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OUTLINING THE PORT HEDLAND STYLE: A DISTINCTIVE LOCAL SIGNATURE WITHIN THE BROADER SHARED ICONOGRAPHIES OF THE PILBARA, NORTHWEST AUSTRALIA

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Abstract

This paper explores the use of style to define homogeneity and heterogeneity within and across rock art provinces in the Pilbara, focusing on the Port Hedland region of northwest Australia. It is proposed that within the Port Hedland rock art repertoire there are two styles: a heterogeneous and distinct local style, distinguished by highly variable anthropomorphs, marine fauna and material culture items, set against a dominant homogeneous style including geometric and track motifs. These two distinct components within the one rock art body have been argued to represent both localised signalling of territoriality, and broader inter-group bounding. The relationship between these two components are examined to understand how Port Hedland was positioned within the chains of stylistic connection across the broader Pilbara region.
Introduction

Port Hedland is a distinct stylistic province within the stylistically diverse Pilbara region of northwest Australia (see Figure 1), which is home to many distinct engraving provinces, accompanied by a smaller suite of pigment art across the hinterland. Port Hedland style rock art is found across the majority of available calcarenite ridges fringing the Port Hedland harbour and coastline. It is argued in this paper that there exists within the Port Hedland repertoire two style subsets: a small heterogeneous figurative component made up largely of marine species, material culture items and distinctive anthropomorphs; and a larger track and geometric repertoire, that it will be argued falls within a broader body of homogeneous arid-zone track and geometric styles. This paper thus proposes that the rock art of Port Hedland presents a dual, but complementary style, with both functional and small-scale temporal variation.

The earliest recordings of Port Hedland rock art resulted in the development of a stylistic chronology which, along with other regions, was used as the basis of an Australian-wide rock art sequence, as well as being stylistically linked to the engraved art of the Sydney-Hawkesbury basin (McCarthy 1962). Whilst the validity of this sequence has largely been discredited (e.g., see Franklin 1984, 2004; Maynard 1979; McDonald 1994; Mulvaney 2013), particularly its validity as a pan-continental phenomenon, the stylistic chronology retains some value at the local level in relation to considerations regarding whether or not there exists localised phases reflecting social change during the mid- to late Holocene.

This paper begins with a brief outline of the history of rock art recording across the Pilbara to provide context to the following discussion. Issues covered in the outline include the consideration of potential bias in previous rock art recording (i.e., a preoccupation with anthropomorphic diversity—see Campbell 1911; Cleland and Giles 1909; McNickle 1984; Worms 1954; Wright 1968). The outline also explores variability across engraving style provinces to determine whether this former focus was warranted, and provides an overview of the Port
Hedland style to explain how this rock art body forms a regional style. By interrogating motif choice within the Port Hedland repertoire, division into figurative and non-figurative art is supported as the large collection of track motifs is dominated by macropod and bird tracks, and in comparison figurative depictions of animals are dominated by marine fauna, to the exclusion of macropods or emu. Studies of superimposition suggest that the figurative art may be limited to a restricted timeframe, where track motifs are present throughout the sequence. Consequently the difference in motif choice between track and animal motifs is argued not to be reflecting temporal change, but instead reflects choices made by artists.

From this, it is proposed that figurative styles and track and geometric styles are being used for different functional purposes (sensu Munn 1973) specifically around Port Hedland. Consequently, these two style groups need to be read against each other for a comprehensive understanding of the importance of both difference and cohesion for social group maintenance across the Pilbara region.

**Figure 1** Map showing linguistic groups, major rivers and rock art sites of the Pilbara, and examples of anthropomorphic stylistic diversity, with suggested stylistic regions (after McDonald and Veth 2013) (purple) (map not to scale) (anthropomorphs redrawn from Wright 1968 and Mulvaney 2013).
First Investigations of the Rock Art of the Pilbara

The Pilbara is a biogeographic zone in the northwest of Australia that also forms a broad culture bloc across which a number of distinct rock art styles can be identified (Figure 1). The observation of rock art across the Pilbara by Europeans, particularly along the coast, began with explorers in the 19th century (Basedow 1925; Campbell 1911; Cleland and Giles 1909; Clement 1903; King 1827; Richardson [in Curr] 1886; Wickham 1843, 1901). Withnell, in addition to later observers (Bates [in Crawford] 1972; Tindale 1987), witnessed engravings being made along the Pilbara coast. He reported on the method of Aboriginal engraving at Roebourne:

...the method adapted is to draw the outline with chalk or ochre and with a sharp hard stone hammer within the outline until the rock is fretted away about one-eighth of an inch deep... (Withnell 1901:29)

From this it has been inferred that he actually witnessed Aboriginal people producing engravings. Following this early interest, and other early descriptions of Pilbara rock art, came the recognition of stylistic variability in the region and the development of McCarthy's (1962) sequence (see Basedow 1925; Campbell 1911; Cleland and Giles 1909; Davidson 1937; Elkin 1949; Petri and Schulz 1951; Rose 1950; Worms 1954).

Pilbara Rock Art Repertoires

Across the Pilbara the majority of rock art is engraved, and McCarthy (in Wright 1968:vi) suggested that the ‘Pilbara district...is without doubt the richest and most exciting region of rock engravings in Australia’, and it is in the engraved repertoires that we see the breadth of stylistic diversity. Drysdale (in Wright 1968:vii) has similarly commented that:

...one would imagine that the laborious method of hammering and pecking would inhibit the artist to severe formalism. Instead, the figures display the exultant freedom of a drawing swept in with chalk, and so convey a state of excitement and movement that is both sophisticated and arresting.
The Pilbara’s engraved rock art has also received the bulk of academic attention in this region, although as noted above pigment art may also be found in parts of the hinterland (Mulvaney 2015; Wallis et al. 2015; Wright 1968). It has been argued that the pigment art lacks some of the complexity and diversity found in the engraved repertoires, it is also known to suffer from preservation issues (Wallis et al. 2015) as the predominantly white and yellow pigments were added to open surfaces (McDonald pers. comm. 2016). Given these factors this paper focuses on the better known engraved provinces, whilst acknowledging that further exploration of pigment art will provide complementary information that will enhance our understanding of landscape marking across this region.

As a result of the complexity and diversity of these engravings, stylistic regions have been identified across the Pilbara, as summarised by McDonald and Veth (2013) based on current research. The best-known of these regions include Port Hedland (Franklin 2004; McCarthy 1962); the Upper-Yule (Woodstock-Abydos particularly) (Petri and Schulz 1951; Worms 1954), Cooya Pooya (Wright 1968), the Dampier Archipelago (Mulvaney 2010, 2015) and Depuch Island (McCarthy 1961; Ride and Neumann 1964).

A handful of researchers have undertaken systematic studies across the Pilbara, led by Wright’s pivotal (1968) summary, and include McNickle’s (1984) Pilbara style analysis, a recent review by McDonald and Veth (2013), and headdress analysis by Piercy (2011). Apart from these, few systematic studies across the Pilbara have been undertaken to compare these identified rock art repertoires, or explore connections across the region. More common are studies of key sites with comparisons made between them, such as those exploring the Burrup Peninsula (Lorblanchet 1983, 1992; McDonald and Veth 2009; Mulvaney 2006, 2010; Vinnicombe 1987, 2002; Virili 1974, 1977), Depuch Island (Campbell 1964; McCarthy 1961), Port Hedland (Crawford 1972; Franklin 2004; McCarthy 1962; Palmer 1975; Petri and Shulz 1951; Tindale 1987) and Woodstock-Abydos (Petri and Schulz 1951; Worms 1954). The size and complexity of each of the provinces within the Pilbara needs to be recognised, and without detailed small-scale
recording and research, many bigger questions cannot be resolved.

Wright’s (1968) seminal analysis of Pilbara rock art covered 19 ‘galleries’, which he recorded as an avocationalist researcher. His focus was largely on anthropomorph variation across these galleries, where during his fieldwork, all ‘clear human and animal figures’ were recorded, along with a sample of geometric, track and other motifs (Wright 1968).

Wright recorded 4845 motifs across the following sites/stylistic provinces: Upper Yule, Cooya Pooya, Black Hill Pool, Hamersley Station, Hooley Station, Chiratta Station, Sherlock Station, Nynerry Gorge, Pirina, Juna Downs, Cape Lambert, Croydon Station and Pyramid Hill. Across these sites he recorded variations between site size and density (total motif counts), and differences between frequency of motif class and subject. The Upper Yule River sample accounts for the majority of his data (n=3007, 62.3%), where six of his sites include fewer than 100 engravings. In the Upper Yule sample we see 24% of the engravings are tracks, with 26% classed as ‘other’, which are largely comprised of geometric motifs, and 24% are anthropomorphs.

Following Wright (1968), Crawford (1972) estimated that there were perhaps 100,000 engravings across the Pilbara, reiterating the differences in style and technique of anthropomorphic engravings made by Wright. It may be that the track and geometric repertoire across the Pilbara is more homogeneous than the more obvious variation in depictions across figurative (and recognisable) motifs such as human and animal forms. Whilst it may be argued that track and geometric engravings are inherently more stylistically uniform than figurative motifs, the track repertoire from Port Hedland, as discussed below, will show that this is not always the case. The selection of the figurative motifs for focus by these researchers may indicate that there is a major difference between these two kinds of images in the Pilbara, and may account for the region’s exclusion from Maynard’s (1979) earliest phase: the Panaramitee.
Port Hedland Rock Art

Port Hedland has received significantly more attention than most other engraving provinces (with the exception of the Dampier Archipelago). This art has been recorded by Cleland and Giles (1909), Campbell (1911), Basedow (1918), Davidson (1936), Elkin (1949), Rose (1950), Petri and Schulz, with the Frobenius Institut team (1951), Worms (1954), McCarthy (1962), Tindale (1987) and Franklin (2004). However, amongst these studies particular sites—typically those that are easily accessible—have been recorded to the exclusion of others, and recordings tend to focus on figurative engravings of humans, animals and material culture to the exclusion of tracks and geometric motifs.

Naturalists Cleland and Giles (1909:46) provided the first written account of the Port Hedland engravings at Two Mile Ridge declaring:

Port Hedland itself is of little interest, being merely a sandy island almost without vegetation, cut off from the mainland by mangrove creeks. However, on a flat limestone ridge bordering one of these creeks and quite close to the town are a number of rough native carvings chipped with much labor on the horizontal surfaces...Many of the carvings are complicated and symbolic, others represent emu-tracks and spears, still others fish...and turtles...

Petri and Schulz (1951) visited Port Hedland in 1938–1939, recording approximately 20 outline figures, making notes on associations with different religious cults. Their recordings were made near the 'Native Hospital', close to Anderson Street in the centre of the current township, and along the main Two Mile Ridge. Their recordings focused on anthropomorphs and material culture, trying to understand the socio-cultural aspects of the engravings. In notes from their photographs they connected Minjiburu figures with the Kurangara cult, in line with Worms’ (1954) interest in connecting mythologies and anthropomorphic motifs. Kurangara was linked by Worms (1954), Berndt (1951) and Capell and Berndt (1952) with the Kunapipi cult, which he argued spread out of the Great Sandy Desert in historical times into Arnhem Land, the Kimberley, and also into the Pilbara, but only as far as the Upper Yule—and
specifically argued for the cult not reaching the coast and Port Hedland (Worms 1954:1082). They also remarked on the presence of spiral and concentric circles as being sacred central desert motifs, commonly associated with material culture used in secret-sacred ceremonies. They suggested that their presence in Port Hedland may result from ‘stimulative influences reaching their creators from desert tribes living far away’ (Petri and Schulz, translated, 1953:79).

Worms (1954) refers to Port Hedland as Bilba-ra (perhaps confused with the broader Pilbara) and, working with informants, wrote that the engravings across Port Hedland were made by a group called the Mindjebururung, or Mani wangu-mele (literally translated as ‘sign-stone-belonging’, i.e., ‘rock carving people’), who left behind reproductions of themselves on the rocks of the country through which they passed. Worms (1954:1086) distinguished the Minjiburu figures amongst the engravings, noting an ‘economy of drawing which I have not observed elsewhere’.

Tindale was part of an Anthropological Expedition team in 1953, alongside J.B. Birdsell, who travelled through the Pilbara, spending time in and around Port Hedland. Tindale’s main informant, Kundjung, a Kariyarra man, identified different kinds of material culture amongst the engravings such as a wooden boomerang used in fishing, specific names for marine fauna, and male and female anthropomorphs. Tindale (1987:55) repeatedly stated that engraved motifs were open for all Kariyarra to see, going as far as saying that for the Kariyarra there were no secret ceremonies. However, the same motifs that are found in the Hedland repertoire are known as secret-sacred in other parts of the Pilbara and further inland, and are only safe for initiated men to see (see Palmer 1981). This is an interesting difference because it suggests that during the time that Tindale spent in and around Port Hedland, his Kariyarra informants clearly distinguished their rock art from that of the broader Pilbara in terms of shared iconographies and cultural practices.

From these early recordings across Port Hedland a few key themes can be drawn out. A broad range of researchers have recorded engravings around Port Hedland. These recordings
were largely restricted to the Two Mile Ridge, of which little is left today as a result of the expansion of the town and associated infrastructure. Overall, few researchers have discussed the extensive track and geometric repertoire prior to McCarthy's (1962) comprehensive recording, with the exception of Petri and Schulz (1951).

**Temporality of Port Hedland Engravings within a Pilbara Context**

Currently there are no direct dating techniques appropriate for use on rock art produced on the exposed calcarenite ridges of Port Hedland. As the ridges are largely horizontal surfaces located on a cyclonic coastline, no crusts trapping organic materials have formed over engravings, and dateable sediments or archaeological deposits are not trapping or forming over them either. Consequently, dating of the Hedland art relies on inferential processes. These include superimposition of motifs, relative weathering of engravings, changes in sea level and consequent availability/prominence of the ridgelines in association with changing resources (from terrestrial to marine); and the presence of certain motifs within the repertoire such as material culture dated in archaeological contexts, terrestrial versus marine fauna, and other animals with associated dates for the region (such as the dingo).

Fluctuations in sea level both created the calcarenite ridges (former coastal dunes) during the Pleistocene (i.e., ca 125,000 years ago, the last time the sea was as high as it is currently), and created the mangrove, tidal creek and marine environment surrounding these ridges at approximately 6000 BP when sea levels reached their current stand (Baker 2001). As observed during the fieldwork for this project, within the figurative component of the Hedland engravings, all fauna has been identified as marine-based, with turtles, stingrays, whales, sharks, seals and various fish dominating the assemblage. Complementing their presence within the material culture are identified fishing boomerangs (see Tindale 1987) and fishing spears, occasionally with a line indicating that a rope was attached (Basedow 1925; McCarthy 1962; Tindale 1987). There is a strongly marine dominated economy documented amongst the figurative component of the Hedland rock art. The track repertoire, in comparison, largely focusses on terrestrial fauna,
with macropod and bird tracks the most common, with some lizard, insect and dingo tracks present.

Another potential age marker are the presence of dog or dingo tracks. Two key mitochondrial DNA studies contribute to debates about the timeframe of the arrival of dingoes into Australia from South East Asia. Both Oskarsson et al. (2012) and Savolainen et al. (2004) came to the same conclusion that dingoes most likely arrived in Australia approximately 5000 years ago, with a less probable margin of up to 10,000 years. The archaeological record similarly suggests arrival 3500 years ago (Gollan 1984; Milham and Thompson 1976) and 4500 years ago (Hiscock 2008; Walshe 1994), which fits loosely with the mitochondrial story. The arrival of dingoes in Australia from 5000 years ago provides one piece of evidence to narrow down the maximum production period of engraved dingo tracks. This broad date range may not be particularly specific, but it does accord with the engravings being made at Port Hedland following sea-level stabilisation from 6000 BP.

The McCarthy Sequence and Debate
McCarthy's (1962) fieldwork in Port Hedland and other rock art regions across Australia led him to develop a pan-continental four-phase model for engraved rock art (prior to Maynard's work, as discussed above):

1. Abraded grooves;
2. Outline naturalistic;
3. Linear; and
4. Intaglio/Fully pecked.

McCarthy (1962:87) argued that the change in stylistic repertoires was the result of changes in cult mythologies and rituals, with consequent spread of new associated art motifs across the continent, arguing that it was ‘important to realise how rapidly the diffusion of these cults affects the art of the local groups and tribes’. His explanation for a change from an outline to linear style was diffusion from northwestern Australia into the interior and south, the opposite direction to wooden
tjurungai from Central Australia to the north-west through the desert groups (McCarthy 1962: 86).

McCarthy’s sequence has been criticised on many fronts by fellow rock art researchers (see RAR 1988). Maynard (nee McMaha) specifically rejected McCarthy’s pan-continental sequence when developing her own (Maynard 1979; McMah 1965), and reiterated that using Port Hedland as the archetype for all Australian engraved art does not allow for the time depth of engraving across Australia, since ‘that bloody limestone is too soft for the entire development of Oz rock engravings to be manifest on its present surface’ (Maynard 1988:30). It was also suggested that the Port Hedland repertoire is homogeneous with minor stylistic changes in patterning and infill of figures, and all belongs to one broad time period (Maynard 1979, 1988; Rosenfeld 1988).

Maynard’s temporal criticism is valid in light of known Pleistocene-aged art (Dragovich 1987). However, her argument around accuracy based on style raised the more interesting question around Panaramitee-style art all being Pleistocene-aged, and how to deal with the extensive geometric and track engravings amongst the Port Hedland corpus (Clegg 1988:21). The basic problem here is that McCarthy’s perceived sequence did not follow the same sequence as other Australian engraving sites such as Sturts Meadows (Dragovich 1987).

McCarthy (1988) defended his conclusions, and whilst his Sydney-Hawkesbury specific sequence has been soundly refuted by further research in the region (e.g. Clegg 1977, 1987; Franklin 1984; McDonald 1994; Morwood 1980; Officer 1984), it is his defence of the Port Hedland sequence and its relationship with an Australian pan-continental sequence that is addressed here.
**Marine and Terrestrial Signals: The Port Hedland Repertoire as a Mid- to Late Holocene Sequence**

Some key theoretical issues around the Port Hedland style (or styles) lie in motif choice between motif classes, and how these compare to other Pilbara engraving assemblages. For the Port Hedland repertoire, a comparison can be made between the figurative motifs—where marine fauna dominate, and in addition some fishing paraphernalia can be seen—and the track repertoire, which is dominated by terrestrial species. It is argued here that between these two parts of the repertoire then, different identities are being negotiated. These foci mark Port Hedland as different to the broader Pilbara, where figurative macropods, as well as emus, are common, whilst the track repertoire more closely resembles that found in other Pilbara assemblages.

McNiven and Brady’s (2012) research on rock art and seascapes of the Torres Strait, northeast Australia, summarises the difficulties of marking a maritime identity on terrestrial surfaces, or at the interface between the sea- and landscape. This approach may present an unnecessary dichotomy, as groups during the Holocene across the Pilbara are likely to have been hyper-mobile, and seasonally adjusted to accessing resources both in the arid hinterland, as well as being coastally adapted (see Veth et al. 2014). Comparing these two coastal regions may have different results, reflecting a more nuanced understanding of coastal diversity. McNiven and Brady (2012:76) synthesised ontological and epistemological dimensions of seascape construction—their argument was that whilst much marine-themed rock art is found along the current coastline, the rock art itself is not a passive reflection of the environment, and that to ‘state that the occurrence of marine motifs in coastal contexts reflected the marine identity of its producers is simplistic’. Rather, marine rock art is a strong indicator of the inherent agency within rock art in the construction and maintenance of a maritime identity, as opposed to mere representation of resources or food (sensu David 2004).
If this premise is correct, the dominance of marine fauna at Port Hedland, as opposed to other repertoires, suggests that a maritime identity is being negotiated and asserted here as a point of difference. Amongst coastal Pilbara sites, the Dampier Archipelago provides evidence of a maritime identity emerging through time, and associated with changes in sea levels. The limestones of Port Hedland contain a much shorter sequence of engravings through time, as opposed to the engravings stretching back into deep time on the Dampier Archipelago (Mulvaney 2010). Of fundamental importance to understanding the Port Hedland repertoire, within its broader Pilbara context, is whether the figurative marine-dominated component of the corpus reflects a response to environmental change at the point of sea-level rise, or instead reflects the assertion of maritime identity for other reasons.

The recorded engravings from sites South West Creek 4 and Mourambine Kariyarra 3 is presented below as representative of the Port Hedland rock art style. The content and variation of this repertoire is examined in order to understand this proposed maritime identity.

Methods

Several field trips to sites in and around Port Hedland were undertaken between 2013 and 2014. Intensive rock art recording was undertaken at two key places, the tidal islands named South West Creek 4 (SWC4) and Mourambine Kariyarra 3 (MK3) (Figure 2) over a four week period in 2014. Each of these islands, located within the supratidal Port Hedland harbour, are ringed by mudflats and mangroves. They both present rich archaeological complexes with engraved art, grinding grooves and patches, shell midden, stone arrangements and a handful of stone artefacts.
Across SWC4 and MK3, 8320 motifs were recorded in detail. All motifs were entered into a relational database with standard attributes across all motifs recorded (e.g., technique, form, size), and for specific motif classes, additional variables were recorded specific to each motif class (e.g., such as tail form and liver presence for stingray motifs). The purpose of recording these attributes and variables was to determine whether the Port Hedland rock art repertoire was internally homogeneous (sensu Maynard 1979), or divided into technically and stylistically different groups. If the latter was visible, these attributes could be used to assess whether McCarthy’s sequence accurately described the rock art of this area.

At the core of much debate around defining a stylistic chronology for Port Hedland is the ability to correctly identify the order of superimposed engravings, particularly without the use of magnifying or other technology (Maynard 1979:91). This may be influenced by conflating Sydney sandstones with Port Hedland limestones, as many of the commenters were basing their comments on experience of the former (e.g., Clegg 1988:20). For example, Clegg (1988:21) stated that:
The study of superimposition of unpatinated engravings is less promising than the study of drawing superimpositions, for a little experimentation reveals that all combinations of engraved grooves or pits can be reproduced by making either groove first.

Consequently, whether superimposition order was visible was a key research question for this research and on-site assessment of superimposition order was undertaken.

In defining how style is portrayed across Port Hedland engravings, both technique and form were considered as having the potential for being encultured i.e., reflecting social/cultural preferences. However, across this particular assemblage the form of motifs appears to have more distinctive stylistic patterning. Additionally, within the repertoire, distinctive motif groups are presented to explore perceived active group signalling i.e., repeated designs included in representations of material culture (boomerangs, shields and spearthrowers) (see McDonald and Harper 2016), probable culture heroes (Minjiburu and Murra Murra), and their connections to mythological narratives, and engagement with territoriality and environment through distinctive marine fauna (particularly turtles and stingrays).

Results from South West Creek 4 and Mourambine Kariyarra 3

Across the two key sites examined for this research, SWC4 and MK3, 8320 engravings were recorded by the author (Table 1). Almost half of the motifs recorded were geometrics (n=3956, f=47.54%), followed by tracks (n=2569, f=30.87, where 839 of the latter are human tracks). Geometric and track motifs together comprise 78% of the repertoire, with the remaining more figurative classes (i.e., anthropmorphs, material culture, phytomorphs, therianthropes and zoomorphs) comprising 22% of the assemblage. Interestingly, material culture comprises ~10% of all engravings, which is argued to be considerably higher than in other Pilbara regions, and higher than many engraved rock art assemblages (e.g., Franklin 2004; McDonald 2004; Mulvaney 2010).
Table 1 Count and frequency of all motifs by class.

<table>
<thead>
<tr>
<th>Motif Class</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geometric</td>
<td>3956</td>
<td>47.54</td>
</tr>
<tr>
<td>Spooromorph</td>
<td>2569</td>
<td>30.87</td>
</tr>
<tr>
<td>Material Culture</td>
<td>898</td>
<td>10.79</td>
</tr>
<tr>
<td>Zoomorphic</td>
<td>566</td>
<td>6.80</td>
</tr>
<tr>
<td>Anthropomorphic</td>
<td>220</td>
<td>2.64</td>
</tr>
<tr>
<td>Amorphous</td>
<td>86</td>
<td>1.03</td>
</tr>
<tr>
<td>Phytomorphic</td>
<td>20</td>
<td>0.24</td>
</tr>
<tr>
<td>Therianthropic</td>
<td>5</td>
<td>0.06</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8320</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

There are some biases in these figures, as all motifs can be broken down into geometric forms (as a combination of lines and shapes), creating a major bias towards inclusion in this class. However, the distinctively local motif classes (material culture, zoomorphs and anthropomorphs) will be summarised briefly below, followed by a summary of the Geometric and Track repertoires.

**The Hedland Style: Figurative Component**

There are several motif classes that are distinctly local, which together make up the hyper-local style (being limited to the calcarenite ridges of the Port Hedland harbour, across an area approximately 20 x 8 km). Three dominant groups are discussed here which combine to present a complex local identity: material culture, marine fauna and two probable culture heroes from the anthropomorph class (Minjiburu and Murra Murra). Following a brief discussion of these three classes, the local Port Hedland identity(ies) is presented.
a. Material Culture

Material culture forms a significant part of the repertoire (n=898, 10.79%) arguably much higher than recorded across other Pilbara regions (although note Mulvaney [2010]); material culture is subsumed within his Geometric class). As such it forms a key aspect of what makes up the Port Hedland style, and way of doing, and the presence of repeated designs on these motifs provides information on what kinds of identity are being signalled here.

Identifiable material culture is somewhat connected to known objects e.g., shields, boomerangs and axes. There are a number of motifs that are classified as geometrics in this study that may represent material culture, such as ovals which may represent shields or coolamons, if ‘read’ with an informed perspective. Consequently this list should be read as a minimum, or limited to what Munn (1973) referred to as ‘continuous’ meaning ranges, finding a visual match with objects in the real world. Shields have been identified here, as opposed to other oval shaped objects, based around the consistency within set shapes and presence of distinctive designs (see McDonald and Harper 2016).

This research recorded axes, bags, boards, boomerangs, headdresses, hooked sticks, nets, rope, shields, shoes, spears and spearthrowers. These objects have been defined as follows:

- Axe: round to pointed head, with attached handle;
- Bag: comprised of intersecting lines, with strap;
- Board: elongated parallel oval, with or without design;
- Boomerang: outline arc, generally tapers at one or both ends, with or without design;
- Headdress: varying shapes, generally associated with anthropomorphs;
- Hooked stick: tick shape, tapered to a point at one end, opposite end rounded and fat;
- Net: gridded design, generally associated with marine fauna;
- Rope: meandering line;
- Shield: various defined oval shapes, with or without design;
• Shoe: oval shape, wider at one end, generally gridded over half of oval;
• Spear: line with barbs indicated; and
• Spearthrower: oval with small barb at one end, longer handle at other, with and without design.

Some of these motifs are identified by their association with other engravings in scenes. For example, when seen in fishing scenes rope is identifiable, though such a motif recorded in isolation, would be classified as a meandering line. In the category of material culture three distinct objects dominate: spears (n=310, 34.52%), boomerangs (n=270, 30.07%) and shields (n=210, 23.39%).

Amongst material culture engravings, the motifs fall into two broad style groups: outline and linear. In the outline styles, 375 motifs include internal design patterning including boomerangs, clubs, shields and spearthrowers. There is some overlap between designs across material culture types (e.g., between boomerangs and shields), but it seems that each object possesses its own range of repeated designs, i.e., certain designs are seen on shields, and a different group of designs are seen on boomerangs. These designs are argued to contain the best potential for identity signalling from this group of motifs (see McDonald and Harper 2016), and the combination of their form (outline + patterning) and technique (pecked and pecked/abraded) with the use of repeated designs is presented as one stylistic group.

Of material culture items with internal designs, shields are the most common, and have the most complex design variability. Shield designs were grouped into: curvilinear, zigzag, asymmetric, wavy, linear, empty space, concentric and blank. Within these types, between one and six design variations were recorded (for a full analysis of shield design variability see McDonald and Harper 2016). In comparison with Sydney basin shield motifs, it was argued that the shield design variability in Port Hedland showed conscious territorial signalling affiliated with focalised coastal resources on the edge of an arid landscape (McDonald and Harper 2016).
The repetition and probable small-group identity signalling shown on shield engravings is not found with the same consistency on either boomerang or spearthrower motifs. Across the 143 boomerang motifs, six qualitative design groups were identified, with between three and five variations, resulting in a total of 22 designs (Figure 3). One particular design comprising vertical banding dominates, with 80 examples known (59.7%). Only one other design has more than ten examples, and half of the designs are unique (i.e., have a single example).

![Figure 3 Stylised line drawings of engraved boomerang design variation.](image)

Spearthrowers show even greater design heterogeneity. Among 16 examples, 12 designs were recorded (Figure 4). Morphological differences were also recorded for spearthrowers, dividing long thin objects from squat, rounded examples.
b. **Marine Fauna**

As shown in Figure 5, 566 figurative animal engravings were recorded, and from this group marine fauna dominate (Figure 4, blue). Of zoomorph figures, which can be definitively classed as marine, terrestrial or avi-fauna, 472 (~83.4%) of the figures are marine. Turtles and stingray figures dominate the assemblage (n=114, 20.14% and n=107, 18.9%, respectively).

*Figure 4* Stylised line drawings of engraved spearthrower variation, in design and overall morphology.
A number of styles are seen across the animal depictions, with the key factor in distinguishing among them being their general form. A majority of the animals depicted are marine species, and a majority of these are outline, and shown as seen from above, suggested by the presence of two eyes, following Rosenfeld’s (1983:35) assertion that ‘in the Port Hedland art, a bird’s eye view of the world prevails’. Form also seems to characterise the small number of terrestrial fauna depicted. For example, all lizards are simple infill forms. Amongst marine fauna, there are a handful of infill examples (crabs and fish), and a few infill heads and flippers on turtles.
The outline styles are heavily dominated by stingrays and turtles, both of which have minor stylistic variation (and sub-styles), followed by various fish and other finned marine species such as probable whales, sharks, dolphin and seals. A small but distinctive subtype (Figure 6) is banded outline marine animals, and these tend to be non-diagnostic of specific marine species.

![Banded marine fauna example](South West Creek 4/SWC4)

Comparing the two dominant fauna groups (i.e., turtles and stingrays), turtles are more stylistically homogeneous, with the majority (n=110) of forms being outline (across the shell, head, flippers and tail) and the carapace pattern being dominated by two designs, and with four carapace shapes. This is in stark contrast to turtle stylistic variability recorded across the Dampier Archipelago (de Koning 2014; Gunn and Mulvaney 2008).

Stingrays are a more heterogeneous group, with a larger range of body shapes recorded (n=13), across a smaller group size (n=99), where four of these shapes (circle, oval, irregular and balloon) has more than ten examples each. Outline forms are also dominant for stingrays, however two infill examples were recorded. Stingrays also include greater variation across attributes, such as the presence of pectoral fins, claspers, livers and beaks. This suggests that these two marine fauna have played different roles within the repertoire, whilst largely fitting in with the general outline style of Port Hedland.
Amongst other marine fauna, a range of styles were recorded (Figure 7), with probable clinal variation between stylised outline figures, through to more naturalistic and anatomical outline figures. The most stylised forms (Figure 7, far left) are the most frequent \( (n=40, f=41.23\%) \), followed by naturalistic symmetrical forms (Figure 7, centre: \( n=17, f=17.52\% \)) and outline forked tail forms (Figure 7, right: \( n=12, f=12.37\% \)).

![Figure 7](image)

**Figure 7** Identified marine styles of fish in the Port Hedland engravings.

In summary, with the exclusion of infill lizard motifs \( (n=14) \), a single unidentifiable quadruped, and snake motifs, all animal depictions are marine species. They tend to be outline in form, with some variation within motif classes, across stingrays in particular.

c. *Minjiburu and Murra Murra*

A total of 193 anthropomorphs were recorded across sites SWC4 and MK3. This is the third largest figurative class recorded, though it comprises just 2.32\% of the entire assemblage. This figure does not fit the broader Pilbara pattern of anthropomorph dominance (see McDonald and Veth 2013), where for example on the Burrup Peninsula anthropomorphs comprise 22\% of the assemblage, at Woodstock-Abydos 23.8\%, and at Cooya Pooya 82.8\% of the assemblage (McDonald and Veth 2013). The large datasets for these other areas—approximately 3000 motifs each for Woodstock-Abydos and the Burrup—provide robust sample sizes to compare these frequencies.
Another point of difference in the Port Hedland repertoire is that these human figures are not dominated by stick figures or other small, stylised humans, but rather by two types of simple but distinctive figurative human types, and probable culture heroes. These two figures are the Minjiburu and Murra Murra, using the names given to the figures by Kariyarra man Captain George to McCarthy (1962). The Minjiburu style is a distinctive upside down U-shaped human figure, often with a rayed headdress or hair, facial features, gendering and large infill hands and feet (Figure 8, left). The Murra Murra style is equally distinctive, and radically different to the former, comprising generally large, long human figures made up of parallel lines (Figure 8, right).

Some spatial differences can also be seen inter-island between these two. For example, the majority of Minjiburu figures are located on SWC4 (72.92%), and whilst more engravings as a whole were recorded on SWC4, this figure can be compared with that of stick figures which have a much higher frequency on MK3 (63.83%), than SWC4 (36.17%). Murra Murra figures have similar frequencies across both islands (MK3=57.14%; SWC4=42.85%). This suggests that the Minjiburu in particular are more strongly associated with actions at SWC4.

![Figure 8](image-url) Comparison of Minjiburu (left) and Murra Murra (right) human figures.
The distinctiveness and dominance of the Minjiburu and Murra Murra figures fit within McDonald and Veth’s (2013:76) proposal that ‘the style of the anthropomorphs [are] the dominant evidence for stylistic variability between the Pilbara provinces’.

The Minjiburu have received the most attention of any motif type across Port Hedland, and have been labelled as a ‘distinct group having no relationship to any other series’ (Wright 1977: 114; see also McCarthy 1962; Petri and Shulz 1951; Wright 1977). The defined uniqueness of this set across the Pilbara singled out this series for detailed analysis, in combination with connections made between these figures and known mythological heroes.

Minjiburu (n=48, f=24.87%) are the most frequent anthropomorph type recorded across the assemblage. When looking more closely at these figures, it may be observed that there is considerable stylistic variation within the motif class. The figures have been grouped into 12 sub-groups, which address body shape, head shape, arm and leg form, presence of a neck line, and whether this is formed using the same line as the arms (Figure 9). It is argued that these sub-types represent clinal change amongst this anthropomorph class, including changes from linear to outline arms and legs, separation of the head from the body line, and changes to the shape of the head. Some sub-types present more internal homogeneity than others.

Figure 9 Examples of typical Minjiburu figures, from simple to complex (left to right), with some associated motifs.
A feature of the Minjiburu figures is their splayed or rayed headdress design. Research undertaken on headdresses in Pilbara rock art by Piercy (2013) used a dataset of 1013 motifs. This work suggested that headdress variability along the Pilbara coast was higher than found in the hinterland, and that their distribution reflects responses to social change and stresses. The splayed headdresses most commonly seen here fit within Piercy’s (2013) homogeneous set, argued to reflect open networks across the Pilbara. The remaining designs then need to be considered to assess closed networks in the region. Having five different style headdresses concentrated in a small area does not suggest a tightly bounded area, unless these headdresses are reflecting change through time. Further spatial and superimposition analysis of these variable headdresses may provide a more nuanced understanding of this anomaly.

Faces are also common on Minjiburu, an otherwise rare feature for engraved anthropomorphs (Dix 1977). The most common feature are eyes, followed by mouths and noses, with a scattering of other face marks. Forty-seven Minjiburu have eyes (71.2%), 13 have mouths (19.7%) and eight have noses (12.1%). Eyes are found across all bar two subtype groups. The more complex faces, which include noses and mouths, are only seen in two of the subtypes, distinguishing these two types. There are also examples of vughs within heads in place of a face (n=6), from five different subtypes.

Both Wright (1977) and McCarthy (1962) discussed the common frequency of female gendering across Minjiburu figures, which are often engraved around a vugh to suggest female genitals. In this study 37.3% of Minjiburu figures were identified as female, 5.9% as male, and 56.8% as non-sexed, based on the presence or absence of visible genitalia. Of the females, approximately half of these were engraved around a vugh in the place of female genitalia, and the other half had engraved female genitalia. Of the male figures genitalia is suggested by a central line between the legs, and one example with carefully placed macropod tracks. The explicitness seen in the female motifs is not shown for the male figures.
When comparing Minjiburu to Murra Murra (discussed in more detail below), the former are more likely to be female than male, while amongst the latter there is a more even male/female balance. Where there are male Murra Murra, their genitalia is explicit. This suggests that there is different gendering and associated stories around the identity of these two iconic anthropomorphic types.

There were 28 ($f=14.5\%$) Murra Murra human figures recorded across SWC4 and MK3. Longitudinally striped anthropomorphs are seen elsewhere across the Pilbara (Mulvaney 2010; Wright 1968), however the inclusion of striped arms and legs is distinctive of the Port Hedland assemblage. This stylistic group has not received the same attention that the Minjiburu figures have.

From this recent research across this type, five style groups have been established (Figure 10). As with the Minjiburu, I argue that these groupings represent clinal change, as opposed to exclusive style groups.

![Figure 10](image)

*Figure 10* Murra Murra styles.

Size varies considerably for Murra Murra motifs, with the largest example measuring 6.25 m in length, with an arm span of 4.04 m, almost double the length of the 2 Mile Ridge example (recorded by McCarthy 1962). Of the Murra Murra with available measurements, 15 are longer than 1 m, and the remaining ten range in size down to 0.24 m long. For these large engravings, a certain amount of available canvas is required to create them, from which information around sequencing can be inferred. The three largest examples (over 3.0 m in length) are each from a different style group.
Unlike the Minjiburu, facial features are uncommon for Murra Murra figures, i.e., ~85% do not have explicit facial figures. Whilst two figures have patterning within their heads, there are only five figures with explicit/identifiable features, all of which are eyes.

Fifteen Murra Murra interact with the vughs, like the Minjiburu in the same location as their genital area, inside the heads, and, in one example, at the end of the arm. Vughs are included across styles and sizes, and we be discussed as part of gendering. This interaction, consequently, may form a key part of anthropomorph style within the Port Hedland repertoire.

**The Pilbara Style: Geometric and Tracks Component**

Whilst both geometric and track motif classes are referred to as homogeneous as a whole, it is argued that this homogeneity relates to the limited number of ways these motif classes can be presented. For example, a circle is a limiting definition (sensu Munn 1973). However, within these repertoires themselves, there is significant variation in technique and form. As recognised by McCarthy, there are examples across track and geometric motifs from all broad form categories (outline, linear and infill). For this paper, a brief summary of the geometric motif class is provided, followed by a detailed review of track motifs. Track motifs are used here to compare these motifs with the figurative assemblage above.

Across SWC4 and MK3, 3956 geometric motifs were recorded. The most common geometric motifs recorded include arcs, circles, dots, fringes, lines, ovals and combinations of these. The size of such geometric motifs is exceptionally variable (motif lengths between 0.02 and 4.6 m), and these geometrics do not fit within the size classes of Maynard’s (1979) Panaramitee (see Franklin 2004).
The majority of motifs are purely linear in form (n=2112, 53.4%), with comparable numbers of outline (n=541, 13.7%) and infill (n=651, 16.5%) motifs, and the remainder are combinations of these three broad form categories. The array of large geometric motifs, however, does fit within the broad array of large motifs recorded across Port Hedland, enabled by the large flat calcarenite ridges.

Human, macropod, bird, insect, lizard, dingo and turtle tracks were recorded (Figure 11).

![Figure 11 Count of all track motifs.](image)

In contrast with the figurative repertoire, terrestrial fauna (including humans) dominate the track repertoire (Figure 11), with a handful of turtle tracks recorded. Bird tracks here are classified as both avi- and terrestrial fauna because of the large number of emu tracks recorded within this class.
The number of human tracks (both hand and footprints) is significant (n=839; f=32.7%), approximately four times the number of recorded anthropomorphs. Of these, approximately twice as many were recorded on SWC4 (n=580, f=70.3%) than on MK3 (n=259; f=29.7%). Across both islands the majority of these tracks are feet (n=802). Variation amongst human tracks was noted by Tindale (1987), who hypothesised that this variation recorded individual identity and identification, through gait and toe placement. Individual footprints ranged in size from 0.86 m to 0.04 m in length. Of these, the majority are infill form including the toes (n=766, f=95.5%), a small number are infill feet with linear toes (n=12, f=1.5%) or outline toes (n=9, f=1.1%), and a small number of feet are outline in form (n=15, f=1.9%).

Figure 12 Animal track variation, with most common bird and macropod tracks indicated (orange circle ≥ 250; red circle ≥ 100; blue circle ≥ 50).
Lizards are represented in both track and figurative repertoires, and like humans, the number of lizard tracks (n=25) is greater than figurative (n=14) representations. A reversal is seen for turtle tracks (n=5) (identification following Mulvaney 2010), where a small number of tracks were recorded in contrast to figurative motifs (n=110). This is significant considering the dominance of turtles within the figurative class, as the second most frequent motif by count, as well as the size and visibility of turtle engravings. Insect (n=67) and dingo (n=4) tracks do not have identifiable correlates in the figurative repertoire, however the former are relatively prevalent.

The two most frequent track types recorded (Figure 11) are bird (n=803) and macropod (n=743) tracks, and these track types both show considerable diversity (Figure 12). This variability in part represents species diversity, as shown by McDonald (1982, 1993) from Sydney Basin rock art. However, as indicated in Figure 12, there are also a range of stylistic choices being made around the form and detail of track motifs, from linear stylised representations, through to infill tracks with anatomical detail such as inclusion of the toe nail.

In comparing bird and macropod tracks, the former has 29 track types (Figure 12), including infill, linear and outline tracks. Variability in toe length, width, shape, and angle is argued to reflect both stylistic choice, and species. From the 29 types, five have more than 50 examples (Figure 12, blue circles), and two have more than 100 examples each (Figure 12, red circles). There are four figurative bird motifs in the assemblage, three are highly stylised, and one is a unique motif, being a naturalistic bush turkey. No emus are represented in the figurative motifs.

Macropods are represented by fewer (n=16) track types (see Figure 12) for the feet, but also include a range (n=11) of track scenes including pentipedalling and hopping macropod tracks. Like with the bird tracks, variability in toe length, number, shape, claw presence and angles are argued to reflect both stylistic choice and species (sensu McDonald 1984, 1993).
Within macropod tracks, one particular type dominates (n=277) (Figure 12, orange circle), followed by one type with greater than 100 motifs (Figure C, red circle), and two types with greater than 50 motifs (Figure 12, blue circles). This suggests slightly more homogeneity amongst macropod tracks than bird tracks. No figurative macropod motifs were recorded, which is at odds with other engraved assemblages in the Pilbara (e.g., Brown 1983; Mulvaney 2010).

Discussion and Conclusions

This overview of Port Hedland rock art styles provides a preliminary understanding of the different components of the rock art repertoire. A division between figurative motif classes and the track and geometric classes is evidenced through local and regional motifs. Amongst the figurative repertoire, familiar but stylistically unique motifs are presented: two unique Port Hedland anthropomorphs dominate their motif class; material culture with designs; and largely outline marine fauna to the exclusion of terrestrial fauna. The heterogeneity of the figurative component across anthropomorphs and material culture is high, with a more homogeneous representation of fauna, with the exclusion of stingrays. Whilst some of this variability may be temporal, it is argued here that this heterogeneity reflects a hyper-localised closed system. This variability likely reflects increased territoriality in an area of fecundity along the Pilbara coast, set against the arid Pilbara hinterland. The probable age of the rock art body in the mid- to late Holocene ties this territorial reaction in the rock art to a period of increased aridity and instability around resources (Brown 1987; Veth et al. 2014). The identity being presented across the Port Hedland repertoire has many aspects, and selects culture heroes, objects and animals as vehicles for transmitting various identities. The creation of this rock art will not be limited solely to identity creation and reflection however, a multitude of other functions will be involved in the choices around creating these distinctive motif classes.
This paper has established that these figurative engravings are only a small part of the engraved repertoire. Whilst figurative motifs are important for identifying localised identity assertion, their enmeshment within a larger, and it is argued prolonged, arid-zone style track and geometric repertoire suggests that regional bounding is the dominant driver of this repertoire as a whole.

With further regional analysis of Pilbara rock art provinces, both pigment and engraved, the ideas being explored here can be developed further. As it stands only the Dampier Archipelago has been tested by rigorous research (McDonald and Veth 2009; Mulvaney 2009, 2010, 2013; Vinnicombe 1987, 2002). Of the areas where large datasets have been collected (the Dampier Archipelago, Woodstock-Abydos/Upper Yule and Port Hedland) it becomes clear that whilst anthropomorphs provide clear information around stylistic variation across the Pilbara, they only form one component of the broader rock art repertoires. Large track repertoires form a rich sources of information, which can be read against the figurative art.

Where the figurative and track repertoires present different foci, as seen in the Port Hedland assemblage, questions around the function of components within art bodies can be asked. Here, the focus on hyper-localised motifs and marine fauna within the figurative art suggests that this part of the assemblage is marking a hyper-localised identity at this place along the Pilbara coast (including a maritime identity sensu McNiven and Brady 2012). This supports the proposal that the Hedland figurative style post-dates sea-level rise (McCarthy 1962). In contrast, the track repertoires focus on human and other terrestrial fauna, utilising a broadly familiar Pilbara-wide (and beyond) iconography, reinforcing open social groups, broad social cohesion, and connections from the coast into the hinterland. Whilst it can be argued that the track and geometric repertoire are engraved over the same time period, the motifs themselves may pre-date this period, and relate to an older iconographic system, that continues to be used in this place.
In summary, the Port Hedland style province provides a window into mid- to late Holocene landscape marking, which can be contextualised against other coastal Pilbara rock art that extends back into the Pleistocene. By looking at motif choice, and reading different styles within a rock art repertoire together, this paper has presented evidence for the importance of marking both difference and cohesion for social group maintenance across the Pilbara region.

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