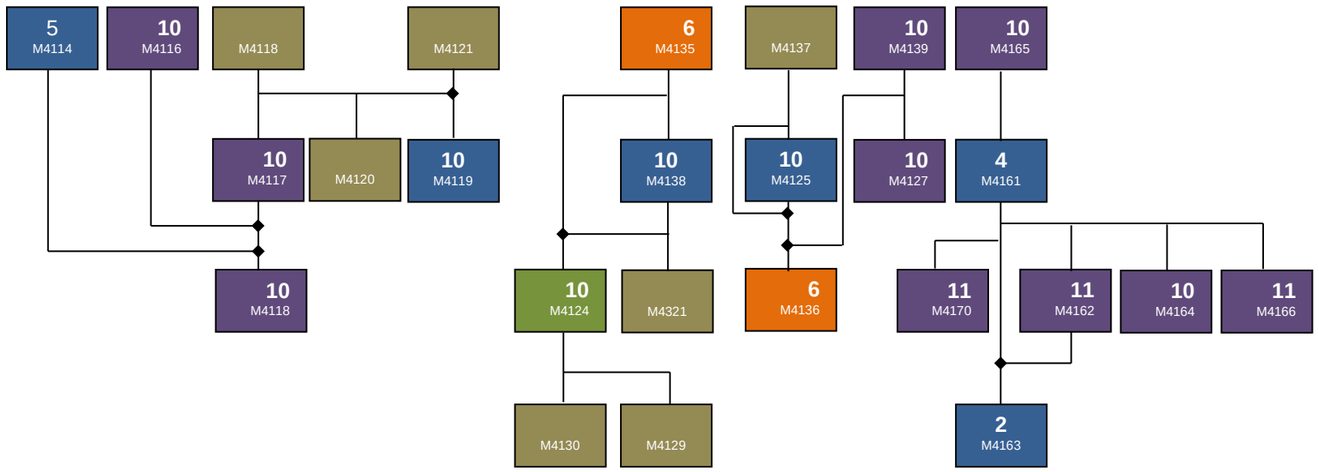
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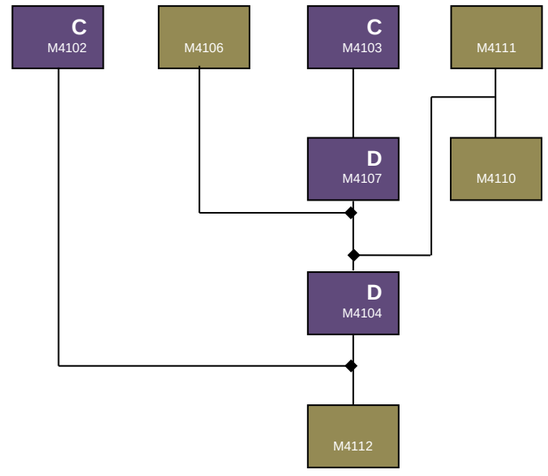
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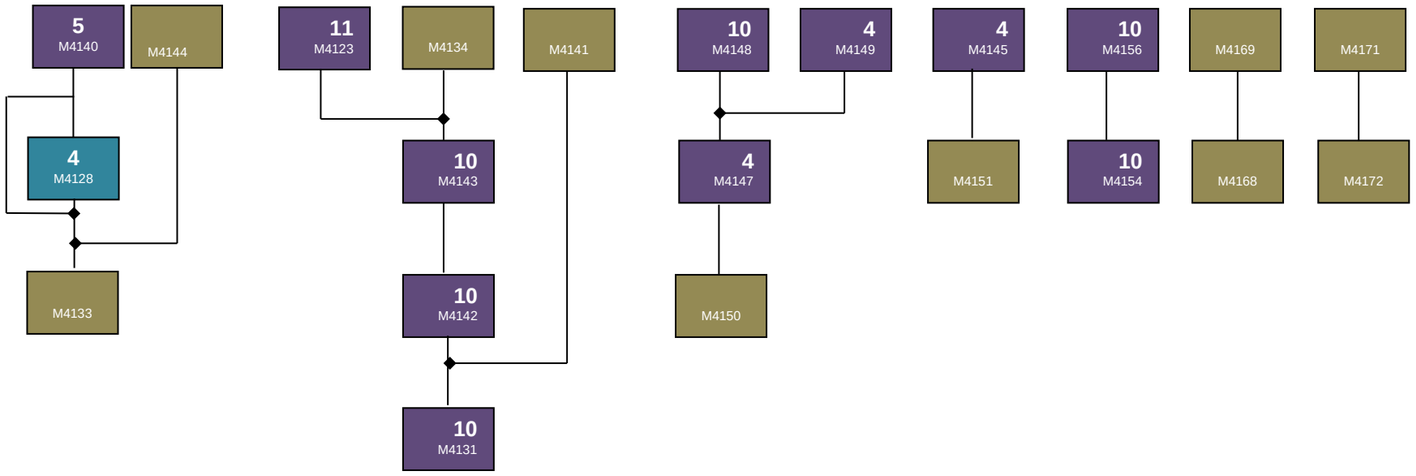

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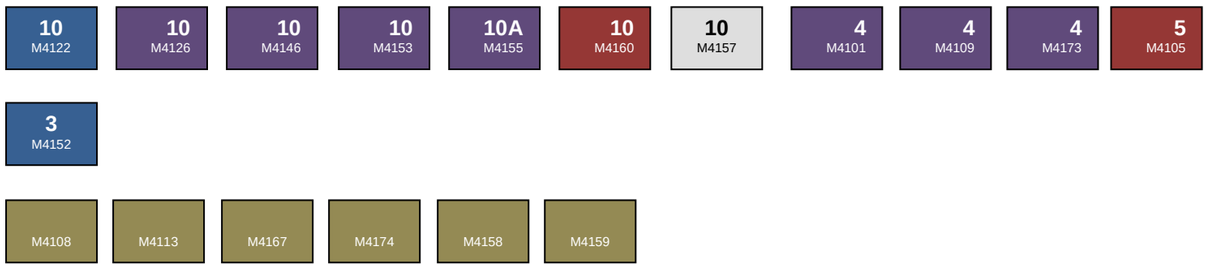

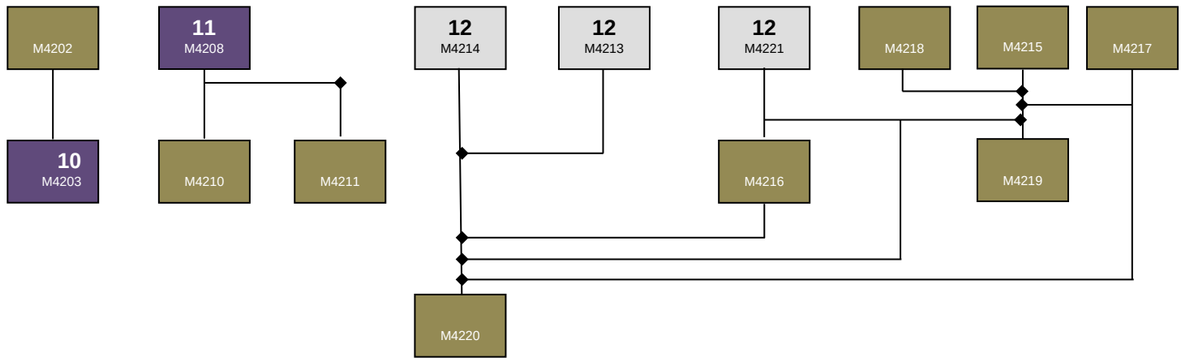

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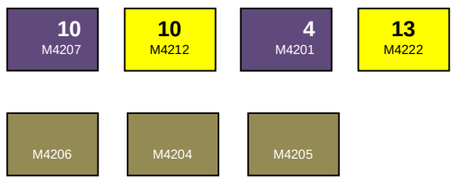

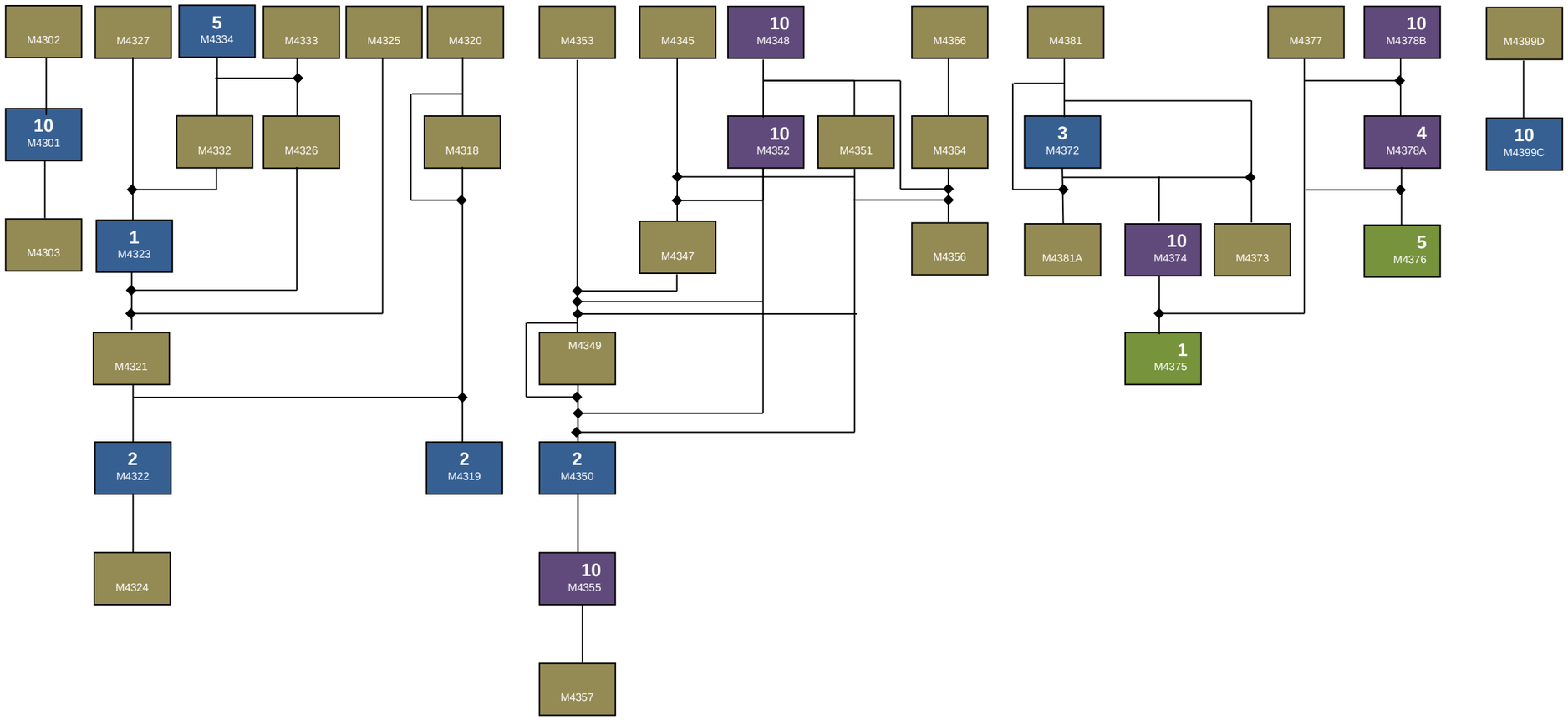
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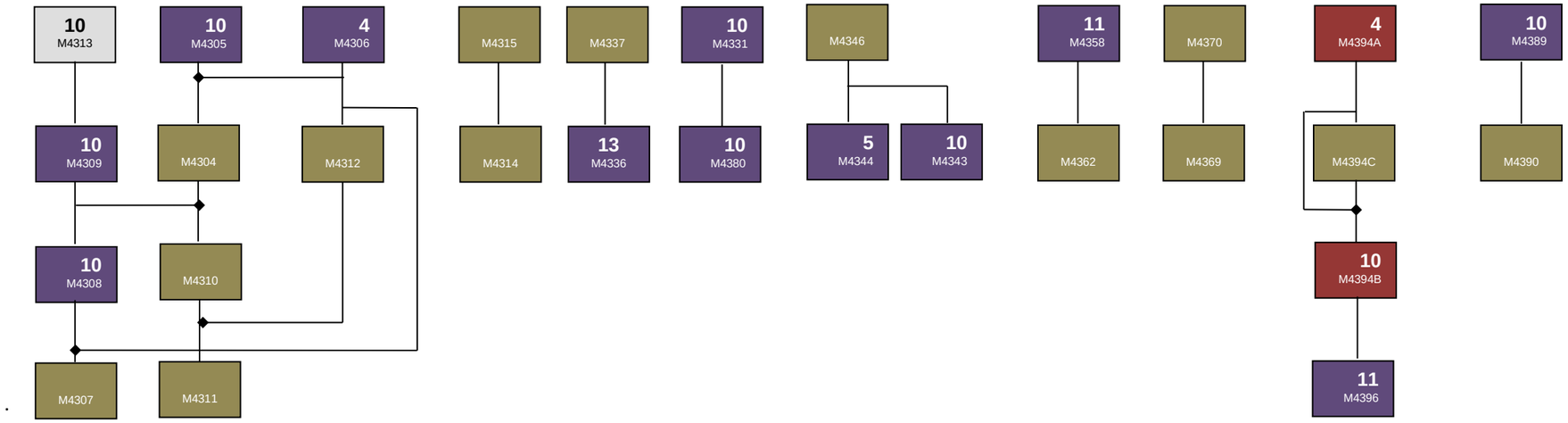
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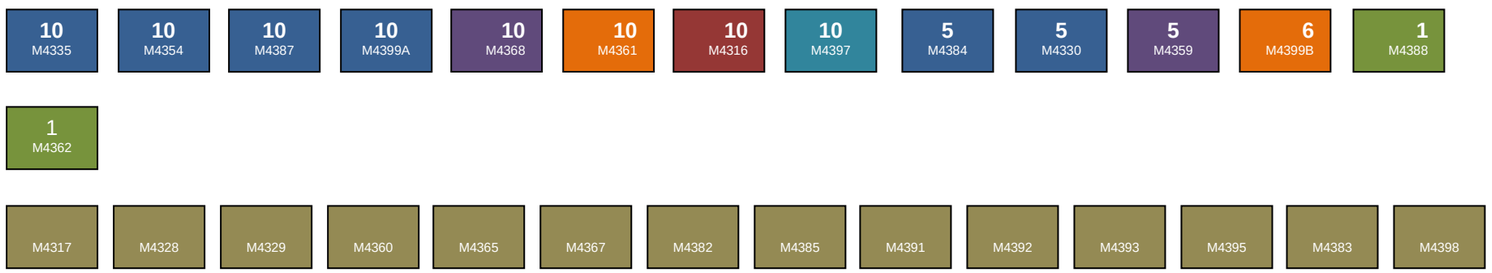
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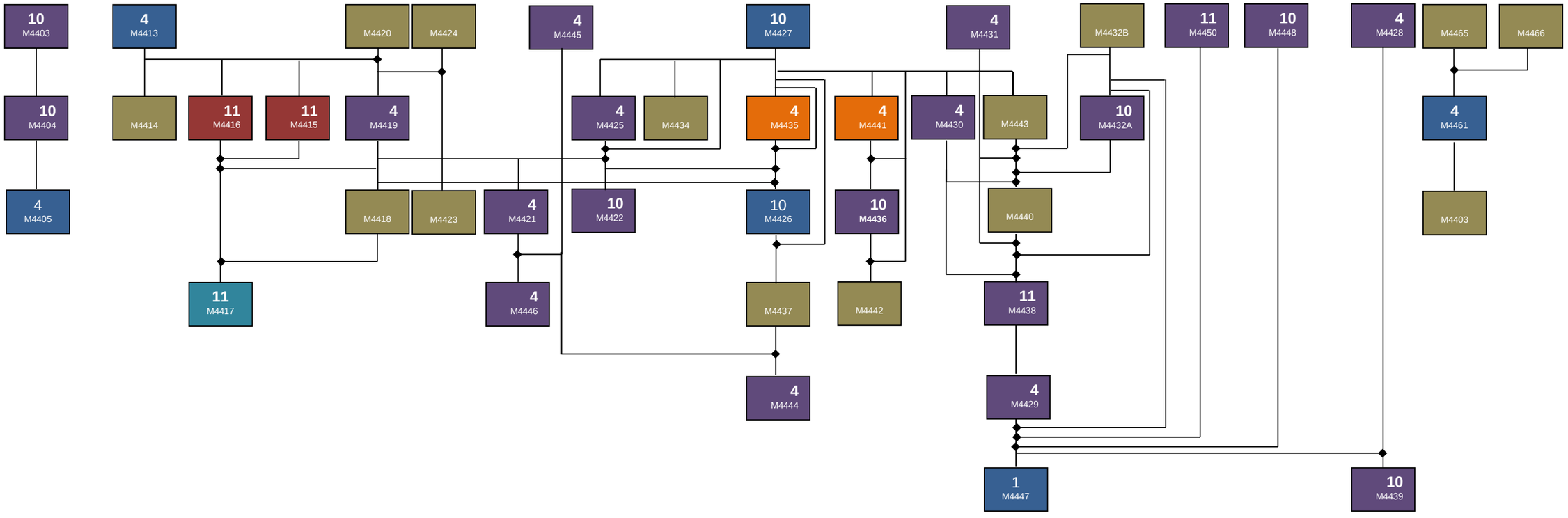
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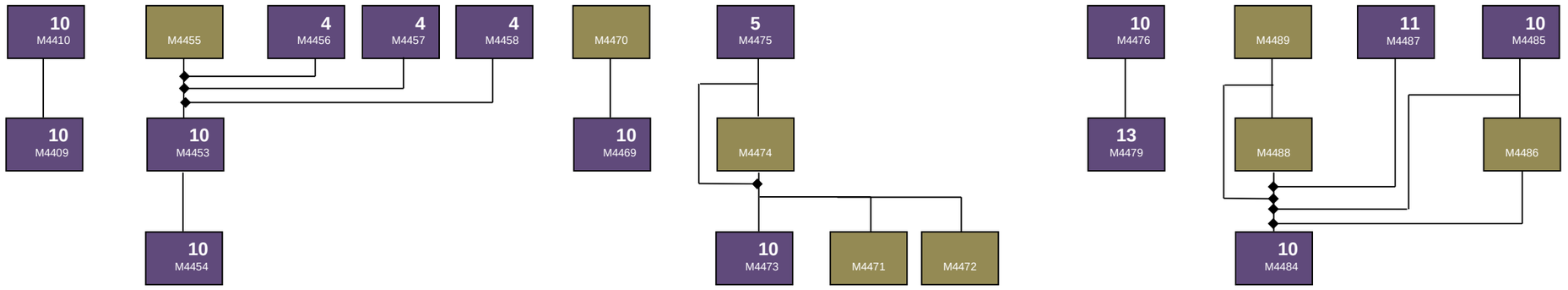

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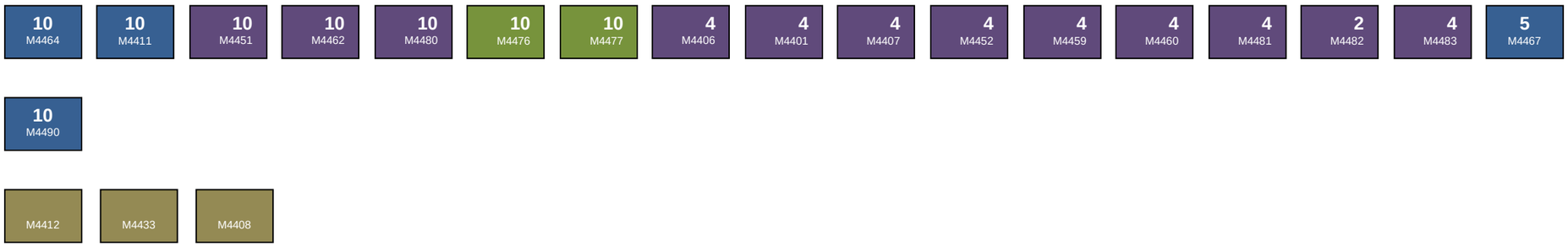

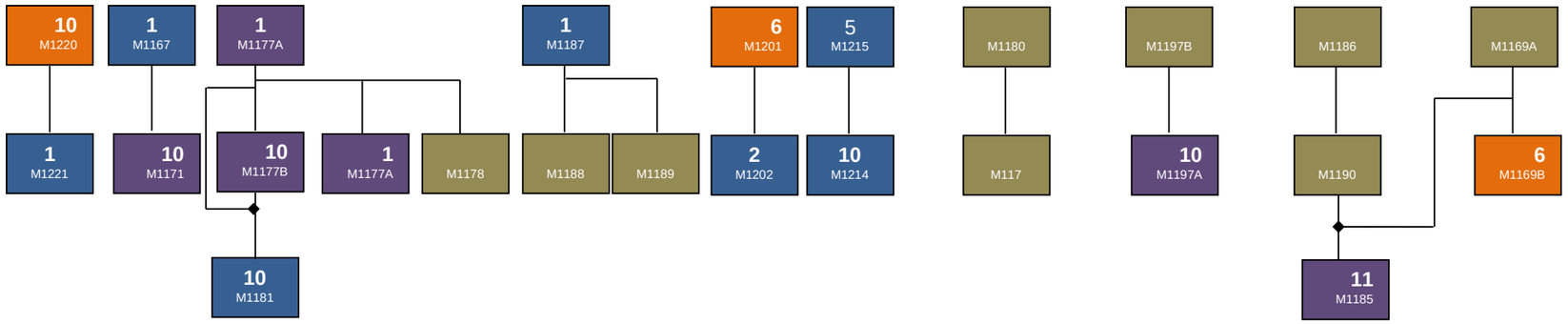

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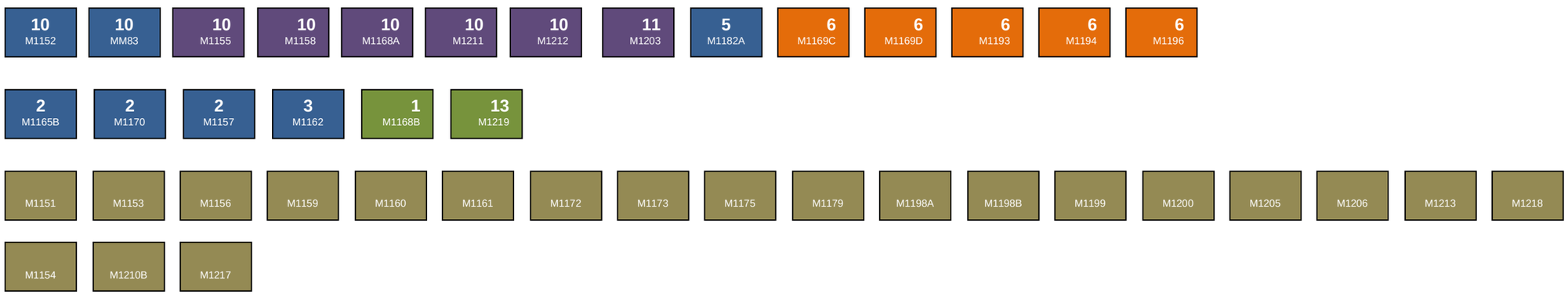

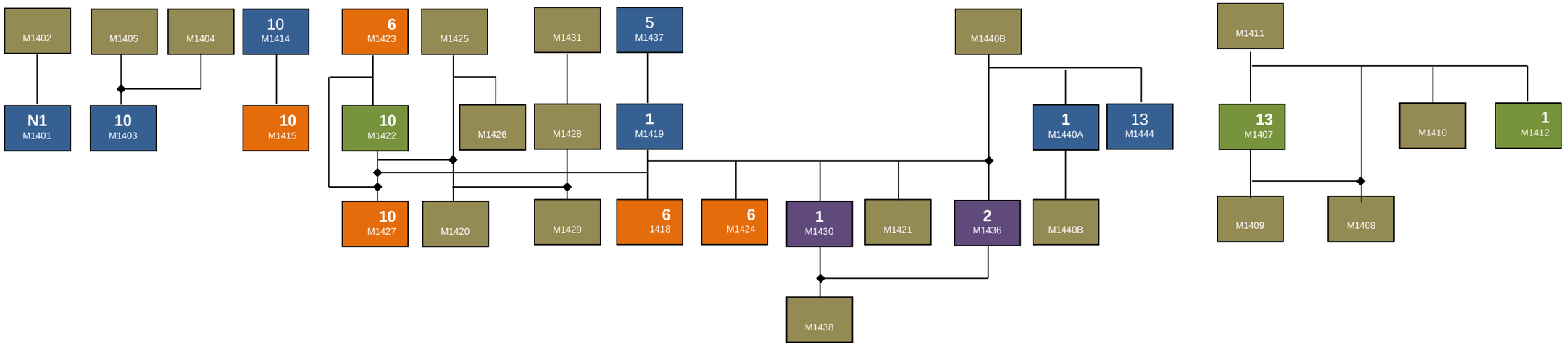

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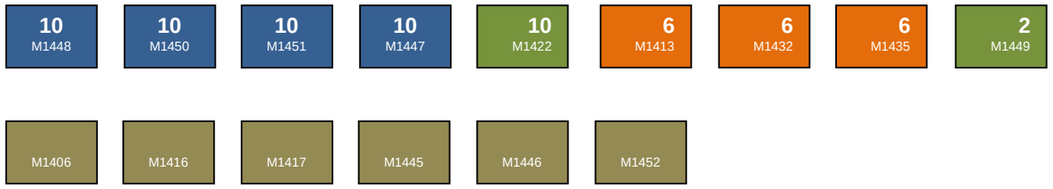

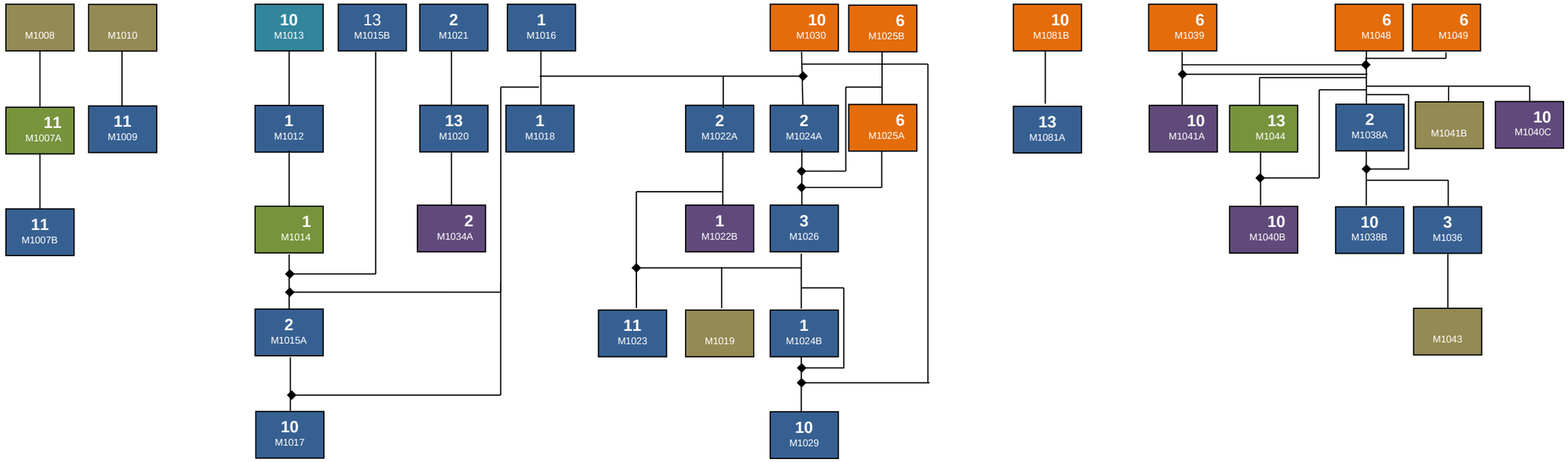
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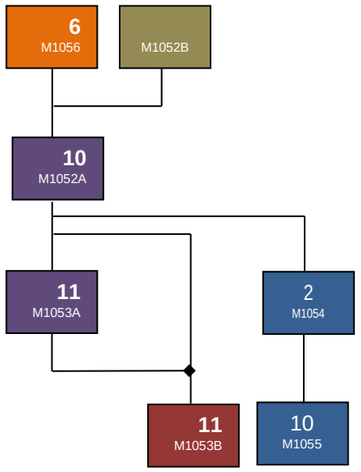

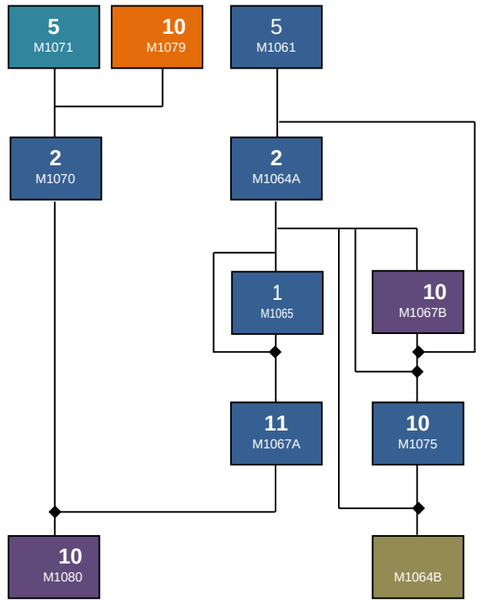

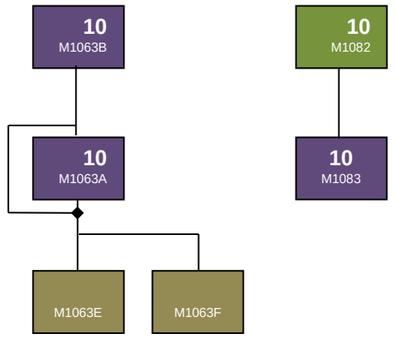

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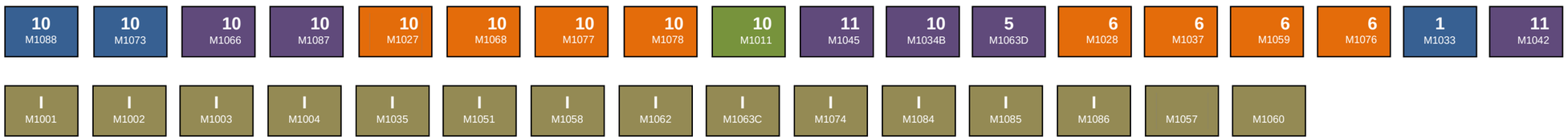

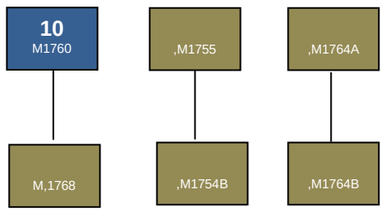

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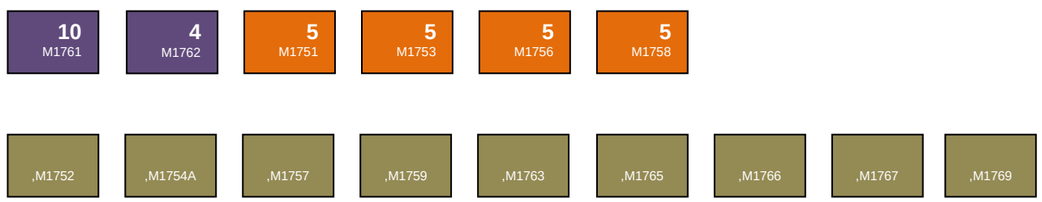

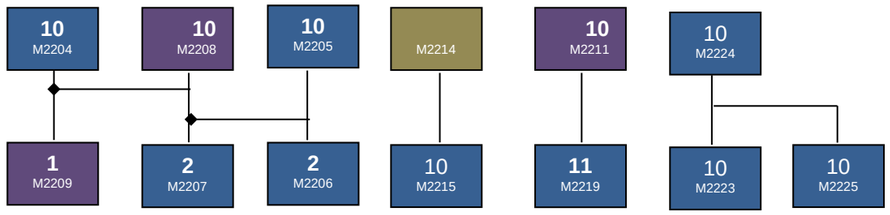

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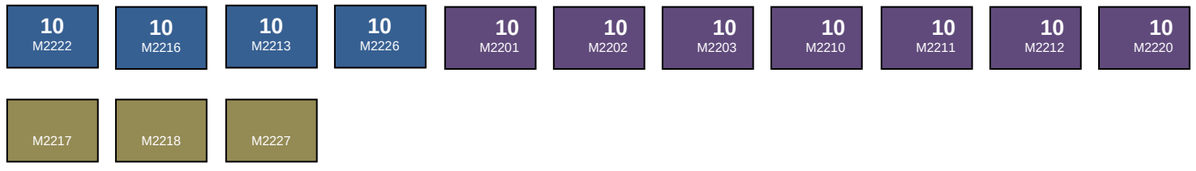

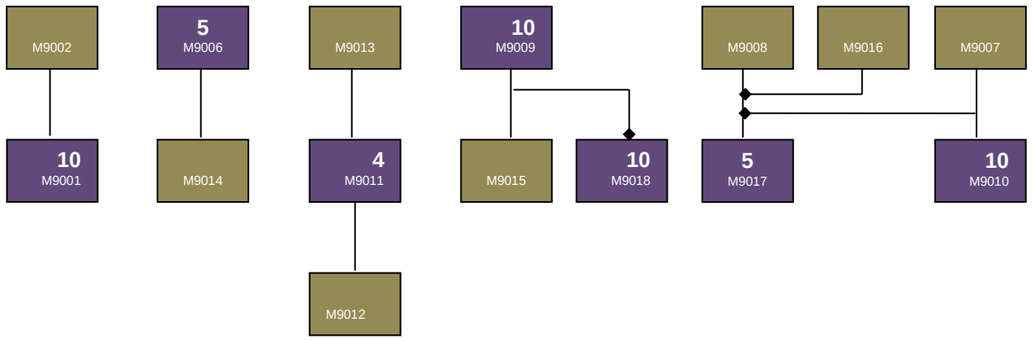

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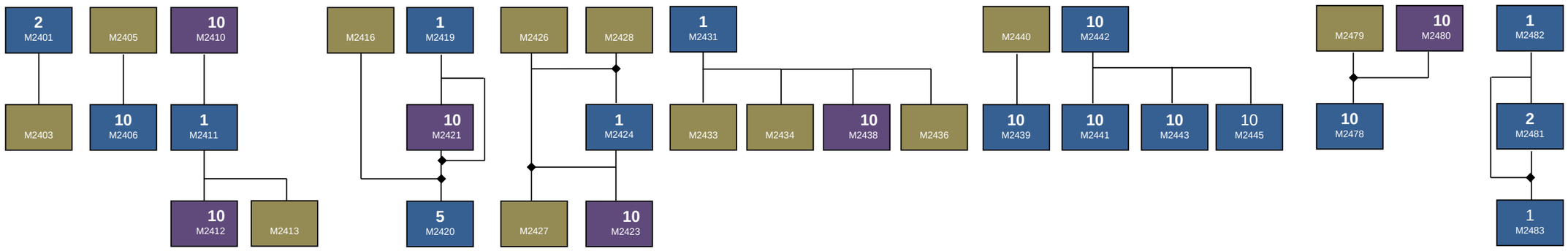
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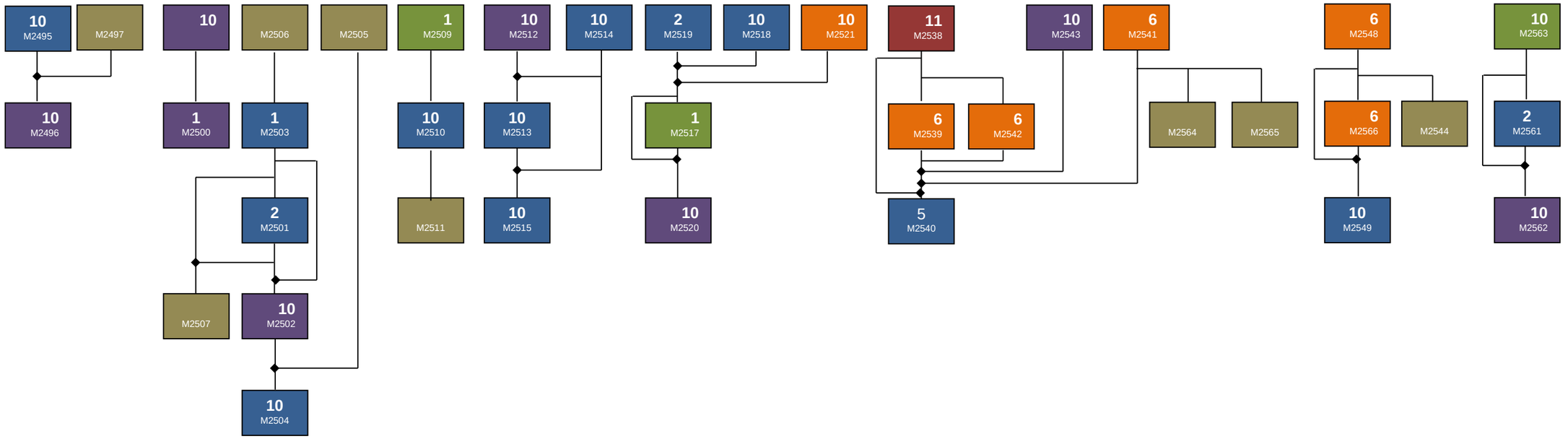
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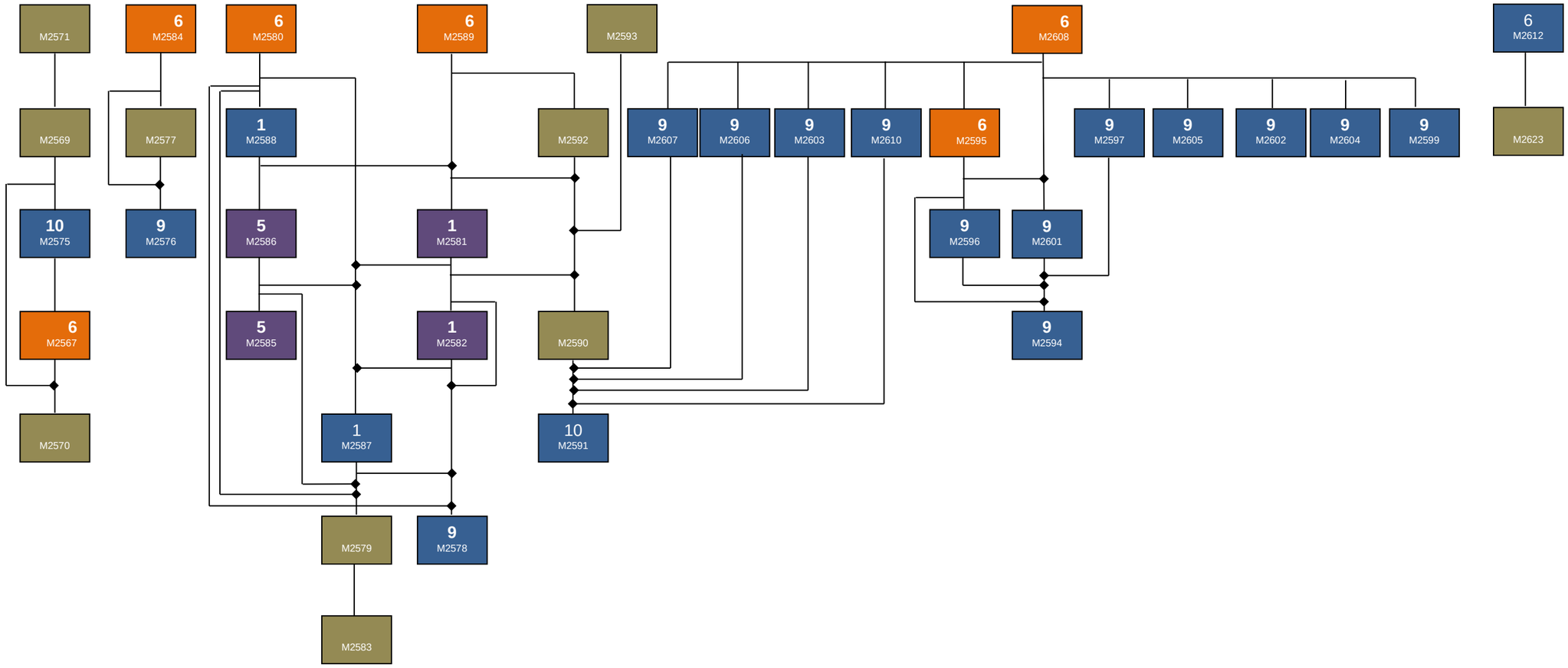
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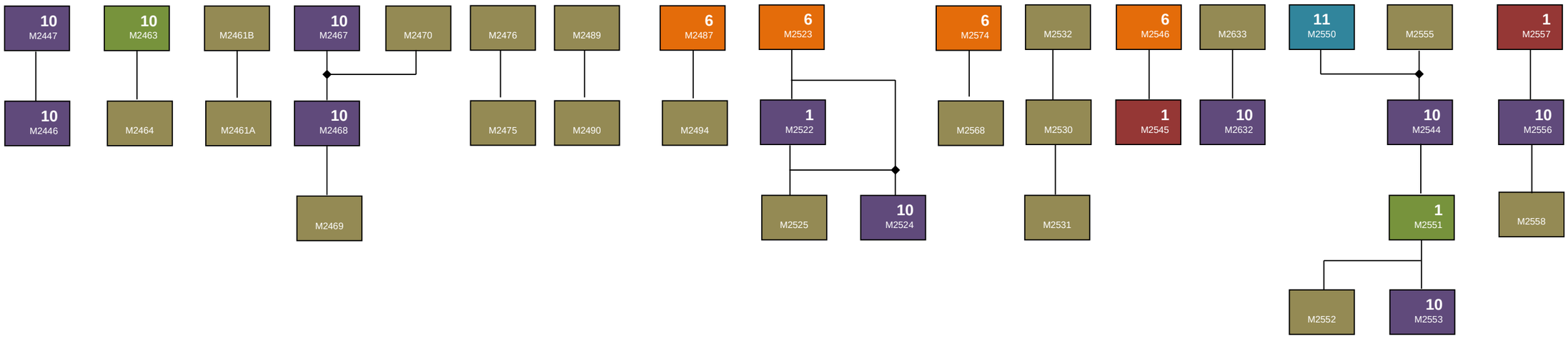

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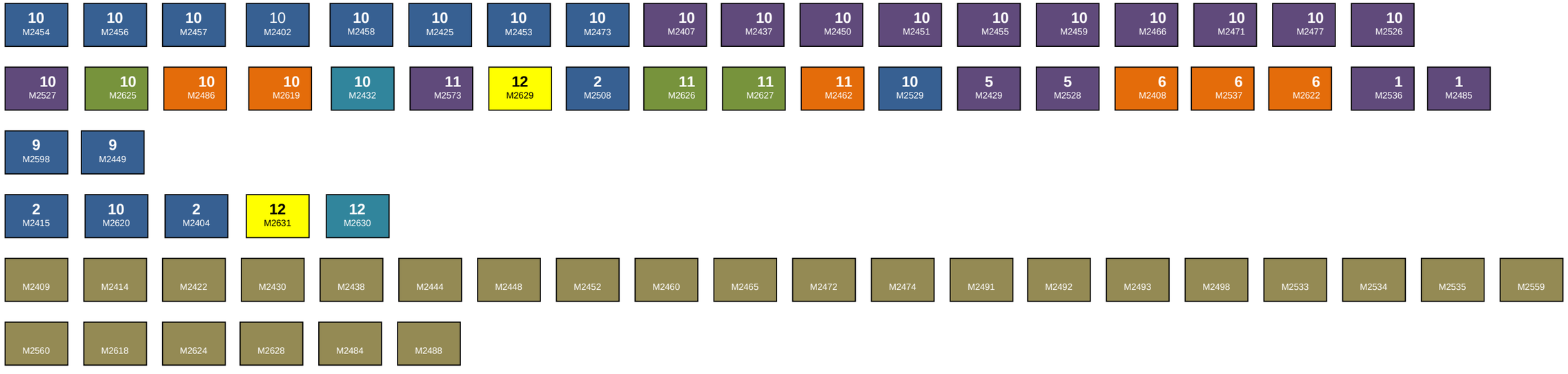

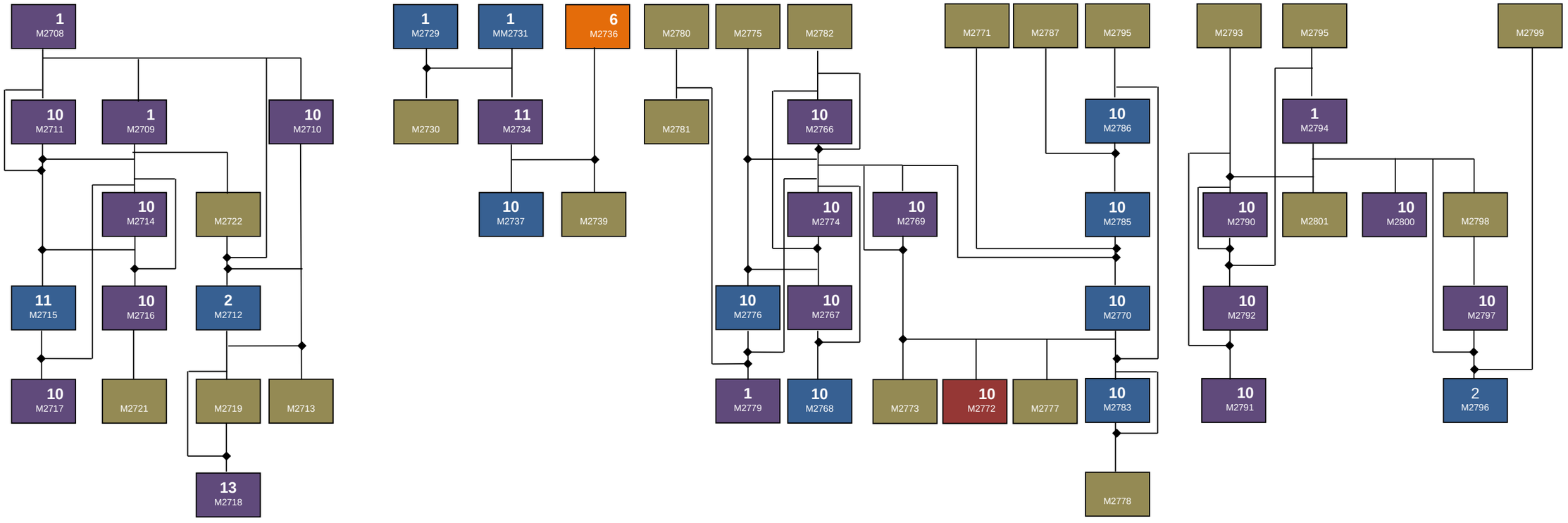
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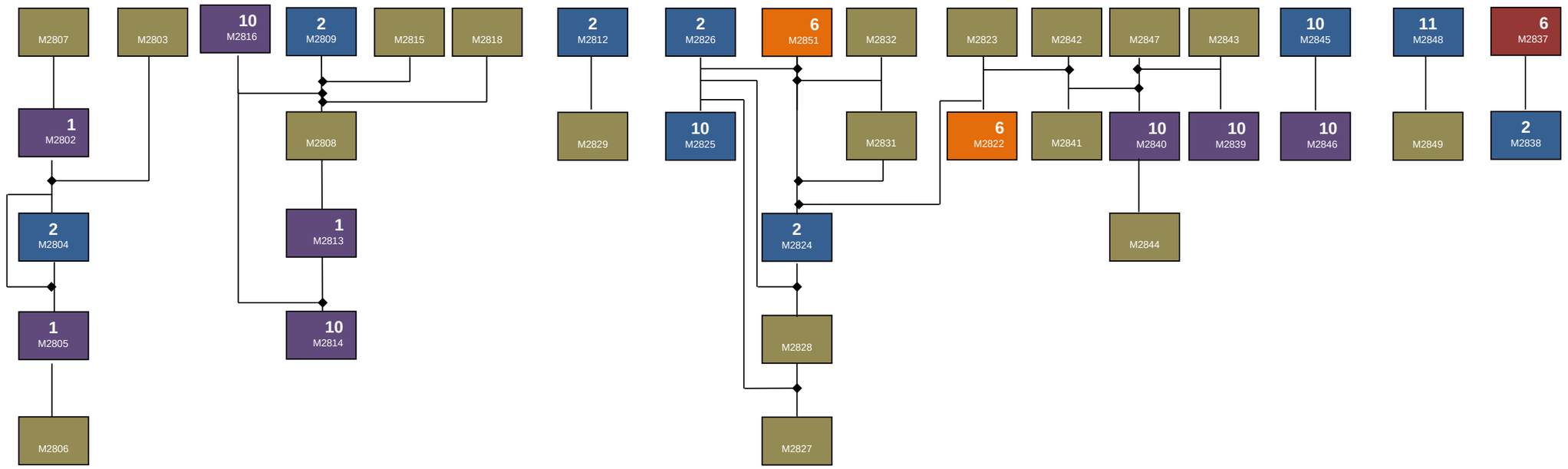
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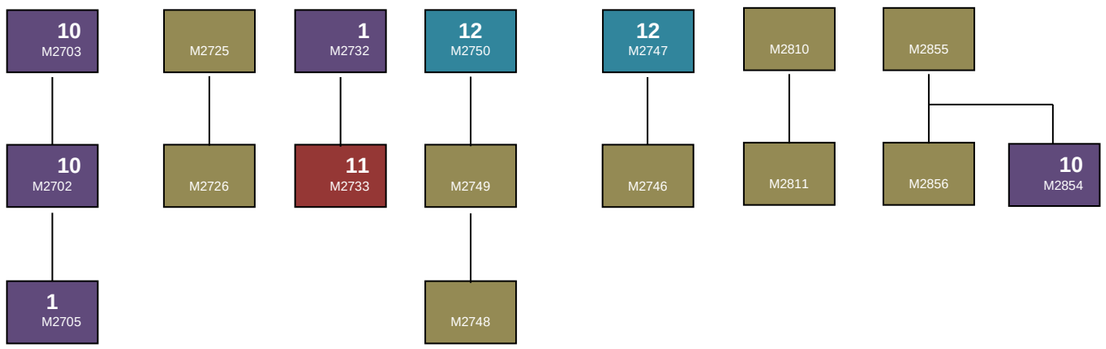

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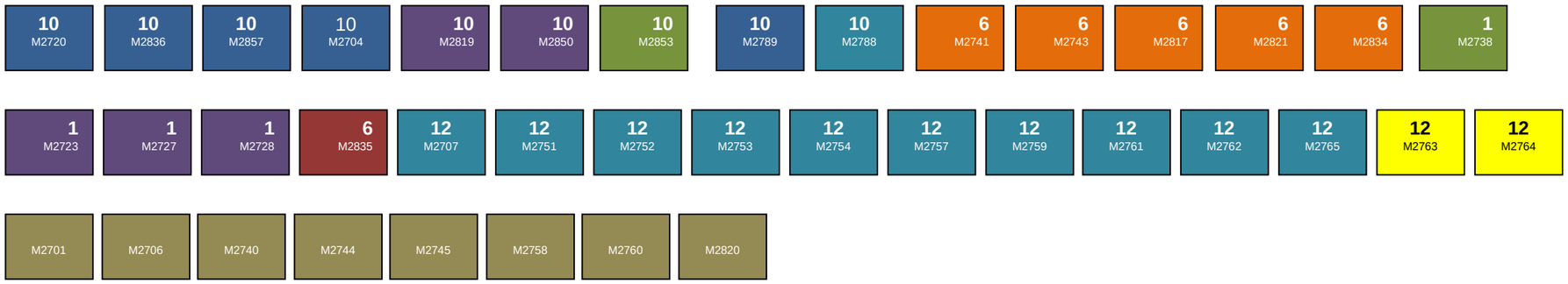

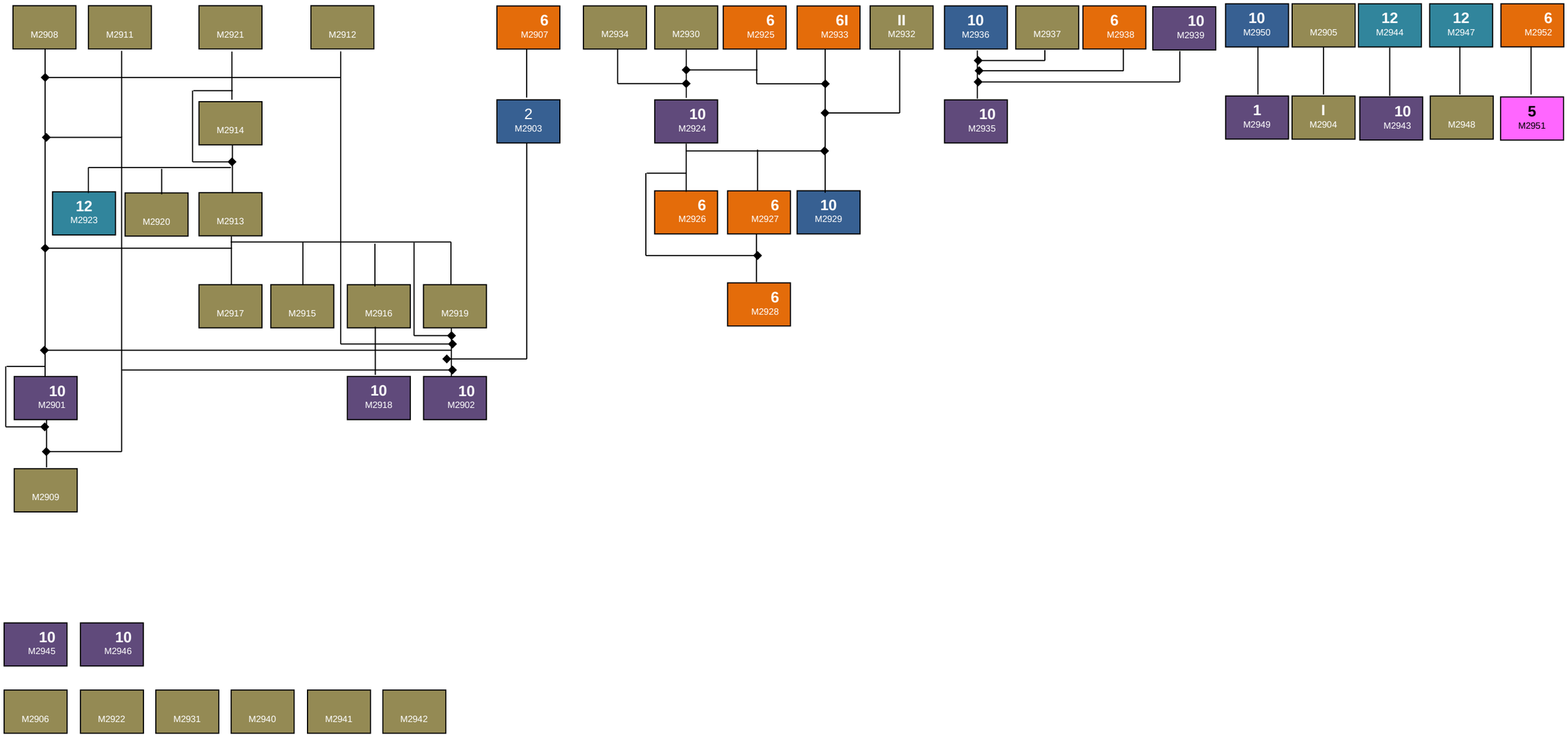
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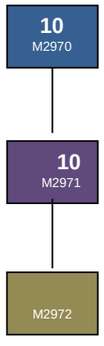

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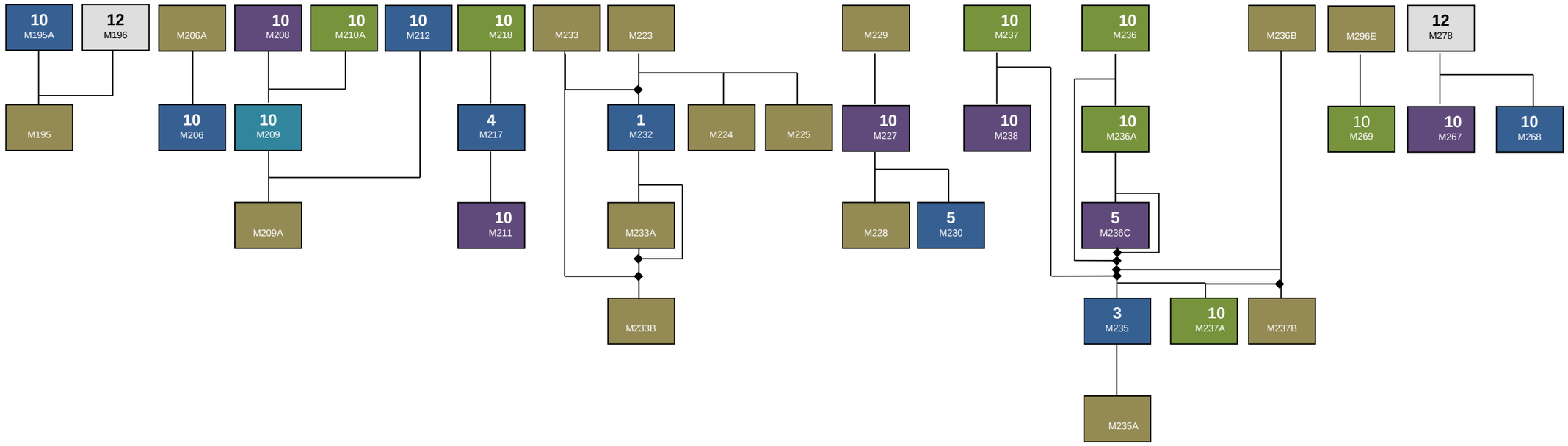
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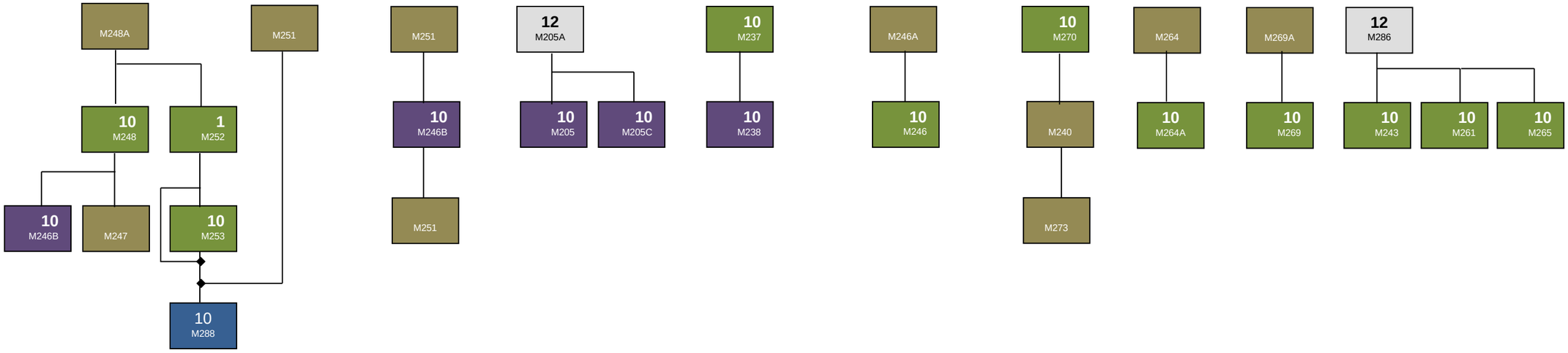
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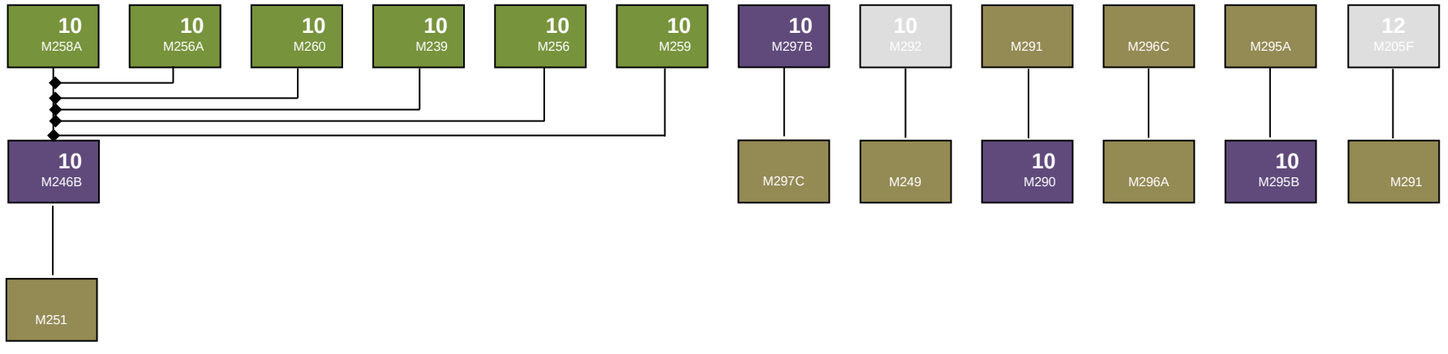

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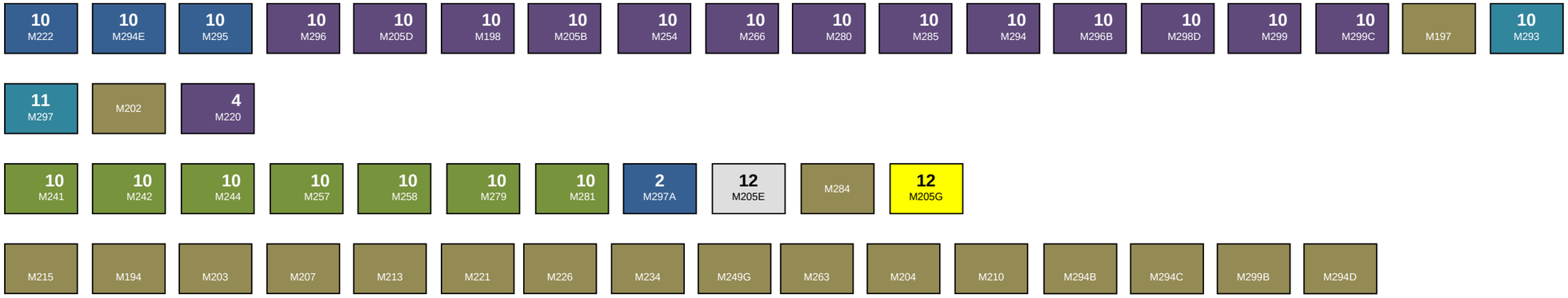

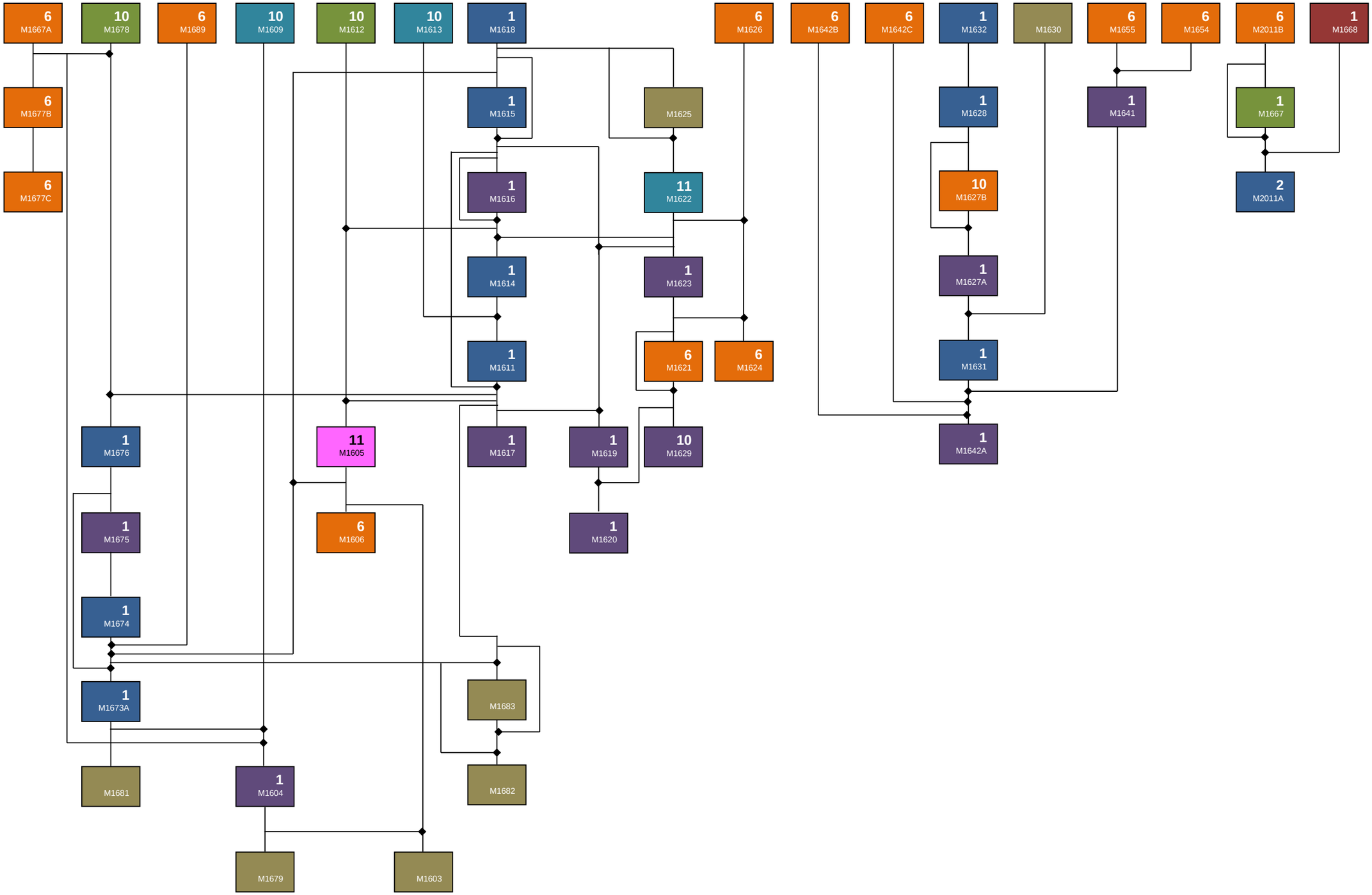
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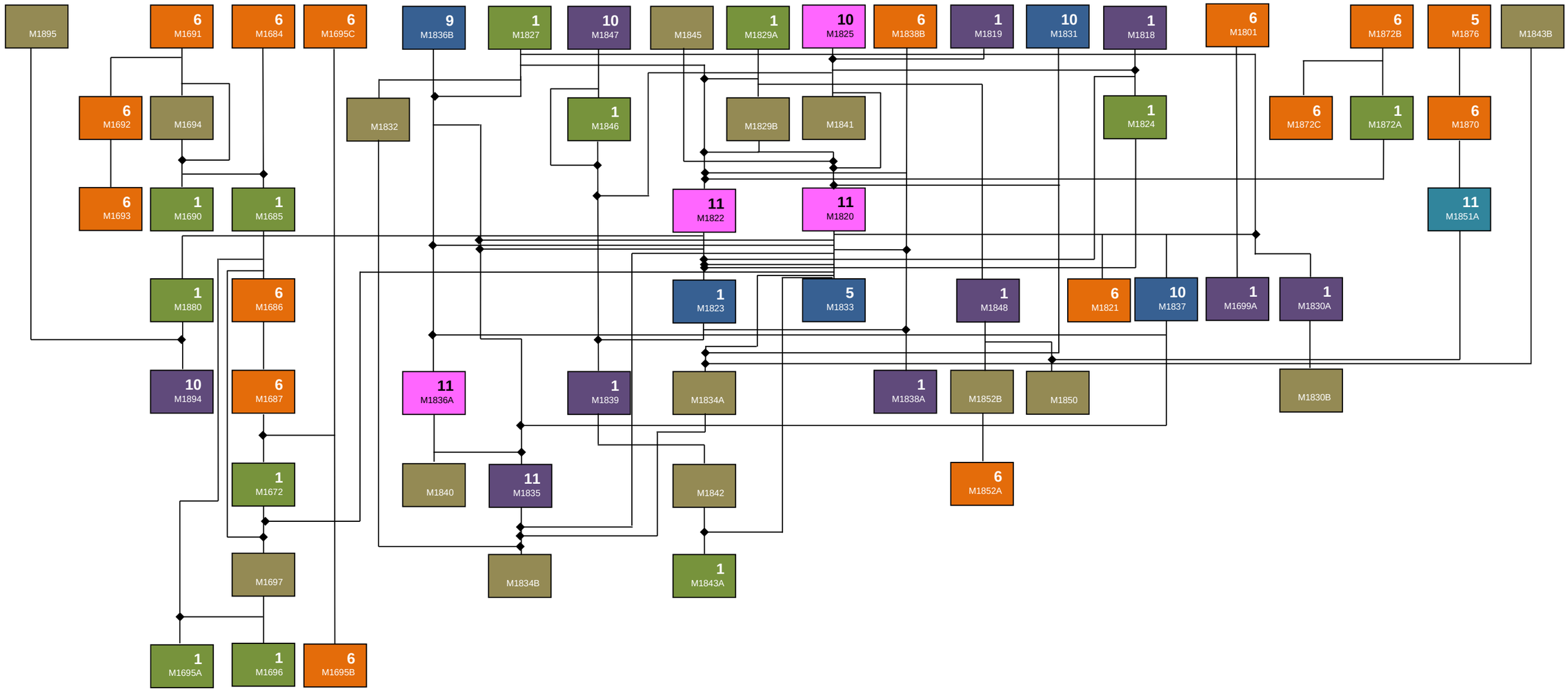
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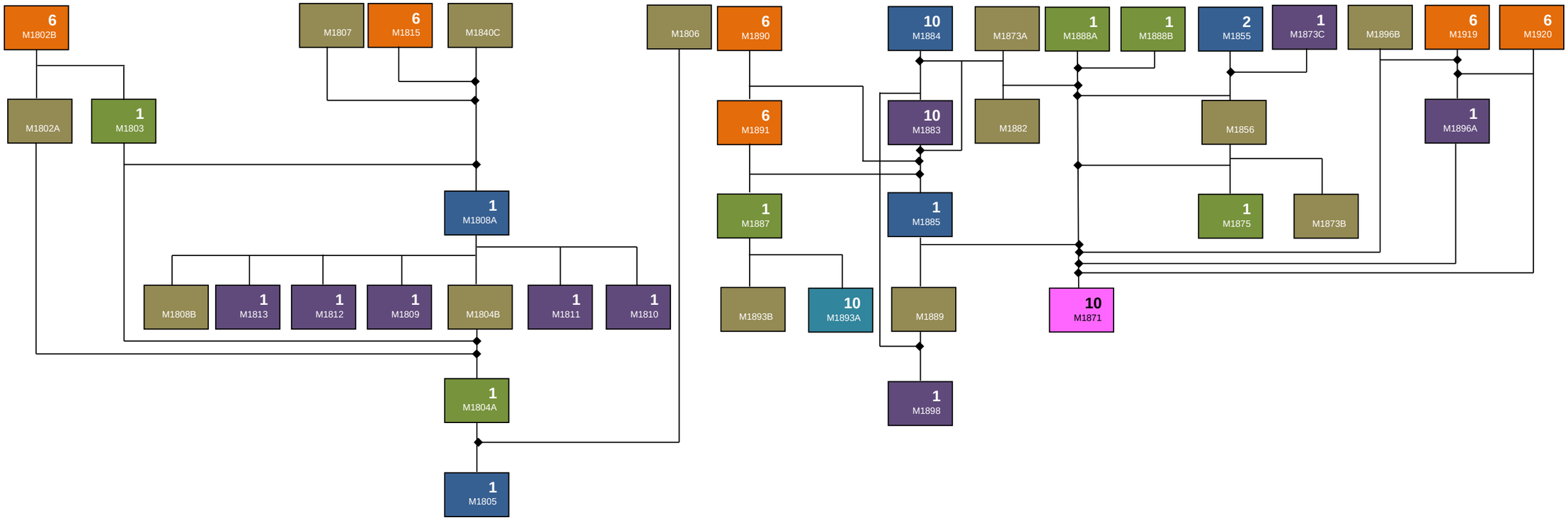
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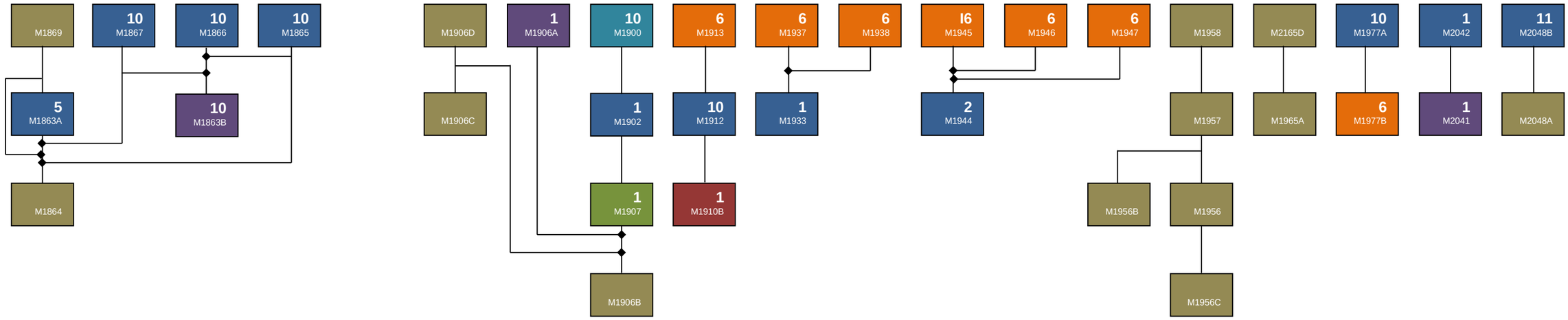
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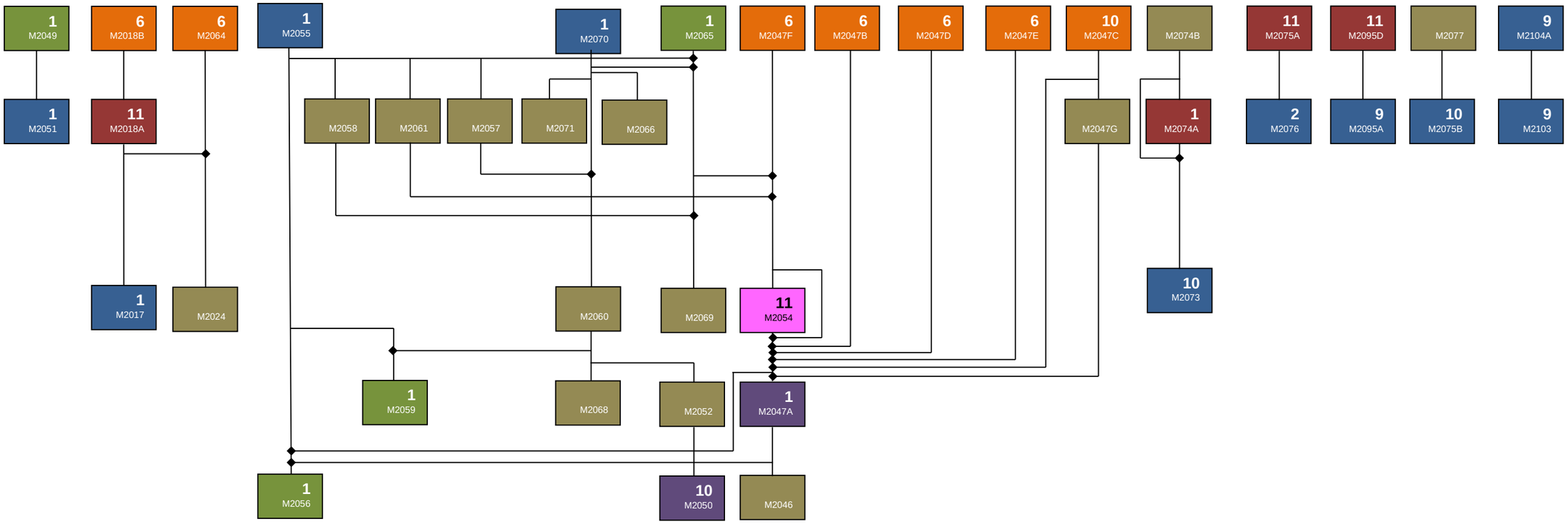
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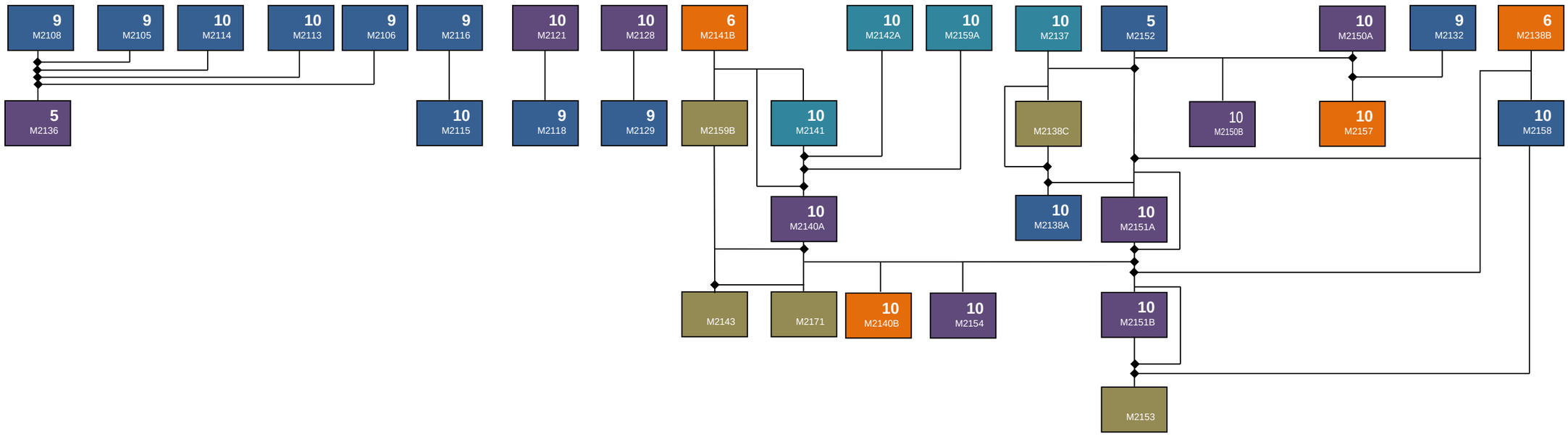
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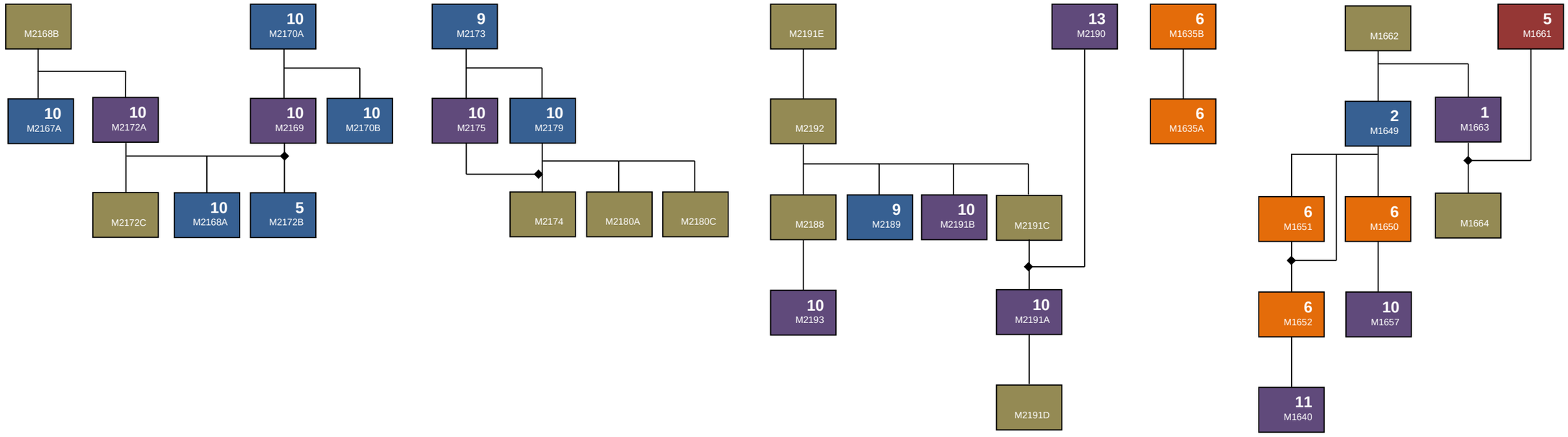
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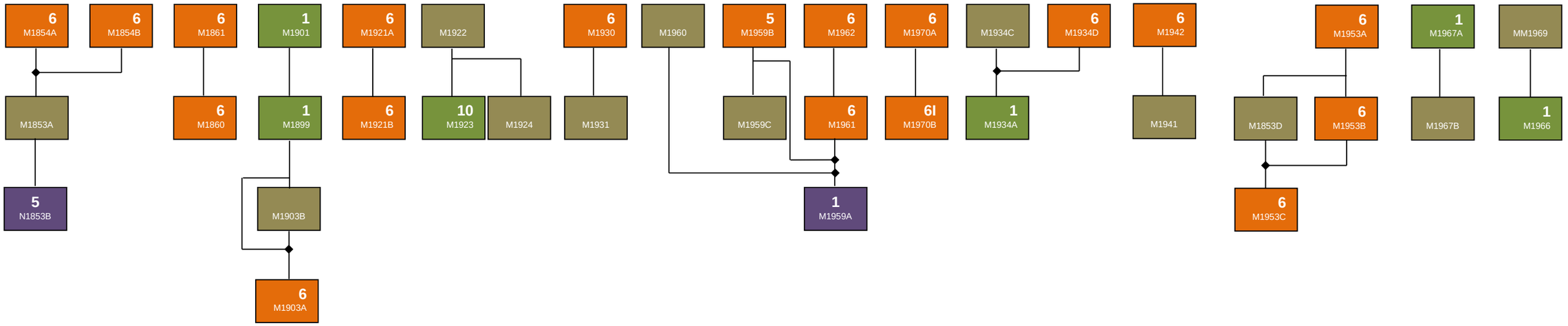
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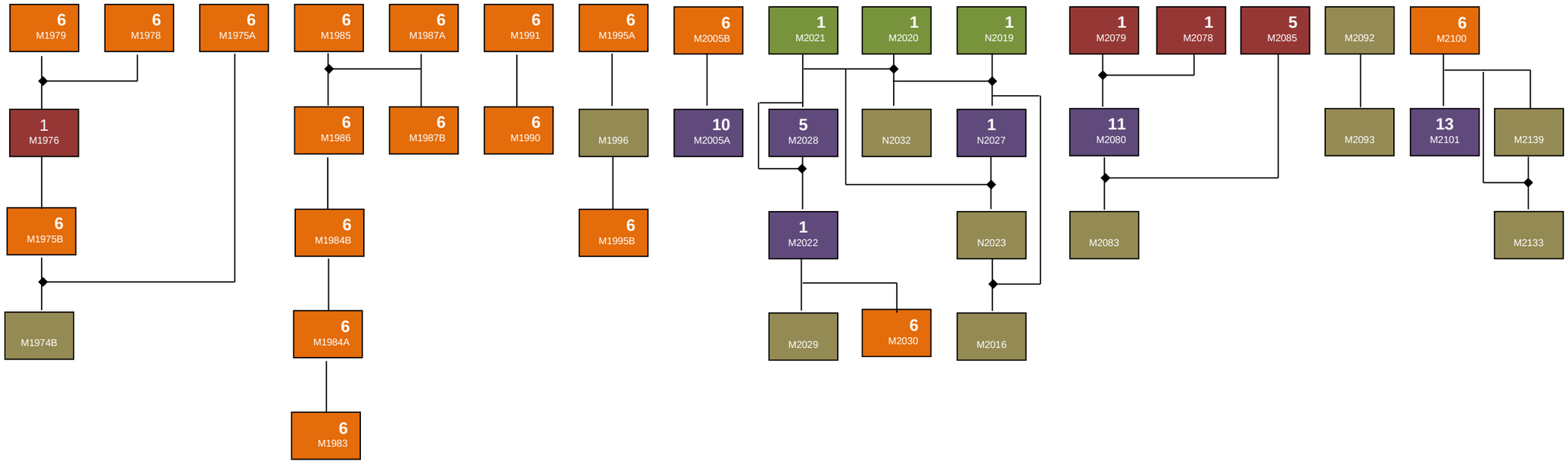
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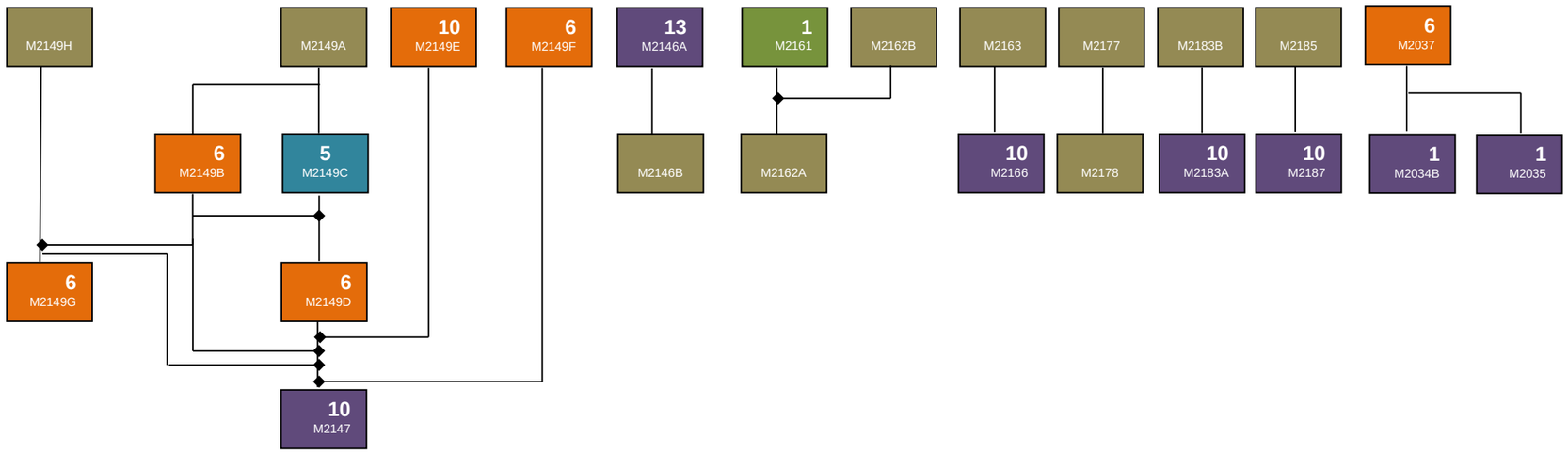
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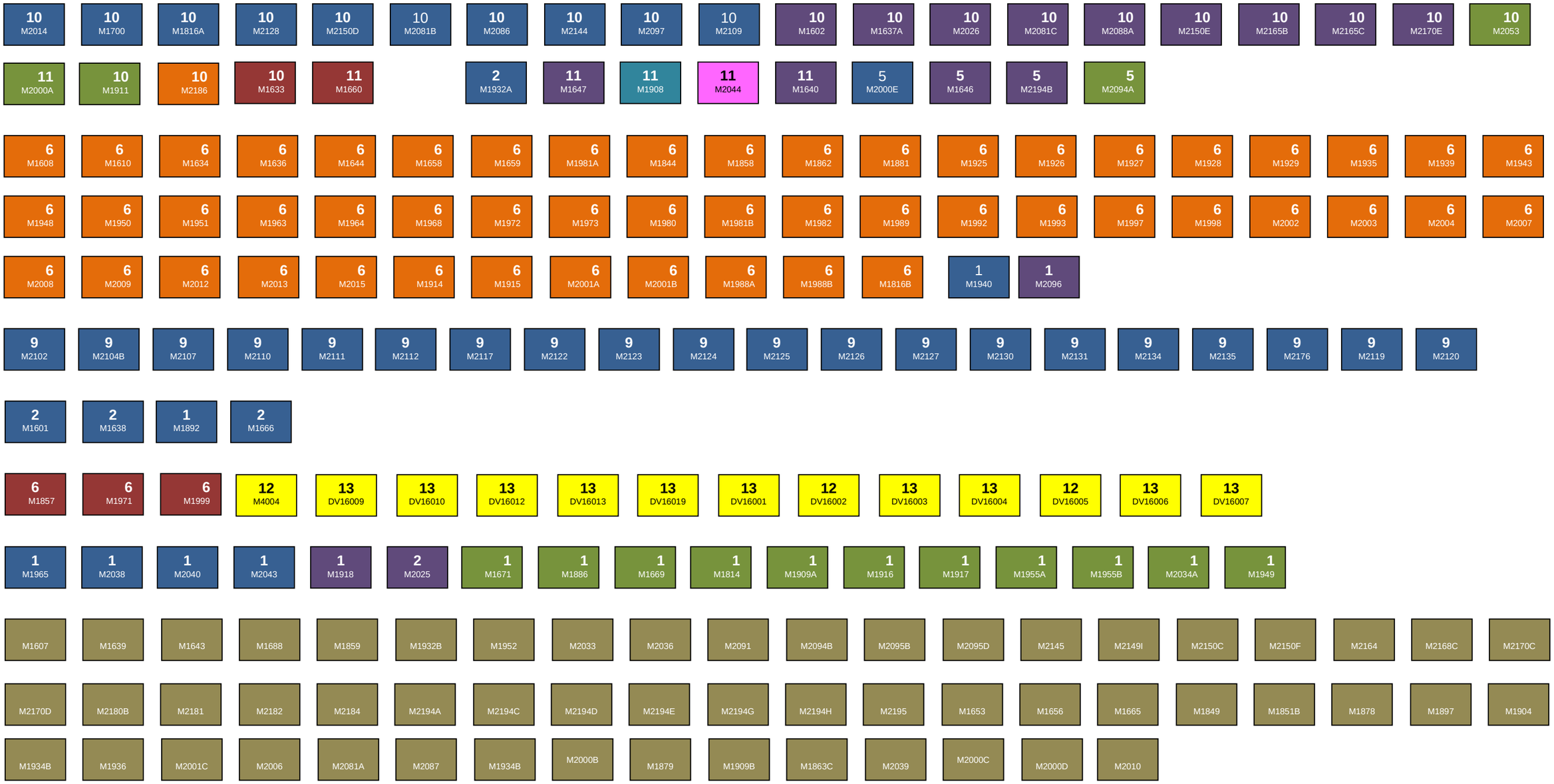

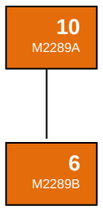

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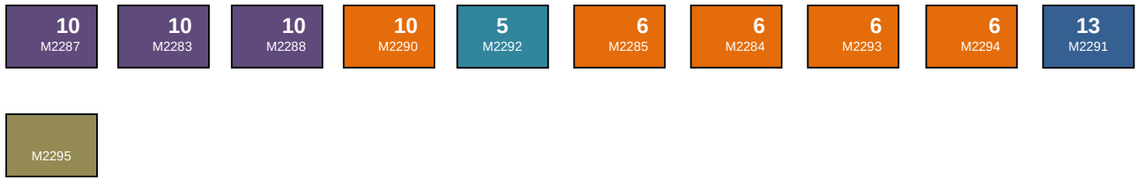

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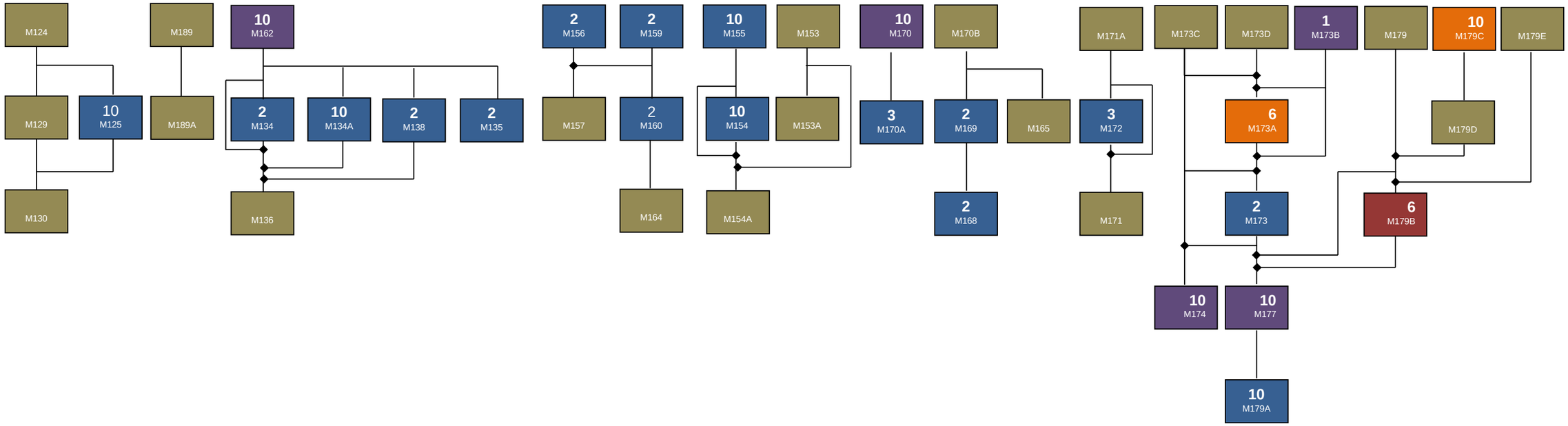
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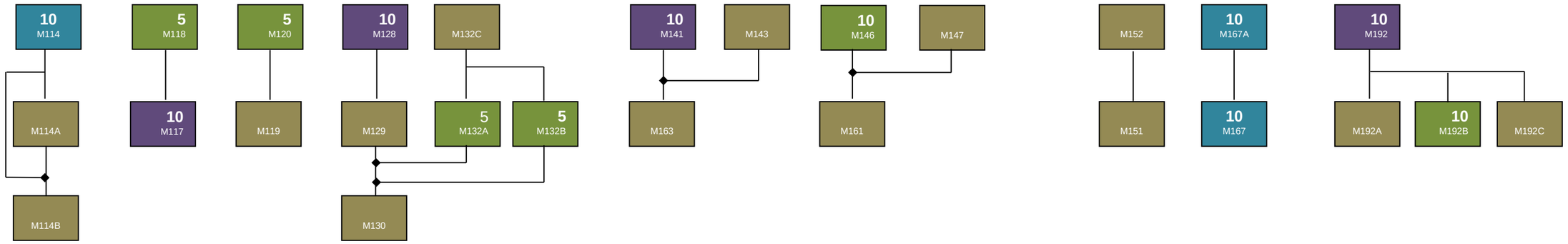

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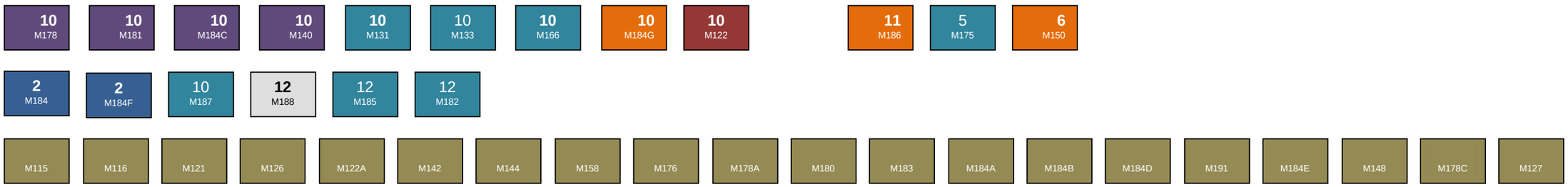

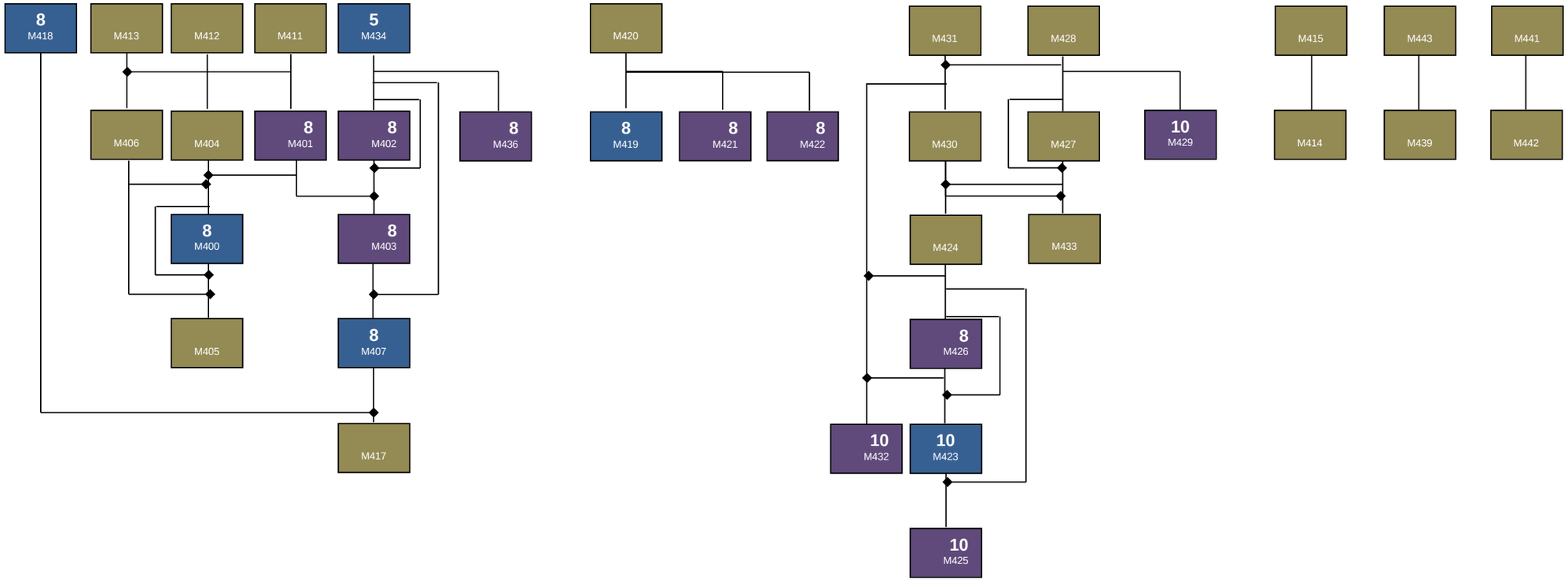

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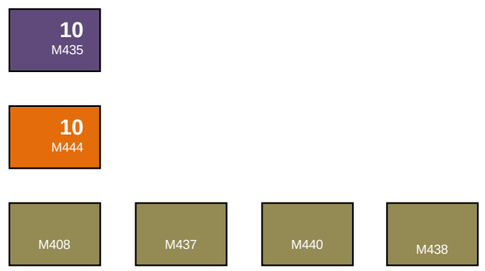

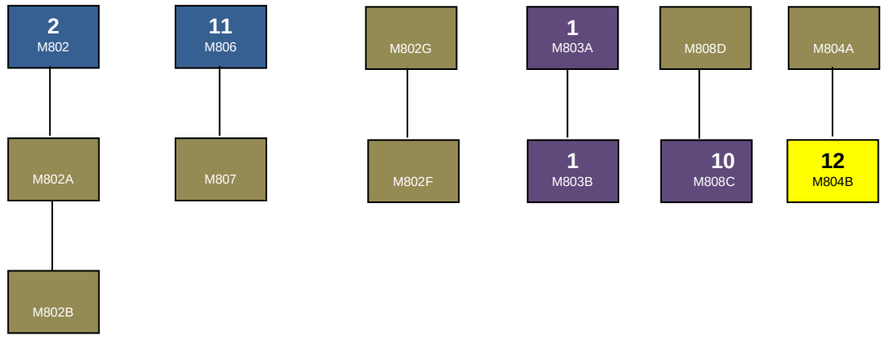

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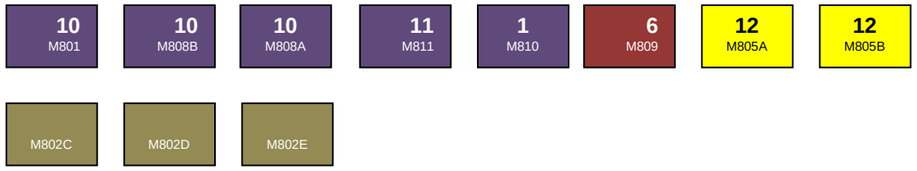

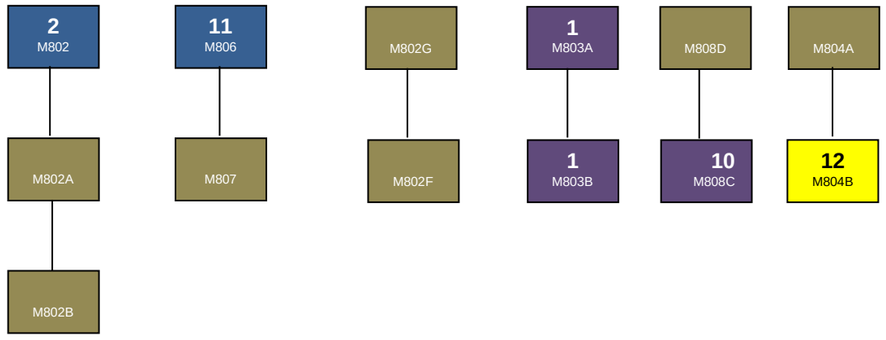

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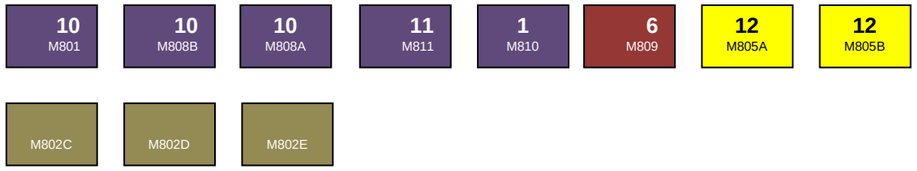

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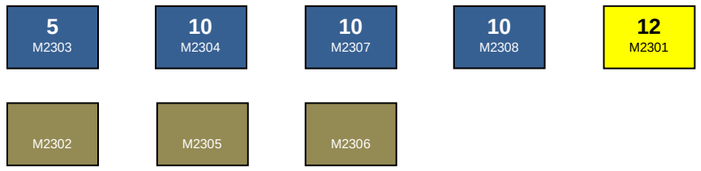

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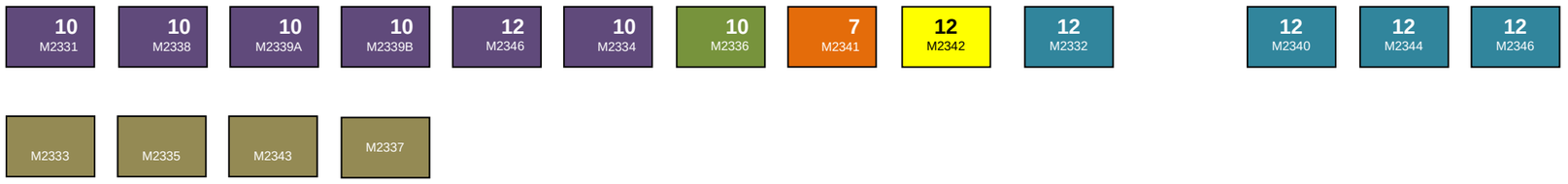

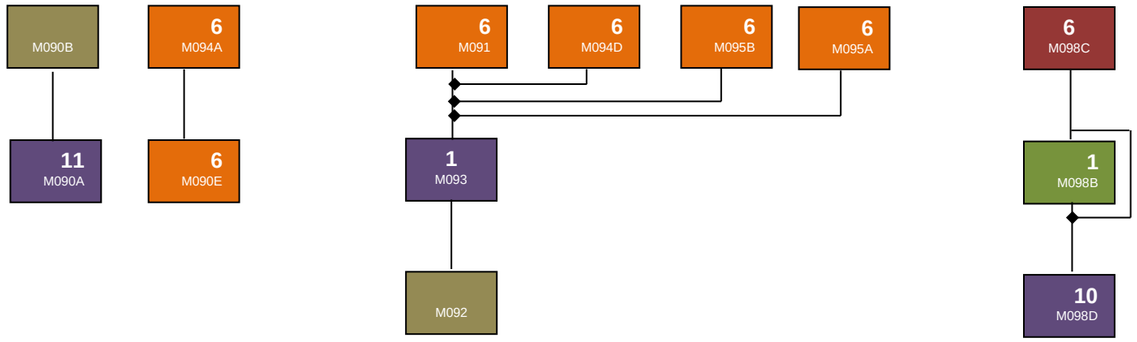

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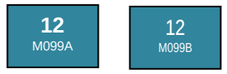

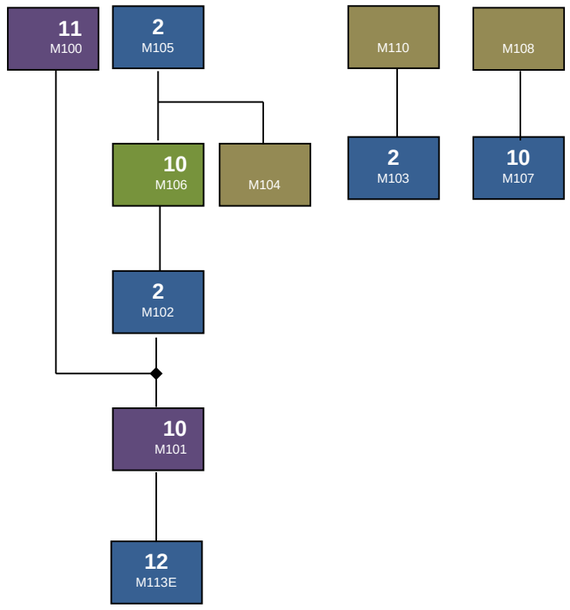

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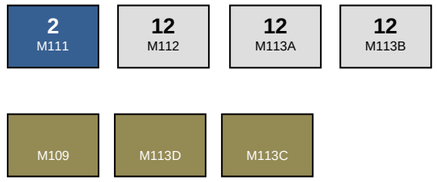

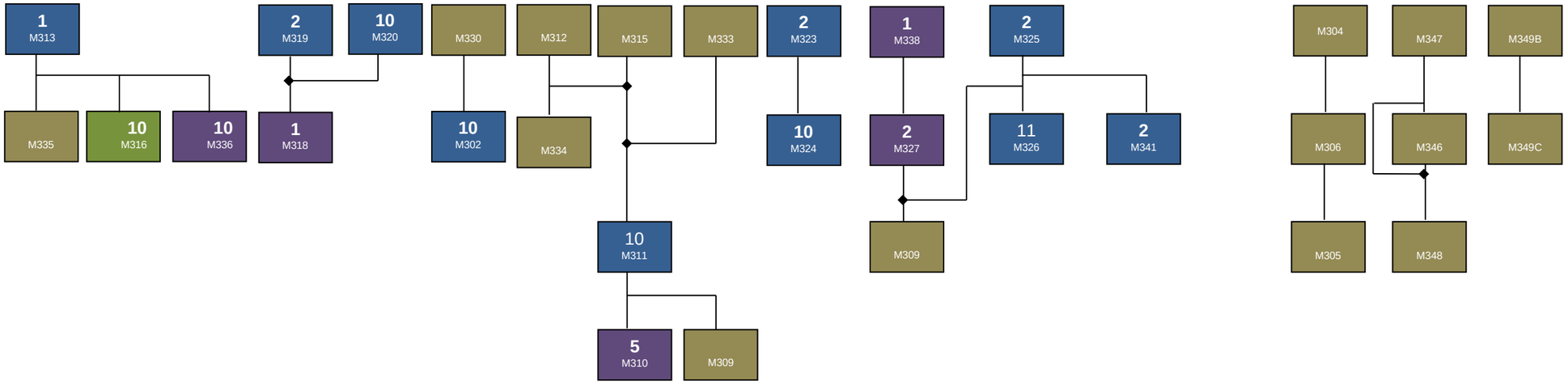

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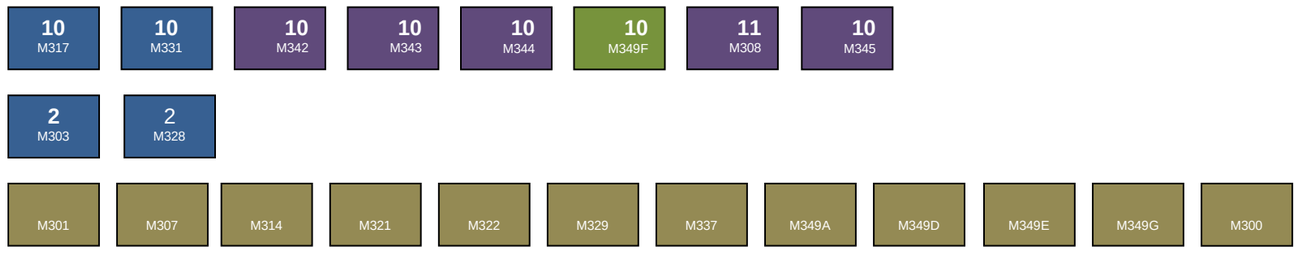

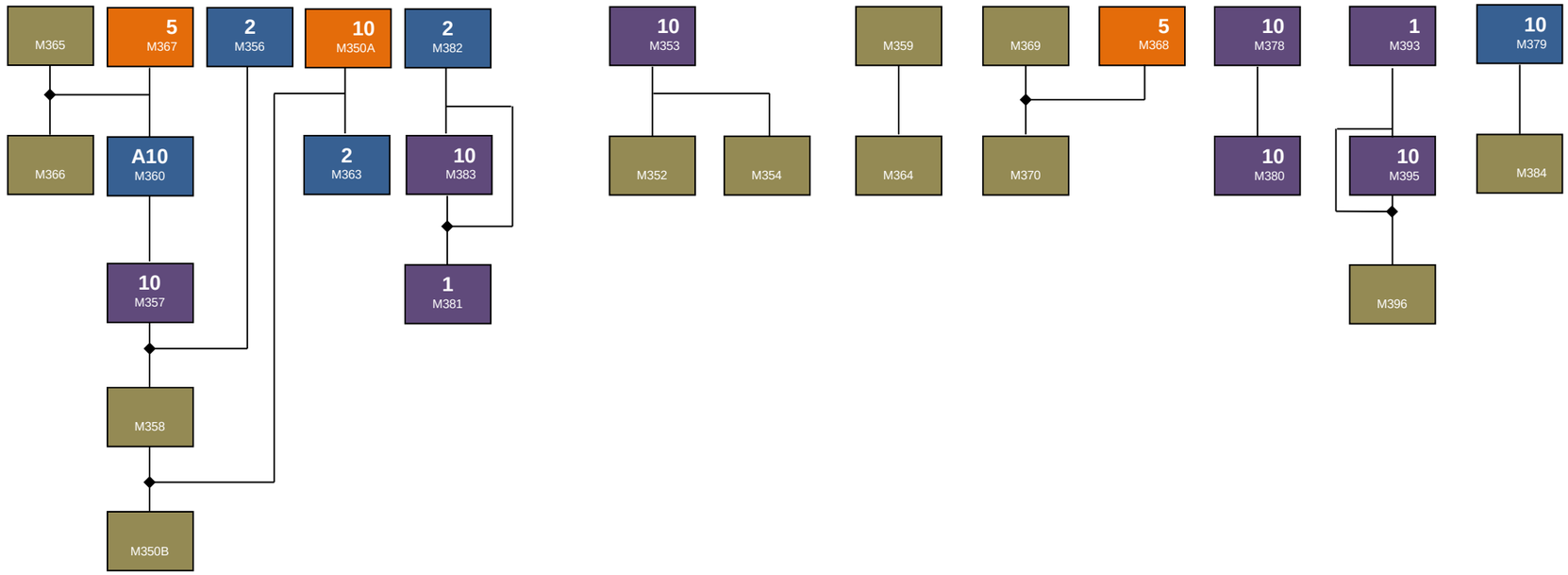

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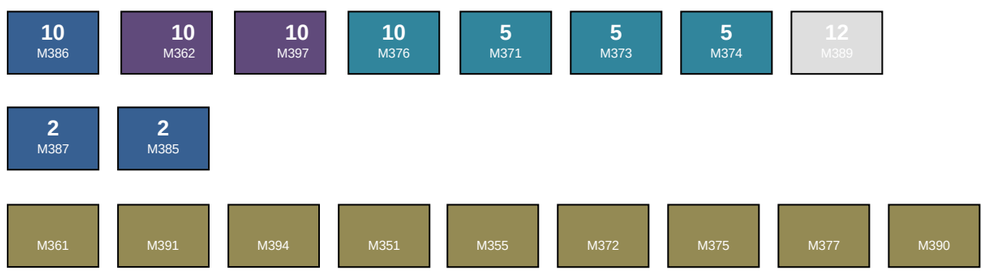

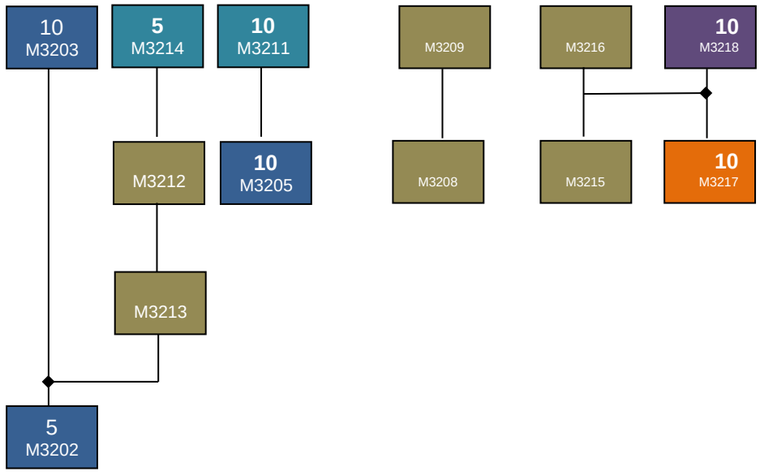

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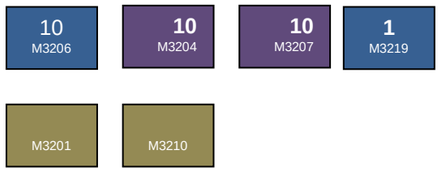

Appendix 11

Ochres and Flakes from Excavations

Introduction

Excavations were conducted at the following sites as part of the Lifeways of the First Australians Project.

- Langurmurru (Carpenter's Gap 3),
- Mount Behn 1,
- Djuru East (also referred to as Windjana Gorge 2 in publications), and
- Riwi.

Results of the excavations have been published and these are cited in the thesis and included in the references as appropriate.

This appendix provides photographs and brief descriptive information on the ochres and flakes recovered during the excavations.

Following completion of field work in 2011 and 2012 two additional excavations were conducted at sites related to this study following, one as a re-excavation of a site and one at the request of the Gooniyandi people:

- Tangalma (Carpenter's Gap 1), and
- Moonggaroonggoo.

Langurmurru

TABLE 1 PIGMENTS AND FLAKES RECOVERED AT LANGURMURRU

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-066	B	5		1.24		Y	1.8	8.1	5.7	Medium sized piece of red ochre. No indications of striations. From 6mm sieve.
O-067	B	7		4.22		Y	32.5	20.6	4.3	Large flake with red ochre. From 6mm sieve.
O-068	B	19		0.51		N	12.7	7.8	4.4	Very small piece of rock with red ochre on one side, appears to be in the rock not on it. Found in spit.

FIGURE 1 OCHRE ON LIMESTONE (O-067)

Mount Behn 1

TABLE 2 PIGMENTS AND FLAKES RECOVERED AT MOUNT BEHN 1

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-001	2	11			10YR 8/6 Yellow 10R 4/8 Red	Y	24.21	5.72	2.24	Painted bone with remnants of red/orange or red/yellow on both sides.
O-002	2	7	A		Red/Brown	N	18.72	11.96		Rock with small scratches on one side revealing red/brown ochre. From 3mm sieve.
O-003	2	7	A		Red	Y	10.43	8.06	5.52	Sandy red ochre with course particles and minute inclusions. From 3mm sieve.
O-004	2	2	B		1 or 6/8 Light Red	N	27.6			Thin flaked rock with painted ochre on one side in faded red.
O-005	2	20	A	1 .19	5YR Pinkish White 10R 6/6 Light Red	Y				6 small pieces of white pigment, one of which has a small, drilled section removed by Max Aubert for analysis. Some pieces have small red flecks.
O-006	2	11	D		10R 5/8 Red	Y	30.2	29.46	17.9	Large piece of rock with substantial red powdery silt (ochre) form and staining surfaces.

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-007	2	6	B		10R 4/8 Red	Y	32.41	18.58	11.45	Large piece of weathered ochre. Bevelled both sides to indicate it may have been used as a crayon or ground for mixing ochre. From 3mm sieve.
O-008	2	13	D		10R 8/1 White	Y				3 pieces of fine grain red ochre.
O-009	2	4	D		10R 8/1 White	Y				Small rock with white ochre on one side.
O-010	2	4	D		10R 892 Pinkish	N				7 pieces of coarse ochre.
O-011	2	11	D		7.5YR 6/4 Light brown red 10R 5/8 Red		40.51	21.1	17.4	Rock with ochre and powdery sand in sample bag. Two red dots on the rock surface. From 3mm sieve.
O-012	2	9	A		10R 5/8 Red	Y	15.4	7.07	4.54	Small piece of ochre with bevelled edges that may be ground or used for drawing.
O-013	2	16	A		10R 8/2 Pinkish White					9 small pinkish white pieces of ochre.

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-014	2	14	D		2.5YR 8/2 Pinkish White		11			1 large piece of fine dry white pigment with fine white powder in sample bag. Tinged pink under the microscope.
O-015	1	1	C		10R 4/8 Red 7.5YR 8/1 White	N	22	21.8	2.8	Small flake of rock with red pigment under white pigment. Both layers are visible and the sandwiching of red between the white and the rock surface is clear both in from the surface and in cross section.
O-016	1	3	D		10R 4/4 Weak Red 7YR 8/1 White		25.5	16.3	3.17	2 pieces of flaked rock with painted red and white pigment. Measurements are recorded for the larger piece. For the smaller piece the white pigment superimposes the red.
O-017	1	3	C		10R 4/8 Red		43.92	17.95	11.1	Rock with dep red colouring and shiny silica inclusions.
O-018	1	4	A							Large piece of ochre with deep red colouring.
O-019	1	4	A							A large piece of painted flake from the wall, with small areas of remnant white pigment. Three small piece of red and white painted flakes and one small piece of red ochre.

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-020	1	5	A							3 flakes with red and white painted pigment.
O-021	1	9	B							One rounded piece of deep red coloured ochre.
O-022	1	12	B							2 small round pieces of white ochre. Very dry and deteriorating in sample bag,
O-023	1	14	B							6 small dry white pieces of ochre. Two are flake shaped and the others are rounded.
O-024	1	14	D							7 small, rounded pieces of fine grained white ochre.
O-025	1	15	A							9 small, rounded pieces of fine grained white ochre,
O-026	1	15	C							13 small, rounded pieces of fine grained white ochre.
O-027	1	15	D							18 small, rounded pieces of fine gained white ochre, some of which have a pinkish tinge.
O-028	1	16	C							7 small rounded fine grained white ochre pieces, some with a pinkish tinge,
O-029	1	16	B							3 small rounded white ochre pieces.
O-030	1	16	D							9 pieces of coarse grained pinkish ochre, with brighter white pieces through it. Very grainy and dry in sample bag.

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-031	1	17	A							Many pieces of white ochre with pinkish tinge. Mostly small, rounded pieces. Some pieces are a brighter white, and possibly tinged with red sediment in which it was found.
O-032	1	17	D							8 pieces of white ochre in varying sizes split into 2 sample bags with Item O-034.
O-033	1	17	C							2 large and 4 small pieces of coarse grained white ochre.
O-034	1	17	D			Y				Small piece of red ochre painted flake of coarse limestone. Painted on both sides.
O-035	1	18	C							15 pieces of rough grained white ochre.
O-036	1	18	B							2 pieces of white ochre and residual coarse pieces of the same broken from them.
O-037	1	18	D							4 medium and 3 small pieces of pinkish white ochre.
O-038	1	18	A							7 small pieces of white ochre and 3 small pieces of flaked rock with white ochre painted.
O-039	1	20	B							3 large and 2 small pieces of fine grained white ochre.

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-040	1	20	C							1 flake of possible red ochre. 1 small, rounded piece of white ochre. 2 small nondescript, deteriorated pieces of possible ochre (flaked).
O-041	1	20	D							7 pieces of fine grained white ochre. 1 piece of red ochre. 5 small rock pieces, not clear if ochre.
O-042	1	20	A							3 large flakes with white and red ochre painted. 2 medium pieces of red ochre. 2 medium pieces of rock (?). Inclusive of smaller bag of very small pieces of white pigment.
O-043	1	21	B							2 very small pieces of white ochre. 2 small pieces of red rock with white ochre painted.
O-044	1	21	A							4 small pieces of white ochre, with minute red inclusions.
O-045	1	21	A							6-8 medium to large pieces of red rock with deep red colouring. Likely ochre, but not clear.
O-046	1	21	A							Collection of small pieces of red ochre.
O-047	1	21	A							1 flake with red and white paint. 2 smaller flakes, possibly related

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-048	1	23	A							Small piece of limestone with red ochre through it.
O-049	1	22	B							3 small, 1 large pieces of white ochre.
O-050	1	22	A							7 small pieces of deep red ochre.
O-051	1	22	D							1 small piece of red ochre.
O-052	1	22	C							1 small white nodule. Very smooth and oval shaped. 1 red nodule, slightly gibber and oval. 1 small piece of flaked rock with white ochre painted. A variety of indeterminate rocks with possible red ochre applied.
O-053	1	22	A							1 medium sized piece of coarse grained white ochre.
O-054	1	23	C							1 small piece of red ochre and several small nodules of white and red fine grained ochre.
O-055	1	13	D							Medium sized piece of red ochre with deep and lighter red tones.

FIGURE 2 PAINTED LIMESTONE FLAKE FROM MOUNT BEHN 1 (O-015)

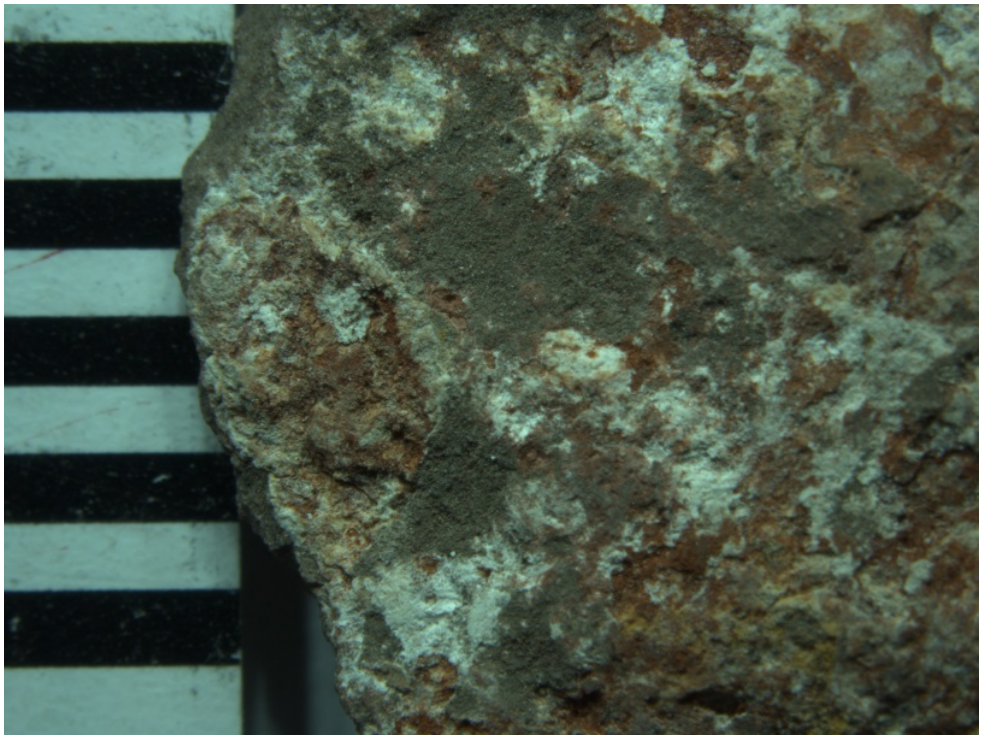

FIGURE 3 CLOSE UP OF PAINTED OCHRE ON FLAKE FROM MOUNT BEHN 1 (O-015).

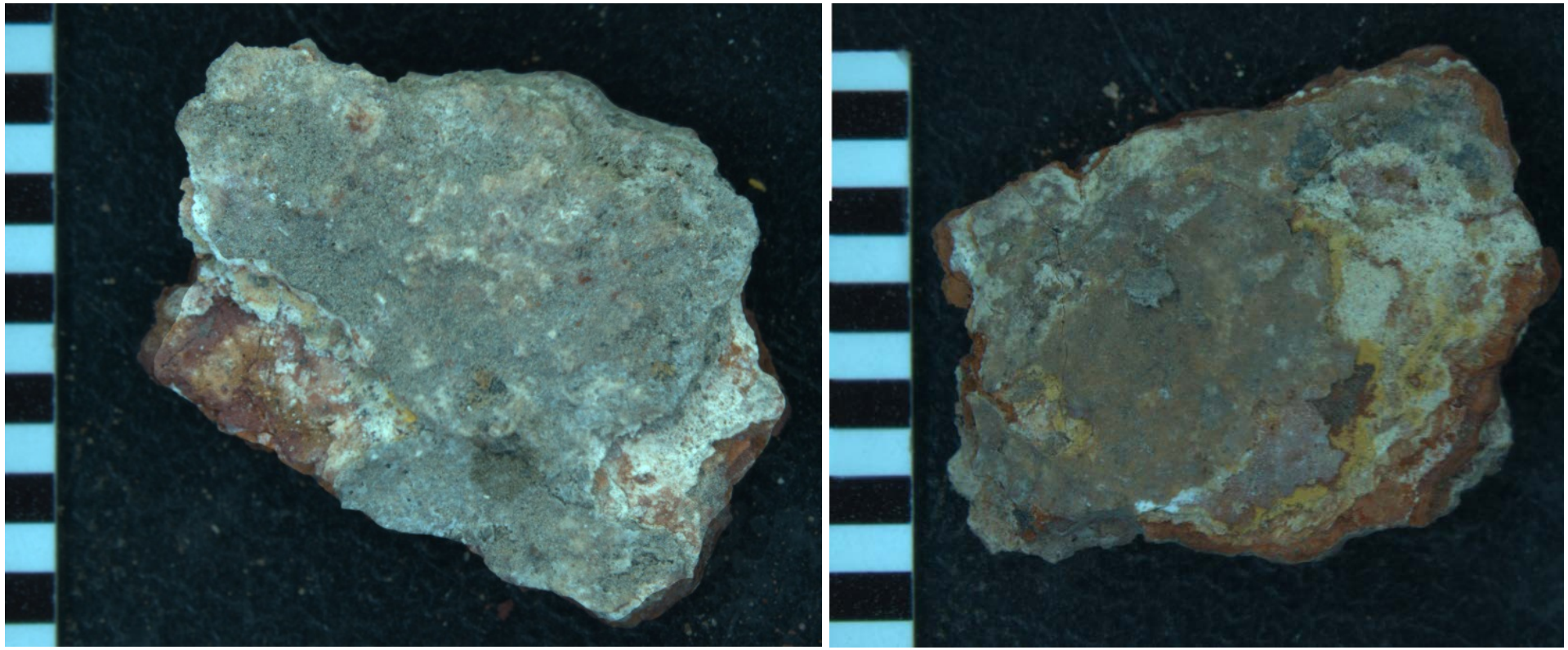

FIGURE 4 LIMESTONE FLAKE WITH OCHRE THROUGH IT AND REMNANTS OF PAINTED SURFACE, BOTH SIDES (O-019)

FIGURE 5 FLAKE WITH PAINT WHITE AND RED OCHRE REMNANTS FROM MOUNT BEHN 1 (O-020)

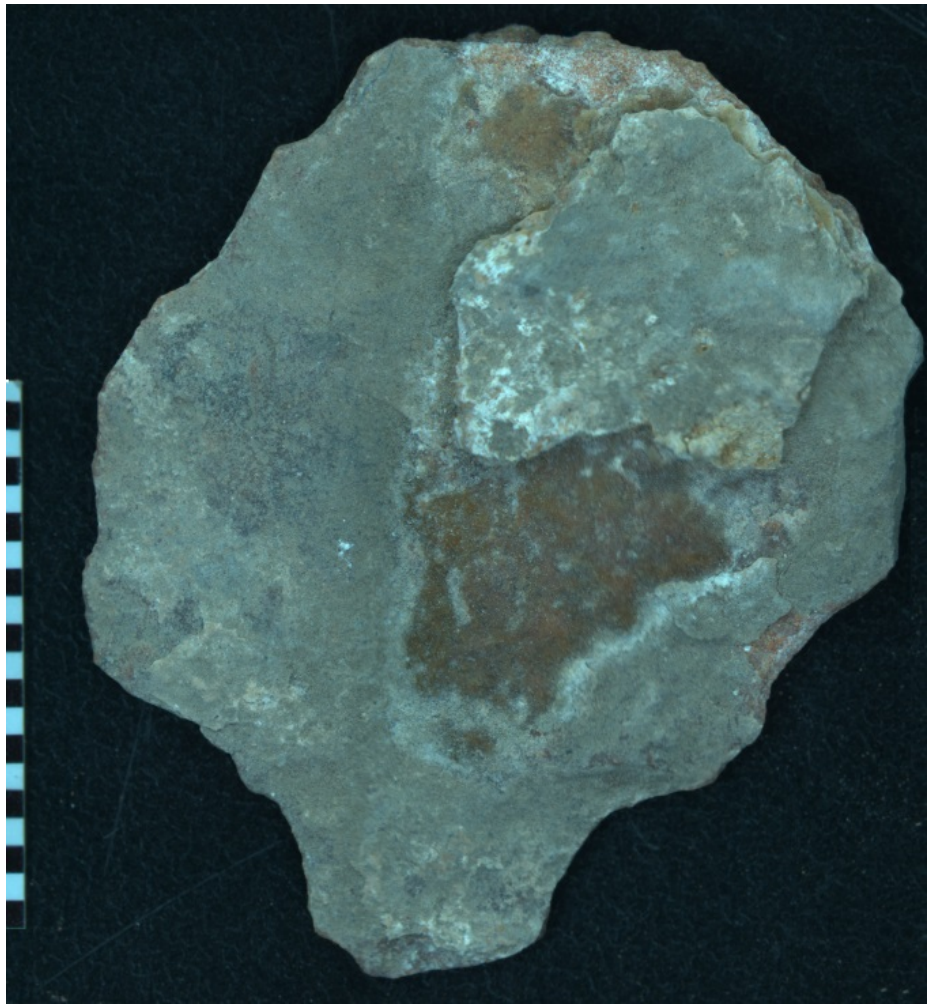

FIGURE 6 FLAKE WITH REMNANTS OF PAINT FROM MOUNT BEHN 1 (O-020).

FIGURE 7 FLAKE WITH PAINT RECOVERED FROM MOUNT BEHN 1(O-004).

FIGURE 8 PIECE OF ROCK, POSSIBLE OCHRE, RECOVERED AT MOUNT BEHN 1(O-006).

TABLE 3 PIGMENT AND FLAKES RECOVERED AT DJURU EAST.

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-069	1	2	C	7.17	1.2.5YR 5/4 Reddish Brown 2. 2.5 YR 8/2 Pink Yellow	N	1.39 2.29.7	1.31.5 2.25.8	1.16 2.15.8	2 pieces 1. Flake with one side smooth and 2 small marks of red ochre on one side only. 2. Broken flake from wall with one straight edge and white paint splotches on one side.
O-070	1	4	B	3.07	2.5YR 6/8 Light red	Y	58.1	52.7	43.8	Piece of possible red ochre with one smoothed edge and possible striations from grinding. Very small and leaves a colour streak when used as a crayon.
O-071	1	4	D	0.8	1.2.5YR 3/6 Dark red 2.10YR 7/2 Light grey	N	12.4	8.9	2.2	Small piece of painted rock with one smooth side with red ochre marks, other side grey limestone.
O-072	1	14	D	10.53	2.5YR 4/3 Weak Red 2.5YR 6/8 Light Red	Y	32.2	26	14.1	Small piece of red rock with smoothed side and curved side. Dar red colouring on smoothed flat side with elements of lighter red through sample.

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-073	1	16	A	5.82	1, 10R 7/6 Light red 2.10YR 7/5 Pale red and 10YR 6/1 Grey	1.Y 2.N	1. 21.5 2.18.9	1.15.2 2.6.8	1.11.5 2.3.9	2 pieces. 1. Round angled small rock with some facets that are smooth and suggestion of striations from the red ochre possibly ground. 2. Flat flake with one side with ochre painted, pale grey limestone on the irregular reverse.
O-074	1	16	C	1.78	5Y 8/1 White	Y				A collection of very small pieces of white ochre (max 5mm) which are deteriorating and creating powdered sediment in the sample bag. Leaves a clear white mark when used as a crayon.
O-075	1	17	C	1.5	2.5YR 5/4 Light reddish brown 2.5YR 4/6 Red	Y	15.4	13.7	5.4	Small flake from the wall with what appears to be painted colour on both sides, one with darker red and one with lighter red with spots of the darker red.

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-076	1	18	D	0.8			8.5	7.4	2.1	Small piece of ochre.
O-077	1	19	D	1.13	1.5Y 8/1 white 2.5Y 8/1 White and 10YR 7/2 Light grey	Y	1. 9.1 2. 11.3	1. 6.8 2. 8.7	1. 3.6 2. 6.6	2 pieces of white ochre, one with a lens of grey ash.
O-078	1	19	D	29.8	10R 5/6 Red and 10R 5/6 Red	N	60.8	33.5	10.8	Large piece of thick limestone with red and lighter red ochre painted only on one side.
O-079	1	19	D	78.25	10R 5/6 Red	N	66.4	452	17.6	Large pice of limestone with splotches of faded red ochre painted on one side only.
O-080	1	21	B	1.88	10R 5/8 Red	N	32.9	23.8	3.2	Flake from the wall with dark red ochre on one side only.
O-081	1	21	C	1.41	10R 5/6 Red	N	18.1	11.9	1.8	Flake from the wall with dark red ochre on one side only.
O-082	1	25	A	5.26	10YR 7/2 Light Grey	Y				Ash. Lots of small pieces of fine ash which has deteriorated and powdered in the sample bag. There are elements of white ochre in the mix, but very small and all <3mm.
O-083	1	33	A	2.5	10YR 8/1 White	Y	1. 12 2. 22.3	1. 9.2 2. 17.1	1. 7.4 2. 12.8	2 pieces of soft chalky white ochre.

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-084	1	34	D	0.7	1.5Y 8/1 White, 2.5Y 8/1 White and 10YR 7/2 Light grey	Y	10.2	9.2	7.8	Small rounded piece of white ochre, very fine grained.

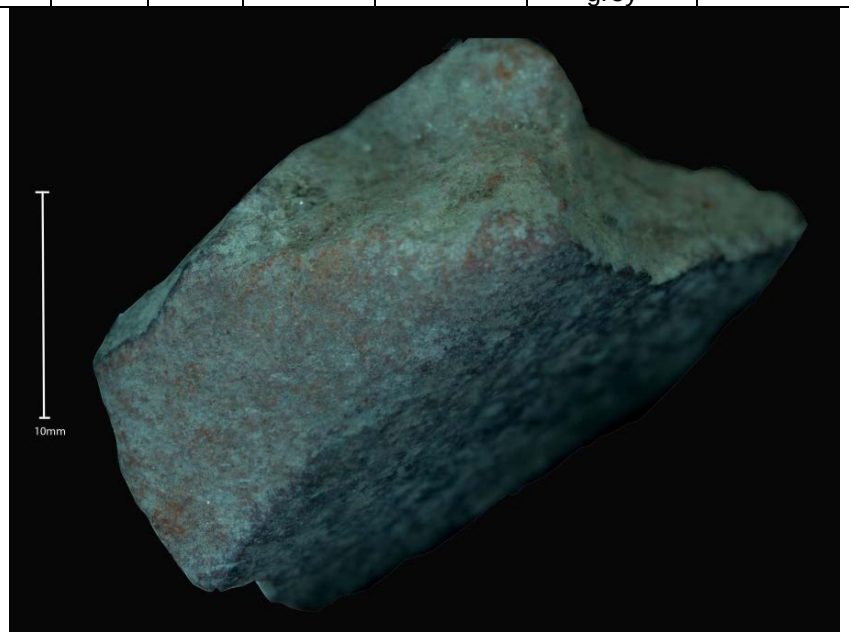

FIGURE 9 SMALL PIECE OF ROCK, POSSIBLE OCHRE, RECOVERED AT DJURU EAST (O-072).

FIGURE 10 PAINTED LIMESTONE RECOVERED AT DJURU EAST (O-069)

FIGURE 11 PAINTED LIMESTONE RECOVERED AT DJURU EAST (O-077).

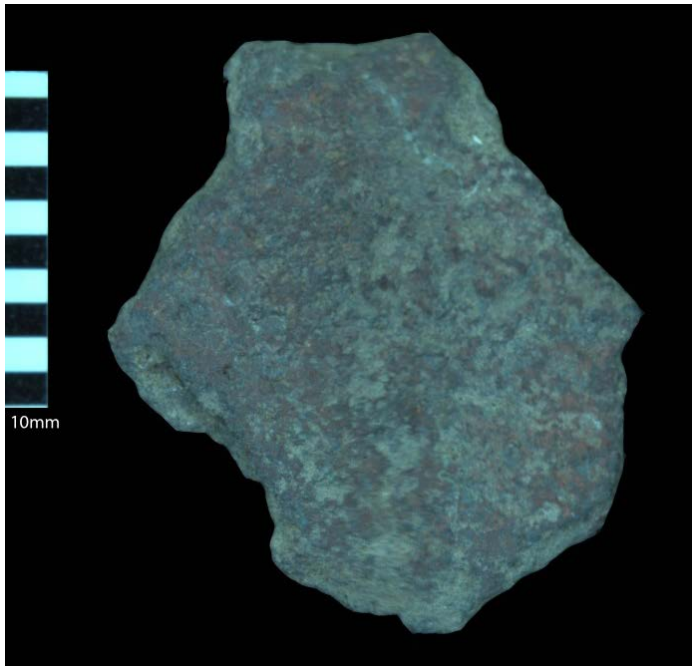

FIGURE 12 PAINTED LIMESTONE RECOVERED AT DJURU EAST (O-080)

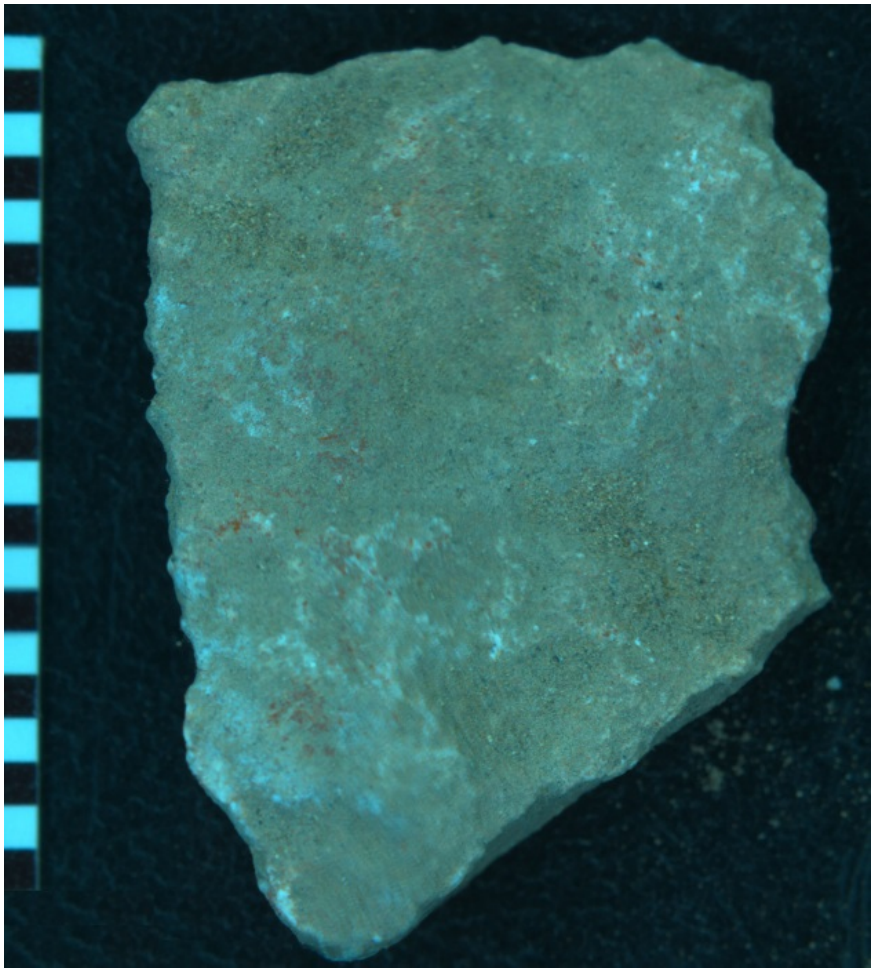

FIGURE 13 REMNANTS OF PAINT ON LIMESTONE RECOVERED FROM DJURU EAST (O-080)

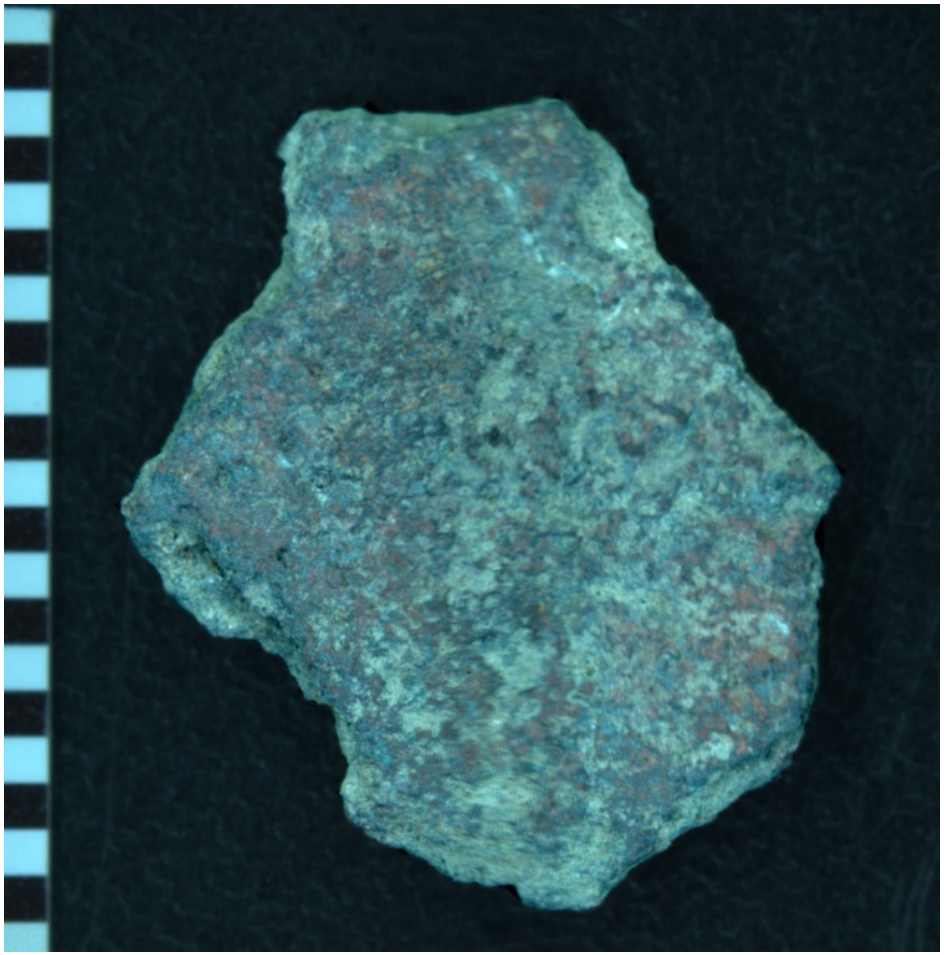

FIGURE 14 REMNANTS OF PAINT ON LIMESTONE RECOVERED FROM DJURU EAST (O-081)

Riwi

TABLE 4 PIGMENT AND FLAKES RECOVERED AT RIWI.

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-R01	1	10	B				13.8	7.9	6	Medium sized piece of red ochre.
O-R02	1	107	A				6.6	4.9	4.9	Small piece of yellow ochre,
O-R03	1	108	B				9.4	7.2	3.3	Small piece of yellow ochre.
O-R04	1	105	C							2 small pieces of red ochre, flaked.
O-R05	1	102	B							Many fragments of red ochre mixed with aggregate sediment.
O-R06	3	1	D	0.59	7.5YR 7/8 Reddish yellow	Y	12.4	14.4	3.4	1 flake of yellow ochre with brown on outside but brighter yellow inside.
O-R07	3	2	D	0.08	1. 10R 4/8 Red 2. 5R 3/8 Dark Red	N	1. 40.5 2. 14.5	1. 26.8 2. 10.6	1. 19.6 2. 8.7	1. Large piece of limestone with red ochre. 2. Rock with nick revealing darker red ochre.
O-R08	3	3	C	24.12	7.5YR 7/8 Reddish yellow	Y	7.2	4.7		1 piece of reddish yellow ochre.
O-R09	3	4	A	0.01	7.5R3/8 Dark red					Tiny piece of dark red ochre.

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-R10	3	4	C	0.017						3 small pieces of limestone with small white deposit which may be ochre or bird droppings.
O-R11	3	5	D	0.96						6 small pieces of ochre. 2 yellow. 1 burnt yellow. 1 white with red ochre on one side. 2 red ochre.
O-R12	3	6	A	0.15						1 small piece of white ochre.
O-R13	3	6	B	2.2	7.5R 4/6 Red	N	25.6	11.2	7	1 medium sized piece of rock from wall with patch of red ochre on one side.
O-R14	3	7	D	0.78	10R 4/8 Red	Y	15.1	9	5.5	1 small piece of solid red ochre.
O-R15	3	9	B	16.68	7.5YR -/1 White	Y	32.3	20.5	18.2	1 large piece of white ochre with brown/red sediment and 2 very small pieces of red ochre.
O-R16	3	10	A	0.018		Y				Very small pieces of coarse grained white ochre.
O-R17	3	11	A	0.18						5 pieces of dark red ochre and 1 piece of white that may be ochre.
O-R18	3	11	C	2.74			19.5	9.4	11.1	1 large piece of yellow ochre. 2 small pieces of red and 1 of possible white ochre.
O-R19	3	11	D	4.08			22.1	17	9.8	1 large piece of red ochre.
O-R20	3	12	A	0.65						2 small pieces of dark red ochre.

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-R21	3	12	D	0.09						1 very small piece of dark red pigment.
O-R22	3	14	B	1.35						1 medium piece of red ochre and coarse white/pinkish sediment and 1 piece of possible white ochre.
O-R23	3	14	C	0.08						1 minute piece of red ochre. May be aggregate sediment with red ochre inclusions.
O-R24	3	15	B	0.22						1 small piece of probable aggregate sediment.
O-R25	3	17	B	0.43						1 small piece of white ochre.
O-R26	3	20	A	1.51						6 small pieces of yellow ochre. 2 pieces of burnt red ochre.
O-R27	3	20	C	0.48	7.5R Dark Red					2 small, exfoliated flakes with dark red paint.
O-R28	3	21	A	1.5	10R 5/8 Red					3 pieces of yellow ochre. 1 small piece of orange ochre.
O-R29	3	25	C	0.14						2 small pieces if red ochre.
O-R30	3	25	D	0.12						1 tiny piece of yellow ochre.
O-R31	3	26	C	0.19						1 small piece of yellow ochre.
O-R32	3	27	A	2.38						1 large and 3 small pieces of yellow ochre.
O-R33	3	27	B	0.3						1 small piece of white ochre.
O-R34	3	28	B	2.83						8 pieces of white ochre in flakes and small chunks.
O-R35	3	28	C	0.64						1 small piece of yellow ochre.
O-R36	3	28	D	0.15						1 small piece of yellow ochre.

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-R37	3	29	B	0.21						1 small piece of dark red ochre.
O-R38	3	41	C	0.15						1 tiny piece of yellow ochre.
O-R39	3	42	D	0.3						1 small piece of yellow ochre.
O-R40	3	48	A	0.16						1 small piece of yellow ochre
O-R41	4	3	B	0.1						1 small piece of red ochre.
O-R42	4	3	C	0.04						2 small pieces of red ochre.
O-R43	4	4	B	0.12						1 small piece of white ochre.
O-R44	4	4	B	0.16						2 pieces of red ochre.
O-R45	4	4	C	0.12						1 small piece of white ochre.
O-R46	4	4	C	0.11						1 small piece of red ochre.
O-R47	4	5	B	0.91						1 medium piece of red ochre with fragments.
O-R48	4	5	B	0.22						2 small pieces of yellow ochre.
O-R49	4	5	D	0.16						1 small piece of white ochre.
O-R50	4	6	A	0.28						2 pieces of white ochre.
O-R51	4	6	C	0.18						1 piece of whit ochre flaked.
O-R52	4	6	C	0.29						1 small piece and fragments of dark red ochre.
O-R53	4	6	D							1 piece of yellow ochre.
O-R54	4	7	A	19.17			29	23.7	18.1	1 large coarse grained piece of red ochre.
O-R55	4	7	B	0.29						2 small fine grained pieces of white ochre.

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-R56	4	7	C	5.34						1 large piece of fine grained red ochre. 1 small piece of fine grained red ochre and 1 of white ochre with fragments of red.
O-R57	4	7	D	3.02						6 small pieces of red ochre. 1 medium and 5 small pieces of white ochre.
O-R58	4	8	A	6.24						1 small piece of white ochre and 2 small pieces of dark red ochre with fragments of white.
O-R59	4	8	C	0.13						1 tiny piece of white ochre with pinkish hue from sediment.
O-R60	4	8	D	0.34						4 tiny fragments of white/grey ochre/pigment. 1 tiny piece of yellow ochre.
O-R61	4	9	C	6.22			20.9	19.7	16.8	1 large piece of rock with yellow pigment through it.
O-R62	4	10	A	0.04						1 tiny piece of light red ochre.
O-R63	4	12	C	0.11						2 tiny pieces of light red ochre.
O-R64	4	13	A	0.17						1 small piece of yellow ochre.
O-R65	4	13	C	0.05						1 small piece of yellow ochre.
O-R66	4	14	A	0.16						1 small piece of red ochre.
O-R67	4	14	A	0.18						1 small piece of yellow ochre.
O-R68	4	15	D	0.45						1 small piece of red ochre
O-R69	4	16	A	0.09						1 small piece of yellow ochre.
O-R70	4	18	A	0.27						1 small piece of yellow and white ochre.

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-R71	4	20	D	0.16						1 small piece of red ochre
O-R72	4	24	C	0.37						1 small piece of yellow ochre.
O-R73	4	25	A	0.55						2 small pieces of yellow ochre, and 1 small piece of red ochre.
O-R74	4	26	C	0.04						1 small piece of yellow ochre.
O-R75	4	26	D	0.25						Tiny fragments of yellow ochre.
O-R76	4	26	C							1 small piece of exfoliated white ochre on a sliver of black rock or charcoal.
O-R77	4	30	A	0.48			19	8.9	2.8	1 medium flake of rock with red ochre patches.
O-R78	4	32	C	0.26						1 small piece of red ochre.
O-R79	4	33	A							3 tiny flakes with possible charcoal markings.
O-R80	4	33	B	0.08						1 small piece of white ochre.
O-R81	4	35	D	1.15						1 medium piece of coarse grained white ochre with red sediment and 1 fragment of red ochre.
O-R82	4	36	A	1.35						1 medium piece of white ochre.
O-R83	4	36	C	0.13						1 small piece of yellow ochre.
O-R84	4	37	B	0.12						1 small piece of white ochre.
O-R85	4	44	A	2.6						2 small pieces of yellow ochre. 9 small pieces of white ochre with red sediment through them.

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-R86	5	2	B	2.46						1 large piece of rock with red and white painted ochre on on side and partially over the edge.
O-R87	5	2	C	0.66						5+ small pieces of dark red ochre.
O-R88	5	2	D	0.23						2 pieces of burnt yellow ochre.
O-R89	5	3	D	0.67						1 medium piece of yellow ochre.
O-R90	5	3	B	0.72						1 medium piece of dark red ochre.
O-R90	5	4	D	0.61						2 small pieces of dark red ochre and 1 small piece of yellow ochre.
O-R90	5	5	A	2.05						4 small pieces of dark red ochre, 1 small and 2 tiny pieces of yellow ochre. 1 small piece of white ochre.
O-R91	5	5	B	2.47						1 large piece of dark red ochre. 1 small piece of burnt yellow ochre.
O-R92	5	6	C							1 medium piece of white ochre.
O-R93	5	7	D							Tiny fragments of white powdery nodules, possibly gypsum used a pigment.

ID	SQ	XU	Quad	Weight (grams)	Colour (Munsell)	Colour both sides (Y/N)	Dimensions			Description
							Length (mm)	Width (mm)	Thickness (at thickest point) (mm)	
O-R94	5	5	A				20.6	11.8	6.5	Medium sized piece of rock with dark red patches on one side.
O-R95	5	2				2.5YR 5/8 Red	51.1	38.1	29.7	Large rock with red and white pigment on one side.