Chapter Five. A summary of results

5.1. Introduction

Out of a total of 215 archaeologically relevant sites recorded during the MARP field survey phases, 74 were designated as rock art sites. This chapter presents a summary of fieldwork results for the rock art sites recorded in detail by the author for the purposes of this thesis, during the fieldseasons of 2014 and 2015. The aim of this chapter is to explore how the rock art of Maski is constituted, both in its landscape setting and motif content, broadly addressing the specific research questions of: Where is the rock art of Maski located? What does the rock art of Maski consist of? What factors influence the continued survival of rock art? Descriptions of the landscape contexts, temporally diagnostic spatially associated archaeological features and assemblages, described in this chapter uses information facilitated by the MARP project. The following features of each rock art site are described which pertain to each site’s landscape context, and site condition using MARP project data.

1. Site Location – taken from the midpoint of each site.
2. Site size in square metres.
3. Site geology.
4. Associated archaeological features or artefacts.
5. The current landuse of each rock art setting.

Whilst the results relating to the contextual settings of rock art sites utilise data from the overarching MARP project, this chapter also presents quantitative evaluations of panel numbers and motif content, demonstrating introductory results for the overarching question, what does the rock art of Maski consist of? It also introduces the results of additional rock art production activities, such as the presence of superimposition phases. These results form part of the author’s original contribution to rock art documentation and is analysed further in Chapters six and seven of this thesis concerning what a study of rock art can contribute to archaeological knowledge in the Indian subcontinent. Therefore, the following features, specific to rock art production patterns are also described for each site documented in this thesis.
1. The number of panels recorded at each site.
2. The number of observable motifs per panel.
3. The main rock art production technique.
4. The presence or absence of superimpositioning.

Though 74 sites were recorded as rock art sites, five were discounted from the subsequent sample for analysis. MARP 120 and 117 were possible megalithic sites with rock art. They were discounted due to uncertainties over their archaeological relevance. MARP 151 was a single rock art panel site, it was discounted due to disagreements over the age of the motifs. MARP 154 was a portable stone column with bovine engravings. However, due to its location it was uncertain whether it had originally been engraved in-situ, or transported to its current location. MARP 178 consisted of two panels but it was discounted due to the collection of insufficient data. Additionally, a number of sites were recorded during 2010 and 2012, before the author’s involvement in the MARP project, and information for these sites is limited to their broad contextual setting. Six sites documented during 2010 and 2012 were revisited and recorded in more detail by the author; these are MARP 18, 33, 39, 64, 71 and 78. The remaining rock art sites recorded in 2010 and 2012 are not described in this chapter, they are utilised for spatial analysis work in Chapter six and further information can be found in Appendix A. The total number of sites presented as the main material of this thesis numbers 54 sites.

Although each of the 54 sites presented in this chapter form an individual rock art site, each site contained a variably complex array of panels and motif forms. These site elements range from a single motif on a single panel, multiple motifs on a single panel, through to multiple panels with single motifs and multiple panels which exhibit multiple motifs. In order to present a logical summary of rock art sites, the rest of this chapter is structured upon divisions of numbers of panels presented at each site. The first group consists of rock art sites that are a single panel, numbering nine sites. The second group consists of rock art sites made up of two to five panels, numbering 14 sites. The third group consists of rock art sites made up of five to ten panels, numbering eight sites. The final group described are rock art sites consisting of over ten panels, numbering seven sites. Quantitative totals for motifs presented in this chapter are the result of fieldwork.
documentation and subsequent Dstretch© visualisation processes, see Chapter seven, section 7.2.3, pp 244-250 for further details. This is to avoid the confusion of presenting multiple quantitative results for motif categories within this results chapter. The effects of Dstretch© analysis on altering the quantities of motifs presented in this thesis is discussed more fully in Chapter seven, section 7.2.3 and 7.4.

A record of patination coding for a large number of bovine motifs can be found in Appendix E, which presents data regarding the stylistic attributes of bovine and bull motifs documented for this thesis. As demonstrated in this chapter, the panel weathering conditions specific to each panel affected the relative patination coding assigned, not just at an intra-panel scale but also at an intra-motif scale, see fig 5.1, p138, for an example of intra-motif patination differences. The issues with patination which have historically been used to assign relative ages to petroglyphs in South India are also discussed in Chapter eight, pp 315-316. Additionally, the findings in Chapter seven regarding material evidence of interaction with motifs after their initial production phase demonstrates how the relative shading of a motif form is a temporary state, that can be easily transformed or removed. This in turn diminishes the reliability of using patination to assign relative age to the bruisings at Maski.

This chapter also evaluates observations about taphonomic conditions relevant to each site, along with site accessibility and landscape visibility from each site. These observations are the combined result of both MARP information and data collected by the author. General comments are made for each site division (see explanation for site divisions below) but not elaborated on further in this thesis, due to lack of panel specific data.
Fig 5.1, Photograph of bovine motif on a vertical panel at MARP 39 displaying different shades of bruising line for the same motif over two different angles of panel surfaces (source author).

The types of information gathered about each rock art site is complex and can be separated into types of data collated about landscape contexts (both geographical and qualitative), through to quantitative motif totals and descriptive motif relationships. Although this chapter is a complete summary of rock art data collected during rock art documentation practices, some of the data remains empirical or merely descriptive in nature for the duration of this thesis, whilst other elements of data are used to make suggestive interpretations.

Information presented in Chapter six, relating to the spatial relationships between specific rock art sites and archaeological features, (section 6.2) and the quantities of motif accumulation (section 6.5) are taken forward to suggestive interpretations about the connections between rock art production practices and evidence of other archaeological activities, discussed in more detail in Chapter eight, pp 320-327. Similarly, image enhancement work, revealing superimposition sequencing and an increased motif clarity, demonstrating common themes in rock art content (especially human and cattle forms), lend
themselves to interpretations about the significance of producing certain types of motifs in specific locations during the prehistoric periods in South India. These interpretations hold up to scrutiny based upon the body of accepted archaeological research around uses of landscape in South India, detailed in Chapter two, section 2.2 and current understandings of rock art in the region, Chapter three, section 3.2.

The research questions presented in Chapter four, section 4.5 were aimed at providing a systematic overview of observable attributes relating to the rock art at Maski. This means the data collected is skewed towards noting presence of landscape patterns, motif forms and relationships, rather than absences in certain features, based upon prior knowledge of a cultural system. Therefore, the analysis of the data looks at the leading patterns found in the data collection, rather than asking why certain motif elements are not apparent in a collected data sample.

Within this thesis, the visual patterns taken forward to suggestive interpretations relate to comparable landscape placements, common assemblage spatial relationships and quantifiable motif themes. Wider suggestive meanings are grounded in currently understood archaeological knowledge of the region, based upon quantifiable data patterns. However, there are elements of rock art documentation in this thesis that do not move beyond an empirical descriptive stance. Rock art sites in lowland settings are not given the interpretative emphasis for rock art sites located at higher elevations. Similarly, certain motif categories which demonstrate a lesser proportion of the entire motif corpus along with abstracted motifs are described in this thesis, rather than included in later interpretations of significance.

There are several reasons why these aspects of the rock art at Maski are limited to empirical description. For lowland landscape settings it is because of the visible paucity of spatially proximal archaeological features. The absence of spatially associated archaeological features does not mean there is a lack of archaeological activity around these rock art sites. It means either these hypothesised forms of past human practices were not designed to leave material evidence, or the available material evidence has become too fragmented to be recordable. The abstracted motif category is only described in terms of empirical presence or absence in specific landscape contexts, rather than being interpreted
any further. This was due uncertainties about the longevity or degree of local understanding pertaining to specific visual symbols within the cultural systems of India. Therefore, it was decided to keep these motif forms at a descriptive level without risking erroneous interpretations, especially given the lack of local community involvement in rock art interpretation in this thesis. The combination of potential local community involvement in continuing to elucidate the wider meanings of rock art documented in this thesis, and attributing interpretations to empirically described abstract motifs is a promising avenue of future research.

Connected strands of information within each of the four size divisions are grouped in different tabular and photographic formats, with accompanying prose description. Each section (5.2 – 5.5) presents the numbers of sites described within each size division, along with general observations about taphonomic conditions, accessibility and panel inclination. Within each section (5.2 – 5.5), three tables summarise different elements recorded about each rock art site. The first table presents contextual setting features in terms of gps location, geological setting and situated landscape feature. It also gives the number of panels present within each site and whether superimposition is present. The quantitative spread of motifs for each site is presented in the second table of each section structured, in four distinct categories of columns, alphabetically by faunal appearance, anthropomorphic, abstract and indeterminate. The table rows are structured based upon the quantitative numbers of motifs recorded, from most to least. The third table addresses the presence and details of temporally diagnostic material culture and visually associated archaeological features documented during field work.

The tables are supplemented with photographs which visualise key details mentioned in the text, such as the appearance of different taphonomic conditions, landscape settings and example motif forms. Due to the multitude of ways different motifs have been produced, there are a large number of photographs providing example motif forms from specific sites within each section. The total number of photographs used to demonstrate visual elements of specific rock art sites is 35.
5.2 Single Panel Sites.

This section summarises the setting and panel condition of sites which were designated single panel sites. It then goes on to summarise specific aspects of each panel. Preliminary interpretations about the chronology of rock art production are also mentioned. Additional information is also provided regarding any spatial associations with archaeological features or temporally diagnostic artefacts.

A total of nine sites were documented during the course of the 2014 fieldseason that were designated single panel sites; sites where only one panel with rock art on it was observed and recorded. Their numerical designations, consistent with MARP are as follows; 105, 110, 118, 128, 131, 143, 146, 149 and 153. MARP 128 is the anomaly within the designation of single site panels; multiple markings were produced within this site, however, it was decided at the time of recording that most of them were of insufficient archaeological age to document. A further two single panel sites were recorded during fieldwork seasons conducted in 2015. Their numerical designations are MARP 177 and 196 making a total of 11 single panel sites.

In summary, see Table 5.1 p142, single panel sites were documented as features on rock slopes, on low relief tor inselbergs or within small stretches of boulder fields. Within this natural designation, sites were also located in areas of current human landscape use for pasture, fallow, or dry crop agriculture settings, which are subject to extensive field clearance. See fig 5.2, p143 for an example of the setting in which single panel sites were located. Additionally, MARP 196 was located 20 metres south west of a rice processing plant. Panels were produced on granite, gneissic or phyllite geologies with one occasion of rock art production occurring on a dolerite surface. There was no evidence of superimposition apart from in one instance (MARP 131). Table 5.2 on p144 summarises the identification of different motif categories recorded at single panel sites, these predominantly feature faunal (particularly bovine fig 5.3, p144), anthropomorphic and abstract forms.
Table 5.1, summary table of landscape and site features of single panel sites (source: author), n.d = no data.

<table>
<thead>
<tr>
<th>Site Number</th>
<th>GPS Location in degrees</th>
<th>Site Size in m²</th>
<th>Landscape Type</th>
<th>Geology</th>
<th>Evidence of Superimposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>105</td>
<td>15°57'4.16&quot;N 76°36'41.57&quot;E</td>
<td>1</td>
<td>Low relief tor inselberg</td>
<td>Phyllite or Gneiss</td>
<td>No</td>
</tr>
<tr>
<td>110</td>
<td>15°56'55.82&quot;N 76°39'49.10&quot;E</td>
<td>2</td>
<td>Rock slope</td>
<td>Gneiss</td>
<td>No</td>
</tr>
<tr>
<td>118</td>
<td>15°57'49.87&quot;N 76°36'48.392E</td>
<td>0.5</td>
<td>Low relief tor inselberg</td>
<td>Phyllite</td>
<td>No</td>
</tr>
<tr>
<td>128</td>
<td>15°56'26.99&quot;N 76°39'29.94E</td>
<td>1</td>
<td>Boulder field</td>
<td>Granite</td>
<td>No</td>
</tr>
<tr>
<td>131</td>
<td>15°56'34.77&quot;N 76°38'38.75&quot;E</td>
<td>3.2</td>
<td>n.d.</td>
<td>Dolerite</td>
<td>Yes</td>
</tr>
<tr>
<td>143</td>
<td>15°57'22.12&quot;N 76°38'30.11&quot;E</td>
<td>n.d</td>
<td>Rock slope</td>
<td>n.d.</td>
<td>No</td>
</tr>
<tr>
<td>146</td>
<td>15°57'22.12&quot;N 76°38'30.11&quot;E</td>
<td>n.d</td>
<td>Rock slope</td>
<td>Granite or Gneiss</td>
<td>No</td>
</tr>
<tr>
<td>149</td>
<td>15°59'11.78&quot;N 76°37'15.99&quot;E</td>
<td>5.1</td>
<td>Rock slope</td>
<td>Granite or Gneiss</td>
<td>No</td>
</tr>
<tr>
<td>153</td>
<td>15°58'56.72&quot;N 76°37'46.31&quot;E</td>
<td>2</td>
<td>Rock slope</td>
<td>Granite or Gneiss</td>
<td>No</td>
</tr>
<tr>
<td>177</td>
<td>15°56'34.79&quot;N 79°39'8.54&quot;E</td>
<td>25</td>
<td>Peneplain</td>
<td>Granite</td>
<td>Yes</td>
</tr>
<tr>
<td>196</td>
<td>15°56'8.01&quot;N 76°39'43.55&quot;E</td>
<td>n.d</td>
<td>Rock Slope</td>
<td>Granite</td>
<td>No</td>
</tr>
</tbody>
</table>

With the exception of MARP 153, which had 180° visibility from north through to south, the other sites possessed 360° visibility when looking externally from the panel and were accessible from all directions in the landscape, implying that existing landscape structures did not inhibit human-panel interaction. Panels at sites MARP 105 and 118 were angled horizontally, whilst the remaining single panel sites were angled vertically to varying degrees of approximately 85° - 130° which were not recorded in any further degree of detail. Each of the panels on these sites were heavily weathered with varying degrees of surface oxidation, erosion and foliation, along with structural cracking and biofilm growth which had, in some cases, obscured the motifs (MARP 105). There is also evidence of surface staining from accretional run off by liquid or organic sources, especially prevalent on panel surfaces which are angled vertically, see MARP 149, fig 5.4 p145 as an example. All motifs recorded on single panel sites were produced using a bruising technique.
Fig 5.2, MARP 110 exemplifying landscape settings of single panel sites, with panel in the foreground (author's own photograph).
Table 5.2, Categories of motifs and numbers recorded at single panel sites (source: author).

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Avian</th>
<th>Bovines</th>
<th>Bulls</th>
<th>Deer</th>
<th>Elephant</th>
<th>Equine</th>
<th>Feline</th>
<th>Snake</th>
<th>Ungulate</th>
<th>Zoomorph</th>
<th>Anthropomorphs</th>
<th>Abstract/Geometric</th>
<th>Indeterminate</th>
<th>Total Motifs</th>
</tr>
</thead>
<tbody>
<tr>
<td>131</td>
<td>131</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>1 2 3</td>
</tr>
<tr>
<td>128</td>
<td>2</td>
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<td></td>
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<td>2</td>
<td>-</td>
<td>10</td>
<td>4</td>
<td>4</td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

Fig 5.3, A bovine motif recorded at MARP 131, a single panel site, photograph taken from above (author’s own photograph).
Fig 5.4, An example of weathering processes, surface staining, foliation and discolouration present at single panel sites and typical of many panels recorded during fieldwork. Anthropomorphic figure is approximately 50 cm in height (author’s own photograph).

Table 5.3, p146 summarises the presence of temporally diagnostic artefacts located in the vicinity of single panel sites. Temporally diagnostic artefacts were recorded in the vicinity in three of the 11 single panel sites, consisting of ceramic sherds of a general prehistoric or Medieval date. Specific sites, namely MARP 128 and 149, based upon the presence of temporally diagnostic material assemblages can be said to be within an Iron Age range of activity, with an Iron Age date being given to some of the motifs produced. Similarly, the presence of Medieval period sherds at MARP 128 and 149 also indicate their association with Medieval ranges of activity. Many of the sites classed as single panel sites did not reveal any temporally diagnostic materials and remain indeterminate in age.
Table 5.3, Summary of temporally diagnostic material culture found at, and in association with, single panels sites (source: author, utilising MARP project data).

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Temporally Diagnostic Material Culture?</th>
<th>Visually Associated Archaeological Features. MARP number and type</th>
</tr>
</thead>
<tbody>
<tr>
<td>105</td>
<td>N/A</td>
<td>MARP 104 – rock art</td>
</tr>
<tr>
<td>110</td>
<td>N/A</td>
<td>MARP 107 - wall</td>
</tr>
<tr>
<td>118</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>128</td>
<td>Black plain and grey plain ceramic sherd – Iron Age and Medieval periods.</td>
<td>N/A</td>
</tr>
<tr>
<td>131</td>
<td>Plain buff ware – Medieval period</td>
<td>MARP 125 – rock art</td>
</tr>
<tr>
<td>143</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>146</td>
<td>N/A</td>
<td>MARP 145 – rock art</td>
</tr>
<tr>
<td>149</td>
<td>Indeterminate prehistoric ceramic sherd</td>
<td>MARP 149 – previously occupied rock shelter</td>
</tr>
<tr>
<td>153</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>177</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>196</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

5.3 Small sites

This section summarises the setting and panel condition of sites which were designated small sites. It then goes on to summarise specific aspects of panels within each designated site which contained additional recordable aspects, such as superimposition. Preliminary interpretations regarding the chronology of rock art production are also mentioned. Additional information is also provided regarding spatial association with archaeological features or temporally diagnostic artefacts.

A total of 14 sites were documented during the course of the 2014 fieldseason which were designated as small sites. These were sites recorded as having between two and five panels within the recognised spatial parameters of the rock art site. Their numerical designations, consistent with MARP are as follows; 104, 115, 116, 119, 121, 123, 127, 129, 136, 142, 144, 145, 150, 152. Additionally, a total of ten sites were recorded as small sites during the two seasons of fieldwork in 2015. Their numerical designations are 166, 168, 171, 172, 173, 193, 195, 197, 198, 199, making a total of 24 small sites.
Table 5.4, Summary of landscape settings and site features of small sites (source: author), n.d = no data.

<table>
<thead>
<tr>
<th>Site Number</th>
<th>GPS Location in degrees</th>
<th>Site Size in m²</th>
<th>Landscape Type</th>
<th>Geology</th>
<th>Number of Panels</th>
<th>Evidence of Superimposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>104</td>
<td>15°57’0.77&quot;N 76°36’41.72&quot;E</td>
<td>450</td>
<td>Low relief for inselberg</td>
<td>Gneiss</td>
<td>2</td>
<td>No</td>
</tr>
<tr>
<td>115</td>
<td>15°57’18.67&quot;N 76°37’18.03&quot;E</td>
<td>400</td>
<td>Boulder field</td>
<td>Phyllite/dolerite</td>
<td>3</td>
<td>No</td>
</tr>
<tr>
<td>116</td>
<td>15°57’24.52&quot;N 76°37’17.46&quot;E</td>
<td>500</td>
<td>Low relief for inselberg</td>
<td>Granite/Gneiss</td>
<td>4</td>
<td>No</td>
</tr>
<tr>
<td>119</td>
<td>15°57’55.84&quot;N 76°36’45.34&quot;E</td>
<td>8</td>
<td>Low relief for inselberg</td>
<td>Granite/Gneiss</td>
<td>3</td>
<td>No</td>
</tr>
<tr>
<td>121</td>
<td>15°58’5.20&quot;N 76°36’41.09&quot;E</td>
<td>25</td>
<td>Low relief for inselberg</td>
<td>Granite</td>
<td>2</td>
<td>No</td>
</tr>
<tr>
<td>123</td>
<td>15°57’27.52”N 76°36’49.60”E</td>
<td>12</td>
<td>Boulder field</td>
<td>Dolerite</td>
<td>3</td>
<td>No</td>
</tr>
<tr>
<td>127</td>
<td>15°56’11.77”N 76°38’31.63”E</td>
<td>15</td>
<td>Peneplain</td>
<td>Gneiss</td>
<td>4</td>
<td>No</td>
</tr>
<tr>
<td>129</td>
<td>15°56’39.33”N 76°38’27.56”E</td>
<td>270</td>
<td>Low relief for inselberg</td>
<td>Granite/Gneiss</td>
<td>2</td>
<td>No</td>
</tr>
<tr>
<td>136</td>
<td>15°57’1.16”N 76°38’33.46”E</td>
<td>240</td>
<td>n.d.</td>
<td>Granite/Phyllite</td>
<td>2</td>
<td>No</td>
</tr>
<tr>
<td>142</td>
<td>15°56’55.00”N 76°38’27.92”E</td>
<td>n.d</td>
<td>Boulder field</td>
<td>Granite/Gneiss</td>
<td>n.d</td>
<td>No</td>
</tr>
<tr>
<td>144</td>
<td>15°57’21.68”N 76°38’31.41”E</td>
<td>n.d</td>
<td>Rock slope</td>
<td>Granite/Gneiss</td>
<td>2</td>
<td>No</td>
</tr>
<tr>
<td>145</td>
<td>15°57’22.36”N 76°38’33.35”E</td>
<td>124</td>
<td>Elevated outcrop</td>
<td>Granite/Gneiss</td>
<td>5</td>
<td>Yes – Panel five</td>
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<tr>
<td>150</td>
<td>15°59’1.55”N 76°37’34.80”E</td>
<td>1482</td>
<td>Rock slope</td>
<td>Granite</td>
<td>3</td>
<td>No</td>
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<tr>
<td>152</td>
<td>15°59’7.15”N 76°37’35.84”E</td>
<td>65</td>
<td>Rock slope</td>
<td>Granite</td>
<td>2</td>
<td>n.d.</td>
</tr>
<tr>
<td>166</td>
<td>15°56’32.56”N 76°39’14.62”E</td>
<td>650</td>
<td>Low relief for inselberg</td>
<td>Granite</td>
<td>4</td>
<td>No</td>
</tr>
<tr>
<td>168</td>
<td>15°56’21.60”N 76°39’13.87”E</td>
<td>655</td>
<td>Hilltop Weathered Terrace</td>
<td>Granite</td>
<td>3</td>
<td>Yes – Panel one and three.</td>
</tr>
<tr>
<td>171</td>
<td>15°56’25.60”N 76°39’11.83”E</td>
<td>286</td>
<td>Rock Slope</td>
<td>Granite</td>
<td>4</td>
<td>Yes – Panel two and possibly Panel four.</td>
</tr>
<tr>
<td>172</td>
<td>15°56’30.53”N 76°39’9.80”E</td>
<td>22</td>
<td>Rock Slope</td>
<td>Granite</td>
<td>4</td>
<td>No</td>
</tr>
<tr>
<td>173</td>
<td>15°56’33.57”N 76°39’11.30”E</td>
<td>67</td>
<td>Low relief for inselberg</td>
<td>Granite</td>
<td>2</td>
<td>No</td>
</tr>
</tbody>
</table>
Table 5.4 details the GPS location, landscape type, geology, cumulative numbers of panels recorded on each site and any presence of superimposition at small rock art sites. In summary, a total of 24 small sites were recorded on the low relief tor inselbergs located at lowland levels and on rock slopes preceding elevated outcrops. There were also occasional instances of small sites recorded on the peneplain and within lowland boulder fields. Figs 5.5 and 5.6, p149 demonstrate a close-up and extended example of landscape contexts in which small sites were located. Recorded rock art sites are also situated within areas of current landuse practices such as pastoral, fallow, or dry crop agriculture which are subject to extensive field clearance. Modern construction equipment and evidence of sediment quarrying was noted 20 metres to the south of MARP 115, along with granite or gravel mining occurring at the southern base of the rock slope at MARP 193.

A total of 22 small sites were recorded on either granite or gneissic geologies, whilst there were two instances of small sites recorded on dolerite. There are instances of panel superimposition at six small sites, designated MARP 145, 168 and 193, 198, 199. All motifs recorded at these small sites were produced using a bruising technique. Table 5.5, p150 details the categories and quantities of motifs recorded at small sites. The cumulative numbers of motifs produced on panels at small sites range from two to 17. Motifs at small sites predominantly consist of bovine and anthropomorphic designs (fig 5.10, p152), with a small range of other faunal motifs, such as ungulates and snakes. There were also a considerable number of abstract motifs, a selection of which are displayed in figs 5.7-5.10, pp 151-152.
Fig 5.5, Immediate landscape setting of MARP 104, a small rock art site within a low relief tor inselberg (author's own photograph).

Fig 5.6, Wider landscape setting of MARP 104 within a current agricultural field system (author's own photograph).
Table 5.5, Categories of motifs and their numbers recorded at small sites (source: author).

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Avian</th>
<th>Bovines</th>
<th>Bulls</th>
<th>Deer</th>
<th>Elephant</th>
<th>Equine</th>
<th>Feline</th>
<th>Snake</th>
<th>Ungulate</th>
<th>Zoomorph</th>
<th>Anthropo-morphs</th>
<th>Abstract/Geometric</th>
<th>Indeterminate</th>
<th>Number of Motifs</th>
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</table>
Top fig 5.7 An abstract motif at MARP 116. Centre fig 5.8 A circular abstract motif at MARP 145, approximately 20 cm in diameter. Bottom fig 5.9 An abstract motif at MARP 121 (photograph for MARP 145 courtesy of P. Johansen, photographs for 116 and 121 were taken by author).
Fig 5.10 An anthropomorphic motif at the base of a small panel and abstract motif above it at MARP 142, the anthropomorphic motif is approximately 20 cm in height, photographed looking down at panel (photograph courtesy of P. Johansen).

Most sites recorded as small sites had 360° visibility when positioned looking externally from the panels. The exceptions to this rule were MARP 142, where visibility data was accidentally unrecorded, MARP 119 and MARP 152, which had visibility from the panels obscured by dense euphorbia and acacia vegetation. This vegetation also hampered access to MARP 119 and MARP 152, which otherwise would have been accessible from all directions. Visibility from the south access point of MARP 199 was hampered by a steep climb, dense vegetation around the rock shelter entrance and associated rock art panels. However, there was clear visibility from the north access point of MARP 199. MARP 145 and 198 were also accessible from all directions after a small climb.
up the rock slope of the inselberg. Motifs on panels at MARP 104 and MARP 119 were produced on vertical rock faces. The rest of the small sites were constituted by motifs produced on panel faces with a range of vertical through to horizontal axes, not recorded in any great detail during fieldwork.

The condition of all panels at the small sites were extremely weathered to differential degrees. This weathering consisted of continual surface foliation over time and structural cracking of rock art panels and their geological formations. There were a range of surface foliation scars present on panel surfaces, both ancient and fresh, along with subtle surface erosion. There was widespread surface oxidation across all panel surfaces, this became more widespread at MARP 144, 145, 168, 198 and 199, possibly due to their location at higher elevations on rock slopes.

A number of panels at small sites MARP 119, 123, 125, 127, 129, 136, 145, 150, 152, 166, 171, 173, 193, 195 have evidence of organic film across the panel surface, demonstrated to varying degrees by figs 5.11-5.13, pp154-155. Often the organic film recorded at these sites was the result of depressions or erosional hollows in the surrounding geology, leading to repeated water accumulation and subsequent growth of organic material across the panel. This film was recorded in localised patches on panel surfaces and also originated at the base of the panel, extending across its surface. In one instance, on panel one at MARP 145, motifs were produced by removing the biofilm from the panel surface, rather than removing the rock surface itself (see fig 5.13, p155). Additionally, MARP 129 displayed some sediment encroachment across the panel surface.
Top fig 5.11 Dark patches of organic growth extending from the bottom right edge of the panel at MARP 152, photograph taken looking down at panel. Bottom fig 5.12 Spread of organic material across a vertical panel at MARP 125 (author's own photograph).
Fig 5.13 Spread of organic material, darkening the left side of a rock art panel at MARP 145 (photograph of MARP 145 courtesy of P. Johansen).

Table 5.6, p156 summarises the presence and types of temporally diagnostic artefacts which were located in the vicinity of small sites. Temporally diagnostic material was located within eight of the 24 small sites, in the form of sparse to moderate scatters of ceramic sherds and occasional evidence of chert flakes or metal working debris. Preliminary interpretation for the chronology of motif production was predominantly indeterminate. There were some sites which exhibited multi period activity in the form of prehistoric material scatters, indicative of Iron Age activity, with later medieval and modern activity patterns.
Table 5.6, Summary of temporal site designation based upon temporally diagnostic material culture found within small sites (source: author utilising MARP project data).

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Temporally Diagnostic Material Culture?</th>
<th>Visually Associated Archaeological Features. MARP number and type</th>
</tr>
</thead>
<tbody>
<tr>
<td>104</td>
<td>Eroded ceramics – indeterminate age</td>
<td>MARP 105 – rock art</td>
</tr>
<tr>
<td>115</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>116</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>119</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>121</td>
<td>Red slip and polish ware, brown slipped ware, indeterminate eroded ware at a moderate density.</td>
<td>N/A</td>
</tr>
<tr>
<td>123</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>127</td>
<td>Grey Plain ware – Medieval Period</td>
<td>N/A</td>
</tr>
<tr>
<td>129</td>
<td>n.d</td>
<td>MARP 130 – modified water retention feature</td>
</tr>
<tr>
<td>136</td>
<td>n.d</td>
<td>MARP 136 – encompassed modified water feature with rock art panels.</td>
</tr>
<tr>
<td>142</td>
<td>N/A</td>
<td>MARP 138 – rock art</td>
</tr>
<tr>
<td>144</td>
<td>N/A</td>
<td>MARP 143 – rock art</td>
</tr>
<tr>
<td>145</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>150</td>
<td>N/A</td>
<td>MARP 150 – encompassed modified water feature, grinding slicks and grinding holes with rock art panels</td>
</tr>
<tr>
<td>152</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>166</td>
<td>Sherds of Iron Age, Early Historic temporal designation, but no additional data.</td>
<td>Composite site with iron working site, definitely smithing material, possibly smelting. Also associated with MARP 168 – rock art and 172 – rock art</td>
</tr>
<tr>
<td>168</td>
<td>One small piece of eroded iron measuring five by one cm was located near panel one.</td>
<td>MARP 169 – previously occupied rock shelter, 170 – rock art</td>
</tr>
<tr>
<td>171</td>
<td>Coarse red slipped and polished wares, Black slip and polished ware (fine), Black and Red ware, Red plain ware, indeterminate eroded, one broken parallel chert blade</td>
<td>MARP 171 is a composite site consisting of rock art and previously occupied rock shelter</td>
</tr>
<tr>
<td>172</td>
<td>N/A</td>
<td>MARP 173 – rock art</td>
</tr>
<tr>
<td>173</td>
<td>Brown plain ware, small piece of slag, exhausted chert core and flake</td>
<td>MARP 166 – Iron working and rock art site and 172 – rock art</td>
</tr>
<tr>
<td>193</td>
<td>N/A</td>
<td>MARP 194 - Passage Chamber Megalith</td>
</tr>
<tr>
<td>195</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>197</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>198</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>199</td>
<td>Red slipped and polished wares (fine), plain buff ware, indeterminate eroded</td>
<td>Composite site consisting of previously occupied rock shelter and, MARP 200 – rock art</td>
</tr>
</tbody>
</table>
Additionally, there is an instance of rock art panels located in the spatial vicinity of, and clustered around, metal working debris (MARP 166). MARP 166 is a composite site of rock art panels (fig 5.14) and metal working evidence, with a small mound containing metal working debris located four metres to the east of the main rock art cluster (fig 5.15, p158). Recovered artefacts included slag associated with smithing and also some slag and refractory material diagnostic of smelting. Cupules and grinding hollows were also noticed, along with quarry marks around some of the inselberg which did not appear to be modern. The morphology of these marks are more commonly associated with Medieval stone quarrying practices (fig 5.16, p158).

Fig 5.14 Setting of rock art panels for composite site MARP 166 (author’s own photograph).
Fig 5.15 Eroded metal working mound to the east of boulders with rock art, the edge of the boulder group is visible in the background. Scale size 20 cm (author’s own photograph).

Fig 5.16 Evidence of ancient stone quarrying marks at the top of the boulder group at MARP 166, on a horizontal surface. Scale size 20cm (author’s own photograph).
There are instances where designated small rock art sites form composite sites with previously occupied rock shelters (MARP 168, 171 and 199). MARP 168 is spatially proximal to a previously occupied rock shelter MARP 169, whilst MARP 171 and MARP 199 are rock shelter sites with occupational material originating in the Iron Age, described in table 5.6, p156, and exhibit clusters of rock art panels around the access points to the rock shelters. Finally, there are three instances of small rock art sites (MARP 129, 136, 150) which are spatially associated with geological modifications that resemble water retention features.

5.4 Medium sites

This section summarises the setting and panel condition of sites which were designated medium sites. It then goes on to summarise specific aspects of panels within each designated site that contained additional recordable aspects, such as superimposition. Any spatial associations with archaeological features or temporally diagnostic artefacts are also presented.

A total of eight sites were recorded during the 2014 fieldseason which were given the conceptual designation of medium sized sites and an additional four sites were recorded during 2015. Medium sites consisted of rock art sites which had between five and ten observed panels deemed archaeologically relevant within the spatial parameters of the site. Their numerical designations, consistent with MARP are as follows; MARP 18, 64, 78, 106, 111, 122, 125, 135, 138, 170, 201 and 202, a total of 12 sites.

Some sites deemed medium sites have specific details to address at the time of recording. MARP 18 was first recorded during preliminary survey work conducted by A. Bauer and P. Johansen in 2010 and revisited in 2014 to record specific panels and motifs in more detail. MARP 64, first recorded during a fieldseason conducted in 2012 as a Neolithic habitation terrace, complete with grinding slicks and rock art, was also revisited in 2014 to record panels and motifs in more detail. Seven panels were recorded at MARP 64 during the 2014 fieldseason in spatial proximity to the habitation terrace, whilst an additional two panels were recorded on the peneplain but spatially associated with the concentration of anthropogenic material at MARP 64 and so included within the site designation.
MARP 78 was also recorded in 2012, its spatial parameters were extended during the 2015 field season, which allowed this site to be recorded in more detail. MARP 106 was recorded in two distinct concentrations of rock art panels separated by a clear stretch of peneplain, measuring 18 metres in width. MARP 135 was initially recorded on 29 June 2014 and an additional panel was included within MARP 135 on 05 July 2014. This was due to its immediate proximal location with the main concentration of rock art site deemed MARP 135, rather than giving it an additional MARP number as a single panel site. Recording was also limited at MARP 202 to five panels, whilst many more panels were observed, the onset of monsoon rains prohibited recording. It is probable that MARP 202 is better representative of a large rock art site.

Table 5.7 details the GPS location, landscape type, geology, cumulative numbers of panels recorded on each site and any presence of superimposition for medium rock art sites. In summary, the majority of medium sites were located on rock slopes or elevated sheetrock contexts with single cases of medium sized sites recorded in peneplain or low relief tor inselberg settings, see figs 5.17 – 5.19 pp 162-163 for examples of landscape contexts for medium sites. In addition to a natural landscape setting, current human land use practices were observed in spatial proximity to the rock art sites. MARP 106 was located in a dry crop agricultural field which had been subject to field clearance and MARP 122 was surrounded by agricultural fields, but its immediate context was uncultivated. MARP 138 was situated in a landscape used for pasture. The rest of the rock art sites were situated within an uncultivated setting. There were sounds of quarrying activities and dynamite blastings occurring within the vicinity of MARP 18.

The geology of most medium sites consisted of either granite, gneiss or a combination of the two, with the exception of MARP 106 which was produced on basalt or dolerite rock. There is evidence of superimposition at the majority of site, apart from MARP 122, 138 and 170. Table 5.8 on p163 details the categories and quantities of recognisable motifs observed at medium sized sites. The cumulative numbers of motifs at medium sites range from 11 through to 40. A large proportion of these motifs can be identified as bovine forms, with large numbers of anthropomorphic and abstracted designs. There are the occasional
instances of other faunal motifs, such as felines and elephant forms, see figs 5.20-5.24 on pp 164-167 for a selection of motifs recorded at medium sites.

Table 5.7, Summary of landscape settings and site features of medium sites
(source: author), n.d = no data.

<table>
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<th>Site Number</th>
<th>GPS Location in degrees</th>
<th>Site Size in m²</th>
<th>Landscape Type</th>
<th>Geology</th>
<th>Number of Panels</th>
<th>Evidence of Superimposition</th>
</tr>
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<td>Granite</td>
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<td>Granite</td>
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<td>Low relief tor inselberg</td>
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<td>1905</td>
<td>Rock Slope</td>
<td>Granite/Gneiss</td>
<td>7</td>
<td>Yes – Panels one, six and seven</td>
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<td>Gneiss</td>
<td>8</td>
<td>No</td>
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<td>Granite</td>
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<td>Yes – Panel five</td>
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<td>15°56'0.45&quot;N 76°39'37.43&quot;E</td>
<td>376</td>
<td>Rock Slope</td>
<td>Granite</td>
<td>5</td>
<td>Yes – Panel four</td>
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</table>
Fig 5.17 Landscape context of a medium rock art site, MARP 138, located in the peneplain (author's own photograph).

Fig 5.18 Immediate setting of rock art site and possible Neolithic terracing at MARP 64, photograph taken from the north east of the site (author's own photograph).
Fig 5.19 View from the north of MARP 64 over the peneplain and megalithic enclosures in the foreground of the photograph (author’s own photograph).

Table 5.8, Categories of motifs and their numbers recorded at medium sites (source: author).

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Avian</th>
<th>Bovines</th>
<th>Bulls</th>
<th>Deer</th>
<th>Elephant</th>
<th>Equine</th>
<th>Feline</th>
<th>Snake</th>
<th>Ungulate</th>
<th>Zoomorph</th>
<th>Abstract/Geometric</th>
<th>Indeterminate</th>
<th>Number of Motifs</th>
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Fig 5.20 A series of panels at MARP 18 demonstrating equine and zoomorphic motifs (author's own photograph).
Top fig 5.21 Bovine motif at MARP 18, panel angled vertically. Bottom fig 5.22 Anthropomorphic motifs at MARP 64, panel angled vertically (author’s own photographs).
Fig 5.23 Bovine and anthropomorphic motifs at MARP 170, width of panel is approximately two metres in diameter at its widest point (author’s own photograph).
The majority of medium sites could be accessed from multiple directions and also had a wide range of visibility from each of the panels. MARP 18, 78, 135, 170 and 201 could be accessed from all directions after a consistent climb. MARP 64 could be accessed from the north and south of the site, also after a reasonable climb. MARP 202 could be accessed from ground level to the west with the majority of panels accessed after a small climb. All other medium sized sites could also be accessed from all directions without the need for climbing. All sites with the exception of MARP 135 and 202 had 360° visibility when looking externally from the location of the panels. There was good visibility towards the peneplains to the west from MARP 135 and MARP 202 and up the rock slope to the south and east. Views from the panels could also be obscured by thorny acacia and euphorbia vegetation, which are to be regarded as seasonal obstructions. No data was recorded for direction of access or visibility for MARP 111.
The surfaces of boulders deemed suitable for rock art production were angled variably between a horizontal and vertical axis, approximately 75° - 190° but specific angles were not recorded during time of fieldwork. As with single panel and small sites, individual panels within medium sites were in open air contexts, subject to repeated weathering and erosional processes which had affected their surface and structural integrity to varying degrees. There was both localised and extensive areas of surface foliation where ancient foliation processes had caused surface scarring, along with recent evidence of surface foliation. MARP 64, 135 and 170 displayed particularly clear examples of surface foliation and surface oxidation, exemplified in fig 5.25 below. Light to moderate organic film growth was observed on some panels at MARP 18, 78, 106, 122, 125 and 138. There was also evidence of structural cracking across the panel surfaces of MARP 18 – Panel four, MARP 64 – Panel one, MARP 135, Panel one and Panel four. All motifs present at medium panel sites were produced using a bruising technique.

Fig 5.25 Image of surface oxidation of a panel surface, complete with surface foliation and patination darkening of abstract/grid motif, photograph looking down onto horizontal surface (author’s own photograph).
Table 5.9 below summarises the presence of temporally diagnostic artefacts which were located in the vicinity of medium sites. Temporally diagnostic material, indicative of a prehistoric date, were recorded within the site boundaries of two of eight sites. Preliminary interpretations regarding the chronology of motif production suggests that some rock art motifs were initially produced during the prehistoric period in South India because of the close spatial association of Iron Age diagnostic ceramics with some rock art panels at sites, such as MARP 135. The sites described in this section as medium sites display a greater accumulation of motifs across panel surfaces than described in single panel sites and small sites. Medium sized sites also have multiple stylistic variations in cattle motif forms which are described in Chapter seven, section 7.5, pp 296-301, indicating possible multi-phase motif production and interaction sequences.

Table 5.9, Summary table of temporally diagnostic artefacts identified at medium sites and visual connections with other sites (source: author utilising MARP project data).

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Temporally Diagnostic Material Culture?</th>
<th>Visually Associated Archaeological Features. MARP number and type</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>N/A</td>
<td>Passage Chamber Megalith - MARP 17</td>
</tr>
<tr>
<td>64</td>
<td>N/A</td>
<td>Composite site, and additional composite site of Passage Chamber Megalith and previously occupied rock shelter - MARP 63</td>
</tr>
<tr>
<td>78</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>106</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>111</td>
<td>Indeterminate eroded ceramic sherds</td>
<td>N/A</td>
</tr>
<tr>
<td>122</td>
<td>N/A</td>
<td>MARP 121 - rock art</td>
</tr>
<tr>
<td>125</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>135</td>
<td>Red slipped and polished ware (fine and coarse), Black and Red ware, Black slipped and polished ware (fine) and indeterminate sherds</td>
<td>Composite site, MARP 133/134 - rock art and MARP 18 - rock art</td>
</tr>
<tr>
<td>138</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>170</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>201</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>202</td>
<td>N/A</td>
<td>N/A</td>
</tr>
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</table>
An additional pattern between sites described in this section as medium sized sites and some small sites, described in section 5.3, pp 157-158 (see MARP 166, 171, 199), is the inclusion of spatially associated archaeological features as composite elements in addition to multiple and accumulative rock art panels within sites. MARP 64 has associated archaeological features identified by the MARP project as a Neolithic habitation terrace, complete with grinding slicks and grinding holes. Fig 5.26 below, displays an example of artefact assemblages recorded in spatial association with some archaeological features in the extended vicinity of rock art sites. These diagnostic forms of material culture, in addition to the stylistic form of some motifs, suggest that rock art production may have been associated with Neolithic activity. Similarly, MARP 135 is a composite site consisting of rock art and a previously occupied rock shelter (see fig 5.27, p171) with dense scatters of diagnostic Iron Age sherds, identified in table 5.9, p169. Although not conclusive, the spatial proximity of temporally diagnostic archaeological features to certain rock art panels with superimposition, especially MARP 135, Panel one, leads to the suggestion that some panels were originally produced during the prehistoric period with repeated cycles of interaction afterwards.

Fig 5.26 Photograph of artefacts located in the vicinity of rock art sites. An eroded piece of Black and Red Ware, three bladelet fragments and an exhausted chert core. Scale is seven cm in length (photograph by the author).
Fig 5.27 Rock art panel at MARP 135 with previously occupied rock shelter visible in the background, panel is approximately 1.5 metres in diameter at its widest point (author's own photograph).

5.5 Large sites

This section summarises the setting and panel condition of sites which were designated large sites. It then goes on to summarise specific aspects of panels within each designated site which contained additional recordable aspects such as superimposition. Preliminary interpretations regarding the chronology of
rock art production are made based on additional information about the spatial association with archaeological features or temporally diagnostic artefacts.

Table 5.10, Summary of landscape settings and site features of large sites (source: author). * The number of panels is based upon an absolute number of panels recorded, but reflects an estimated 50% observation recording strategy adopted during fieldwork.

<table>
<thead>
<tr>
<th>Site Number</th>
<th>GPS Location in degrees</th>
<th>Site Size in m²</th>
<th>Landscape Type</th>
<th>Geology</th>
<th>Number of Panels *</th>
<th>Evidence of Superimposition</th>
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</thead>
<tbody>
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<td>33</td>
<td>15°57’6.58”N 76°39’13.78”E</td>
<td>1751</td>
<td>Elevated Tor Outcrop</td>
<td>Granite</td>
<td>21</td>
<td>Yes – Panels one, three, four and five</td>
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<tr>
<td>39</td>
<td>15°57’9.73”N 76°39’1.03”E</td>
<td>6507</td>
<td>Elevated Tor Outcrop</td>
<td>Granite/ Gneiss</td>
<td>59</td>
<td>Yes – Panels one, two, three, five, six, seven, eight, and ten 14, 20, 21, 24, 26, 38, 40, 42, 48, 50, 53, 59</td>
</tr>
<tr>
<td>71</td>
<td>15°56’9.71”N 76°39’15.96”E</td>
<td>2134</td>
<td>Elevated Tor Outcrop</td>
<td>Granite</td>
<td>33</td>
<td>Yes – Panels five, six, seven, eight, 12, 13, 24, 25, 29</td>
</tr>
<tr>
<td>134</td>
<td>15°57’16.94”N 76°38’36.14”E</td>
<td>507</td>
<td>Rock slope</td>
<td>Granite/ Gneiss</td>
<td>11</td>
<td>No</td>
</tr>
<tr>
<td>175</td>
<td>15°56’49.44”N 76°39’9.36”E</td>
<td>1742</td>
<td>Peak of rock slope</td>
<td>Granite</td>
<td>16</td>
<td>Yes – Panels one, five and 16</td>
</tr>
<tr>
<td>200</td>
<td>15°56’6.31”N 76°39’38.66”E</td>
<td>1816</td>
<td>Peak of rock slope</td>
<td>Granite</td>
<td>14</td>
<td>No</td>
</tr>
<tr>
<td>210</td>
<td>15°57’7.01”N 76°38’55.11”E</td>
<td>1032</td>
<td>Elevated Tor Outcrop</td>
<td>Granite/ Gneiss</td>
<td>52</td>
<td>Yes – Panels two, nine, 11, 15, 17, 24, 25, 29, 30, 32, 37, 45, 49, 50, 51</td>
</tr>
</tbody>
</table>

Two sites were recorded during the 2014 field season which were given the designation of large sites. A further five sites were recorded over both field seasons of 2015. Large sites consist of areas of rock art with ten or more panels with motifs that were deemed archaeologically relevant. Their numerical designation, in keeping with the MARP project were MARP 33, 39, 71, 134, 175, 200 and 210. MARP 33, 39 and 71 were initially recorded during the 2010 and 2012 exploratory field seasons. MARP 33 was revisited in July 2014, whilst MARP 39 and MARP 71 were re-visited in both July 2014 and July 2015, so specific panels and landscape setting information could be recorded in more detail. Some details of rock art sites recorded by MARP were combined post-fieldwork. The
details of MARP 134 described in this section are an amalgamation of rock art sites initially recorded as MARP 133 and 134. When spatially mapped it became clear that the two sites were instead one larger site and site details were grouped as one site.

Table 5.10 on p172 details the GPS location, landscape type and geology of large rock art sites, along with the cumulative number of panels for large rock art sites. It also details additional panel specific details, such as the presence of superimposition. In summary large sites were located on elevated tor outcrop ridges or elevated rock bulbs on rock slopes and were constituted of a granite or gneissic geology. MARP 71 and 200 consisted of two distinct clusters of granite boulders separated by a narrow corridor of vegetation between ten - twenty metres wide. All large sites were situated in an uncultivated setting, demonstrated in figs 5.28 and 5.29, p174, although MARP 33 had a small clearing to the west which has the potential to be used for pastoral practices. Additional human activity within the vicinity of MARP 33, 39 and 210 include the Malik Arjuna Temple, visible to the north of the rock art site, and accessed by a series of stone steps at the base of the outcrop. A water treatment plant was also noticed 200 metres to the west of MARP 33 and 250 metres to the south east from the southern edge of MARP 39. Current human activity observed at MARP 134 consisted of audible dynamite blastings, but it was not possible to discern the direction of their origin.
Top fig 5.28 Landscape context looking to the exposed bulb of MARP 134. Bottom fig 5.29 Landscape context looking to the South of MARP 210 (author’s own photographs).
In the case of all large sites, many more panels were observed than were recorded. As a general rule, an estimated 50% observation vs recording strategy was adopted in recording panels at large sites over the 2014 and 2015 fieldseasons. This fieldwork limitation was due to time constraints; a potential aim for future fieldwork would be to select one large site and record all panels and motifs in order to build up a comprehensive spatial catalogue of rock art over a small area at Maski. Therefore, the numbers of motifs and their categorical breakdown in tables 5.10, p172 and 5.11, p176 should be viewed as a representative sample of the identifiable motif forms and thematic relationships present at Maski, serving to exemplify the sheer quantity of rock art production as a visual tradition in this local landscape.

Panels with discernible sequences of superimposition were also prioritised during recording practices at large sites, as it forms the predominate sequencing analysis method utilised for rock bruisings at a global level. In a South Indian rock art context, utilising multiple panels of superimposition provides a means to critically assess the pervasive acceptance of chronologically ordering rock art through the means of style, discussed in Chapter three, section 3.3.3. Additionally, recording panels with identifiable levels of superimposition ensures that arguments for thematic relationships between different motif combinations can be made. This will hopefully go some way to elucidating some of the complexities in the pervasive tradition of rock art production in this local area of South India and highlight possible reasons for its use as a communicative device, originating during South Indian prehistory. Superimposition was present on multiple panels within MARP 33, 39, 71, 175, and 210. On some specific panels at these sites, the sequencing of superimposition was especially dense, specific panels are analysed in Chapter seven.

However, superimposition was absent on recorded panels at MARP 134 and MARP 200. These sites exhibited the rock art production tradition of singular or few motifs produced as distinct, individual events across a panel surface with no evidence of cross cutting, intersection or obliteration. The quantitative totals for recorded motif categories are displayed in Table 5.11, p176 and, as with previous sites, show a large proportion of bovine and anthropomorphic forms, abstracted motifs and rare instances of other faunal motifs. See figs 5.30-5.36, pp 176-179 for visual examples of motifs recorded at large sites.
Table 5.11, Categories and quantities of motifs recorded at large sites (source: author).

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Avian</th>
<th>Bovines</th>
<th>Bulls</th>
<th>Deer</th>
<th>Elephant</th>
<th>Equine</th>
<th>Feline</th>
<th>Ungulate</th>
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<th>Number of Motifs</th>
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<td>24</td>
<td>10</td>
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<td>11</td>
<td>103</td>
<td>122</td>
<td>87</td>
<td>714</td>
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</table>

Fig 5.30 Deer motif at MARP 33, motif is approximately 30 cm in length (author’s own photograph).
Top fig 5.31 Abstract motif at MARP 33. Bottom fig 5.32 Elephant motifs at MARP 175 (author's own photographs).
Top fig 5.33 Bovine motifs at MARP 200. Bottom left fig 5.34, Eroded panel of bovine and anthropomorphic motifs at MARP 134. Bottom right fig 5.35 Anthropomorphic motif at MARP 210 (author's own photographs).
Fig 5.36 A panel of accumulated, but not overlapping motifs at MARP 71 (author’s own photograph).
All sites designated large sites could be accessed from a variety of directions after a moderate climb. Climbing was also necessary when moving through these sites. In general, access to all sites were hampered at variable intervals by the presence of thorny scrub vegetation at the base of exposed outcrops, or if the rock face encountered during systematic pedestrian survey methods was too sheer to ascend safely.

There was often a clear and uninterrupted visibility from large rock art sites. There was localised poor visibility from specific rock art panels, where external visibility from the panel was hampered by other boulders. In addition to visual sighting of the Malik Arjuna temple, MARP 33 has clear views to the base of the outcrop, the modern day settlement of Maski below and surrounding agricultural lands. MARP 39 had 360° degree visibility along the top of the inselberg ridge, with modern settlement of Maski to the east, along with the area of the known Early Historic Settlement (MARP 97). MARP 155 and MARP 210 were visible to the west, which are described in table 5.12, p182. Similarly, MARP 210 had 360° degree visibility from the top of the ridge, with MARP 155 and MARP 39 visible to the east and the peneplain to the west. MARP 134, 175, and 200 also displayed 360° visibility to points of the Durga Gudda outcrop and the surrounding peneplains. There was uninterrupted visibility from MARP 71 to the northern peneplain, the Durga Gudda outcrop and 360° from the top of each ridge cluster.

The surfaces of boulders deemed suitable for rock art production were angled variably between a horizontal and vertical axis of approximately 75° - 190° but specific angles were not recorded during fieldwork. As with all other site sizes, large sites were situated in open air contexts and subject to repeated weathering and erosional processes, affecting their surface and structural integrity to varying degrees. The condition of each panel is variable, consisting of weathered and oxidised granite and some surface staining. Mineral encrustations are also present on some horizontal panels (see MARP 33 panel 19, in fig 5.37, p181). There is also variable presence of weathering cracks, structural panel cracking and surface exfoliation. Similarly at MARP 134, each panel surface displayed variable erosional processes such as surface oxidation, erosional surface foliation scars of varying ages and differential biofilm growth. These weathering
processes have already been discussed and visualised in sections 5.2-5.4 and are not repeated here. All motifs were produced using a bruising technique.

Fig 5.37 MARP 33 displaying mineral encrustation of a horizontal panel surface, along with organic film darkening which is obscuring motifs (author’s own photograph).

As with some small sites and medium sites, rock art sites designated as large sites are often within spatial proximity of archaeologically relevant human activity in the area, in the form of other rock art sites, previously occupied rock shelters, habitation terraces and megalithic structures. Large sites also encompass areas of additional past human activity, rather than being separate rock art sites spatially associated with distinct areas of past human activity or habitation evidence. Four large sites displayed temporally diagnostic artefacts, summarised below in table 5.12, p182 and recorded in moderate to dense quantities, their type indicative of the South Indian Iron Age.
Table 5.12 Summary table of temporally diagnostic artefacts identified at large sites and visual connections with other sites (source: author utilising MARP project data).

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Temporally Diagnostic Material Culture?</th>
<th>Visually Associated Archaeological Features. MARP number and type</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>Single sherd of coarse red ware</td>
<td>Visually associated with MARP 97 - Early Historic Settlement</td>
</tr>
<tr>
<td>39</td>
<td>N/A</td>
<td>MARP 155 – small habitation area, MARP 210 – rock art site, MARP 97 – Early Historic Settlement</td>
</tr>
<tr>
<td>71</td>
<td>N/A</td>
<td>MARP 70 – Passage Chamber Megalith, MARP 93 – Painted rock shelter</td>
</tr>
<tr>
<td>134</td>
<td>Single ground circular disc of coarse red ware</td>
<td>MARP 17 – Passage Chamber Megalith, MARP 18 – Rock art, MARP 135 – previously occupied rock shelter and rock art</td>
</tr>
<tr>
<td>175</td>
<td>Indeterminate eroded sherds</td>
<td>n.d</td>
</tr>
<tr>
<td>200</td>
<td>N/A</td>
<td>MARP 199 – previously occupied rock shelter and rock art</td>
</tr>
<tr>
<td>210</td>
<td>Dense scatters of red slip and polish wares with three jar rims, plain coarse red ware, small fragments of slag</td>
<td>Composite site including a previously occupied rock shelter and prehistoric habitation terrace, MARP 155 – small habitation area, MARP 39 – rock art site</td>
</tr>
</tbody>
</table>

Preliminary interpretation regarding the chronology of motif production at large sites suggests that some rock art motifs were initially produced during the prehistoric period in South India, possibly during the South Indian Iron Age for MARP 39, 175, and 210. This suggestion is based upon their proximal association with an established Iron Age settlement (MARP 175 in relation to MARP 82, see Chapter six, p205) and presence of temporally diagnostic Iron Age ceramics within the site boundaries of MARP 210, demonstrated in fig 5.38, p183. The clear visual associations between MARP 39, 33, 134 and 200 with other sites bearing Iron Age assemblages, described in table 5.12 above, also increase the plausibility of some rock art production phases occurring during the prehistoric period at these sites.
Motif production also appears to continue through the historic periods into recent times. There is also evidence of sporadic modern production in the form of hearts with arrows, along with English and Kannada script, especially prevalent at MARP 33, 39 and 210. Although no temporally diagnostic artefacts were recovered from MARP 71, the presence of an unusual bovine motif style preceding other bovine forms, argued in this thesis to be linked with the South Indian Iron Age, could indicate an earlier phase of motif production, see Chapter seven, section 7.5, pp 296-302. The sites, described in this section as large sites, display a pattern of motif production as a single or few motifs per panel and specific panels exhibiting accumulations of overlapping motifs. Large sites also exhibit multiple stylistically superimposed variations across cattle motif forms, alluding to their use as sites with multiple phases of rock art production and interaction.
5.6. Conclusion

This chapter has summarised the results of rock art site, panel and motif documentation occurring as part of the author’s doctoral research project. It has described the different landscape contexts where 54 different rock art sites are situated, along with their constitutive geologies. Additionally, this chapter has summarised weathering and erosional processes present at rock art sites, along with a numerical categorisation of motif forms. Finally, this chapter has situated each rock art site in spatial relation to other archaeologically relevant material culture.

In conclusion, rock art production is a widespread phenomenon in the Maski landscape occurring in a variety of open air contexts; from the peneplain to isolated tor inselbergs, on rock slopes and elevated outcrops, inclusive of the main Durgada Gudda outcrop. Rock art is predominantly located on granite or gneissic geologies, with minor cases located on dolerite. All 54 recorded sites exhibited rock art petroglyph production using a ‘bruising’ technique. These granitic/gneissic outcrops are also currently subject to modern quarrying and field clearance practices, raising concerns for the long-term existence of rock art sites in differentially elevated landscape contexts.

This summary has demonstrated the applicability of conducting rock art documentation surveys in collaboration with established archaeological research projects, utilising similar data gathering methods for complementary research aims. This chapter has demonstrated just how complex and pervasive the presence of rock art is within a specific localised landscape, inferring that it has been a widespread human activity, despite remaining temporally ambiguous. This chapter has introduced the rock art present at Maski in a broad sense, connecting it within an inhabited landscape with a complex archaeological history. The next two chapters analyse certain themes within the rock art, demonstrating what a study of rock art can contribute to archaeological knowledge in the Indian subcontinent.

The key themes for analysis can be divided into two strands, spatial association and technical motif details. The first analysis chapter focuses on spatial associations of rock art with specific archaeological features. Temporally diagnostic material culture in the form of ceramic sherds or lithics were rare at
rock art sites; when observed they were often in small scattered quantities. Chapter six analyses the spatial proximity of rock art sites to additional archaeological features in the form of modified water features, previously occupied rock shelters, megalithic features and prehistoric habitation terraces with the rock art sites recorded at Maski. The aim of Chapter six is to focus on specific archaeological features which have measurable spatial connections to certain rock art accumulations, providing a hypothetical temporal control for some rock art sites, along with connections for inferred patterns of archaeological activity.

The second analysis chapter looks at specific panels in more focused detail. The four main size divisions structuring Chapter five have demonstrated the consistent quantitative prevalence of bovine, anthropomorphic and abstracted motifs within the corpus of rock art, interspersed with other faunal images. The content of motif production demonstrates that the activity of producing bovine and anthropomorphic related imagery has been a significant landscape activity, visualising the longevity of relationships between bovine and humans. Additionally, the presence of other faunal motifs within the rock art corpus argue that the production of rock art at Maski is significant is visualising relationships between humans and animals. Specific panels were chosen based on the presence of superimposition phasing, described in the preceding tables in this chapter. One aim of Chapter seven is to provide a level of relative temporal control to certain rock art production phases, cross-referenced with temporally diagnostic material culture presented in Chapters five and six. An additional aim of chapter seven is to visualise phases of interaction with the rock art at Maski. Combined with an analysis of panel specific interaction marking, providing evidence for how panels and motifs have been manipulated over time, Chapter seven aims to demonstrate how people have participated or understood the (re)production of rock art at Maski.
Chapter Six. Patterns in landscape placement

6.1. Introduction

The previous chapter presented a summary of results from fieldwork during 2014 and 2015, structured according to the size of each site in terms of quantities of recorded panels. Chapter five also presented broad quantities of motif categories represented at each site. It also summarised the artefacts visually identified within the boundaries of rock art sites, along with archaeological features which could be visually verified from rock art sites during fieldwork stages of this thesis. The next two chapters are the analysis chapters of this thesis, addressing key results summarised in Chapter five, concerning spatial associations with diverse forms of human activity and technical details inherent at panel level.

Chapter six provides an analysis of broad patterns present in the rock art in the Maski landscape, using a macro form of spatial analysis, advocated by Chippendale (2004) and presented in Chapter two p52. It investigates how the corpus of rock art sites and motif content spatially connects to its landscape as both a natural form and a product of anthropogenic action as demonstrated in Bradley (2000) and Hartley and Wolley Vawser (1998). Chapter seven utilises panel specific motif content to draw out technical details of motif form and intra-panel patterning at a smaller, more localised level of analysis. Taken together, the two chapters represent a means to analyse the rock art in the Maski landscape from multiple scales, examining the complex layers of information contained at different scales at rock art sites. The findings presented in these two chapters are discussed regarding their archaeological implications within the local Maski landscape and, more broadly, within South Indian archaeology.

The locational GPS information contained in this chapter, along with characteristics about related archaeological sites and features utilise data from the MARP project. The author has used them to present a more concise spatial analysis of rock art sites within their landscape settings, attempting to identify connections between types and numbers of motifs within the main landscape contexts (introduced in Chapter five). These main landscape contexts being the peneplain, low relief tor inselbergs, rock slopes and elevated tor outcrops.
Firstly, section 6.2 of this chapter analyses the spatial associations of rock art sites with other archaeological features within the landscape, at varying scales of distance, to situate rock art sites within a landscape understood as a relationship between natural and anthropogenic variables. Secondly, section 6.3 investigates the numbers of motifs found within each site when it is compared to each site’s spatial area. The aim of this section is to identify patterns between a site’s size and the numbers of motifs documented within a defined area, with a particular focus on different landscape contexts (peneplain, low tor relief inselberg, rock slope or elevated outcrop). Put more specifically, is there a connection between a rock art site area size and the numerical distribution of motifs in a specific contextual setting? Section 6.4 addresses the forms of identifiable motifs produced in specific landscape contexts. The question is; are there differences in the identifiable categories of motifs produced in the main landscape divisions of peneplain, low tor relief inselbergs, rock slopes and elevated tor outcrop settings? Finally, section 6.5 presents an analysis of motif distribution at an intra-site level for specific rock art sites.

Before this chapter continues with the majority of its spatial analysis, the proportions of geological material which form rock art panel surfaces are considered. Of the 54 rock art sites analysed in this thesis, four of them were produced on dolerite geologies, a proportion of 2.2%, with the remainder produced on granite or gneissic geologies. Additionally, the rock art sites recorded on dolerite geologies are restricted to sites given a ‘small’ designation in Chapter five, with one site (MARP 106) having a medium size designation. This finding contrasts with rock art recording carried out by Ravi Korisettar and others at Sanganakallu, Northern Karnataka, see Chapter three, pp 85-87, where connections were drawn between the repeated activities of rock art production and ground stone axe manufacture on dolerite geologies (Brumm et al. 2006). Within the context of Maski, differences in geology does not appear to have been a primary deciding factor on the production of rock art in an extended landscape setting. This raises wider questions about whether, and how, the geological constituents of a rock art site was a significant factor in the choice of rock art production in the prehistoric and historic periods of South India? This discussion point is raised in more detail in Chapter eight pp 319-320.
6.2. Spatial associations with archaeological activity zones.

This section analyses the spatial associations between rock art sites and other forms of anthropogenic/human activity zones. This analysis looks to explore the hypothesis that rock art sites are situated within a complex array of human activities throughout the Maski landscape, indicative of a range of prehistoric and historic landuse practices. This analysis utilises all GPS location data gathered during all seasons of systematic fieldsurvey from the MARP project (2010-2015). However, only rock art sites documented during the seasons of 2014 and 2015 will be analysed in detail. This is due to the author’s direct involvement during those fieldseasons and primary control over the form of material documented at the rock art sites presented in this thesis.

The process of this analysis is twofold. Firstly, using the centre point of the rock art site in question, and visualised using mapping software, a radius was widened at intervals of 50 metres, 100 metres, 150 metres and 200 metres. All archaeological sites geographically passed through at these intervals were counted, along with their main activity type. Sites are not duplicated at spatial interval boundaries, if a MARP site is spatially associated at an interval of 50 metres from the centre of a rock art site and then extends for a further 72 metres, then it is recorded as an encountered site at 50 metres and not recorded again. This is so each MARP site is spatially associated with the rock art site once and does not lead to an overestimation in the perceived number of sites encountered from a single site overall. It does however not give an indication that some sites do extend for a large spatial area. However, MARP project field forms provide more detailed information on the dimensions of these archaeological sites.

A total of 141 sites, documented by the MARP project were considered for further spatial analysis regarding archaeological activity in the vicinity of rock art sites. This number is based on the 215 total sites subtracting the 74 rock art sites. Twenty-nine sites were not included in this spatial analysis for a number of reasons. Firstly, MARP sites 7, 41, 58, 61, 65, 66, 85 and 109 were not included in this spatial analysis as the author was unable to ascertain their site type or access the required field recording forms. MARP 180-209, 211, 213-215 were recorded in the far north eastern and south eastern edges of the MARP 8km² survey area and were not recorded near any rock art to be relevant for this sample.
of spatial analysis. After the above mentioned sites were discounted, the remaining number of sites for spatial analysis numbered 112.

Limitations of this analysis are to do with the categorisation of activity areas. These categorisations of main site types are an inference of the main use within a designated space through documentation of the main form of artefact assemblages. It is highly probable, in fact almost certain, that other anthropogenic activities occurred in the same locations, in addition to its nominative site type classification. However, either the archaeological remains are ephemeral enough to not be noticed through fieldwalking means or will be identified at a later date through invasive archaeological methods. Either way, the categorisation of main activity sites utilised in this analysis are the results of visible evidence of archaeologically relevant land use practices, gathered through non-invasive, fieldwalking survey. Therefore, it is likely these activity areas will be more fully understood during future seasons of the MARP.

Secondly, these sites are also analysed in terms of their age, if that is indeterminate, generally prehistoric or temporally diagnostic; Neolithic, Iron Age, Early Historic or Medieval. Broad comments in terms of site age are taken from the types and densities of spatially associated material assemblages, explained in Chapter four, p118, and subsequent discussions of chronology with members of the MARP project during primary field recording. The aim of this analysis is to demonstrate if there is an increased intensity of activity areas proximally located near rock art sites which have the potential to be temporally diagnostic. These can then be used as evidence to situate elements of some rock art sites within temporally specific contexts of past human activity areas. Some sites also contained material assemblages, predominantly ceramics which were temporally undiagnostic. Undiagnostic sherds were highly fragmented, small pieces of ceramic which did not have visible surface glaze, polish or identifiable morphology to be assigned an approximate date range. Although the spatial analysis presented in this chapter will remain broad, it is worth investigating in terms of situating rock art sites within temporally diagnostic activity areas, which tie into exploring the cultural significance of rock art production traditions within temporally specific periods of South Indian archaeology.

6.2.1 Distances from rock art sites
Table 6.1. Numbers of sites encountered at specific intervals in metres from rock art sites. The spatial clusterings refer to areas in figures 6.1a-i (source: author).

<table>
<thead>
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<th>Site Number</th>
<th>0m</th>
<th>50m</th>
<th>100m</th>
<th>150m</th>
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From the spatial analysis of each rock art site, see table 6.1 p190, there are eight distinct clusterings of archaeological activity which occur. Each spatial cluster is located in its wider landscape context, in fig 6.1a, p193, with more detail provided for each cluster in figs 6.1b-i, pp 195-206. Further details of site types
which are spatially encountered from each rock art site can be found in Appendices A and B. Appendix A details MARP data, inclusive of rock art sites, from the 2010 and 2012 fieldseasons. Appendix B details archaeological data, exclusive of rock art sites, for the 2014 and 2015 fieldseasons. As a general pattern, there are few sites directly encountered within a 0-100 metre radius of a rock art site, the number of archaeological sites drastically increase as distance from the centre of the rock art site increases.

The following rock art sites, presented in table 6.2, p192, were not associated with any temporally associated archaeological assemblages, either spatially or visually. Their temporal framing is uncertain, and they will not be analysed in any further detail. They remain examples of temporally uncertain rock art sites within the wider Maski landscape.
Table 6.2. Numbers of sites encountered at specific intervals from rock art sites not included in subsequent figures (source: author).

<table>
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<th>Site Number</th>
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Fig 6.1a Overview Map of survey area with rock art concentrations and approximate elevation boundaries. Each rock art concentration and associated archaeological activity cluster is designated by a letter in this figure and discussed below with figures 6.1b - 6.1i in more detail (source: author).

Each of the site clusters are visualised in figs 6.1b - 6.1i, pp 195-206, where comments are also made regarding temporal framing and visual site connections. Figures 6.1b – 6.1i display broad topographies and the sites covered within each topography. They also display the outline boundary of each rock art area, if they form multiple panels, or as a square if recorded as a single GPS point. All rock art sites are numbered in each figure. All other forms of archaeological activity areas or zones are designated with a specific letter for their main site type rather than their MARP number. Further attribute information
can either be located in Chapter five for rock art sites, or Appendices A and B for other archaeological site types.

Spatial clustering A, visualised in fig 6.1b, p195 contains rock art sites; MARP18, 134, 135, 143, 144, 145 and 146; contextual details can be found in Chapter five. These rock art sites are located in close proximity to two previously occupied rock shelters, MARP 135 (a composite site) and MARP 147. MARP 135 has evidence of ceramic sherds indicative of the Iron Age (red slip/polish coarse and fine, black slip/polish fine and black and red ware (BRW)) in dense quantities within the rock shelter. MARP 147 also contained traces of diagnostic Neolithic material in moderate densities within the rock shelter, some of which had been burned.

In their wider radius area of 101-200m there are also three more previously occupied rock shelters, two of which were mentioned in the Yazdani excavation report (Yazdani, 1938), and traces of mineral processing, arguably prehistoric in origin. The minor edict dedicated to Ashoka, Early Historic in origin, is also located within this spatial clustering. There were six instances of megalithic features, one of which is arguably Iron Age based upon morphological characteristics, whilst the rest are of an unknown temporal designation. No temporally diagnostic artefacts were recovered from these megalithic sites. There were also visual connections made with rock art sites and other archaeological sites made in the field. Rock art site MARP 145 was visible from MARP 146, and there was mutual visibility between MARP 134 and 135. MARP 135 has the strongest evidence, based upon proximity to other temporally diagnostic archaeological sites, for activity occurring during the South Indian Iron Age.
Fig 6.1b Spatial clustering of archaeological activity on the north western edge the outcrop. Marked (A) in fig 6.1a (source: author).

Spatial clustering B, contains two large rock art zones, MARP 39 and MARP 210, in the centre of the survey area that are both mutually associated, both visually and spatially, see fig 6.1c, p196. They are also spatially associated with MARP 155, an Iron Age/Prehistoric ephemeral habitation area such as a seasonal camp, situated centrally and north between MARP 39 and 210. There is also a modified reservoir feature of an indeterminate age. MARP 210 is also associated with a previously occupied rock shelter with an Iron Age diagnostic assemblage of coarse red slipped and polished ware in dense quantities, inclusive of large jar rim fragments. Additionally, the habitation zones to the east of MARP 39 contain archaeological ceramic assemblages in sparse to moderate densities, (black slip/polish (coarse), red plain ware (fine) and grey plain wares) which are indicative of both Iron Age and Medieval activities. It is probable that an amount of rock art present at these two sites are Iron Age or at least prehistoric in nature. They also contain a large quantity of modern images.
Fig 6.1c, Spatial Clustering of archaeological activity at the centre of the outcrop. Marked (B) in fig 6.1a (source: author).
Fig 6.1d, Spatial Clustering of archaeological activity south of the main outcrop. Marked (C) in fig 6.1a (source: author).
Spatial cluster C had a high proportion of spatially associated sites at lower elevations to the southern end of the Durgada Gudda outcrop, see fig 6.1d, p197. It also demonstrated an increased variety of spatially associated archaeological activity types. Rock art sites included in this spatial cluster are MARP sites 78, 166, 168, 170, 171, 172, 173 and 177. MARP sites 171 and MARP 169 are previously occupied rock shelter sites, spatially proximal to rock art sites. There were sparse quantities of ceramics at MARP 169 in black slip/polish (coarse) and red slip/polish (coarse) wares. These ceramic types were also present in sparse quantities at MARP 171, with additional ceramic types of black slip/polish (fine), red plain (fine) and black and red ware (BRW). These material assemblages are indicative of the South Indian Iron Age activity. Additionally, this activity cluster also contained two metal working areas, MARP 166 and MARP 176 in spatial proximity to rock art sites. Information about the types and quantities of temporally diagnostic material was unavailable for MARP 166. Many ceramic types were recorded at MARP 176 (red slip/polish (fine and coarse), black and red ware (BRW), black slip/polish (fine) and red plain (coarse)) in very dense quantities, indicative of Iron Age activity. Additionally, items indicative of smelting and smithing practices such as ore, iron bloom and smithing slag were also recorded at this site.

There are also a number of burial areas MARP 79, 167 and 174 present in this spatial clustering in the wider setting of the named rock art sites. Burial jars were identified at these sites. Recorded ceramic types include: red slip/polish (fine and coarse), black slip/polish (fine), red plain (fine and coarse) and black and red ware (BRW) in dense quantities and are indicative of a range of Iron Age burial practices. Additionally, radiocarbon dates were obtained from four burial deposits at MARP 79 located to the west of MARP 78, see fig 6.1d, p197. The resulting dates of 1222-1117 cal BC, 1407-1276 cal BC. 1389-1225 cal BC and 1985-1756 cal BC (Bauer and Johansen, 2015, 800) place these burial practices within 2nd millennium BC activity, between the accepted Neolithic and Iron Age cultural periods for the region. Finally, a single settlement area was identified on the edge of this spatial clustering (MARP 81). Recorded ceramic types (red slip/polish (fine and coarse), black slip/polish (fine), red plain (fine and coarse) and black and red ware (BRW)) were noted in dense quantities, along with three pieces of smithing slag. This settlement area is also indicative of Iron Age activity.
There are also visual associations which can be made between the rock art and other archaeological features identified in this spatial clustering. The metal working area of MARP 166 was visible from the rock art area of the same site. The rock art at MARP 171 was also intervisible from access points of the previously occupied rock shelter. Rock art sites MARP 168 and 170 were intervisible, along with sight lines to a previously occupied rock shelter MARP 169. Rock art sites MARP 172 and 173 were also intervisible. This complex pattern of archaeological activity argued to be associated with the Iron Age or Early Historic periods, along with intervisibility between these two forms of archaeological activity, argue for an Iron Age connection to some rock art sites in this cluster.

MARP 71, marked area D on fig 6.1a above, and visualised in fig 6.1e, p200, at the southern edge of the survey zone, is spatially associated with other rock art sites and no temporally diagnostic artefacts were recovered. This spatial cluster demonstrated some of the most intensive motif accumulation on panels, see fig 6.6d, p225. Although given a temporally uncertain date range due to lack of temporally diagnostic features, it arguably represents some of the earliest motif production phases, see Chapter seven, section 7.4, pp 273-281, and discussed further in Chapter eight, pp 336-337.
Fig 6.1e, Spatial clustering of archaeological activity on smaller outcrop to the south of the Durgada Gudda outcrop. Marked Area (D) on fig 6.1a (source: author).
Fig 6.1f Spatial clustering of archaeological activity on a elevated outcrop to the south of the survey region. Marked (E) in fig 6.1a (source: author).
Fig 6.1g, Spatial clustering of archaeological activity on a elevated outcrop to the south of the survey region. Marked (F) in fig 6.1a (source: author).
Spatial cluster E, see fig 6.1f, p201, contains five rock art sites, four of which are solely rock art locations without temporally diagnostic features, whilst one, MARP 199, is a composite site with a previously occupied rock shelter. A sparse quantity of ceramic sherds in a red slip and polish (fine) type were recorded, indicative of ephemeral Iron Age activity. This activity cluster also contains a settlement, MARP 203, with sparse to moderate densities of diagnostic Neolithic sherds (pink and grey, grey plain, pink plain and buff plain), along with dense quantities of lithics including cortex, reduction debitage and bladelets. Additionally, a granite grinding stone was recorded. Based upon spatial and visual proximity to Iron Age diagnostic archaeological features, MARP 199 demonstrates some evidence for Iron Age occupation. The association with earlier activity indicates that some motifs may have been produced during the Neolithic period.

Additionally, a further spatial clustering, marked as F in Fig 6.1a and displayed in more detail in fig 6.1g, p202, is situated at the southern elevated outcrop in the Maski landscape and comprises four rock art sites of 193, 195, 197 and 198. There is megalith site spatially and proximally located to MARP 193. No temporally diagnostic archaeological features are associated with this clustering and therefore no clear distinction can be coherently made regarding their temporal frame based upon archaeological activity patterns.

There are two large rock art sites, centrally located in the Maski landscape, marked G in fig 6.1a, p193, that have spatially associated, temporally diagnostic assemblages. MARP 175 is spatially associated with settlement sites MARP 82 and 30, containing a large amount of rock art and temporally diagnostic Iron Age material in dense quantities. Temporally diagnostic ceramic types recorded at MARP 82 and 30 include red slip/polish (fine and coarse), black and red ware (BRW), black slip/polish (fine), red plain (fine and coarse) and black plain (coarse). Due to access problems at MARP 82, this site is in need of more thorough investigation. It is likely that MARP 175 contains some rock art production that is Iron Age in date and may even link up with MARP 82. There is also a spatial association with MARP 83, a megalithic site indicative of Iron Age. Additionally, there is also a settlement site, MARP 31, with Medieval diagnostic sherds of grey plain ware in dense quantities. MARP 33, a rock art site, is spatially associated with a Medieval shrine and megalith sites (MARP 96, 89). This site
has clear visual association with MARP 97, an Early Historic settlement and the present day Maski settlement. It is difficult to justify a temporal designation for this site (MARP 33) based upon spatially or visually located archaeological features.
Fig 6.1h, Spatial clustering of archaeological activity on an elevated outcrop in the centre of the survey region. Marked (G) in fig 6.1a (source: author).
Fig 6.1i, Spatial clustering of archaeological activity located three km north of the Durgada Gudda outcrop, marked area H 3km north, off-map in fig 6.1a (source:author).
This spatial clustering, area H, see fig 6.1a on p193 and fig 6.1i, p206, is at a 3km distance north of the main cluster groupings on the Maski outcrop and contains rock art sites MARP 64 and 149. These sites are mutually spatially and visually associated. MARP 64 as a composite site includes structural terracing, grinding slicks and hollows which can arguably be representative of localised Neolithic activity. MARP 64 is visually associated with megalithic area 62 of an unknown origin. MARP 149 is also a composite site with prehistoric occupation evidence in a previously occupied rock shelter containing a constructed wall at the rear of the shelter. There is a reasonable amount of evidence to demonstrate the proximity of these rock art sites to areas of Neolithic activity in this localised area. However, it is uncertain whether some elements of rock art production in spatial cluster H can attributed to the Neolithic period.

This section has demonstrated distinct spatial clusters of rock art and spatially proximal activity located with the Maski landscape. It has demonstrated that rock art sites are situated within past human activity zones connected to water management, ephemeral and more permanent habitation and megalithic features. It has also demonstrated that the combined spatial proximity of specific zones and their associated artefact assemblages are indicative of cultural activity which can be linked to the South Indian Iron Age and the Medieval periods. There is also assemblage evidence for definitive Neolithic or Early Historic activity, although this is less frequent and more difficult to link coherently to rock art production sites. The next section looks at the frequency with which different activity zones are associated with rock art production sites at Maski.
6.2.2. Patterns in spatially associated activity areas.

Fig 6.2. Line graph displaying the numbers of archaeological activity zones encountered at regular intervals from rock art sites (source author).

Table 6.3. Numbers of rock art sites encountered at each distance interval from a specific rock art site in each spatial cluster mapped in fig 6.1a (source: author).

<table>
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<th>Distance (metres)</th>
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<td>14</td>
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<td>35</td>
<td>36</td>
</tr>
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</table>

There are a range of main activity zones that are geographically situated within a 0-200 metre radius from the centre point of each rock art site. This is demonstrated in fig 6.2 above. Certain isolated sites such as mining shafts, mineral processing area and the Ashokan Edict were not included in this analysis because they were recorded too sporadically to make up a numerically relevant category. It was decided to focus on main activity types evidenced in the landscape. Other widespread artefact scatters were also not included in this analysis due to uncertainties over the inference of the main activity type,
Additionally, they were often not located within a 200 metre radius of a rock art site.

The numbers of rock art sites are presented in table 6.3 on p208. They have been displayed separately because their sheer number dominates the nuanced differences of spatial placement of other activity zones presented in fig 6.2, p208. This table again demonstrates the prevalence of rock art sites in the Maski landscape. The further one gets from a specific rock art site, the consistently high number of other rock art sites encountered from a 51-200 metre radius.

There are a consistently high number of previously occupied rock shelters, encountered within a 0-200m radius of a rock art site. They form the highest number of composite sites, as a rock art with previously occupied rock shelter combination site type. The numbers of previously occupied rock shelters also increases as the distance from a rock art site increases, demonstrating a quantifiable proximal relationship. The numbers of activity sites classed as megalithic increase the further you get from the centre of a rock art site, with a steady rise from 0-100 metres and then a steep increase from 101-150 metres before decreasing in number from 151-200 metres. The results indicate that rock art sites and megalith sites do not often share the same spatial location. However, this pattern could also indicate that megalith sites are visibly, rather than proximally, located to rock art sites and is discussed in more detail in Chapter eight p324.

Fig 6.2, p208 demonstrates that more burial sites are encountered when distance is increased from the centre of a rock art site. This implies that burial practices and rock art production sites do not share the same immediate geographical space. However, as the results from this graph are representative of one area (spatial clustering C, see fig 6.1d, p197), encompassing an assemblage concentration indicative of prehistoric burial practices, this pattern implies a trend for a specific area, rather than a wider localised pattern. Rock art sites are also located within the spatial vicinity of small numbers of metal/iron working sites and modified water features. These instances occur sporadically and in too few numbers to indicate any deliberate spatial patterning at this stage.
There is a complex spatial relationship between rock art sites and distinct settlement sites, visualised in fig 6.2, p208 and noted during fieldwork. Fig 6.2 demonstrates a singular occurrence of a composite rock art and settlement site with Neolithic assemblage material. However, the graph then shows a gradual increase in settlement sites at increasing distances from the centre of a rock art site. The experience from anecdotal evidence of fieldwork during the 2010 and 2012 fieldseasons posit a greater inclusion of rock art sites within developed Iron Age settlements, such as MARP 82. However, due to accessibility issues during fieldwork, the spatial proximity between activities indicative of developed settlement practices, and rock art production was unable to be explored any further. Therefore, the relationship between the spatial association of settlement sites for different time periods and rock art sites is more complex than demonstrated in 6.2, and something to be investigated in the future.

6.3 Motif quantities in relation to site size

This section presents an analysis of motif numbers compared to site size areas. The unprocessed information from these two variables is demonstrated in the results summary (Chapter five) where absolute values are found. In Chapter five, the numbers of motifs and the associated sizes of the areas in which they are contained are presented in terms of site size per number of panels. The main hypothesis is that the greater the landscape area of a rock art site, the greater the number of motifs present, due to available space for producing motifs.
Fig 6.3, Scatter graph demonstrating numbers of motifs in relation to site size for different landscape contexts (source: author).
Nine sites presented in Chapter five were not included in this section of analysis for two reasons. MARP sites 111, 122, 128, 131, 136, 146 and 196 (see Chapter five, for individual site characteristics) were not included in this spatial relationship analysis section due to insufficient site size information collected on the relevant days of fieldwork. MARP sites 142 and 144 were not included in this analysis due to the author's absence from the field on the day of documentation. This leaves a total of 42 rock art sites, from the 2014 and 2015 fieldseasons, which are analysed spatially below in terms of number of motifs related to the area size of their recorded site. Fig 6.3, p211 visually demonstrates the relationship between motif numbers at each rock art site and their approximate area size to the nearest square metre.

Rock art sites are divided within this scatter graph into distinct series, based upon natural landscape location noticed at the time of recording. It should be noted at this stage that the size variable for this analysis is in square metres, it does not take into account accurate and measurable changes in topography at a smaller scale. These landscape categories are divided by approximate elevation ranges, with peneplain at the lowest end of the relative elevation range and elevated outcrops occupying the highest category. These series are; peneplain (blue), low relief tor inselbergs (red), rock slope (green) and elevated outcrops (purple).

The current presentation of this scatter graph, fig 6.3, p211, does not include two data points as they skewed the value ranges along both axes. The sites not included in this visualisation are MARP 138, a peneplain site consisting of a site size of over 7000 m² with 11 documented petroglyphs, and MARP 39, an elevated outcrop site 6507m² with 215 documented petroglyphs. They are not included in the scatter graph as their inclusion obstructed appropriate visualisation of any relationship between motif numbers and site size for the remainder of rock art sites displayed in fig 6.3. Data points MARP 138 and MARP 39 are mentioned as outlier examples in the discussion of the relationship between site size and motif numbers on p213.

Sites on the peneplain and on low relief tor inselbergs (lower elevation zones), show a consistent trend with low motif numbers within small site areas. These sites, plotted within the peneplain and low relief tor inselbergs, are also located at a distance from the Durgada Gudda outcrop, in active agricultural
settings. The exception to this rule is site 138 which was measured at roughly 7000 m², with a total 11 rock bruisings. All the sites plotted within these two series, apart from 138, are also classified as single panel or small sites in Chapter five, and reflect the ground availability of geological material upon which to produce bruisings.

Data in the scatter graph representing the sites in rock slope and elevated outcrop contexts, at increasingly higher elevations than the previous two series, demonstrate a general relationship between site area size and number of motifs produce; the larger the area, the greater the number of motifs. However, the spread of data points in fig 6.3, p211 do not demonstrate a concise linear trajectory. MARP 39, mentioned above and not visualised in fig 6.3, is a site with an area of 6507 m² and 215 motifs. Some data points indicate a large number of motifs clustering in a reasonably small size area. This trend is present in both the rock slope and elevated outcrop series. Overall, this trend implies that the availability of rock surfaces to produce rock bruisings is significant, but some sites have greater numbers of motifs over others, irrespective of overall area size of rock slope or elevated outcrop site.

6.4. Motif percentages in landscape contexts

This section addresses the second theme of spatial analysis of documented rock art around Maski. It uses the numerical data presented in the results summary chapter (Chapter five, tables 5.2, 5.5, 5.8 and 5.11), and seeks to visualise patterns between the chosen form of motifs documented in each of the four natural landscape contexts. It is acknowledged that it would be inaccurate to represent total numbers of motifs documented as absolute values.

Visualising the motif categories found as proportions of a whole landscape type provides an acceptable means to analyse motif choice patterns in a general way. The pie charts, see fig 6.4a-d, pp 215-216, provide a guide to the similarity of motif proportions documented in each landscape type. There is a trend towards more varied forms of motifs produced at higher elevations, rock slopes and elevated tor outcrop contexts, with higher proportions of equine, feline, elephant and zoomorph forms, see figs 6.4c-d, p216. At lower elevations, on low tor relief inselbergs and on the peneplain, there are higher proportions of abstracted and
snake motifs, see figs 6.4a-b, p215, when viewed as overall percentages of cumulative motifs per landscape type but less variety in the identifiable motifs overall. Some abstracted motifs were identified as shiva lings and gameboards, whilst the serpents represented nagas. It is likely that a number of these motifs at lower elevations may stem from the Medieval periods onwards, although this date interpretation is subject to change.
Fig 6.4a, Proportions of motif types in peneplain contexts (source: author).

Fig 6.4b. Pie chart proportions of motifs in low tor relief inselberg contexts (source: author).
Fig 6.4c. Proportions of motifs in rock slope contexts (source: author).

Fig 6.4d. Proportions of motifs in elevated outcrop contexts (source: author).
Providing rough proportions of categorised motifs, in the form of percentage pie charts, does not represent the sheer quantity of motifs documented for designated categories in different landscape settings. Overall fig 6.5, p218 presents comparative proportions of categorised motifs identified with other landscape types, whilst providing an indication of motif totals documented across the four main landscape types.

From this chart, the cumulative nature of rock art motifs documented across the Maski landscape can be considered. The presence of motifs on elevated outcrops represents 59.9% of the motifs within the sample, with rock slopes making up 29.6%, low tor relief inselbergs 5.9% and 4.6% on the peneplain. These numbers demonstrate that rock art production is most common in landscape area where the available surface is most plentiful, at higher elevations. This implies that the availability of appropriate surface material is an important, decisive factor in the production of rock art motifs. Furthermore, the repeated creation of motifs on available rock surfaces may have contributed to developing ideas of importance for these places in the South Indian past. However, despite the majority of motifs being produced on rock surfaces at higher elevations because of the availability of rock surface material, they are not spread evenly over the available surface, as demonstrated in section 6.5, and this implies that there could be other choices for the prevalence of rock art motifs in some areas over others. The significance of this is explored more fully in section 8.2 regarding possible interpretations about the spatial relationships between rock art accumulations on available rock surfaces and other archaeological features.

Although displayed to some degree in Chapter five, tables 5.2, 5.5, 5.8 and 5.11, fig 6.5 p218 demonstrates the prevalence of bovine motif forms at all levels of the landscape at Maski, followed in cumulative numbers by anthropomorphic and then abstract motifs. The abstract motifs are not going to be analysed in any further detail due to difficulties in expressing coherent interpretations of their wider meaning beyond an identifiable visual description. There is also a significant number of indeterminate motifs which are also not discussed any further.
Fig 6.5. Stacked bar chart representing absolute values of motifs as a proportion of each landscape context (source: author).
Motifs that could be categorically identified as bulls form a very small percentage of the corpus of rock art documented as part of this thesis and predominantly restricted to elevated settings. The prevalence of bovine, as opposed to more specific bull forms, opens up the suggestion about the significance of cattle throughout prehistory into contemporary periods in this area of South India, in addition to published works prioritising bull imagery (Allchin and Allchin 1994; Boivin 2004a). Additionally, there are small numbers of other recognisable faunal motif forms, see fig 6.5, p212. Although these categories only form a small percentage of the rock art corpus, their repeated presence in numerous landscape locations demonstrates that the content of motif production extended beyond the production of cattle motifs, encompassing a wider range of animal, anthropomorphic and abstracted designs. This finding is explored further in Chapter eight, pp 333-334.

This section has demonstrated the proportional spread of motifs across the four main categories of natural landscape contexts. However, it is not able to demonstrate how motifs are situated within each site, this will be addressed in section 6.5. Additionally, it does not address the visual differentiation of motif forms, beyond a blanket identifier of category representation. Technical visual differences in specific categories of motifs are discussed more fully in Chapter seven, as part of an intra-site level of analysis.

6.5. Motif accumulations on panels.

Sections 6.3 and 6.4 have presented evidence for accumulative motifs in different landscape settings, based upon recorded sites as a whole. This section addresses the distribution of motifs within specific sites. The aim of this section is to demonstrate the prevalence of motifs to accumulate on specific panels, whilst acknowledging the widespread tradition of a single or few motifs to be present on many panels in the Maski landscape, particularly in rock slope and elevated outcrop locations. Whilst this section does not distinguish between the identifiable forms of motifs, generally described in section 6.4, it does treat each motif as an equal entity in itself, indicative of an image production event adding to the landscape corpus of rock art as a whole. Distinguishing features of specific motif characteristics are addressed more fully in Chapter seven, section 7.5.
The data for this analysis section utilises rock art sites classed as medium and large sites, sites with more than five recorded panels, see Chapter five pp 159-173, and have been grouped according to their landscape locations of peneplain, low relief tor inselbergs, rock slope and elevated outcrop, for consistency with the previous sections. It is apparent from the outset that medium and large sites are predominantly located in rock slope and elevated outcrop settings, with singular instances of medium and large sites present in both the peneplain and low relief tor inselbergs (see figs 6.6a and b, p221). MARP 111 was not included in this analysis of panel accumulation due to uncertainties over the quality of landscape setting information documented during fieldwork. The graphs presented appear as radar graphs, with the number of panels presented in the circumference of the graph and the quantitative totals of motifs presented from the centre of the graph to the outer edge. The graph is intended to be read clockwise with each number around the circumference representing the number given to the panel during fieldwork documentation.
Peneplain Motif Accumulation

Fig 6.6a. Graph demonstrating motif accumulation by panel at MARP 138 (source: author).

Low Relief Tor Inselberg Accumulation

Fig 6.6b. Graph demonstrating motif accumulation by panel at MARP 106 (source: author).
Fig 6.6c, Graph demonstrating motif accumulation by panel for rock slope contexts (source: author).

The radar graphs demonstrate a singular instance of motif accumulations across single panels in peneplain and low relief tor inselberg contexts, see figs 6.6a and b, p221. However, as these are singular cases, these are not interpreted any further. There is a set of mixed patterns for the spread of motifs across specific panel surfaces in rock slope contexts. MARP 78 and 202, both medium sized sites, demonstrate a clear increased proportion of motifs over single panels within the site, panel one and panel four respectively, see fig 6.6c above.

The other documented panels within these sites all display a small number of motifs between panels. MARP 134, a large site, has a more even spread of motif numbers across each panel. The same pattern can be argued for MARP 125. MARP 18 and 135, also medium sites, demonstrate increased motif numbers on multiple panel surfaces, with other panel surfaces only registering a
small number of documented motifs. This indicates accumulations of motifs over panel surfaces and a possible preference of panel choice for motif production, but over an uncertain time period.
Elevated Outcrop

Fig 6.6d, Graph demonstrating motif accumulation by panel for elevated outcrop contexts (source: author).
The number of motifs on specific panels in fig 6.6d, p224, visualised in the radar graphs, demonstrate the vastly increased numbers of rock art motifs in specific sites as a whole, particularly MARP 33, 39, 71 and 210. Additionally, these sites have specific panels with numbers of motifs ranging from 12-32 per panel, demonstrated by the spikes in the graphs. There are also recorded panels that have relatively low numbers of motifs. A number of the panels with large numbers of motifs are presented in Chapter seven, section 7.4 as part of superimposition sequencing analysis. This demonstrates specified landscape areas on elevated outcrop settings that have definitive accumulation areas of motifs. Similarly, as with rock slope sites such as MARP 134 (fig 6.6c, p222), there is a pattern of an even distribution of motifs across panel surfaces, with small numbers of motifs per panel for MARP sites 64, 170, 200 and 201.

Limitations of this method of analysis is that it does not take panel size into consideration and therefore does not account for the localised variable of available space per panel surface. It must also be acknowledged that the numbers of panels documented do not represent an absolute total for rock art in each location, due to the impracticability of documenting every single rock art motif during field survey strategies. The motif totals represents the total motifs per panel documented as part of this thesis. The motif accumulation focus of analysis also does not take into account the numbers of geological surfaces which do not have any visible bruising on them. Attention was placed on identifying rock art panels, rather than identifying the proportions of rock art panels against unmodified panels. This is an interesting point of comparison which could be looked at in the future. Analysing the proportions of unmodified and modified panel surfaces would assess the argument that rock art production traditions were widespread throughout the prehistory and history, yet accumulate in certain areas within the local Maski landscape.

However, findings from this analysis are helpful to demonstrate that motifs accumulate on specific panels over time, whilst other panels remain the product of a single case of motif production. The accumulation of motifs on specific panels are useful to display temporal sequencing through superimposition analysis, detailed in Chapter seven. Overall, there is a trend for specific panels within a site to display a vastly greater number of motifs in comparison to other spatially proximal panels. This finding raises interesting questions about whether these
panels are the result of a singular intensive production event, or if the initial production of motifs attracts accumulative motif production practices through time.

6.6. Conclusion.

This chapter has demonstrated the prevalence of rock art sites with a large proportions of motifs to be situated in rock slope and elevated outcrop settings, throughout the main residual hill morphology of the Durgada Gudda outcrop. There are also specific panels within medium and large sites, often located on rock slopes and elevated outcrop settings, that exhibit panels of increased motif production. For medium sites, concentrated motif production is exhibited by one panel, whilst for large sites multiple panels exhibit motif concentration. This accumulation of motifs at specific places, in both the wider Maski landscape and the more immediate setting of the rock art site, pose interesting questions about the choice of particular panels over others, and the nature of specific production events.

It has demonstrated that rock art sites tend to be situated within clusters of activity zones and are especially connected to previously occupied rock shelters at a spatial level. There is also the possibility for megalithic features to be visible from rock art sites, but this statement requires future and more focused investigation. This chapter has more fully explored the quantitative motif categories encountered in each landscape context, exposing the enormous skew towards bovine and anthropomorphic forms in all landscape contexts, accompanied with sporadic and diverse faunal motifs at higher elevations.

Previously occupied rock shelters tend to be directly associated with temporally diagnostic archaeological assemblages, indicative of Iron Age or Neolithic cultural activity, or at least periods of prehistoric occupation and sporadic medieval activity. Sites with previously occupied rock shelters also demonstrate large numbers of motifs, which accumulate on certain panels. This provides a strengthened argument for certain motif forms originating during the Iron Age period in South India. These sites with previously occupied rock shelters, along with motif accumulation, also demonstrate multiple superimposition sequencing events. These are explored more fully in the Chapter seven, sections
7.4 and 7.5. The next chapter analyses specific rock art panels in terms of motif form and placement, using enhancement visualisation methods in Dstretch®.
Chapter Seven. Technical image production on panels

7.1. Introduction

This chapter presents results of experimental visual enhancement analysis conducted on photographs of rock art panels collected during fieldwork seasons of 2014 and 2015, described in Chapters four and five of this thesis. The previous analysis chapter focused on elucidating broad connections between rock art sites, their landscape placement and spatially associated archaeological assemblages. This chapter focuses on specific panels at rock art sites which required more detailed analysis. These panels were identified during fieldwork as requiring more intensive documentation than field conditions allowed in terms of time constraints and intensive light conditions, with the potential to reveal intriguing insights about phases of intra-panel interaction and motif form.

This chapter is intended to form a close, micro scale of analysis aimed at panel and motif level. It aims to visualise rock art motifs in a clearer way than has been attempted in rock art research in South Indian contexts to date, making confident assertions about motif forms and sequencing. It aims to provide a means of relative temporal control, to assess if some motifs, especially bovine forms, can be sufficiently argued to be produced during the prehistoric period in South India. If so, this chapter furthers this thesis argument examining what a study of rock art can contribute to archaeological knowledge of South Indian prehistory by presenting rock art as a significant production tradition for visualising anthropomorphic and animal forms in prehistoric South India. Furthermore, by analysing the presence and nature of interaction inherent on rock art panels through time, this chapter suggests that rock art production can be a transformative activity negotiating relationships between humans and animals during a time period experiencing transformative changes in landuse practices and social organisation (Bauer and Johansen, 2015; Roberts et al., 2016).

As a chapter it complements Chapter six, which takes a macro approach to rock art in the Maski region. Used together, these chapters provide a means to view the extent of rock art creation at Maski as an overarching image production tradition, rooted in specific landscape contexts, whilst demonstrating the nuanced changes or interaction phases through differential rock art production activities.
The following chapter is structured as follows. Firstly, section 7.2 details visualisation enhancement methods utilised in an off-site setting and makes evaluative comments about specific enhancement software, Dstretch©. Secondly, sections 7.3-7.6 demonstrate the different ways Dstretch© analysis has visually enhanced the rock art at Maski. Section 7.3. presents results of motif identification, to both indeterminate markings and new motifs recorded in off-site contexts, along with clarifying motif boundaries. Section 7.4. presents results of superimposition sequencing for a sample of panels recorded during fieldwork, providing an overarching level of relative temporal control over some elements of rock art production phases. Section 7.5 builds upon an elucidation of superimposition phasing presented in section 7.4, presenting some stylistic patterns which have emerged from a superimposition analysis, partially facilitated by Dstretch©, regarding the chronological changes in bovine motifs present in the rock art at Maski. Finally, section 7.6 presents results of additional interaction phases which do not fit into the previous sections of motif identification and accepted superimposition sequences. These additional interaction phases represent sporadic, yet numerous, examples of modification, rejuvenation and obliteration of specific motifs on panel surfaces. Taken together, this chapter displays some of the underlying image structure inherent in rock art production, but also the potential for it to be interacted with in unpredictable ways.

7.2. Dstretch© methods and analysis evaluation

7.2.1. Digital imaging in rock art analysis

The digital enhancement of rock art goes hand in hand with increased use of computers, as a way of storing large amounts of information indefinitely. Photographs form the main means by which a visual record of a rock art site, its context and information about panels and motifs can be stored. Since the 1980’s, techniques have been in place to scan analogue photographs into digitally storable images of rock art (Rip 1983). Storing images of rock art on computers are more freely accessible to a larger number of people than have direct experience of a rock art site, from a non-specialist or research capacity. Off-site image enhancement is not a method to be used as a total replacement for direct field recording. The advantage of rock art documentation directly in the field is
the potential to record contextual and spatial patterning in a range of seasonal light situations. However, digital enhancement does allow for off-site study of rock art images and environments which otherwise would be constricted by fieldwork time pressures and budget limitations.

Additionally, a photographic record of a rock art site becomes evidence for the existence of rock art sites, which may be destroyed after initial documentation procedures. The record enables a destroyed rock art site to remain relevant in providing a means to investigate its past cultural significance, whilst tragically raising awareness about the need for increased conservation measures. A digital image of a rock art assemblage, whilst containing subjective information, provides multiple avenues of interpretation due to its wider accessibility. As a research article, it has the potential to provide more nuanced understandings of rock art than a single record produced and classified by one individual, or research team.

Concurrent with the means to store and visualise rock art images digitally is the means to digitally document rock art panels and motifs using high quality, consumer grade digital cameras (Chandler et al. 2007; Sanz et al. 2010). Digital cameras can be incorporated into methodologies than required light, portable equipment where rapid documentation was highlighted as a priority (Chandler et al. 2007, 2005, 12). From the initial documentation stage, certain levels of image enhancement have been utilised in rock art photography, such as the use of infra-red photography to document faded pigments in rock paintings (Fredlund and Sundstrom 2007).

Image enhancement of digital photographs is utilised as an additional tool to identify rock art patterns which are not visible to the naked eye and there are several techniques which have been successfully utilised in rock art research projects. Photogrammetry is often used to gain an accurate depth perception of rock art in an off-site context (Mudge et al. 2012, 654; Noya et al. 2015). Photographs can be viewed stereoscopically and stitched together with specific software, such as Agisoft to replicate rock art panel features which get visually compressed in a photograph.

The use of Reflective Transformance Imaging (RTI) focuses on providing information about subtle shape and surface variables of a rock art panel. This is
achieved by minimising the capture of colour, instead focusing on rebuilding an image based upon the angle of light incidence in a series of photographs (Mudge et al. 2012, 648). Similarly, the use of laser scanning of rock art panels has been effectively utilised to capture surface texture and motif form to sub millimetre accuracy (Davis et al. 2017; Jailet et al. 2019; Lymer 2015), making it a more objective means to capture rock art panels than direct human tracing. These methods for image capture and enhancement of rock art panels are very spatially accurate and are useful for identifying shapes and sequences of petroglyphs. They are reflective of a move towards a 3D means of visualising rock art panels (Alexander et al. 2015; Jailet et al. 2019), but require a large amount of time spent at a site with heavy and expensive equipment, prohibitive for the fieldwork described in this thesis, Chapter four, section 4.5.

7.2.2. A Description of Dstretch©

Decorrelation stretch is a process by which highly correlated colours in digital images are decorrelated and stretched to maximise differentiation of colour within the pixels of that image. Decorrelation stretch has been extensively used and refined over time within remote sensing for the analysis of multispectral satellite images since 1996 (Harman 2008; Moya et al. 2014, 176). It forms one component of the “digital revolution” (Brady and Gunn 2012) in rock art analysis techniques and is applicable in both on and off-site contexts. The decorrelation stretch (Dstretch©) programme is comparable to other image enhancing software, such as Adobe Photoshop, yet is more widely accessible because of its reduced costs as a plug-in for open source software ImageJ and is free for individual researchers, with donations expected from institutions.

It is beyond the scope of this chapter to examine the mathematical theory behind decorrelation stretch, see Alley (1996) and Gillespie et al. (1986) for more detail on its utility in remote sensing as a colour enhancement tool. As a brief explanation for its technical framework, for any digital image Dstretch© uses the Karhunen-Loeve statistical transformation, abstracting colours into sets of numerical codes or colour spaces (Harman 2008). This transformation decorrelates the pixel colour histogram and enhances the main colour of that pixel (Assefa et al. 2014, 139).
The main colour spaces utilised within the Dstretch© program operate within three main abstracted colour paradigms. The first set of colour spaces are ones with an L as the first letter of each colour space acronym, such as LAB, LDS, LYE and LRD. The L in each of these acronyms refers to the manipulation of brightness for each designated colour pixels represented by the second two letters in the acronym. LAB means a numerically defined enhancement of colour pixel brightness in the A component (green-red) and B component (blue-yellow) of an image (Margulis 2006; Murali and Govindan 2013. 98). This can also be inverted, known as LABi, which give results that look like a photograph negative. The LDS colour space also focuses on a general enhancement of all overall colour values. Other L acronym-based colour spaces, LYE and LRD focus on enhancing the brightness of specific colours rather than a range, LYE (Lightness, Yellow) and LRD (Lightness, Red).

The second main colour space utilised in the Dstretch© program is with Y as the first letter of the colour space acronyms, such as YDS, YRE, YBK and YWE. The Y represents luminescence or lightness of a colour pixel value to be manipulated (Yanjie et al. 2018. 1686). The YDS colour space, like the LDS colour space, focuses on the general enhancement of all colour values. Other Y colour space acronyms focus on enhancing the luminescence or lightness of colour pixels to varying degrees, YRE (Lightness, Red), YBK (Lightness, Black) and YWE (Lightness, white).

In other words, the Dstretch© plug-in artificially highlights different colours in an image by selectively enhancing specific colour spaces and increasing the separation between colour fields in the image (Harman 2008), see fig 7.1 p233. It is being increasingly applied to digital images of rock paintings with deteriorating pigments, assisting in the identification and definition of faded motifs and construction of superimposition sequences (Assefa et al. 2014; Brady and Gunn 2012; Dodd 2013; Domingo et al. 2015; Moya et al. 2014). To date, it has been effective at using specific colour spaces to draw out yellow, black and red pigments. For example, the LDS colour space is generally used for an overall enhancement of pigments whilst the YRE and CRGB colour spaces brings out the details of red pigments most effectively (Brady and Gunn 2012). In addition, the LYE colour space brings out light yellow pigment shades (Brady and Gunn 2012).
There is a debate about the reliability of utilising digital enhancement software to make interpretations about bodies of rock art. How do we know that a motif is really there? Could a researcher just alter colours until they get a result based upon an already predisposed idea? Are the results repeatable? These are just some of the queries surrounding the use of digital enhancement techniques. They reflect concerns around the more general problem of objective recording.
and analysis on a type of visual imagery integrally linked to the subjective understanding of past human perception (Layton 2000; Le Quellec et al. 2015, 9; Lorblanchet 1984; Ucko 1992). This debate is exemplified by the attitudes of certain researchers to prioritise detailed drawings traced directly over rock art, despite conservation criticism, as opposed to digital image enhancement (Le Quellec et al. 2015, 2). However, the enhancement of digital images is no more subjective than the creation of detailed scaled drawings (Defrasne 2014; Le Quellec et al. 2015); the former allowing for rapid documentation and processing, whilst the latter encourages time spent on site and is effective within experiential research frameworks.

Digital enhancement techniques are now also increasingly favoured as non-invasive methods of recording rock art, in keeping with priorities of conservation and management of rock art across the globe (Defrasne 2014, 33). Having explored some of the principles behind Dstretch© and the debate around the suitability of its applications, the author moves on to describe the recent growth in the use of Dstretch© as an effective tool for the visualisation of rock art panels, advocating reasons for its continued use within rock art research frameworks.

The creator of Dstretch©, Jon Harman, has utilised the software in a variety of contexts but most commonly at various rock shelters in the USA and Mexico. His website has several visually appealing presentations, providing examples of rock art sites where the implementation of Dstretch© has been effective, Cueva San Borjitas in Baja California Sur, Mexico is one such example (Harman 2010). Whilst the incorporation of Dstretch© software into many rock art research projects is increasing in specific countries, it is by no means widespread (Le Quellec et al. 2015, 2). Rock art recording projects in France and Africa have utilised Dstretch© software to identify deteriorated painted motifs (Le Quellec et al. 2015), adding to the growing corpus of identified and recorded rock art sites (Assefa et al., 2014; Tomášková 2015).

Dstretch© has been utilised to great effect in the Torres Straits, north eastern Australia (Brady, 2006; Brady and Gunn, 2012), identifying details in heavily deteriorated and superimposed pigment art unidentified through more traditional recording techniques. The discovery of a comprehensive new set of images at Angkor Wat, only visible using Dstretch© software, has provided
striking iconography related to Theravada Buddhism and, consequently, a wider understanding of a well-known monument (Tan et al. 2014). The disparate examples mentioned above demonstrate the global applicability of Dstretch© as an effective tool for the enhancement and identification of nuanced bodies of additive rock art traditions, such as paintings or drawings, in post-fieldwork contexts.

This section now moves on to discussing recent work in the applicability of Dstretch© as a tool for analysing corpus of rock art consisting of petroglyphs. Worked examples include documentation of Native American style petroglyphs at Chickering on the North Fork of the American River, California/Nevada and the Donner Bass petroglyph site, also in California (Harman(b) n.d.). The enhancement of petroglyphs using Dstretch© is best applied when there is a colour contrast between the background and the ‘pecking’, and the background is relatively uniform (Harman(a) n.d.). Advice is provided on the experimental utility of specific colour spaces or digital processes that can work well on enhancing motifs at petroglyph sites for example, YRD, LRD, YWE colour spaces, inversion of images and conversion to gray-scale, (Harman(a) n.d.). However, petroglyphs often do not have the addition of painted pigments as a standardised colour, meaning the petroglyph must have a distinctive contrast of hue, often as a patina, compared to the surrounding panel.

Subsequent Dstretch© analysis of engravings at the Oullas rock shelter, Saint-Paul-Sur-Ubaye, Alpes-de-Haute-Provence, France has enhanced details of Iron Age warrior images which were previously difficult to identify (Defrasne 2014, 34). However, Dstretch© analysis on underreported engravings in South Africa yielded disappointing results (Tomášková 2015, 229–230), especially when compared to pictographs documented in a similar context. The variable results of Dstretch© analysis demonstrate the specificity of geological context as to the appropriateness of application of Dstretch© for petroglyphs (Defrasne 2014, 34). One of the problems of this method is that unrealistic colour combinations do occur, and some journals are hesitant to publish such drastically altered rock art images (Le Quellec et al. 2015, 4). The regarded strengths of Dstretch© include, its potential to display previously unknown or covered motifs, define boundary limitations of highly eroded and fragmented motifs, and also provide an alternative means of analysis for projects that are all too often
restricted by research costs, time and harsh environments. (Domingo et al. 2015, 80).

Whilst most types of image enhancement software were developed for the purpose of image retouching (Photoshop, Photopaint, Paintshop, GIMP), they were not developed for the specific purpose of rock art motif analysis (Rogerio-Candelera 2015, 69). The software has additional features of preset colour spaces and the ability to set and save custom colour spaces (a selection are mentioned above), meaning that the enhancement of selected images are standardised and repeatable. This enables a dialogue amongst researchers regarding motif identification and sequencing to occur. It also is considered good practice to have a copy of the original rock art image alongside the enhanced one for ease of comparison.

More recently advocates of image enhancement within rock art research have experimented with utilising Dstretch© in combination with more conventional image enhancement software, such as Adobe Photoshop. Firstly Dstretch© is used to identify the finer contours of motifs, followed by Photoshop to digitally recreate the original colour shades of pictographs, which are then transposed back onto the original image (Defrasne 2014; Le Quellec et al. 2015). The finished product is a hypothetical visualisation of how types of rock art would have looked like when originally produced. This method provides a visually striking and engaging way of viewing rock art and may assist in the contextual understanding of specific rock art sites containing motifs created within a narrow time range. However, researchers should remain aware that dense concentrations of rock art in the same site may have been produced over thousands of years, subsequently the processes of fading, renewal, obliteration and superimposition of motifs may also be crucial to their wider understanding.

Whilst the Dstretch© programme can be used as a conservation tool in documenting rock art panels which do not have adequate protection status, it is primarily used in this thesis as a ‘revealing’ research tool, to enhance visualisations of rock art panels which pose subjective conflicts to the naked eye.

Image enhancement techniques and methods, such as Dstretch©, may improve our vision when dealing with newly discovered rock art motifs. They may also improve the ability to reconstruct superimposed and fragmented pigment art. However, it only forms part of our perceptions regarding the underlying reasons
for the production of rock art and how they were used by previous societies (Le Quellec et al. 2015). Off-site analysis of rock art motifs, whilst convenient and beneficial, separates rock art from a situated landscape context, a context which is integrally important to an understanding of rock art as a landscape practice. Therefore, it is still advisable to document locational aspects of rock art, where panels are located, spatial relationships to other concentrations of rock art and significant landscape features, both natural and man-made.

In short, multiple techniques should be utilised when documenting and analysing rock art concentrations to obtain a more comprehensive interpretation of their forms and meanings (Brady and Gunn 2012, 630; Robinson et al. 2015). Additionally, the use of multiple techniques to document rock art gives researchers ample opportunity to build up a detailed inventory of rock art motifs suitable for interpretation (Brady and Gunn 2012, 635). However, the impossibility of a full and comprehensive recording of an entire rock art site should be acknowledged (Read and Chippendale 2000). Speaking from experience there is always one more image lurking behind a boulder or later discovered in a photograph. Therefore, it is fruitful to employ a range of methods to build as adequate an inventory of rock art as possible. The Dstretch© work presented in this thesis is the result of combined onsite documentation with the aim of off-site analysis, in order to access differing scales of information regarding the rock art at Maski.
7.2.3. Using Dstretch© Analysis on images of petroglyphs at Maski.

Utilising background knowledge described in section 7.2.2, it was decided that the use of Dstretch© could prove to be an effective analysis technique. The geological conditions at Maski of rock bruising on granitoid surfaces which weather and discolor to form variable red-orange-brown shades. The subsequent patination of motifs is of “a sufficiently different colour to the surface of a panel upon which a motif is produced (Harman(a), n.d.).” Other favourable variables include “rock that is of a reddish hue and maintains a fairly ‘smooth’ appearance (Defrasne 2014, 34).”

A total of 115 digital images representing rock art panels from 33 numbered sites were included for Dstretch© analysis. Panels for subsequent image enhancement were selected from sites documented during 2014 and 2015 field seasons, these were sites which the author was able to primarily photograph with subsequent analysis of image enhancement in mind. The sample of panels deemed suitable for image enhancement are predominantly centred around the Durgada Gudda outcrop as part of the spatial clusters of archaeological assemblages and rock art production densities labelled A - H in Chapter six, see fig. 6.1a, p193. Additionally, a few panels located in the wider Maski landscape were also selected for image enhancement, such as MARP 106, 122, 123 and 125 on the north and western peneplains, the reasons for their selection are detailed in the next paragraph.

Panels selected for image enhancement procedures were selected based upon several criteria, described in terms of descending priority. 1. Was there any superimposition identified on the panel surface during initial fieldwork phases? 2. Was there indecision during the primary fieldwork phase about aspects of motif identification, either in terms of its primary classification, extent of motif boundary, or stylistic attributes? 3. Were there any other anthropogenic bruising markings around motifs, which indicated small scale specific panel interaction, distinct from identified superimposition? Image enhancement in this chapter is used as an additional method of visualising technical rock art production information which could not be adequately achieved during fieldwork, due to time constraints and over-bright light conditions. Panels containing anthropomorphic and animal imagery were also picked preferentially over other panels due to the overarching
focus of investigating archaeological animal and anthropomorphic relationships presented in this thesis.

The chosen panels were put through a series of prescribed colour spaces in the Dstretch© programme; LAB, YBK LRD, YRD and YWE. The acronyms for these colour spaces are explained on p222. The main aim was to assess how chosen rock art panels were differentially visualised, and if enhancing or diminishing the visual appearance of certain colours in each photograph could draw out extra motif details not immediately visible during fieldwork with the naked eye. The results of an example panel are demonstrated in fig 7.2, 240. It was thought that this off-site analysis technique would also be beneficial to researchers who are unable to visit rock art sites in person, or who lack field experience in recognising the general patterns and common motif forms identified in the rock art at Maski. These colour spaces were chosen due to prior knowledge about their utilisation in geographically disparate rock art research projects. The colour spaces represented in this chapter focus on a selection of different visualisation results; an overall enhanced brightness of colour for each image pixel (LAB), enhanced brightness of black pixels (YBK), enhanced brightness of white pixels (YWE) and enhanced brightness of red pixels (YRD and LRD). These colour spaces the geological colour tones present in granite/gneissic surfaces which constituted most rock art panels.
Fig 7.2 Results of colour space manipulation for each of the five main colour spaces described in this chapter. From top left to bottom right: Unenhanced, LAB, YBK, YRD, LRD, YWE (photo and analysis images by author).
The un-enhanced image demonstrated in fig 7.2, p240 shows a series of single line anthropomorphic figures on horseback, carrying implements across the surface of the panel. There is also a lightly bruised bovine motif in the top left of the image. Additionally, there are a large number of darker, indistinct bruisings or markings, along with a number of very faint linear markings which are difficult to distinguish in the unenhanced image.

The LAB (top right), YRD (middle right) and LRD (bottom left) improve the overall clarity of motif form and bruising or line boundaries, to a lesser extent with the LAB colour space, and to a greater extent with the YRD, LRD colour spaces. These are examples of successful colour spaces for this particular image. Some of the indeterminate darker markings to the left of the dominant combined anthropomorph/horse motif could be better argued to represent additional single line anthropomorphic figures. Their darker patination colouring and lack of clear boundary definition may also indicate a possible earlier production phase than some of the combined anthropomorphic/horse motifs. Additionally, the LAB, YRD and LRD colour space results also draw out details of a more recent bovine motif in the bottom right quadrant of the images, superimposed over earlier anthropomorphic and combined anthropomorphic/horse motifs. In the unenhanced image this motif is very faint, initially identified as indeterminate markings, with the boundaries of the motif and subsequent classification made possible through colour space enhancement.

The YBK (middle left) and YWE (bottom right), colour space images were recorded as examples of unsuccessful image enhancements for this panel. The YBK image made many motifs even more difficult to enhance, with many blurred colours. The YWE image was useful in bringing out details that were visible to the naked eye at the time of recording, but diminished most other indeterminate markings which could not have the white pixel value enhanced. Whilst this colour space was good at smoothing out the panel surface, it erased additional chances to identify motifs, stylistic attributes or possible sequencing.

Certain panels were also put through a wider selection of colour spaces in an experimental fashion, and specific instances of success were noted. Appendix D demonstrates the success or failure of each colour space to elucidate additional motif production or sequencing information about rock art panel images selected.
for image enhancement. It can also be referred to regarding experimental success rates of additional colour spaces, other than the five colour enhancement spaces presented in this chapter.

The basic success and failure rates for each main colour space are displayed in table 7.1, p243 as absolute values and as a percentage of the image analysis sample. A preliminary attempt was made to put all 115 images through 15 colour spaces, but this proved to be prohibitively time consuming and did not provide significantly different results to the use of the five main colour spaces. All images were then treated in the same way, by enhancing a selected photograph through the five main colour spaces, described in this chapter, with an additional sporadic instance of experimental colour space use, the results of which can be found in Appendix D. A selection of Dstretch©ed image results not included in the main content of this thesis can be found in Appendix F, see the accompanying datastick with this thesis.

Overall, the colour spaces for LAB, YRD and LRD performed better than the YBK or YWE colour spaces, in enhancing the visual appearance of motifs, clarifying superimposition sequencing or enhancing other interaction markings. This is likely due to their function of enhancing pixels with variations of red, visually abundant in images of orange and brown granite geologies in the Maski landscape. The colour spaces prioritising black (YBK) and white (YWE) pixels were less successful. Of the 115 images analysed with Dstretch©, 24 images (21%) did not reveal any additional information about the rock art panel in terms of; additional motifs documented, clarity of motif identification, distinction between superimposition layers or identification of other markings. This means that for 79% of the time, the use of Dstretch© did reveal additional information for rock art panels not documented during primary fieldwork phases.
Table 7.1. Success rate of image enhancement for each colour space per image with percentage success rates (source: author).

<table>
<thead>
<tr>
<th></th>
<th>LAB %</th>
<th>YBK %</th>
<th>YRD %</th>
<th>LRD %</th>
<th>YWE %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Successful</td>
<td>79</td>
<td>13</td>
<td>43</td>
<td>44</td>
<td>17</td>
</tr>
<tr>
<td>Unsuccessful</td>
<td>32</td>
<td>97</td>
<td>66</td>
<td>57</td>
<td>93</td>
</tr>
<tr>
<td>Uncertain</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Totals</td>
<td>115</td>
<td>115</td>
<td>115</td>
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<td>115</td>
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</tbody>
</table>

Within the context of this thesis, Dstretch© software has provided an additional method of analysing rock art, not only in terms of a retrospective critique of primary fieldwork documentation, but also as a means of documenting rock art beyond human visual perception. It is acknowledged that this software can produce skewed and overly artificial colour contrasts. It is also acknowledged that use of this software has the potential to create more visual uncertainties with an already subjectively documented form of archaeological material. However, the use of Dstretch© software in this thesis was an experimental venture that has proved to be a cost effective and highly fruitful analysis method in clarifying motif forms and identifying new motifs on panels. There has also been promising results in its use to tease out superimposition sequences and highlight novel interaction markings within the rock art production tradition in the Maski landscape (see sections 7.3 – 7.5 below). As a software, it is becoming increasingly utilised in global rock art research and further experimentation of advanced colour space settings may continue to reveal interesting insights into rock art images, both at Maski, other rock art sites in the Indian subcontinent and further afield.

7.3. Identifying motifs, clarifying indeterminate images and delineating motif boundaries

The first case study exemplifies how the use of Dstretch© software has enabled the author to make increasingly robust statements regarding the identification of bruising motifs at Maski. One of the main problems facing researchers who deal with rock art as their prioritised form of material is the
obstacle of coherent motif identification. Most notably, the author had one discussion with colleagues in the field regarding whether a set of motifs were a series of dancing figures with headdresses or a set of patterned bovines, demonstrated in figs 7.3, p240 and 7.4 p245. The top image represents how the panel was initially encountered, however by changing panel rotation it appears to show a repeated set of bovines.

Along with differential panel orientation affecting motif identification, other factors influence the initial categorisation of motif content. This includes, but it not limited to, training of the eye to localised geological and environmental conditions which affects the appearance of the panel surface and ,consequently, the visual integrity and appearance of the motifs themselves. More specifically, a motif may generally be agreed upon as fitting a certain visual category, however the subtler nuances of its form or delineation are often difficult to convey satisfactorily during documentation in the field.

Fig 7.3. A rock art panel at MARP 200 which was subject to discussion about motif identification. Initially identified as a series of anthropomorphs (photograph by author).
Fig 7.4 The same photograph as in fig 7.3, p244 viewed from different angles, leading to different image interpretations (photos by author).

Of the 115 rock art images enhanced through Dstretch© colour spaces, 69, (60%) of the total resulted in improved clarity of existing motifs on a panel, or an increasingly robust identification of indeterminate markings. An example of improved panel and motif clarity is demonstrated by single a rock art panel site, MARP 177, in fig 7.5a and 7.5b, p247. The site consists of a large granite boulder eroding in an upright position. A single panel was centrally located on the north face of the boulder. At the base of the panel was another large granite boulder, creating a natural platform, elevated 1.5 m from ground level. Three motif bruisings identified onsite include a possible outline bovine form and an anthropomorphic shape depicted in a single line style, superimposed by an outline ungulate motif.

As demonstrated by fig 7.5a, a digital recording of the rock art in question does not provide satisfactory visual information regarding the more faded motifs,
which have been superimposed by the more recent ungulate. There are also other confusing visual effects caused by surface panel staining and localised surface foliation. However, visualising the same image through an LRD colour space, there is a clearer delineation of the linear anthropomorphic figure and outline bovine. The bovine faces east with long parallel horns curving backwards, an exaggeratedly large hump rising directly behind the back of the head, with a thin straight outline torso. The rear of the bovine form is difficult to make out due to superimposition of the later ungulate motif.

Along the western edge of the panel the anthropomorphic figure is visualised with a small circular head, continuing with the body as a single line, lines emitting from the top of the body at an acute angle downwards. The western most ‘arm like’ extension continues as if holding a linear implement. The lower half of the anthropomorph remains indistinct after image enhancement, however there is a spatial relationship and patination similarity between the bovine and anthropomorphic motifs, before the later ungulate superimposition. Lastly, the experimental use of colour spaces have revealed other unidentifiable linear bruisings in the centre of the panel, almost completely covered by the later ungulate addition.
Top Fig 7.5a Unenhanced image MARP 177, panel one. Bottom 7.5b Enhanced image in LRD colour space (photo and enhanced image by author).
The unenhanced digital photograph in figs 7.6a and 7.6b, p250 displays panel five recorded at MARP 18. This panel was discovered below an overhanging granitic boulder, making up the rock slope on the western face of the main Durgada Gudda outcrop. This panel was primarily documented as a series of six linear anthropomorphic figures produced in a line, diminishing in size across much of the panel surface. An indeterminate zoomorph with a thin rectangular torso and each limb formed with a single linear bruising was produced in the bottom east quadrant of the panel. After enhancement using LAB colour space, elements denoting a bovine classification to this motif were identified, postulating a pair of parallel horns curving backwards at a slight angle, and an anatomically incorrect hump added as a separate element from the main torso of the bovine.

This bovine appears to have been superimposed over the lower half of the first two anthropomorphic-like figures. Image enhancement of this panel also presented greater clarity in identifying nuances inherent in this style of anthropomorphic form. A proportionally large outline circular ‘head’, a linear bruising representative of a torso extends straight down, bisected in the middle of each motif by another small outline circle and ending with a pair of single line limbs. Interestingly, an additional short single line emanates from the top of each of the anthropomorphic ‘heads’.

Of the 115 rock art images enhanced through the Dstretch© colour spaces, a total of 56 new motifs over 28 panels were recorded, which had not been identified during the primary, onsite documentation phase. Additionally, five motifs across five panels were discounted, which had originally been recorded during fieldwork. The total motifs presented in Chapter five, tables 5.2, 5.5., 5.8 and 5.11 are inclusive of these adjusted quantities.

Figs 7.6a and 7.6b, p250 and 7.7a, 7.7b, p251, demonstrate how motifs can be ‘identified’ during Dstretch© procedures. Figs 7.6a and b implies there are three concentric semi-circular/circular designs at the northern edge of the panel. The relative chronology of motif sequencing indicates that this is one of the earliest motifs to have been produced on this panel, which is explicated in the section on superimposition sequencing in section 7.4, p256. Figs 7.7a and 7.7b, p251, demonstrates a visually striking example of an extra motif identified post-fieldwork, aided by image enhancement software. This panel (MARP 135, panel
one) was documented amongst a variety of other panels containing bruisings. Motifs were initially recorded as an infill bovine design, repeated three times and connected to an ornamental stand. However, using a combination of LAB, YRD, LRD and RGB0 colour spaces, an earlier bovine can be determined underneath the centre and eastern most (right side of image) bovine-stand motif combination, also repeated in the section on superimposition sequencing, p257.

These results demonstrate how new motifs can be recorded in an off-site setting, adding to a rock art catalogue, whilst identifying more indeterminate markings. However, caution should be taken to consistently review unenhanced images with the enhanced versions to avoid making over ambitious claims regarding the delineation and identification of bruised motifs. It is worth noting that localised geological discolouration and other micro erosional processes within the Maski environment can cause misleading colour combinations, when viewed through the enhancement software, which can be mistakenly identified as motifs. Therefore, it is advisable to use and review multiple colour spaces in combination, see Appendices D and F for full details.
Top fig 7.6a Unenhanced image of MARP 18, Panel five. Bottom fig 7.6b Image enhanced through LAB colour space (photograph by author).
Top fig. 7.7a Unenhanced image MARP 135, panel one. Bottom fig 7.7b Enhanced image through LRD colour space (photograph by author).
7.4. Superimposition sequencing

A total of 69 panels were identified as exhibiting superimposition with potential for sequencing to be distinguished. After the processes of fieldwork documentation and subsequent visual enhancement, 29 of these panels presented sufficient evidence for superimposition sequencing at an intra-panel level, 42% of the overall total. Table 7.2 below presents numbers of panels with the presence of superimposition against the resulting panels able to be sequenced. These have been grouped according to spatial cluster groupings A-H described in Chapter six, pp 195-206. Four additional panels of superimposition were also identified during fieldwork to be analysed further using Dstretch®, not grouped in the spatial clustering described in Chapter six. These were at rock art sites MARP 106 and MARP 125; however no additional sequencing could be visualised, and these four panels are not described in any further detail.

Most group clusters (A - H) contained between one and three panels for which superimposition sequencing was possible, usually divided between multiple numbered rock art sites within a specific cluster. However, there were a larger number of discernible superimposition sequences which could be constructed within cluster B, containing MARP 39 and 210. Similarly, a moderately large and complex image rich series of sequencing could be constructed for cluster D within one site, MARP 71.

Table 7.2. Numerical values of superimposition sequencing success and failure (source author).

<table>
<thead>
<tr>
<th>Spatial Cluster</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superimposition sequencing successful</td>
<td>2</td>
<td>11</td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Superimposition sequencing unsuccessful</td>
<td>2</td>
<td>25</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td>36</td>
<td>4</td>
<td>8</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

The rest of this section is dedicated to a presentation of superimposition sequences, these have been confidently constructed through multiple means of
in field documentation, coupled with Dstretch© analysis comprising multiple colour spaces, described in section 7.2.3. Each superimposition layer was decided based upon evidence of motif lines cutting through, or intersecting over, other motif boundaries, deeming it a later production phase than the motif it was produced over, see fig 7.8, p254. The additional Dstretch© procedure utilising different colour spaces, assisted in accentuating lighter coloured pixels in rock art photographs, indicative of more recent production phases.

A process for deciding on superimposition phases generally went as follows. The earliest produced motifs per panel were often recorded as unidentified motifs, as they were too faded to distinguish morphological details with the naked eye. It was only when they were put through the colour spaces mentioned in this chapter that they became discernible. The second level of production phasing was indicated by motifs which were more deeply pecked into the rock, their brightness in red and white pixels especially were enhanced in the Dstretch© images. Finally, recently produced motifs were often lightly pecked (maybe even scratched) onto the panel surface, without full removal of the primary rock layer. These motifs could only be made out after selected photographs were enhanced with Dstretch© colour spaces enhancing white pixels. The superimposition phases in each image are presented in a coloured continuum from grey to black in two different ways. Firstly, motifs on each rock art panel are separated into numbered sequencing layers. Secondly, they are
pictured in a combined format in terms of their spatial placement within each specific panel.

Fig 7.8 Photograph demonstrating layering of image production phases, MARP 71, panel 14. The hind legs of the bovine in the top of the photograph are produced over the horns of the bovine in the lower half of the photograph (photograph by author).

The author accepts that the latter method of using Dstretch© to bring out lighter pigments, mentioned above, is one to be treated critically, given the sequencing issues that occur when relying on the colour differentiation of patination coding, see Chapter five, pp 137-138. However, it is hoped that by cross-referencing the double technique of infield observation and later image enhancement visualisation processes, utilising multiple colour spaces, that more
reliable versions of superimposition sequencing can be agreed upon for the 29 panels presented in this section. This method of multiple cases of intra-site superimposition sequencing also provides a means to compare current accepted chronological sequences of rock art, which until now have been dominated by stylistic changes of bull motifs, discussed in Chapter three, p98.

There are additional limitations to this analysis method of superimposition layering. Firstly, each superimposition sequence phasing is constricted to one specific panel. One representative panel cannot be used to explain the nuances of temporal sequencing for the entire rock art production tradition in the Maski landscape. It is possible to make some broad associations to rock art production traditions by utilising a large number of panels bearing similar motifs in comparison, see discussion section 8.3.2 and 8.3.3. Secondly, there is the potential for sequencing discrepancies to occur, where motifs fall later or earlier in the sequencing matrix, based upon the spatial patterning of where superimposition events occur at an intra-site level. The following section presenting superimposition phasing contains a significant number of images, a total of 64 images form the bulk of material in section 6.4. They are presented as unenhanced photographs, selected enhanced images with colour spaces explained and the resulting superimposition sequence diagrams. Additionally, there are also two summary sections for superimposition sequences for spatial clusters (A - D, p284-285) and (E - G p296).
7.4.1 Spatial Clustering A

1. MARP 18, Panel five

Top Fig 7.9 Photograph of superimposed panel (photograph by author). Bottom Fig 7.10 Image displaying three phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
2. MARP 135, Panel one.

Top Fig 7.11 Photograph of superimposed panel (photograph by author). Bottom Fig 7.12 Two phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
7.4.2 Spatial clustering B

3.MARP 39, Panel two

Top Fig 7.13 Photograph of superimposed panel (photograph by author). Bottom Fig 7.14 Three phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
4. MARP 39, Panel ten

Top fig 7.15 Photograph of superimposed panel (photograph by author). Bottom fig 7.16 Three phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
Top fig 7.17 Enhanced Image of rock art panel at MARP 39, Panel ten, using LAB colour space, Bottom fig 7.18 Enhanced image of the rock art panel using LRD colour space. The images display an enhancement of recent production phase of an equine motif and some of the morphologies of the outline bovine displayed in superimposition phase two in fig 7.16 p259 (source: author).
5.MARP 39, Panel 38

Top fig 7.19 Photograph of superimposed panel (photograph by author). Bottom fig 7.20 Two phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
6.MARP 210, Panel two

Top fig 7.21 Photograph of superimposed panel (photograph by author). Bottom fig 7.22 Two phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
Top fig 2.23 Enhanced image of rock art panel at MARP 210, panel two in LAB colour space demonstrating an overall enhanced clarity of motif morphology. Bottom fig 2.24 The same image enhanced in YRD colour space enhancing the most recent bovine production phase (source: author).
Top fig 7.25 Photograph of superimposed panel (photograph by author). Bottom fig 7.26 Two phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
Top fig 7.27 Photograph of superimposed panel (photograph by author). Bottom fig 7.28 Two phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
Fig 7.29 Photograph of superimposed rock art bruises on a large structural boulder, designated MARP 210, panel 32 (photograph by author).
Fig 7.30 Possible superimposition sequencing for rock bruisings on the right side of MARP 210, panel 32 demonstrating four levels of overlapping motifs (left) and their spatial positioning (right). Note that the bovine motifs on the left-hand side of MARP 210, panel 32 in fig 7.29 p266, are not included in the sequence due to lack of observed layering of motifs (image created by author)
Top fig 7.31 Photograph of superimposed panel (photograph by author). Bottom fig 7.32 Two phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
Top fig 7.33 Photograph of superimposed panel (photograph by author). Bottom fig 7.34 Two phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
Top fig 7.35 Photograph of superimposed panel (photograph by author). Bottom fig 7.36 Three phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
Top fig 7.37 Photograph of superimposed panel (photograph by author). Bottom fig 7.38 Three phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
7.4.3 Spatial clustering C

14.MARP 168, Panel three

Top fig 7.39 Photograph of superimposed panel (photograph by author). Bottom fig 7.40 Three phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
7.4.4 Spatial clustering D

15. MARP 71, Panel Five

Top fig 7.41 Photograph of an intensively bruised panel at MARP 71, panel five (photograph by author). Following page, fig 7.42 Image demonstrating four possible levels of discernible superimposition and their spatial association (images created by author)
Top fig 7.43 Photograph of superimposed panel (photograph by author). Bottom fig 7.44 Three phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
Top fig 7.45 Photograph of superimposed bruisings at MARP 71, panel seven (photo by author). Following page fig 7.46 Image demonstrating four possible levels of discernible superimposition and how these levels are spatially associated on the panel (images created by author)
Fig 7.47 Enhanced image of a rock art panel at MARP 71, panel seven using LAB colour space, using fig 7.45. This image demonstrates an enhanced bovine and anthropomorphic figures in production phases two and three, along with enhanced clarity of the most recent phase of motifs (source:author).
Top fig 7.48 Photograph of superimposed bruisings at MARP 71, panel eight. Fig 7.49 (page 280) Image demonstrating four possible levels of discernible superimposition. Fig 7.50 (page 281) Image demonstrating how these levels are spatially associated on the panel (created by author).
Top fig 7.51 Photograph of superimposed panel (photograph by author). Bottom fig 7.52 Two phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
Top fig 7.53 Photograph of superimposed panel (photograph by author). Bottom fig 7.54 Three phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
Summary of Sequencing for Spatial Clusters A - D

Spatial Clustering

Panels in spatial cluster A, figs 7.9 – 7.12, pp 256-257, visualise early levels of abstract motifs and concentric circles, superimposed by later anthropomorphic and bovine designs. Figs 7.11-7.12, p257 are especially interesting as they exhibit an earlier form of bovine motif, which differs in visual appearance from the three bovine forms placed upon stands. The preceding bovine has longer, more elongated horns and is less ‘full’ in bodily form. The three bovines over the earlier level of image production are stylistically different, with shorter ‘V shaped’ horns and a thicker torso.

Spatial Clustering B

There are more panels with discernible superimposition present in spatial cluster B than in the other spatial clusters in the Maski landscape, see figs 7.13-7.38 pp 258-271. The earliest and latest phases of specific panels are distinguished by abstracted forms and there are multiple levels of bovine superimposition. There is also a variety of other faunal motifs represented in the superimposition sequences, such as equine, snake, elephant and tiger forms. All these faunal motifs are spatially associated with stick line anthropomorphs. Most of the earliest production phases of panels in MARP 39 and MARP 210 consist of bovines of differing styles, analysed in section 7.5. There are also instances of intense panel accumulation, as at MARP 39, panel 38 and MARP 210, panel 32 which display a sporadic mixture of bovine styles, other faunal motifs and bovine contact with single line anthropomorphs.

MARP 210 panel 51, p271 demonstrates a striking example of a ‘narrative scene.’ A narrative scene consists of a visual effect generated by a series of rock art production episodes, usually of implied activity around a focal point. In this case the focal motif being a bruising of a feline (tiger) and single line anthropomorphs clustered around it. There has been some rejuvenation of the feline outline after its initial production phase. At this stage it is unknown whether the feline motif replaces an earlier motif and the single line anthropomorphic motifs pre-date the current feline bruising. It is difficult to ascertain more than two
to three levels of superimposition per panel for spatial clustering B, some of the intense motif accumulation in the same panel area obscures the ability to discern further complexities of motif production phases.

Spatial Clustering C

There is only a single panel with discernible superimposition sequencing in spatial cluster C, MARP 168 panel three, figs 7.39-7.40 p272. This sequence is less certain than other panels, due to the access concerns in climbing directly up to the panel. Nevertheless, it demonstrates a layered relationship between bovine and anthropomorph figures with surrounding abstracted designs. This panel demonstrates an anthropomorphic form executed in more detail than single line anthropomorphs. It is produced in an infill design, with detailing around the limbs and the construction of additional implements.

Spatial Cluster D

Spatial cluster D presents a selection of large and intensely bruised panels, with two to four levels of discernible superimposition, see figs 7-31-7.54, pp 273-283. Most of the panels are restricted to bovine and anthropomorphic motifs. There are some distinctive repeated forms of bovine superimposition, with the earliest phases displaying the long, elongated horns and slim torsos, and later image production phases demonstrating shorter ‘V-shaped’ horns, conjoined limbs and fuller frames, see section 7.5 for more details. There are also more recent bovine designs presented. Anthropomorphic figures are also varied and conclusively appear later in the superimposition sequencing than some bovine forms, as demonstrated on pp 275, 279 and 280. They are represented as single line bruisings, or, more rarely, as infilled figures with defined limbs and holding additional implements. MARP 71 panel 29 p282, also demonstrates a means of indirectly representing anthropomorphic motifs, in the form of footprints, rather than direct representations of anthropomorphic motifs.
7.4.5 Spatial Clustering E

21.MARP 199, Panel one

Top fig 7.55 Photograph of superimposed panel (photograph by author). Bottom fig 7.56 Three phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
22.MARP 199, Panel two

Top fig 7.57 Photograph of superimposed panel (photograph by author). Bottom fig 7.58 Three phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
Top fig 7.59 Photograph of superimposed panel (photograph by author). Bottom fig 7.60 Three phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
Top fig 7.61 Photograph of superimposed panel (photograph by author). Bottom fig 7.62 Two phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
7.4.6 Spatial Clustering F

25.MARP 193, Panel three

Top fig 7.63 Photograph of superimposed panel (photograph by author). Bottom fig 7.64 Two phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
7.4.7 Spatial Clustering G

26.MARP 33, Panel one

Top fig 7.65 Photograph of superimposed panel (photograph by author). Bottom fig 7.66 Three phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
Fig 7.67 Enhanced image of rock art panel at MARP 33 panel one, using YRD colour space. The enhanced image revealed clearer details of a possible faunal motif to the left of the main bovine motif indicative of an earlier production phase than portions of the main bovine image (created by author).
Top fig 7.68 Photograph of superimposed panel (photograph by author). Bottom fig 7.69 Two phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
28. MARP 33, Panel five

Top fig 7.70 Photograph of superimposed panel (photograph by author). Bottom fig 7.71 Three phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
Top fig 7.72 Photograph of superimposed panel (photograph by author). Bottom fig 7.73 Two phases of superimposition sequencing, separated (left) and spatially associated (right) (created by author).
Summary of Sequencing for Spatial Clusterings E, F and G

Spatial Clustering E and F

The sequences presented in panels in spatial cluster E and F are from four different sites and display a varied layering of motifs, from bovines, though to anthropomorphs, footprints, elephants and felines. Fig 7.55 and 7.56, p286 display abstracted (tridents) and (shiva-lings) motifs in the latest superimposition layer, along with a visual form of bovine design, of a different style than previously displayed, see section 7.5. Panels in spatial clusters E and F, see figs 7.57 and 7.58, p287 and 7.63 and 7.64, p291 also display a means for motifs to represent anthropomorphic forms, either indirectly (in the potential form of footprints and handprints) or directly (in the form of single line anthropomorphs). MARP 202, panel four (fig 7.61 and 7.62, p289), is another example of a narrative scene consisting of a focal elephant motif, surrounded by anthropomorphic forms of an earlier motif production phase. The production of the elephant motif has obliterated evidence of earlier motif production phases beneath it.

Spatial Cluster G

Panels in spatial cluster G also demonstrate the appearance of abstracted motif forms present in the first layer of image production, followed by the prevalence of bovine and anthropomorphic motifs in spatially associated superimposition sequencing, see figs 7.65-7.67, pp 291-292, and figs 7.72 and 7.73, p295. MARP 33 panel one, see p292, also displays later evidence of motif rejuvenation or interaction, discussed in the final case study in section 7.6, pp 302-307, and Chapter eight, section 8.3.2.

7.5 Bovine stylistic categories.

The superimposition sequencing figures and descriptions presented in section 7.4 demonstrate the variable means of producing bovine and cattle motifs. There are striking visual similarities and differences which can be grouped stylistically. These have been identified as bovine styles A - F. along with a miscellaneous component. The miscellaneous category for bovine forms combines a number of visual uncertainties. On one hand, miscellaneous bovine motifs are missing.
identifiable stylistic attributes which can assign them to a hypothetical category. On the other hand, these miscellaneous motifs bovine motifs may present unusual ‘horn’ shapes, additional ‘limb elements’ or other irregular motif morphologies which do not fit with accepted motif descriptive categories. 13 panels, totalling 70 bovine motifs, detailed in table 7.3 below, displayed sufficient bovine motifs in discernible superimposition phases to group into stylistic categories. Whilst the stylistic categories described below are by no means representative of the entire corpus of bovine and cattle motifs present at Maski, they represent efforts to sequence changes in bovine depiction, where appropriate levels of superimposition are present. For data regarding the stylistic attributes of bovines included in this analysis, see Appendix E. The following bovine stylistic types, classed A - F, p298-299 are described below according to their common attributes; visual examples of each motif category are presented in fig 7.74, p300.

Table 7.3. Table of appropriate panels selected for superimposition phasing, based upon superimposition analysis in section 7.4. This table also demonstrates the number of discernible bovine motifs and their presence in the hierarchy of production phase per panel (source: author).

<table>
<thead>
<tr>
<th>MARP Panel Reference</th>
<th>Number of Bovine motifs</th>
<th>Discernible superimposition phases.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARP 33 - Panel five</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>MARP 39 - Panel one</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>MARP 39 - Panel ten</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>MARP 39 - Panel 38</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>MARP 71 - Panel five</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>MARP 71 - Panel six</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>MARP 71 - Panel seven</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>MARP 71 - Panel eight</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>MARP 71 - Panel 12</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>MARP 135 - Panel one</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>MARP 199 - Panel one</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>MARP 210 - Panel 48</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>MARP 210 - Panel 49</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>
Type A
- Wide V shaped – irregular convex (horns) which extend 180 degrees from the (head) of the motif, before extending at a perpendicular angle.
- Infill design.
- Individual limbs represented with anatomical details, and a bending of each limb.
- Very small, anatomically correct (hump).
- Thin (body).
- No ornamental additions.

Type B
- Narrower V shaped (horns) which curve in a regular fashion in a convex to concave morphology.
- Mostly infill design.
- Individual limbs often represented but in a schematic fashion, sometimes conjoined.
- Small, anatomically correct (hump).
- Thin (body).
- No ornamental decorations.

Type C
- Regular V shaped (horns) which extend from the centre of the (head), flare out and then flare in in a regular manner.
- Variable infill or outline design.
- Conjoined limbs, connected by an arched (underbelly).
- Large anatomically correct (hump).
- Large, Thick (body).
- No ornamental decorations.
Type D

- Straight, parallel (horns) rising straight up from the (head).
- Infill design.
- Conjoined limbs.
- (Hump) positioned high up the (neck).
- Long (tails).
- Thin (bodies).
- No ornamental decorations.

Type E

- Straight, parallel (horns) rising straight up from the (head).
- Mostly outline design.
- Mostly individual limbs represented.
- (Hump) positioned directly on the (neck) and is variably sized.
- Thin (bodies).
- No ornamental decorations.

Type F

- (Horns) are often parallel.
- Are lightly pecked across a panel surface.
- Often outline designs.
- Can display individual or conjoined limbs or a combination of the two.
- (Hump) is variably sized and positioned.
- Thin or thick (bodies).
- Have ornamentation/additional elements around the (neck) or from (horns).
Fig 7.74 Image demonstrating examples of the main bovine stylistic types described in pp 298-299. Their quantitative appearance in panel production phases are presented in fig 7.75, p301 (created by author).
Fig 7.75. Cumulative bar chart demonstrating the presence of each of the main bovine stylistic types in superimposition phases one – four (source: author).

Each of the panels used for grouping like-stylistic attributes of bovines together demonstrate a distinction between the visual forms of bovines produced in each of the discernible superimposition phases, the cumulative results of which are displayed in fig 7.75. Motif types ‘A – D’, see fig 7.74, p300, were consistently observed at the first production phase of each panel which displayed them. There are greater numbers of motifs type ‘B’ and ‘C’ overall, with motif ‘B’ type present in greater numbers in the first two production phases and motif ‘C’ type more prevalent in the third production phase.

Motif types ‘D’ and ‘E’ were only documented in low quantities, compared to motif types ‘A - C’, and represent a visually distinct means of depicting bovines, as they rarely appear on the same panels as motif types ‘A - C’. Motif type ‘F’ are more frequent in later production phases and potentially indicate relatively recent motif production events. The miscellaneous category of types is present across production phases one-three and can indicate two things. 1. The continued difficulty in adequately visualising earlier production phases. 2. Raising
interesting examples of inconsistent skill or intent of a past agent in a specific production event. Due to the categorisation of specific motif types and an analysis of their relative placement in superimposition sequences, it is likely there are chronological implications for the production of certain motifs types, particularly motif types ‘A - C’, discussed in more detail in Chapter eight, section 8.3.3.

7.6. Additional interaction phases

The final section of this analysis is to demonstrate an additional use for Dstretch© as an off-site analysis tool utilised in this thesis. A small percentage of the images, totalling five (5.4%) of the total sample put through Dstretch© analysis, revealed extra marks of interaction, which didn't fit with traditional understandings of superimposition demonstrated in section 7.4. These markings are argued to be sporadic events of rejuvenation, modification or obliteration of motifs, and the significance of these interaction phases are discussed more fully in Chapters eight and nine. It is not possible at this time to argue for a chronological framework regarding the interaction marking presented on specific motif forms, but they are visually described below.

Fig 7.76 and 7.77, p302 represents a particularly clear example of motif rejuvenation present within the rock art corpus at Maski. Panel 23 forms one of several rock art panels that make up MARP 71, the motif inquestion was originally classified as an infill bovine with stylised conjoined limbs, stocky build and correctly positioned (although exaggerated) hump and V shaped horns. Before moving on, it should be noted that it is likely the horns on this style of bovine motif were probably longer, but past panel fracturing has truncated the northern edge, upper portion of the motif. In the unenhanced image it is clear to see a colour differentiation between the filled in bovine form and outline of the bovine. However, when passed though LAB colour space, it appears that the outline of the image has been reworked subsequently to the motif being originally produced, resulting in the visualised colour differential. Rejuvenation attempts are especially clear in the modification of the tail, and the differing run of line from the base of the muzzle to the extremity of the front leg.
Top fig 7.76 Unenhanced image from MARP 71 (photograph by author). Bottom fig 7.77, Panel 23 enhanced image using LAB colour space. (created by author).
The example mentioned above provides a case of rejuvenation or reworking of this rock bruising, which can be easily visualised through image enhancement. The next example is less straightforward, see figs 7.78a-c, page 305. This series of motifs form part of a complex series of bruisings located in MARP 39, one of many panels on the Durgada Gudda outcrop and associated with extensive prehistoric activity, especially diagnostic Iron Age material culture. The unenhanced digital image of this motif group clearly shows three deeply bruised bovine forms, characteristic of the Iron Age period according to the stylistic chronology for this region, see Chapter three p98, although there are subtle differences of form between each individual motif. There are also a series of 12-15 circular bruisings in a linear arrangement cutting through the centre bovine motif, and a complex arrangement of indeterminate markings which will not be looked at further in this section.

The enhanced image in LAB colour space show an exaggerated lighter discolouration, focusing on the entire bruising area of the most southerly bovine (right side of image), which may account for localised micro-environmental processes affecting patination formulation and does not in itself indicate rejuvenation processes. However, when this image is visualised through more distorted colour spaces, in this case YYE (light yellow pixel enhancement, and not part of the analysis utilising the same five colour spaces described throughout this chapter), a later process of schematic re-bruising over the original motif may be inferred. This suggestion calls into question the appropriateness of formulating a relative chronological framework regarding the rock art of Maski using a patination coding index, without first considering identifiable interaction with rock art motifs after they were initially produced.
Top fig 7.78a Unenhanced image MARP 39, panels one - two. Centre fig 7.78b Image enhanced in LAB. Bottom fig 7.78c Image enhanced in YYE, (created by author).
Running digital images of rock bruisings through enhancement software also produced one final pattern regarding interaction with rock art motifs in the Maski landscape after they were initially produced, of a distinctly modern nature. When some rock art panels were enhanced through more distorted colour spaces such as YYE and LYE, it led to reduced visual clarity of significantly patinated motifs visible to the naked eye, but to increased visibility of modern graffiti as demonstrated by fig 7.79 and fig 7.80, p307. This panel was located within MARP 33 panel 12, consisting of a differentially foliated vertical boulder with uneven surface contouring. Identifiable motifs include a patinated, stylised bovine facing east and a linear anthropomorphic figure in the bottom right quadrant of the image, along with indeterminate bruisings and scuff marks.

However, when visualised through the LYE colour space (not included in the analysis of the five main colour spaces, see Appendix D for its inclusion as an additional colour space) a series of letters spelling AMAR and a possible DS become much clearer. This is clearly a modern motif, utilising European alphabet lettering, which at its very earliest date puts it to the 19th century. However, the visual juxtaposition of its positioning directly over other patinated motifs highlights the existence of archaeologically relevant rock bruisings in a lived landscape context. These brusings are not given any form of protected status and remain a culturally rich, yet ephemeral, form of human landscape interaction. It also symbolises the human activity of inscribing into stone, but in different visual forms, with potentially different understandings of the reasons for doing so.

Additionally, the evidence that modern motifs are more difficult to visualise with the naked eye and, when clarified, look technically different to heavily patinated motifs, suggests the techniques of producing motifs and images on stone at Maski has not remained consistent through time. The modern graffiti in this image exhibits the effects of roughly scraping at the panel surface, rather than the deliberate and concise removal of the top layer of rock. This visual difference of technique at the production level of differently aged motifs brings to light hypothetical temporal variations in choice behind motif form, technique of production and the varying lengths of time taken to produce different motifs.
Top fig 7.79 Unenhanced image MARP 33, panel 12. Bottom fig 7.80 Image enhanced through LYE colour space (created by author).
7.7. Conclusion

This chapter has argued for the continued incorporation of off-site analysis procedures in rock art research projects. More specifically, it has demonstrated an effective and experimental method for use of Dstretch© image enhancement software on a significant sample of rock art at Maski. At a global scale, this chapter can be incorporated as an extended example for the successful and effective use of Dstretch© software on images of rock art bruisings, in addition to its global effectiveness on rock art images produced with additive methods (paintings or drawings). This chapter is also suggestive of the need for further experimentation with different colour spaces in effectively visualising rock art images.

Within the context of this thesis, the effectiveness of utilising image enhancement software has been presented through the identification and improved visualisation of nuanced technical details present on specific panels. These include off-site identification of new motifs, improved clarity in delineating motif boundaries, improved understanding in the production of superimposition sequences and the suggestion of additional interaction phases with previously produced motifs. The presentation of technical details within this chapter serve as a strand of evidence to suggest that rock art was purposefully interacted with through time in the Maski landscape. Moreover, interacting with rock art was a widespread means of visually transforming different inhabitations of space, originating and continuing throughout South Indian prehistory.

The next chapter moves to a wider discussion on some of the themes presented in this thesis so far. Most notably, drawing together strands from the previous two analysis chapters to provide a nuanced account of broad spatial patterning of rock art in the Maski landscape, with combined panel and motif specific interaction phases. The next chapter also discusses the fundamental concept of superimposition sequencing presented in this chapter, comparing the sequences at Maski with current understandings of style within South Indian rock art research. Finally, suggestions are made regarding the overall significance of rock art at Maski in understanding the developing relationships between animals and anthropomorphs during the prehistoric period in this small region of South India.
Chapter Eight. Discussions

The discussion points presented in this thesis are based upon two key areas. Firstly, there are methodological considerations of rock art documentation regarding the types of information that can be gleaned from different scales of research focus, influenced by Chippendale (2004). Secondly there are key themes arising from the placement and content of rock art in this localised landscape, which can help in unravelling its significance as a landscape practice. These discussions are influenced by archaeological studies on land use within the Indian subcontinent (Allchin 1963; R Bauer 2008; A Bauer 2011; Morrison and Sinopoli 1992; Sinopoli et al., 2008), along with understandings of landscape within rock art research, see Bradley (1997, 2009), David and Wilson (2002), Diaz-Andreu (2002) and Taçon (1994). Additionally, this discussion is supplemented with how use of style as a ‘way of doing,’ conceptually influenced by Hegmon (1992) and utilised within rock art research by McDonald (2016), McDonald and Veth (2012) and McDonald and Harper (2016), has been able to explore the significance of motif variability within a local area, beyond the provision of relative chronological sequencing.

The first issue discussed in section 8.1 is about the combined implementation of on and off-site documentation methodologies to enhance a recording of bruisings at Maski. It connects the dual purpose of multi-scaler primary rock art documentation as advocated by Chippendale (2004), with off-site image analysis procedures, as explained by (Defrasne, 2014; Harman, 2008; Le Quellec et al., 2015). It also includes an extended discussion about the continued obstacles in using patination colouring as a chronological indicator, based upon fieldwork results.

Section 8.2 details the spatial extent of rock art within the Maski landscape. It discusses motif production choice and accumulation in specific landscape areas, connecting rock art with conceptions of landscape as part of an accumulative process of people and activities through time (Ingold, 1993). It connects the placement of the rock art with certain landscape zones and archaeological features that are representative of chronological periods and differential landscape uses throughout the prehistoric periods of South India.
(Bauer and Johansen, 2015; Johansen and Bauer, 2015). Spatial relationships between certain archaeological features and rock art sites are also discussed in more detail, providing preliminary suggestions about the temporal and social significance of rock art sites as part of a complex archaeological landscape matrix. More specifically, this section makes suggestive comments that rock art has functioned as part of a process of socialising the landscape (David and Wilson, 2002; Taçon 1994), forming mutual connections within the cultural groups who inhabited it (Domingo-Sanz 2008), the connections of which can be transformed over time and reflected in the nature of how rock art was produced (Bradley 2009; McDonald 2016; Recalde and Navarro 2015).

Thirdly, section 8.3 draws together some themes of content regarding the technical details of motif and panel production, using analysis results presented in Chapter seven. This section demonstrates how recording objective attributes of motifs can expand an understanding of motifs beyond identifiable categories. Instead this section discusses the intricacies of motif variation and sequencing motif changes, taking inspiration from McDonald (2016), McDonald and Veth (2012). Using this means of assessing stylistic variability, this section discusses how the rock art at Maski can be argued to communicate ideas about prehistoric landscape activities in South India, addressing another aspect of transformative land use activities during the prehistoric period of this region, explored in Allchin (1963), R Bauer (2007), A Bauer (2011), Boivin (2004a), Johansen (2014), Morrison (2015), Morrison et al. (2016) and Sinopoli et al. (2009).

Technical details about additional markings which the author argues represent additional panel interaction phases through time are also discussed. Finally, comments are made about the utility of investigating rock art within an Indian context that use notions of style addressing graphic variability within the same category of identifiable motifs (McDonald 2016; McDonald and Veth 2012), and what can be inferred from changes identified in specific motif forms (Domingo-Sanz 2012; McDonald 2016). Within this discussion of style, comments are also made regarding the appropriateness of utilising stylistic frameworks to access chronological sequencing in the rock art at Maski, as noted in Allchin and Allchin (1994), Boivin (2004) Chandramouli (2014).
8.1. Methodological Discussion

The methods implemented for rock art presented in this thesis were influenced by several factors. They had to be cost-effective, time efficient for field survey and intersect with the methods used by MARP. Additionally, methods used to document rock art were aimed at providing a more standardised set of motif identification standards. Overall, the methods of standardised site forms and multi-scalar photography at a landscape, panel and motif level, see section 4.5, has provided an increased effort to mitigate an over-emphasis on unstandardised motif identification practices.

The methods utilised for documenting and analysing the rock bruisings at panel and motif level at Maski were designed in order to improve the visualisation of rock art in this region. As demonstrated in Chapter three, p84 a critical examination of presenting motif forms in publications, such as Allchin (1987) and Neumayer (1993), have relied on approximately scaled sketches of motifs. These traditional methods of rock art documentation in this region are often open to debate regarding the accuracy of motif identification, and the level of detail which can be documented by the eye of the researcher, no matter how well trained. They are then fossilised interpretations, along with being divorced from their landscape context.

More recently, rock art research at Brahmagiri, Karnataka has also focused on enhancing photographs of rock paintings using Photoshop (Arjun, 2018). The work conducted on appropriate image enhancement in this thesis adds to the comparatively recent approaches of investigating rock art within an Indian context through digital methods. Critical efforts were taken in this thesis and presented in Chapter seven, section 7.2.2 and 7.2.3, to develop an appropriate procedure for utilising image enhancement techniques to avoid unrealistic, erroneous results. The visualisation procedures implemented in this thesis can be easily facilitated within other rock art documentation projects in the Indian subcontinent. Generally speaking, the incorporation of an additional means of documentation practices for rock art enables a critique of in-field documentation practices to occur. It also provides alternative perspectives to recognise new information about rock art panels, which operate within algorithm set parameters, uninfluenced by subjective human experience. The results presented in this thesis, relating to the complexities of motif relationships and
interaction phases, see Chapter seven sections, 7.3-7.6, add to the argument for advocating an increased use of digital methods for rock art documentation and analysis within the Indian subcontinent.

Chapter seven has demonstrated how the incorporation of off-site image enhancement software into a contents analysis of rock art motifs has produced a multiplicity of new information about interaction with specific rock art panels. This is evident by deliberate markings over existing motif forms, indicating attempts to obliterate, rejuvenate or modify certain motifs. Image enhancement has provided a means to explore rock art as a practice, moving beyond a focus of chronologically ordering rock art in this region by means of motif identification, see sections 8.2 and 8.3. The use of this software has also resulted in a greater quantity of suggestive superimposition sequences for panels in spatial proximity to Iron Age (1200 - 300 cal BC) material assemblages and activity zones, see section 6.2.1 and 6.2.2 for details. The results of the complex layering of rock art production and interaction presented in this thesis, its connection to understanding South Indian prehistory and possible impact for archaeological understandings of the Indian subcontinent is discussed in sections 8.2 and 8.3.

This issue of problematic rock art visualisation was further compounded by the variable weather conditions and times of day experienced in the field, affecting the general visibility of motifs, and means of accurately recording them, see p127. Additionally, due to time constraints placed on the fieldwork project for the author’s thesis, a common situation for researchers, emphasised in Domino-Sanz (2015), the additional procedures of digital photography, which could then be enhanced off-site with image enhancement software Dstretch© was a useful, if experimental tool. See sections 7.2 and 7.7.3 for more evaluative comments about the use and procedure of Dstretch© as a suitable analysis technique for this region and in other global areas.

The use of Dstretch© software within this thesis was an initial experimental attempt to enhance visualisation procedures with bruisings at Maski, especially considering this programme had not been utilised to the same extent on petroglyphs as on additive rock art techniques, eg. paintings, with the exception of the Iron Age warrior petroglyphs at Oullas rock shelter in the French province of Alpes-de-Haute-Provence (Desfrasne 2014). No attempts were made to manually alter the algorithmic parameters of colour spaces used for enhancing
photographs of rock art presented in this thesis. As such, the pre-programmed colour spaces provided in the Dstretch© programme were considered sufficient to use. Therefore, it seems prudent to consider the accuracy, replicability and accessibility of any image enhancement software chosen for colour analysis work with rock art and become familiar with the colour spaces contained within each programme, as advocated in Le Quellec et al. (2015), before manually altering colour space algorithm parameters. Ideas for future work, stemming from this doctoral project, could involve the experimental manual alteration of colour spaces within the Dstretch© programme, using the same rock art photographs presented in this thesis, so as to continually improve rock art visualisation procedures.

The accessible method of off-site rock art analysis with free and effective software, presented in Chapter seven, is one which can be applied at a far more local community level as an avenue for future local education and research. As a combined methodology it has the potential for; 1. documenting rock art sites at a broader scale in Northern Karnataka, adding to the growing catalogue of known sites within their wider landscape contexts. 2. Opening up avenues for recovering existing knowledge about rock art sites, both at Maski and in the surrounding region, involving local parties at the initial documentation process, leading onto analysis and interpretation stages. 3. Contribute to a locally engaged connection with rock art documentation practices and awareness of their situated landscape significance. This in turn may enhance broad the rich archaeological nature of South Indian prehistory and highlight the need for developed rock art conservation procedures.

An acknowledged limitation within this thesis is its inability to present a complete catalogue of all motifs present at Maski, due to variabilities in motif placement on differentially angled panels, coupled with the different ways humans navigate through the same landscape. For example, research groups on fieldwalking surveys move through the landscape in a different way to a local farmer. However, as a comprehensive recording strategy it focused on collecting information about rock art sites from a variety of scales, from broad contextual information, through to small scale environmental and anthropogenic interactions on a panel surface. The limitation of incomplete rock art documentation also affects how far researchers can use repeatedly documented motif forms to imply
significance of meaning in specific landscape settings, within the understanding that some information is missed during survey procedures. This point is detailed more precisely on pp 76-77. Additionally, the content of this thesis contributes to a multi-faceted means of cataloguing and analysing rock art in the Karnataka state, coinciding with field survey and off-site image enhancement methods implemented on a single rock shelter at Brahmagiri (Arjun 2018). The combined methods of primary fieldwork documentation, coupled with off-site visualisation procedures, are easily transferrable to other regions in South India. It has the potential to be implemented as a methodological procedure throughout the subcontinent, producing an enhanced systematised means of cataloguing rock art for paintings, drawings and petroglyphs.

The need for preservation procedures to be considered for the rock art at Maski cannot be understated, as Chapter four p115 and five p160 and p173 demonstrate, frequent dynamite blastings were overheard during rock art documentation at a number of sites (MARP 210, MARP 135, MARP 18 in 2014 and 2015). The material of rock art sites is ideal for repairing roads and other construction projects, meaning the content of rock art sites are incrementally encroached upon. Additionally, the dramatic changes inherent in the wider contexts of rock art sites at Maski, such as increasingly intensive agriculture, transforms surrounding landscapes which the outcrops are situated in. These actions resulted in the complete obliteration of archaeological sites, in addition to rock art sites. The MARP project holds information about the widespread destruction of Iron Age - Early Historic burial assemblages, see field forms for MARP 79 (information with the MARP project). The need for the provision of adequate construction materials and resource extraction, due to the demands of the global economy transferred to a local level, is of course understood. However, the complex prehistoric and historic human-landscape activities in South India will continue to be lost before it can be fully understood, or at least recorded, due to the continued destruction of its material evidence.

Protected heritage status is afforded in exceptional circumstances to rock art sites in India, such as Edakkal and Bhimbetka rock art cave complexes. At Bhimbetka, its designated UNESCO status coupled with its promotion as a cultural landscape for tourism and educational purposes, has meant that the rock art presented there is managed. By limiting public access to some rock shelters,
and displaying others in a controlled manner, a selection rock art at this site is afforded some level of preservation. Additionally, presenting educational information about the continuing cultural significance of the area itself heightens awareness of how people were using landscape features during Indian prehistory. The majority of rock art sites are lacking in such protective conservation measures, both within the Indian subcontinent and at a global level. The means of providing accessible and cost-effective rock art recording methodologies, demonstrated within this thesis, provides a means of keeping a record of rock art sites, which may be digitally stored and retrospectively analysed, even if the original site is compromised.

The use of Dstretch© off-site analysis was also utilised as an additional means of chronologically sequencing rock art through superimposition sequencing, see section 7.4, due to uncertainties about the historic reliability of relative dating by patination shading. There was a general understanding that the older a motif, the darker (orange or brown) the shade of the patina of the motif (Boivin 2004b). A patination coding of one – five (1-5) was implemented by the author during the course of fieldwork in 2015, in an attempt to provide some systematic structure to an element of rock art recording that remained overly descriptive. This patination coding was only applied to granite and gneissic geologies, rather than rock art panels constituted in dolerite as dolerite rock art sites were documented in 2014, before the patination coding practice was implemented.

Using patination coding to provide a chronological framework for rock art, particularly petroglyphs has been regularly utilised during investigations in Africa, see Barnett and Guagnin (2014), Butzer et al., (1979) and Campbell and Coulson (1998), connecting patination shades to differing environmental conditions. The results of patination coding for rock art at Maski is located in Appendix E However, as demonstrated in the results summary in Chapter five, pp 141, 153, 168 and 181, there is a vast number of localised environmental factors which can change the patination coding within the morphology of a single motif. Differences in the constituent geology of a panel surface and resulting patina colouration may mean recording colouration differences is not applicable from one geology to another. Recording colouration differences between motifs and associated panel of dolerite is going to be different when applying the same process to granite or
gneissic geologies. Natural depressions or overhangs in panel geology can cause biofilm growth and surface staining, meaning one extremity of a motif may be given one numerical patination coding value, with a different value given for another part of the same motif.

Even a variable angle of a panel surface can produce differentially shaded patinas on the same motif that is assumed to have been produced during one event, as demonstrated by fig 5.1 in Chapter five. Finally, as visualised in section 7.5, the preliminary evidence of interaction with motifs subsequent to initial production phases, again throws the applicability of judging the age of motifs by patination colouring alone into question. It seems likely that the application of patination coding in this context is to be treated with caution and used in conjunction with other means of assigning a temporal framework to rock art in this region to mitigate erroneous temporal sequencing.

This first section of this discussion has focused on the positive results of utilising a range of methodological procedures which can be succinctly replicated, both as part of archaeological research projects and as stand-alone investigations. Sections 8.2 and 8.3 focus more directly on spatial patterns and motif content themes presented in Chapters six and seven of this thesis. In particular, if rock art placement at Maski can be viewed as a long-term visual communicative mechanism of developing animal and anthropomorph relationships throughout the prehistoric and historical periods in South India.

8.2. Landscape choices in rock art placement

The incorporation of ‘landscape’ into rock art research frameworks, remains influential, as demonstrated in Chippendale and Nash (2004); Tacon and Chippendale (1998), providing a an objective means to gather information about the contexts of rock art placement within a strictly archaeological remit. Chapter two presented the variable understandings of what landscape means when investigating its significance to past cultures. Landscape is simultaneously used as a unit of analysis (Hodder and Orton 1976), and understood as a means of connecting the activities of humans through time, which build up like a ‘tapestry’ (Ingold 1993), influencing the multiple ways humans connect with their landscape settings (Bender 1993).
When it comes to rock art research, an inclusion of landscape is influential in providing interpretations about the significance of placement, and interaction with, rock art in a number of global locations, as demonstrated in Diaz-Andreu (2002), Nilsson (2010) and Tacon (2008). Making marks in the landscape have been argued to be integral to constructing localised identities (Diaz-Andreu 2002), signalling territorial claims (Taçon 1994, 2008; McDonald and Harper 2016), or demonstrating long-term community feeling about rock art which are considered to be pre-existing for the groups that actively interact with it (Nilsson 2010; Recaldo and Navarro 2015). For all the arguments about what rock art is interpreted to signal, Chapter two argues that rock art encompasses one aspect of transmitting information, communicating social ideas within and about cultural groups, which may change through time (Bradley 2009; David and Wilson 2002, Domingo-Sanz et al. 2016).

However, as Chapter two p37 and pp 59-60 have demonstrated, there are some caveats apparent in too strongly adhering to perceived visual connections provided by sensory perceptions of an external researcher between ‘static’ archaeological remains and other landscape features (Brück 2005). Other rock art research projects have incorporated additional sensory investigations into the auditory nature of rock art production (Boivin 2004a, 2004b; Ouzman 2001; Rainbird 2002) and the tactile qualities of production surfaces (Aas 2017; Ljunge 2010) as an alternative means of investigating meaning in rock art traditions, which do not prioritise visual pattern recognition.

Rock art research as Sanganakallu in Karnataka, bear some objective landscape similarities with Maski, in terms of archaeologically relevant material culture, along with some recognisable motif content. Interpretations from this region are based on the use of sensory observations, in addition to the identification of visual patterns (Boivin 2004a). They have argued for the significance of rock art production to be linked to the sonorous qualities of rocks in that area (Boivin 2004a; Boivin 2004b) and see Chapter three pp 86-87, This phenomenological approach to understanding the placement of rock art in specific landscape locations was not attempted within the context of this thesis. This was due to uncertainties over the appropriateness of using such methods to infer significance in rock art production patterns at Maski.
Despite the concerns, described above, in using spatial landscape connections to visually verify patterns in rock art content, this thesis has supported the use of objective approaches to measuring aspects of landscape from a variety of scales, advocated by Chippendale (2004). The reasons for this are as follows: objective approaches to documenting rock art intersected well with the procedure of archaeological field survey advocated by the MARP project, detailed in Chapter four, sections 4.3 and 4.5. Although ethnographic approaches are increasingly advocated in rock art research within the Indian subcontinent, as demonstrated by the work of Ghosh (2007), Malla (2012) and Pradhan (2012), there did not appear to be contemporary, active involvement in structured rock art production at Maski to warrant ethnographic investigation. Therefore, it was deemed unsuitable to pursue extra sensory means of investigation into rock art production in this region without ethnographic or ethnoarchaeological guidance, which was deemed beyond the scope of this thesis.

The resulting documented patterns or idiosyncratic evidence of behaviour around, and within, the rock art sites presented in Chapter five to Chapter seven are consequently interpreted within an understanding of landscape as continually engaged in a social negotiation of activities and features (Bradley 1997; David and Wilson 2002; Ingold, 1993). If rock art production is then understood as one of those landscape-based activities, it is argued within this thesis that rock art production at Maski acts as a means of communication, transmitting information embedded in the certain settings (Domingo-Sanz et al. 2016).

Results in this thesis has demonstrated observable landscape placement patterns in rock art production, and in terms of motif content, see section 8.3. The connections between different observable landscape features, such as mutual spatial locations, have been suggested in the analysis outcomes of section 6.2.1 and 6.2.2. Whilst the author notes that these analysis outcomes are preliminary, reflective of the interim nature of the MARP project at the time of the author’s involvement, they do at least provide avenues for positing the situated placement of rock art production as a poignant practice within local region of South India.

One of the apparent results demonstrated in Chapter five, and followed up in Chapter six, p187 regards the geological composition of rocks used as panel surfaces, a granitoid-gneissic landscape with dolerite seams. Current academic literature has prioritised an investigation into the symbolic use of dolerite, both for
ground stone axe manufacture and as a surface for rock art production at Sanganakallu (Brumm et al., 2006; Shipton et al., 2012). The use of systematic transect survey for rock art documentation also prioritises a dolerite dyke when supporting a systematic method for rock art documentation (Blinkhorn et al., 2010). Motifs are fleetingly noted as appearing on granite surfaces (Boivin et al. 2007). A methodological and interpretative concern for the significance of dolerite during prehistoric South India is apparent in the current literature (Boivin 2004b; Brumm et al., 2006).

At Maski, dolerite geologies constitute 2.2% of the total numbers of rock art sites documented during 2014 and 2015, see Chapter five, tables 5.1, 5.4, 5.7 and 5.10. Additionally, the majority of these sites were designated small sites, consisting of between two and five panels. They did not demonstrate evidence of motif accumulation or panel superimposition and are sporadically located at low elevations within the landscape. The overwhelming majority of rock art sites presented in this thesis were constituted of granite-gneissic geologies, which forms the dominant available geology for rock art production surfaces in the localised Maski landscape. They also exhibited greater panel accumulation of motifs and were vastly greater in size, a reversal in characteristics of dolerite sites at Maski, and also different in terms of research undertaken at Sanganakallu.

The results presented in Chapters five and six do not demonstrate a patterned distinction between the presence or absence of motifs on a distinctive type of geology, leading to the suggestion that rock art production practices at Maski were not constricted by a preference for producing petroglyphs on dolerite. It was seem, based upon the quantities and types of motifs produced in elevated contexts and rock slope locations in comparison with low relief inselberg and peneplain settings, see figs 6.4a-d, that the physical availability of rock surfaces is a key component in the choice of rock art production at Maski. Over time, the repeated production of motifs on available surfaces may relate to areas of available geology becoming nodes for production and associated with the transmission of certain social ideas (Conkey 1980; McDonald and Veth 2012, 90). Given that certain materials are argued to be important in constituting social relationships across the landscape in South Indian prehistory (Johansen and Bauer 2018), it could be argued that the available geologies for rock art production were key to creating places of importance in this local landscape.
Instances of other variables, such as sonorous qualities and other intangible cultural knowledge often influence the choice in production of rock art around the world, see sections 2.4.1-2.4.3. It may be that decisions to produce rock art at Maski, and at other areas within the Indian subcontinent in specific locations, were governed by a set of activity patterns or cultural logics. However, the reasons behind these decisions remain intangible using archaeological methods of documentation and analysis, but see Aas (2017) and Lewis-Williams and Dowson (1990) for interpretations regarding the permeable nature of the rock surface. However, by analysing how different rock art motifs are accumulate near other archaeological features of past human activity, as demonstrated in Chapter six, section 6.22, inferences about the possible reasons for their production and subsequent interaction can be more adequately made.

Other analysis efforts in Chapter six focused on a spatial examination of the proximities of rock art sites to other archaeological sites documented, as a larger part of the MARP project. Evaluative comments regarding the spatial analysis procedure are on p188-189 and are not discussed any further here. Within the context of the MARP project, rock art sites made up the most numerous site category documented throughout the course of field survey seasons, ie: 74 of a total of 215. Additionally, other rock art sites are the most numerous spatially encountered type of site, see table 6.3 p208. This spread of documented rock art sites demonstrates just how prolific rock art production locations are within the Maski landscape, if there is an available surface upon which to produce it.

A number of different categories of archaeological assemblage were also noted from 0-200 metres from the centre of each rock art site, see section 6.2-6.2.3 for quantities on each activity zone and their spatial association. Some key spatial patterns are explored in detail in this section relating to the occurrence of dense rock art accumulations in immediate spatial proximity to previously occupied rock shelters, occurring in multiple archaeological activity zones (see figs 6.1b-6.1i, pp195-206). Additionally, there are some spatial patterns of distance relating to rock art accumulations and recorded megalithic features. These patterns are discussed in due course. However, some points of discussion are now made regarding other types of archaeological features recorded in the Maski landscape and their spatial proximity to rock art accumulations.
The numbers of site types linked to metal working practices, burial patterns, water features or settlement/habitation deposits are displayed on fig 6.2, p208, separated at distance intervals. There are some inferences which can be made about the spatial relationship between accumulations of rock art and these types of archaeological sites, although inferences are confined to results taken from one archaeological activity zone, named Zone C, see fig 6.1d p197.

Rock art sites were not immediately associated, or within 100 metres of metal working areas, burial sites or water management features in this zone, but were located at distances of between 100 – 150 metres. Rock art sites are found at higher elevations to these other forms of archaeological activity; these other forms of archaeological activity are found clustered around the base of these rocky outcrops. Although each of these activity areas, mapped in fig 6.1d, p197 is given a bounded shape, this reflects the spread of visible evidence found when fieldwalking, rather than through excavation, and so it is likely the size and extent of these activity areas are subject to change. This is particularly exemplified by the areas in zone C marked as burial deposits, as these were recorded when the burial deposits became exposed by modern ploughing or sand extraction.

Despite uncertainties in the size and extent of these different activity zones, there is the possibility that rock art production in Zone C featured as a form of temporally parallel activity with burial traditions and metal working activities in this region. However, it is not possible to say using the data in this thesis, whether they formed part of a related set of activity practices; ie: rock art was made in association with metal working or in association with burial practices, or as part of temporally connected but conceptually separate set activity patterns. With regards to rock art and metal working activities, MARP 166 formed a composite site of metal working debris and immediately associated rock art. However, there was not enough evidence to link metal working activities with temporally connected rock art production, either at this site or in the wider Maski landscape.

Certain site types, such as mining shafts and mineral processing activity are not included in a wider discussion of spatial proximity to rock art sites. The reason for this being that the author was not part of the MARP project until after these features had been documented. However, the mapped locations of mining shafts, mineral processing areas can be viewed in fig 6.1b, p195 and their relation
to four distinct rock art sites. No rock art sites were documented within the immediate vicinity of notable mining shafts, mineral processing areas or the Ashokan edict. It is not possible, with the data available in this thesis, to make inferences regarding the mutual significance between these areas related to geological processing, or Early Historic inscriptions and the production of rock art concentrations.

The spatial data presented in this thesis is acknowledged to be a fragmentary archaeological landscape. It is likely that, but difficult to prove, that other forms of rock art production were associated with archaeological features in peneplains settings. Sporadic instances of rock art motifs were located in peneplain settings, demonstrated in table 6.2, and other ephemeral archaeological remains were also noted in these settings. However, active field clearance procedures were also documented during MARP fieldseasons, and it is likely that field clearance and other transformative land use practices have destroyed small scale rock art production sites in the wider landscape, along with other associated archaeological activity. It is therefore difficult to raise a concise discussion point about the spatial proximity of other rock art sites and archaeological site types, due to the lack of available evidence.

One site encountered during MARP fieldseason of 2012, MARP 82, consisted of an intensively terraced settlement site at the summit of the Durgada Gudda outcrop, complete with dense ceramic deposits indicative of Iron Age habitation and extensive rock art panelling, within activity zone G, see fig 6.1h, p205. A focused study into the contexts of these rock art panels, motif content and intra-panel sequencing would have assisted in a further understanding of the relationship between certain habitation areas and the production of rock art. However, due to its current occupation by a bear, personal security concerns were expressed at the time of encountering this site (MARP 82) and only a preliminary observation could be made. It is a site that could be investigated at an unknown future date.

The results of spatially associated archaeological assemblages within 0-200 metres from the centre point of each rock art site suggest two key patterns. These are a spatial relationship of proximity to previously occupied rock shelters, and a potential relationship of distance and visibility with some megalithic structures, although the second relationship is more suggestive than certain.
Section 6.2.2 demonstrates that previously occupied rock shelters are the site type which occur most frequently as composite archaeological assemblages with rock art sites and are also frequently encountered as distance from the centre of a rock art site increases.

These previously occupied rock shelters are shallow in extent, no more than four metres in depth, when measured from the entrance. They have at least 180° visibility from the rock shelter entrance and are located on rock slopes around the external margins of the outcrop, overlooking the peneplain expanse at Maski. Within the rock shelters were moderate to dense artefact scatters of Iron Age ceramics (black and red ware (fine and coarse), red ware, plain (fine and coarse) and black slipped and polished ware (fine)), along with scatters of indeterminate or eroded sherds. Medieval and modern sherds also form smaller proportions of the material assemblage, as do exhausted chert cores and partial or complete bladelets.

These composite sites of previously occupied rock shelter and rock art also consist of panels which have accumulations of rock art, indicative of several production phases, see figs 7.7a, 7.7b, p251 for MARP 135 and figs 7.55 and 7.56, p286 for MARP 199. They also contain a variety of bovine, anthropomorphic and abstract designs around the access points of each rock shelter. At first glance, it would be convenient to give a chronological indicator of South Indian Iron Age rock shelter habitation, due to associated material assemblages and assign with the first phase of rock art production as Iron Age. However, when appreciating the myriad ways people use and reuse landscapes features within South Indian prehistory, see section 2.2, the means to assign a definite chronological indicator, based upon spatial proximity with an archaeological assemblage and a rock art panel, is not straightforward.

For example, does the initial production phase of rock art at these previously occupied rock shelter sites precede or succeed human activity at the rock shelter which included Iron Age diagnostic ceramics? There is a case for arguing that certain motifs at locations in the Maski landscape, belong to a period more closely aligned to the South Indian Neolithic, but assigned an Iron Age date because of spatially associated diagnostic ceramics. Similarly, certain motifs may be produced much later, but give an erroneous earlier date because of past human reuse of diagnostically earlier Iron Age ceramics. These two hypothetical
suggestions demonstrate that both arguments for the temporal sequencing of rock art motifs, based upon different ways of understanding temporally diagnostic archaeological assemblages, carry equal weight. Additionally, as explored in pp 48-51 of this thesis, groups of people in the prehistory and history of South India have reused material culture temporally indicative of earlier periods. The same could arguably be said of Iron Age ceramics in previously occupied rock shelters at Maski, therefore assigning an Iron Age date to early rock art production phases cannot be treated with certainty.

The second broad landscape pattern to discuss, presented in section 6.2.2, is the increased number of megalithic features encountered as the distance from the centre of a rock art site also increases. There are occasional instances of passage chamber megaliths situated within 50 metres of the centre of a rock art site (such as MARP 63 associated with MARP 64, and MARP 17 with MARP 18). The majority of megalithic features in the form of stone constructed enclosures and menhirs are situated around the base of inselberg outcrops, at distances of up to 200 metres from the centre of a measured rock art site. At MARP 64, there were clear sight lines to megalithic enclosures, see fig 5.19, p163. At the time of fieldwork, observations during rock art site recording were made regarding visual associations with other archaeological features from locations within a rock art site, these can be located in Chapter five, tables 5.3, 5.6, 5.9 and 5.12. However, no attempts were made of an intervisibility study from multiple directions within the same site. Therefore, it is not possible to assess the variable sightlines or visibility relationships between rock art sites and megalithic features on the lower rock slopes or peneplain levels. An intervisibility study, similar to Diaz-Andreu et al. (2017), is an avenue of future work which could be implemented, now that relevant sites have been identified. If implemented, an intervisibility analysis between certain rock art sites and megalithic features could further enhance investigations into possible spatial relationships people held between rock art production sites and long-term megalithic commemorative practices.

Research conducted at Sanganakallu has emphasised the ritual aspects of rock art production, focusing on the use of soundscapes as an extra sensory element to understand prehistoric activities in South India. One interpretation, supporting the ritual production of rock art, is of men demonstrating the strength
and agility to reach challenging, elevated areas and produce a widely visible motif, representative of fertility (Boivin 2004b, 45).

Findings at Maski question this interpretation on two grounds. Firstly, the overwhelming evidence at Maski, see Chapter five sections 5.2-5.5, demonstrates that rock art sites themselves were relatively straightforward to access from multiple different directions, providing the person accessing them did not have mobility issues. Motifs dispersed within the site were also located in areas that were easy to access and fairly comfortable to produce motifs on. In a number of cases, the natural geology provided a horizontal ledge which would have aided in the production of motifs at greater heights. It is therefore likely that rock art sites would have been physically accessible during the prehistoric and historic period at Maski. If there were limitations placed on individuals or groups accessing, viewing or interacting with rock art sites, this would be due to intangible elements of social or cultural understanding, see Bradley (2009), which are beyond the scope of this thesis. Secondly, the overemphasis on identifying cattle motifs as bulls is discussed on pp 330-331. Findings at Maski, in terms of easily accessible locations for rock art production and a variable means of producing bovine motifs, demonstrates that rock art was able to be produced by multiple groups of people, for diverse reasons, in addition to other symbolic interpretations.

There also were specific rock art panels which were difficult to reach, in addition to more accessible locations (MARP 168, MARP 175 and 71). This raises additional questions about how certain motifs were produced, if extra equipment was needed for scaffolding or an additional height element? Were these motif production events the work of groups or individuals? The processes required to produce motifs in difficult to access locations could also be investigated by experimental means at a future date.

The analysis results and general reasons discussed so far have highlighted the overall spread of rock art sites with regards to geological and accessibility preferences in location, along with possible connections to other archaeological assemblages from a spatial and chronological perspective. A further point coming from a spatial analysis of rock art sites in Chapter six, section 6.3, are results concerning site sizes and accumulations of motifs on specific panels.
Generally, there is a defined relationship between the numbers of motifs recorded at specific sites that increase with the area size of a site. The availability and distribution of potential rock surfaces to become panels affects the subsequent number of panels making up a site and its overall area size on peneplain and low relief tor inselberg morphologies. The pattern is not so straightforward with regards to rock slopes and elevated tor outcrops. Rock art sites recorded on rock slopes and elevated outcrops show a tendency to exhibit greater numbers of motifs over a smaller area size, and multiple visible phases of layered motif production are demonstrated in section 7.4. The author acknowledges that this result is heavily influenced by the increased availability of potential panel surfaces at higher elevations. Sites at higher elevations also exhibit increased accumulations of motifs on specific panels, whilst always containing panels which only instances of singular motifs per panel, see section 6.5 for more details.

A discussion of some intriguing spatial patterns regarding the rock art of Maski have been presented in section 8.2, focusing on purposeful elements of landscape choice for long-term rock art production practices in the Maski landscape. Investigating the spatial extent of rock art, within an Indian context, has provided an additional means of connecting it as a widespread form of human activity, with other archaeological features in the landscapes of South India. Work within this thesis has also suggested that the production of rock art at Maski is often spatially connected to developed or ephemeral occupation areas, bearing Iron Age (1200 - 300 BC) deposits, along with continuing Medieval activity. There is also a preliminary suggestion that some rock art production may be connected to differential visibility of commemorative megalithic structures, this could be investigated further with intervisibility studies. A spatial analyses of rock art at Maski has demonstrated its potential to be accessible, in content and placement, to many groups of people throughout the prehistoric and into the historic periods. This implies that rock art production at Maski may have been widely available and used for more reasons than communicating ritual displays.

A spatial analysis of rock art at Maski has provided an additional means to investigate rock art from an archaeological perspective in an Indian context, when cognitive or ethnographic approaches are not pursued. Additionally, future rock art documentation and spatial analyses within an Indian context, at other
petroglyph sites in Karnataka and extended regions of the subcontinent, would be beneficial to assess and compare the spatial connections between prehistoric occupation assemblages and commemorative structures. As there is further survey work, excavation and theoretical investigation into the nature of prehistoric transitional land use practices in South India, the patterns suggested in this thesis can be critically appraised. This discussion now moves on to explore analysis results focused towards the motif content of the rock art at Maski.

8.3. Themes in Motif Content

8.3.1 Identifiable Motif Forms

This section explores detailed, technical specifics of motif form from panels exhibiting multiple production phases and incorporates means of assessing ‘style’ within South Indian rock art. Rock art documentation by motif identification has been a popular means of cataloguing motifs in rock art research in South India (Allchin and Allchin, 1994; Chakravarty, 1984; Chandramouli, 2002; Neumayer, 2013). The proportional breakdown of motif categories in Chapter six, section 6.4, for each of the four main landscape zones demonstrate there is a minor amount of variation in the percentage representation of motif categories at Maski. The main motif categories which make up between 50 and 66% of the total motifs documented across each of the four main landscape zones are classed as bovine, anthropomorphic and abstract motifs. There are also consistent proportions of other ungulate and zoomorph motifs. Indeterminate motif proportions are discounted from this discussion.

Whilst the motif category denoted as abstract was not investigated as part of the analysis chapters, it is defined within Chapter four, p128 and numerical values are presented in Chapter five for each site size section. The abstracted motifs on rock slopes and elevated tor outcrop settings were often heavily patinated and more complex interpretations as to their meaning or wider significance are not discussed here. There is one repeated motif abstract form which always had the same technical make up, demonstrated in fig 5.31, p177 and present at four recorded sites. Additionally, there were many cases of subcircular paired bruisings, often in outline, that could arguably represent
footprints, produced irregularly over multiple time periods, see p283 as an example.

The last two identifiable abstracted forms were mostly located on peneplain or low relief tor inselberg contexts, with the Shiva Linga representing a widespread Hindu symbol from the Medieval through to modern periods. The grid designs, and associated indented markings around them, were also thought to be representative of a board game called ‘Tiger and Goat’ or ‘The Pebble Game,’ upon advice from local colleagues during fieldwork. A limitation to this thesis is the absence of interpretation regarding abstracted forms of motifs, described fully on site forms and presented visually in Chapter five and Chapter seven, but not explored in great detail. Further work could be achieved in analysing the contexts and visual comparisons of abstracted motifs at Maski and other comparable areas in South India, such as Sanganakallu.

Overall, as demonstrated in section 6.4 there is less variety of motif categories across low relief tor inselbergs and peneplain settings, with a slightly increased proportion of snake motifs, and other abstracted forms. Rock art sites on rock slopes and elevated tor outcrops exhibit a greater variety of faunal content, such as recognisable elephant and feline motifs. Bovine and anthropomorphic motifs also make up a higher proportion of the motif corpus than on sites at lower elevations. As noted by the author, there is a methodological difficulty in attempting to document the absolute quantities of motifs throughout the local Maski landscape. The quantities used within this thesis represent a sample of motifs documented through systematic field survey. Future rock art documentation projects at Maski and other similar regions may reveal different motif percentages based upon their documentation methods. However, the consistency of the proportional analysis for represented motif categories across multiple landscape contexts, demonstrated in section 6.4, exhibits a rock art corpus which predominantly visualises animals and anthropomorphs.

When the totals of rock art motifs are displayed by identifiable categories over different landscape contexts (fig 6.5, p218) both forms of cattle motifs, that is bovine and bull motifs, total 407 motifs making 35% of the total motif corpus documented. Discounting abstracted and indeterminate motif categories, the next most numerous identifiable motif category are anthropomorphic designs, with a total of 191 motifs or 17% of the total motif corpus. The numbers of cattle motifs
present in the landscape dominate the overall motif corpus presented in this thesis. Rock art research in South Africa has demonstrated that figures underpinning San cosmology are purposefully absent in the motif corpus, such as the /Kaggen (Hollman 2007; Lewis-Williams 1980, 1981, 1982), and other highly significant figures are rarely portrayed, see Solomon (1998). The published literature indicates that recording vast numbers of one motif does not automatically imply significance of meaning for the numbers of cattle motifs present at Maski.

However, as demonstrated from other published examples, there are instances where repeated production of specific motifs form a basis for understanding an aspect of what rock art is trying to communicate as a landscape art. Eland motifs in South African rock art (Lewis-Williams 1981, 1982, 1987; Parkington 2003) are understood to be a polysemic symbol, after numerical documentation and corroboration with San peoples (Lewis-Williams 2006, 360). The repeated instances of footprints near water sources in Scandinavia are believed to communicate the association between water and human liminal states (Bertilsson 2013; Bradley 1997, 2006). Additionally, there are numerous examples of anthropomorphic figures in Western Australia which are argued to communicate differences between aboriginal social groups in the region (McDonald 2012, 2016). These examples demonstrate that increased numbers of the same motif, may indicate that a specific motif form may hold significance for a society, when those increased motif numbers are compared with ethnographic or other contextual information.

A total of 374 or 85% of the cattle motifs were recorded in elevated contexts. Whilst this is a vast skew in numbers of cattle motifs being produced in elevated contexts, there are other factors within the elevated contexts that indicate the continuing importance of cattle motifs in the rock art at Maski. Cattle motifs are produced within these elevated outcrops regions, where there are extensive and clear views over the peneplain areas. This suggests the possibility that cattle motifs were produced in response to what individuals, as part of a cultural group, were experiencing in their daily lives during the prehistoric and historic periods in this region of South India.

This may be further supported by data that demonstrates how cattle motifs accumulate on surfaces in immediate association to previously occupied rock
shelters in elevated outcrop locations, explored in more detail in Chapter eight, section 8.2. Although there is a skew towards increased numbers of cattle motifs in the Maski landscape, there are also a range of other motif forms produced through time at higher elevations, including other identifiable animals, anthropomorphic figures and other abstract designs. These form a set of motifs produced in layers across a panel surface and included within a superimposition sequence that contains cattle motifs. This indicates that rock art production at higher elevations involved a range of motifs, possibly communicating a range of social ideas, in addition to the ones primarily concerning the production of cattle images.

There is an amount of graphic variability in the way of producing cattle motifs in elevated locations in the Maski landscape, with the purposeful placement of different styles of cattle motifs over others; this is covered in more detail in section 8.3.2. Additionally, a range of cattle motifs in elevated contexts, see Chapter seven, fig 7.12 for an example, were documented atop ornamented stands. However, although this thesis has demonstrated that cattle accumulations do occur, see images in Chapter seven, section 7.4, there are many instances of cattle motifs occurring as individual production events on boulder surfaces across elevated outcrop locations. The same can also be said for other identifiable motif categories (animal, anthropomorphic and abstract). The evidence of graphic variability in how to produce cattle motifs in elevated locations indicates that the production of this motif has been a significant and long-standing practice within the Maski landscape. Additionally, this graphic variability suggests that the purposes for production may have changed through time, indicating that the information encoded in a cattle motif form was also subject to negotiation. Furthermore, the nature of rock art production in this landscape was open to producing more than just cattle motifs, implying that rock art in this region could be used to communicate concerns about a variety of things.

The incorporation of a standardised system of motif cataloguing, described in section 4.5 for bovines, based on elements of visual form meant that a number of themes could be drawn about the technical details of cattle, moving beyond a series of blanket identification of ‘bulls’ that dominates the current published literature on the subject. Efforts were made when documenting cattle
motifs to distinguish between a ‘bull’ motif, which included the presence of genitalia, or a bovine motif, which did not have any such element distinguished and therefore could visually indicate a bull, a steer/bullock or a cow. As section 6.4 demonstrates, the numbers of identifiable bulls included in the corpus of cattle motifs, number 43 overall, or 11% of the total number of cattle motifs.

Even though the identification of bull motifs are common in rock art research in India (Chandramouli 1995, 2002; Neumayer 2013) and has been linked to the symbolic representation of male fertility (Boivin 2004a, 45) and see section 3.2 in this thesis, there is a lack of identifiable bull motifs at Maski to warrant a blanket acceptance of this interpretation. Additionally, there are sporadic instances of motif identification at MARP 210 which could arguably represent buffalo horns, due to their distinctive skull. This distinction of motif form between bulls, steers or cows demonstrates that rock art production at Maski centred on visualising cattle rather than limited to the display of ‘bull’ motifs. The results of this thesis demonstrate that visualising cattle as a broad species was a significant part of the motif corpus throughout South Indian prehistory. Future avenues of research could further investigate the nature of the developing relationships between humans and cattle during the prehistoric period in South India, which are then visualised as motifs in the landscape.

8.3.2 Continued interaction with rock art panels

Sections 6.5 and 7.4 of this thesis demonstrates how motifs accumulate across specific panels. Due to variations in patination, bruising technique and irregular panel placement, it may be that each rock art production event is limited to the placement of singular motifs as cycles of activity, that either occur over a considerable period of time (MARP 39, 71, 210) or as the focus of intensive production phases. There are social implications for discussing differential levels of human interaction with rock art at Maski, subsequent to the period of motif production. As this thesis argues that rock art is a means of communication, visually encoding information to social groups as a process of making landscapes meaningful (David and Wilson 2002, Taçon 1994), evidence of continued interaction with motifs at Maski demonstrates that rock art may have been one mechanism in how people negotiated an understanding of the past (Ingold 1993,
Nilsson 2010). With the current visualisation procedures utilised within this thesis and consistent difficulties in rock art dating described in section 3.3.2, it is difficult to ascertain when motifs accumulate on panels over time at Maski. However, it is possible to suggest why there are differential phases of interaction with individual motifs and whole panels as recorded in this thesis.

There are sporadic occurrences (such as at MARP 210, 202, 39) where the production of a dominant faunal motif (a feline or elephant) is the focus of a panel, both in relative size to other motifs and located as the centre motif, see p271 as examples. They are located with at least 180-360 degree visibility over the surrounding peneplain, situated along the rock slopes and outcrop settings of the main Durgada Gudda outcrop. These focal motifs are often surrounded by other anthropomorphic figures carrying implements. Additionally, these panels often exhibit evidence of subsequent rock bruising or marking elements. The author has termed these panels ‘narrative scenes,’ akin to published work by Domingo Sanz (2012, 309), Domingo Sanz et al. (2016), Brooks and Wakankar (1976) and Mathpal (1998). In this respect a narrative scene refers to the construction of scene of a recognisable set of activities which can be described in addition to identification of single motif forms. When these scenes are taken as a contemporary whole, they represent a coherent and understandable action of visualising anthropomorphic interaction with a focal faunal motif at Maski.

What is unknown is whether these panels directly refer to the portrayal of realistic events, such as human encounters with felines or elephants in the local Maski landscape, or whether they represent the ideas that are more conceptual within society but less accessible to the researcher using archaeological methods (Domingo Sanz et al. 2016). It is also unknown whether these panels were produced as part of an accumulative process of singular motif production over time, or if motifs were produced predominantly in one phase as part of exhibiting a narrative scene. The author tentatively suggests it is the latter due to the spatial relationships of motifs on the panels denoted as narrative scenes. Examples of these can be found in Chapter seven fig 7.37 (p271) and fig 7.61 (p289). On these panels, the focal animal motif is produced directly in the centre of the panel with anthropomorphic figures and other abstract motifs occupying panel space around the focal motif and directed towards it. These rock art examples have underlying production phases, but it is not possible to distinguish if the production of the focal
motif and associated formulation of a narrative scene obscures an earlier ‘narrative scene’ or a collection of individually produced motifs.

If specific panels are understood to be ‘narrative scenes,’ then it further enhances the range of production traditions applicable to rock art at Maski, which can be demonstrated in the production of a single motif on a surface and potential episodic superimposition over time (see fig 7.35, page 270), through to large scale production of narrative scenes. It is not possible, with the results available, to understand if these ‘narrative scenes’ are a past historic representation of a realistic event, or more symbolic representations. The literature and archaeological evidence regarding the history of felines, specifically tigers in Northern Karnataka beyond current conservation areas is unknown at this current time. However, as cattle are increasingly prominent in the archaeological record of South India (Allchin, 1963; Chandramouli, 2012; Paddayya, 2011; Paddayya et al., 1995), and their products are increasingly used in ceremonial contexts (Boivin et al., 2005; Johansen, 2004; Paddayya, 1993), it could be suggested they are of some importance to social groups inhabiting this region and that real world threats to cattle were a prominent concern during the prehistoric period in South India. Therefore, if rock art at Maski is understood to be a method of communication in transmitting important ideas to societies who inhabit the landscapes through time (David an Wilson 2002), then the inclusion of possible realistic threats to cattle (and evidence of human response) within the rock art corpus of Maski would have realistic meaning and value.

Analysis of additional interaction markings evidenced in section 7.6 also adds to the complexity of rock art production phasing, in addition to superimposition sequencing at Maski. This additional form of panel and motif interaction is not limited to complex ‘narrative scenes,’ and is also found on smaller panels with singular motifs. The number of panels representing additional interaction markings was small, a percentage of 5.4% of the total percentage of panels sampled for off-site Dstretch© analysis. It is likely that more panels exhibit these additional interaction markings than were documented during fieldwork, or selected from fieldwork results for Dstretch© analysis. As stated previously in section 8.1, this analysis result continues to highlight the utility of conducting onsite and off-site documentation procedures. Additionally, the results in section
7.6 highlight how rock art at Maski is interacted with in complex, sporadic and unpredictable ways in situated landscape contexts after motifs are produced.

These interaction elements have been termed rejuvenation, modification and obliteration, each represent a different and permanent visual result for the sets of motifs being interacted with. Firstly, there is rejuvenation; a subsequent rock marking phase following a motif production phase which follows the line morphology of the previous motif, see figs 7.76 and 7.77, p303. Secondly, motifs with modification markings exhibit subsequent rock marking phases, which do not change the overall visual identification of a motif, but do change the motif boundaries, see figs 7.65-7.67, pp291-292. Thirdly, there is the obliteration of motifs which represent a complete reproduction, or elimination, of a motif by the production of a motif over the top of the earlier one, see p289.

The technique of rock bruising as a reductive practice means that elements of an earlier motif is destroyed during subsequent interaction phases. Motif obliteration can also be seen a more intensive form of rejuvenation or modification activity. These elements of additional interaction with rock art panels and motifs post-production also raises interesting social implications for examining rock art as a valid form of situated material practice through time. It demonstrates that people, possibly individuals, did interact with certain motifs and panels in a variety of different ways. This implies a choice between a range of acceptance and rejection of the visual motifs produced in accessible locations throughout the local landscape at Maski. A result of which is the use of rock art as a communicative mechanism of ideas, despite the uncertainty of the reasons behind motif production in the first place. Results of motif interaction also raise problems for chronologically sequencing rock art through motif identification alone, especially if a motif form is sporadically changed at indeterminate points after its initial production phase. This second point is explained in more detail in section 8.3.3 as it intersects with a discussion on stylistic implications for the rock art at Maski.

### 8.3.3 Style at Maski

Aligning rock art to a temporal period in the prehistory - history of the Indian subcontinent has usually relied upon identifying the presence of faunal motif
forms within a corpus of rock art. Wild animals indicate a general Mesolithic period, coinciding with hunter-gatherer means of subsistence, whilst the identification of cattle are interpreted as being characteristic of the Neolithic period with the arrival of agriculture (Allchin and Allchin, 1994). Meanwhile the appearance of ‘horse’ motifs indicate an Iron Age transition (Mathpal, 1990). The appearance of abstracted symbolic forms and writing are often aligned to more historic periods if they demonstrate visual similarities to written historical sources (Taçon et al., 2010). Section 3.3.2 and 3.3.3 offers a wider critique of rock art sequencing within the Indian subcontinent. The main obstacle remains that if chronologically ordering rock art by the presence or absence of specific motifs is indicative of assigning a temporal period, then there is little room to consider the relationships between a range of different motifs, or how the same identifiable motif category can be variably represented as part of later sequences.

This thesis has placed a greater emphasis on aligning the spatial associations of rock art sites with other more temporally certain archaeological features, in order to improve the contextual setting for the corpus of rock art at Maski. Additionally, temporal sequencing of rock art at Maski hinges on those panels which have distinguishable intra-panel superimposition sequencing. Using this dual means of investigating potential temporal sequences for rock art at Maski has meant that an Iron Age date range can be more confidently attributed to some motifs and origins of motif production sequences. Future radiocarbon dating at Maski, expanding upon radiocarbon dates in Johansen and Bauer (2015) and other regions of South India, see Morrison et al., (2016), will continue to enhance wider understandings of prehistory within Karnataka, providing a spatially contextual basis for temporally hinging rock art accumulations.

As stated on pp 328-331, forms of cattle motifs make up the largest percentage within the motif corpus documented at Maski. Cattle motifs are a main chronological indicator of the Neolithic period, coinciding with accepted cultural indicators of agricultural development and increasing sedentary human populations. However, the presence of cattle motifs at Maski are indicative of rock art production practices arguably extending from the South Indian Neolithic through to the modern periods. Chronological stylistic subdivisions of cattle motifs from the Neolithic through to modern periods were suggested, due to perceived
changes in visual appearance from naturalistic – exaggerated – diagrammatic to crude (Allchin and Allchin, 1994).

The stylistic investigation, presented in Chapter seven of this thesis, attempted to critically address the problems with visually describing differences within a single identifiable motif category based upon a set of undefined, subjective terms. It is difficult to understand what constitutes an exaggerated bovine from a diagrammatic bovine or a crude bovine, other than these distinctions have chronological implications spanning 5000 years. The methods of describing motifs in the field focused on the identification of defined attribute elements, demonstrated in section 4.5, instead of unstandardized descriptive accounts. In the case of motifs identified as cattle, attention was paid to the number of legs visualised, whether the motif was an outline or filled in bruising, if the horns were ‘V’ shaped, straight or other? Were there any additional elements added to the main body of the animal, and if so what? Was the hump position of the motif anatomically correct for a representation of the humped cattle species? The size of each motif was also recorded. All these distinctive attributes for cattle motifs are documented in Appendix E, a few key points for discussion and their resulting implications for understandings of style in the rock art at Maski are discussed below.

Panels with complex layers of superimposition, presented in Chapter seven, section 7.4, especially those panels with many cattle motifs, indicate a production phase sequencing of three distinct stylistic trends of visualising cattle, followed by an increase in cattle motif attribute variability. The earliest distinguishable production phases present infill cattle bruisings with thin bodies and small, anatomically correct humps, noted as style type ‘A’ and ‘B’ in Chapter seven, section 7.5. Style type ‘A’ is not always present within a superimposition production sequence, when it is identified it is always present in the earliest phase. All limbs are visualised, sometimes with variable hoof extensions and the horn elements follow a widening, convex asymmetrical V trajectory. The size of these motifs are variable, ranging from 20 cm to over one metre in width from tail to neck. These earliest cattle production phases are also associated with abstracted motif forms, such as repeated dots arranged in a linear formation or other cattle motifs within the same motif production level. These motif forms are
located in spatial proximity to previously occupied rock shelters bearing Iron Age and later period diagnostic material, or in spatial proximity to other rock art sites.

Subsequent production phases demonstrate a change in visual appearance of cattle motifs, which have thicker torsos and larger shoulder elements and larger anatomically correct humps than the previous stylistic representation of cattle described previously. They are termed type 'C,' see section 7.5. They present fore legs and hind legs which are conjoined in an arc, ending in points. There is also a tendency for these bruisings to be in outline, rather than completely filled in. Additionally, the shape of the horns are presented as an increasingly symmetrical, convex to concave, V shape. These cattle motifs are also presented on top of an additional element, which may be identified as a display or ornamental stand. Their size range in width is less variable, between 40 cm – 70 cm in width from tail to neck. This stylistic variation of cattle motifs are often located over types ‘A’ and ‘B,’ if the two are present on the same panel, and were recorded in greater numbers than types ‘A’ and ‘B.’ Motif type ‘C’ are also recorded in rock art sites which have a spatial proximity to previously occupied rock shelters bearing Iron Age and later period diagnostic material.

There is also a complex array of cattle motifs throughout all production phases presented in Chapter seven, section 7.5, which exhibit both infill and outline designs. They also demonstrate varying thicknesses of torso shape and a range of conjoined, combined and individual limb elements, they are termed types ‘D - F,’ A range of hump sizes are represented in motifs from large to small, sometimes the connecting torso is shown bisecting through the hump, denoting it as an additional element to the torso, rather than an integrated part of the body. There are also degrees of anatomical correctness in motif hump placement. The shape of the horns within the motifs can vary greatly, from convex V shaped, parallel, wavy or irregular. Additionally, cattle motifs with an increasing variety of visually identifiable attributes also have a range of additional elements included within the motif form, such as eyes, neck or horn decoration, the inclusion of anthropomorphic additions or linear features extending beyond the motif form.

Cattle motifs classed as type ‘D’ through to type ‘F’ of are located in sites throughout the Maski landscape from peneplain to elevated tor outcrop settings, in a wide range of numbers per panel, whilst types ‘A - C’ are a concentrated in rock slope and elevated outcrop contexts. Types ‘D – F’ are also proximally
located to a wide range of archaeological assemblages from multiple time periods and the relative chronology for their production remains uncertain. Some motifs may be contemporaneous with motif types 'A - C', or they may form part of later sequences, the results are inconclusive at this stage.

There are also discussion points to be made regarding stylistic portrayals of anthropomorphs in intra-panel sequences, identified in the descriptive sections for superimposition sequencing, p284-85 and p296. Although this discussion point is preliminary, with evidence stemming from a small number of panels in spatial clusters C and D, it raises possible connections about the shifting social relationships between animals and humans during the prehistoric period in South India.

Firstly, there is the identification of single line curvilinear anthropomorphic motifs, appearing to be wearing widening, convex, asymmetrical V trajectory horns of the same stylistic variation as the cattle motif classed as type 'A', see Chapter five, fig 5.23, p166. There were two instances of this motif occurring in spatial cluster C at either side of a depression in the Maski landscape, at MARP 170 and MARP 168. Secondly, an additional stylistic variation in anthropomorphic styles is demonstrated in Chapter seven, pp 280-282. This anthropomorph motif consists of filled in, individual bruisings with expansive thighs. A descriptive similarity is noted in Raymond Allchin’s thesis (Allchin, 1954, 251). This motif form is usually depicted holding a large linear implement with trident or leaf shaped detail at the end. This motif was noted in singular instances at MARP 39, MARP 210 (spatial cluster B) and in complex intra-panel sequencing at MARP 71 (spatial cluster D). When larger, individual anthropomorphic motifs are noted within panel superimposition sequences, they are superimposed directly over earlier cattle motifs.

Thirdly, the most numerous stylistic form of anthropomorphic motifs are schematic single line figures, with additional single line implements. They are small in scale, measuring approximately ten cm to 20 cm in height and occur in numerous groupings at all landscape contexts. They are proximally associated at an intra-panel and intra-site level with a selection of fauna, and produced as if engaged in hunting and herding activities, see section 7.4 for visual superimposition examples. Specific identification of these implements was not possible during this research; only further questions regarding the overarching
social implications for each of the identification possibilities can be suggested at this time. Do they represent weapons in the traditional sense of swords for localised attack and defence strategies of local communities, or do they represent switches utilised in herding livestock? It is possible the corpus of single line anthropomorphic rock art at Maski represents both forms of implement additions.

An additional factor affecting the style of rock bruising at Maski, beyond visual recognition of motif content, concerns the way bruisings are executed across a panel. These distinctions relate to the method of panel surface removal, and the resulting condition of the motifs at the time of field documentation. One method of motif creation focuses on systematic and even panel surface removal, resulting in a relatively clear definition of motif boundaries. The other method, still termed bruising in this thesis, is the uneven abrasion of the rock surface. This method results in unclear motif boundaries and morphology, occasionally resulting in motifs invisible to the naked eye and identified post-fieldwork using Dstretch© software, see fig 7.47, p278. These fainter bruisings are often located in later production phases within panel sequences motifs produced with more systematic surface removal.

These visual differences in perceived bruising technique suggests a chronological division in motif production technique over time. Furthermore, the social implications for long-term motif visibility achieved through a systematic removal of a rock surface for motif production implies these motifs were intended to be seen. They were able to then communicate certain messages to those who either knew their location or encountered them in the landscape. Motifs produced using light abrasion methods have reduced long-term visibility, therefore the reasons for their production may differ.

An awareness of contemporaneous differences in production technique may still have social implications for continued motif production in the Maski landscape, but other factors need to be considered for perceived differences in motif production, before the social implications of improved visibility can be stated with more conviction. These factors include the variable times taken to produce motifs using differential bruising methods and the skill required to produce motifs. There is also the possibility that a faint, abrasive bruising or scratching technique may also have taken place in conjunction with systematic surface removal, but due to erosional conditions affecting the geology of the Maski landscape, may no
longer be visible for documentation. One of the limitations of this thesis is a lack of analysis for the variable depth and execution of bruising technique used on motifs to achieve the results demonstrated on panels at Maski. However, future experimental research into producing variable motif forms, using a range of bruising techniques, would provide indicators about the length of time taken and degree of skill required to produce motifs with the resulting visual characteristics described above.

As discussed in pp 336-338, there are key stylistic variables in the presentation of cattle forms, coupled with spatial association to Iron Age diagnostic cultural assemblages and associated panel accumulation, that act as markers for visualising the changeable relationships humans at Maski have had with animals, especially cattle during the South Indian Iron Age (1200 cal BC – 300 BC). The distinction between distinctive cattle motif forms of types ‘A - C’ also indicate that this relationship with cattle was subject to change, and that these changes were communicated on a landscape level in the ways that different motifs were produced.

It can also be argued that type ‘A’ cattle motifs, recorded with abstracted linear dot bruisings, and within some of the earliest production phases of rock art at Maski, may have been produced as a prehistoric means of socialising the landscape (David and Wilson, 2002, Taçon 1994). Early bovine imagery could be indicative of prehistoric groups visually communicating encounters with wild bovine forms, before embarking on experimental processes of domestication. This would open up avenues for acknowledging a pre-Neolithic date range for some rock art motifs at Maski, incorporating bovine motif forms into pre-agricultural rock art sequences in the Indian subcontinent. There is also plentiful motif evidence that distinguishable stylistic forms of representing cattle types ‘A - C’ were not the only accepted means of producing this category of motif. The visual attribute diversity inherent in the rock bruisings at Maski, many of which can be simultaneously contemporaneous with multiple time periods in the accepted sequence of South Indian archaeology, exemplifies how visual changes within the rock art corpus at Maski does not follow a linear chronological trajectory.

In fact the stylistic uncertainties, when cross-referenced with currently accepted stylistic sequences for the rock art of Northern Karnataka, can be
compounded from an elephant ‘narrative scene’ panel at MARP 202, see Chapter seven, p289. The elephant form as a chronological indicator is understood to be representative of the 8th century AD (Robinson and Ramadas 2004, 17). However, it is spatially associated with a ‘S’ shaped curved single line human, which current stylistic sequences in India align with a prehistoric means of production (Brooks and Wakankar, 1976). This panel demonstrates the contradictory understandings which occur when a chronological study of rock art is defined by the presence or absence of motif categories. There is also the potential for earlier motifs to be rejuvenated or altered into later motif production phases, adding a further layer of interaction complexity to understanding rock art sequencing by stylistic means.

If using notions of style to chronologically sequence the rock art at Maski can only be of limited utility, then the question remains how understandings of style within rock art research in the Indian subcontinent can aid in providing value to the thousands of bruisings produced in this landscape? Style can instead be understood as a ‘way of doing,’ (Hegmon 1992) and expanded from chronologically hinging motif identification, to include relational motif placement on a panel surface and the graphic variability of motif attributes. As with the graphic variabilities in the way headdresses are portrayed within the common anthropomorphic motif form in Western Australia (McDonald 2012; 2016), there are distinctive variables in the way of representing cattle within the corpus of rock art at Maski. These variabilities affect motif location, motif content and spatial placement which can be argued to follow a stylistic ‘way of doing.’ Style types ‘A’ and ‘C’ are visually very different, and are described more succinctly in p298. Additionally, style types ‘A – B’ are often superimposed by style type ‘C’, indicating an awareness and recognition of a category sameness in motif form, but a replacement in graphic vocabulary. This in turn could imply a negotiation in the communication of social ideas relevant to groups inhabiting the landscape throughout the prehistoric and historic periods in South India.

If the distinctive styles of cattle motifs types ‘A - C’ are part of a prehistoric corpus of motif production, then the changes in attributes to a more formalised design of outline stocky bovines with conjoined pairs of limbs, symmetrically convex V shaped horns, and attached to stands are arguably representative of a ‘formalisation’, a standardised way of representing bovines. There are also
differences in portraying horn, hump, limb and tail attributes of style type ‘D’ and ‘E’, which are limited to two panels and have small sample sizes to make a concise discussion at this point. It is also worth noting that the stylistic changes inherent in the portrayal of cattle forms at Maski are difficult to sequence as part of a consistent tradition of rock art production from the prehistoric periods onwards. Changes in style may also relate to episodic production traditions through time, subject to discontinuities (McDonald 2016). Although it is not possible to investigate this with the current archaeological and rock art knowledge available, a potential investigation of rock art within the context of ‘episodic’ rather than continuous production may provide avenues to understanding social transformations occurring in South Indian prehistory.

Situating a standardised way of representing bovines within the context of archaeological knowledge in South India, connecting the archaeological process of cattle domestication and its subsequent value as a resource for food, traction and landscape transformations (Bauer, 2007), some of the earliest rock art at Maski can be argued to represent a visual negotiation of cattle domestication processes communicated across the local landscape. Therefore, investigating styles present within an archaeological framework, as a means of identifying patterns of variables between often repeated motif categories, has the potential to communicate important social information between and within social groups (McDonald 2008, 2016) who were operating within the Maski landscape through time.

A motif produced in the landscape at Maski is evidence of an individual’s time spent in a specific location, which is then left to be interacted with in a series of deliberate and spontaneous ways, ways which may not remain consistent or retrospectively fully understood through time. Continued interaction with different motifs and panels that make up the expanse of rock art at Maski are indicative of the individual events by which people formulate associations at a small scale level within their lived landscapes. As landscapes are understood to be transformed by the people who inhabit it through time, the evidence of past human activities are still present in landscape settings for contemporary individuals and groups to formulate ideas about (Ingold 1993). The consistent reuse of commemorative material, either in the form of ashmounds and megalithic monuments at numerous locations in the South Indian landscape (Johansen, 2004; Morrison et
serve to indicate that human groups in Indian prehistory had an awareness of temporal past, utilising its remains to construct their lived contexts. In a similar vein, the deliberate interaction with rock art panels at Maski, either through superimposition layers, or the manipulation of pre-existing motifs through rejuvenation, modification or obliteration (described earlier in this section), suggests that rock art production was a means to communicate and negotiate an awareness of the past for groups of people inhabiting this landscape.

In this way, activities within landscape settings can be seen as socially embedded, both subject to displaying and negotiating a personal or group awareness of time within a current place, therefore formulating aspects of their social identity. (Diaz-Andreau 2002). However, the degrees of conscious negotiation between landscapes, the activities embedded within them and the social audience is more difficult to ascertain (Bender 1993). Rock art at Maski is present within a densely inhabited archaeological landscape containing elements of developed and more ephemeral habitation practices, transitional burial traditions, commemorative features and metal working practices from the Neolithic through to the Medieval periods (Bauer and Johansen, 2015; Johansen and Bauer, 2013, 2015). These archaeological features demonstrate how different activities were emerging in the Maski landscape and evidence of transformative social changes occurring within South India more generally, affecting how people formulated social ideas about landscapes and their place within human groups (Bauer, 2011; Johansen and Bauer, 2018; Sinopoli et al., 2009). Rock art accumulations with multiple levels of superimposition exist with previously occupied rock shelters containing ephemeral Iron Age and Medieval deposits, sporadic habitation in these areas could provide the conditions for producing and interacting with rock art as a physically accessible means of negotiating a social identity to place within the prehistoric and historic periods of South India.

As chapter six, section 6.4 has demonstrated, there is a preponderance towards producing cattle motifs across all landscape contexts at Maski, but there are graphic differences in vocabulary used to portray different forms of cattle, see Chapter seven, section 7.5 for detail and the rest of this discussion in Chapter eight, section 8.3.3. As McDonald (2016) has argued, the repetition of the same overall recognisable motif form, and the variations in portraying it, can be argued
to communication both broad social aims and differential means of understanding by portraying variation of details in the same design. The presence of cattle at all superimposition phases of rock art documented at Maski allude to the importance of cattle at different time periods in the archaeology of South India, and coincides with archaeological evidence from multiple sites in South India (Allchin, 1963; Balasubramanya, 1995; Boivin et al., 2005; Chandramouli, 2012; Paddayya, 2011). These strands of evidence imply that concerns about cattle are socially embedded throughout the prehistory of South India and producing rock art motifs of cattle was one mechanism for displaying concerns and ideas about a vital resource. However, the multiple ways of presenting cattle, using a variable vocabulary of producing horns, limbs, what they are associated with and where they are placed in the landscape indicate that ideas about cattle have not remained consistent over time, and these changes in ideas were communicated across multiple landscape settings.

The final chapter draws together the discussion points presented in this thesis regarding the complexity of rock art in the Maski landscape. It draws together key themes for understanding human-animal relationships throughout the prehistoric period in South India. It also presents some ideas for future work stemming from this doctoral research.
Chapter Nine. Conclusions

This chapter describes some of the conclusions drawn within this thesis. It also presents ideas for future research which may assist in expanding the scope of conclusions drawn within this research project. The conclusions described in this chapter are significant for future methodologies of rock art documentation within the Indian subcontinent. Additionally, concluding statements are suggested for how the rock art in this specific region can aid understandings of anthropomorphic and animal relationships during the prehistory of South India, contributing to archaeological understandings of this region.

This thesis has acknowledged the importance of implementing rock art documentation procedures that are cost-effective and easily replicable in numerous geographical contexts. Efforts were made to implement a rock art documentation procedure which provided a level of objectivity to motif identification or sequencing, and could be critically assessed off-site with image enhancement software. Primary fieldwork documentation procedures focused on gaining information about geographical contexts and associated archaeological features, so as to provide spatial connections with rock art sites as part of an intensely modified landscape. Additionally, observations about spatially proximal landuse practices were helpful in assessing conservation concerns for rock art motifs at various locations around the Durgada Gudda outcrop.

The ability to fully connect rock art sites with other archaeological assemblages in a localised landscape setting was made possible due to the author’s involvement with MARP. This doctoral research forms the most comprehensive documentation of rock art at Maski to date, connecting motifs, panels and rock art sites with local archaeological landscape contexts. Utilising contextual archaeological data with a focused rock art documentation project, relationships between previously occupied rock shelters and sequences of rock art at specific sites have been convincingly aligned to Iron Age contexts in South India. This thesis therefore advocates the inclusion of rock art documentation projects within archaeological research projects, as the two can provide mutually beneficial answers to both long-term landscape use and communication practices within landscape settings.
The use of fieldwork photography at site to motif scale, analysed through off-site image enhancement software Dstretch©, also enabled additional panel rejuvenation, modification and obliteration events to be identified as a form of interaction with rock art panels through time. At the time of documenting the petroglyphs presented in this thesis, the use of Dstretch© was considered an experimental effort at image enhancement, and a growing number of publications have advocated the use of Dstretch© for petroglyphs in addition to paintings (Defrasne 2014; Le Quellec et al. 2015). Ideas for future work could focus on an advanced means of image manipulation through Dstretch©, beyond the application of preset colour spaces. As demonstrated in Chapter seven, Dstretch© colour spaces (LAB, YRD and LRD) elucidated interesting patterns in motif sequencing and additional interaction markings. Further manual manipulation of the elements constituting these colour spaces may assist in the continual improvement of rock art visualisation procedures for off-site analysis. Future work with Dstretch© could also involve using a sample of enhanced images and gaining multiple perspectives on how an image is interpreted from a selected study group, thereby providing a means to assess group subjectivity when it comes to rock art identification practices.

It is acknowledged, within the confines of this thesis, that the rock art at Maski was documented using formal or objective archaeological data gathering methods. This was due to the understanding that rock art was not consistently produced by the communities currently inhabiting the local landscape. With formal methods it is appropriate to gather spatial landscape patterns and subsequent hypotheses regarding motif and panel placement, followed by long-term motif accumulation. This thesis has also presented a wide range of rock art information available at Maski from an empirical stance. Interpretations of meaning are focused on the temporal and social significance of certain elements of rock art production, focusing on spatial associations with archaeological features to animal and anthropomorphic motifs. These interpretations were informed by currently accepted archaeological knowledge about South India. Therefore, detailed explanations regarding other abstracted motif forms, motif specific production reasons, remembered production events or ethnoarchaeological comparisons were not investigated within this thesis.
The current trends for rock art documentation and interpretation, advocated by the Rock Art Society of India, demonstrate an emphasis on ethnographic or ethnoarchaeological comparison for rock art documented within the Indian subcontinent. Future work at Maski could examine the suitability of using ethnoarchaeological comparison to further interpret the content of motifs and reason for their contextual placements in the local landscape. Additionally, investigations regarding local community understanding of rock art in the region could be introduced. This would aid contemporary identification and interpretation of rock art at Maski, assisting in assessing the extent and applicability of rock art conservation measures.

Moving beyond methodological conclusions for rock art documentation, a number of conclusions can be drawn relating to rock art arrangement, spatial patterning and visualisation at Maski. These conclusions can also be used, within the context of MARP, as part of a continuing investigation into human interactions and transformations of landscape throughout the prehistoric and historic periods. Firstly, this thesis has presented, through a quantitative proportional breakdown of motifs, the dominance of cattle forms throughout the total corpus of rock bruising documented at Maski, coupled with anthropomorphic and abstracted designs making up the second and third most populous categories.

The use of motif description using objective attribute features, as in the case of cattle motifs presented in this thesis enabled the cataloguing of distinctive visual features within a single motif category which would otherwise have been blanketly recorded as ‘bull.’ This enabled stylistic distinctions between cattle motifs to be identified and compared within a single motif category. The resulting visual details are used as evidence for understanding the transformative relationship between humans and cattle during the prehistoric and historic periods in South India. Most significantly, by using objective identification procedures for cattle motifs, this thesis questions how far theories about rock bruising representing bulls could be understood to be linked to the symbolic reproduction of male fertility, when the overwhelming percentage of cattle motifs could only be objectively identified as bovine forms.

Style type ‘A’ is known from a small number of examples (seven in total) and its occurrence is restricted to one activity zone described in this thesis (D). There are more examples of style type ‘B’ and ‘C’ located on rock slopes and
elevated outcrop contexts. Each of these style types have their own graphic vocabularies in the different attributes that can be identified as cattle, culminating in style type ‘C’ with the formalisation of standard cattle forms on stands. This result has important implications for developing the role of cattle within the prehistory of South India, already acknowledged from archaeological findings in the region (Allchin, 1963; Balasubramanya, 1995; Boivin et al., 2005; Chandramouli, 2012; Paddayya, 2011). It can be argued that changes in style types of the same identifiable motif can be communicative of a change in attitudes that social groups had about cattle throughout the prehistoric periods in South India. That this attitude was visualised in a specific style type, which was then subject to change as human relationships with cattle, changed from understanding of the species as a wild animal, to a modifiable, yet valuable, resource.

There are also other style types ‘D and E’, demonstrated in fig 7.74, p300, which have small sample sizes (four and seven motifs respectively). They are restricted to specific panels in the Maski landscape, but they also demonstrate a stylistic variation in the production of cattle motifs. This could indicate an episodic means of communicating ideas about cattle distinct from information communicated in style types ‘A - C’. However, these motifs are difficult to chronologically sequence and with such small sample sizes, it is not possible to take this point further.

Although the vast percentage of rock art at Maski consists of bovine forms with levels of anthropomorphic interaction, there are sporadic occurrences throughout the identifiable rock art corpus of other faunal motifs in intra panel placement relationships with anthropomorphic figures. The documentation of panels depicting ‘narrative scenes’ of elephants and feline involvement, discussed in section 8.3.2, demonstrates the rock art at Maski was also produced for additional purposes other than the portrayal of bovine forms. These scenes possible serve to communicate other aspects of human and animal relationships, situated in accessible landscape locations, with wide angles of view from panels. However, the specific reasons for the production of these complex scenes remains unknown, as is evidence for the archaeological presence of feline or elephant species in Northern Karnataka.
Whilst the content of this thesis has provided a quantitative breakdown of motif categories, it has also attempted to provide some spatial patterning regarding the locations of rock art panels at Maski. The vast proportions of rock art sites are situated on rock slope and elevated tor outcrop areas, focusing on the Durgada Gudda outcrop. However, there are instances of small scale rock art production on low relief tor inselbergs in peneplain settings. The choice of geology for motif production and panel creation did not seem to be a deciding factor, but rather the availability of an adequately sized surface was significance for rock art production. Results from a broad spatial analysis have demonstrated a spatial proximity with previously occupied rock shelters containing moderate to dense scatters of Iron Age diagnostic material, along with Medieval and modern period ceramic sherds. However, comments about a causal relationship between previously occupied rock shelters and rock art production can only be hypothesised, rather than proven at this time.

Currently, it is also not possible to say state with any certainty the specific nature of temporal or spatial relationships between rock art sites and many of the other forms of archaeological activity such as burial sites, metal working sites, settlements or water retention areas present in the Maski landscape. A slight visual connection was noticed during fieldwork that megalithic sites are visible from various compass directions around some rock art sites. An area for future work could involve a study of intervisibility between identified megalithic and rock art sites, to examine if there were ground for hypothesising a visible connection between these two forms of archaeological feature.

Statements regarding the spatial connections between rock art sites and other archaeological features are only suggestive at this point and are reflective of the author’s involvement in the MARP project at the time of field survey. The MARP project is ongoing, it is hoped that future excavations around rock art sites at the Durgada Gudda outcrop could be incorporated into MARP, as a means of assessing the temporal significance of rock art through time. Additionally, further investigation at MARP 82, if possible, would add to both the known rock art corpus at Maski and provide comparative evidence of rock art between previously occupied rock shelters and more permanent Iron Age settlement areas. Finally, future work utilising rock art documentation data, collected during the course of this thesis, could analyse the content, spatial relationships and contextual
settings of motifs recorded as ‘abstract.’ This would provide a way of assessing their location patterning and possible significance within the corpus of rock art at Maski.

This thesis has been able to state how rock art sites, that are spatially proximal to Iron Age deposits, often have certain panels which bear multiple motif production phases in complex accumulations. These panel accumulations have been instrumental in producing the visual stylistic sequencing of rock art panels in Chapter seven, attempting to provide some chronological indicators of rock art production through time. It is possible to state that distinctive visual styles of types ‘A - C’ are chronologically significant for sequencing cattle motifs at Maski. This finding may have implications for other regions in Northern Karnataka that have a similar corpus of rock bruisings, if comparable documentary surveys are undertaken in the future. The sequencing of panels in section 7.4 also adds to the number of panels possessing intra-site sequencing in the documented rock art of Northern Karnataka. They provide an enhanced means of assessing the suitability of current chronological sequencing models based on style. However, the incredible variability present in the attributes of recorded motifs, coupled with the common pattern of producing a single motif on an available surface, means chronological sequencing is still unattainable for a large proportion of the rock art at Maski.

This thesis has also demonstrated that the use of patination colouring as an indicator of relative age looks increasingly unreliable when localised environmental conditions and panel morphology are taken into consideration for each motif. The increasing unreliability of utilising patination colouring as an indicator of relative age is further suggested due to evidence of interaction markings occurring on motifs following an initial production phase, meaning there are multiple patination shades within a single motif. Whilst these findings have meant further limitations for the chronological sequencing of rock art at Maski, it has provided an understanding about how motifs have been interacted with through time, through means of rejuvenation, modification or obliteration of motifs by other visual forms. This finding implies that in the local Maski landscape rock art motifs, whether directly or indirectly, formed a means of communicating specific ideas at a landscape level. These ideas were continually negotiated through the placement and transformations of motifs in numerous landscape
settings, reflective of the shifting relationships people inhabiting the landscape had with animals present within it.

If rock art at Maski can be argued to represent a continual negotiated communication between human populations who inhabited this landscape and their differing relationships with animals, then it is possible that this idea could be adapted for other areas of Northern Karnataka which bare a similar motif corpus. Archaeological evidence from South Indian Neolithic ashmound sites, in the form of cattle dung and bovine faunal evidence, highlight the multi-faceted importance of bovines (Allchin 1963; Johansen 2004; Paddayya 1991; Paddayya et al. 1995). The extent to which large proportions of rock bruisings in open air contexts are indicative of communicating ideas about the long process of cattle domestication through variations in motif forms throughout the prehistoric period is plausible.

This significance is also argued to continue into the South Indian Iron Age period at sites such as Kadebakale, which exhibit ritually enacted cattle burials along with faunal evidence for ceremonial bovine consumption (Bauer 2007; Morrison et al., 2016 250). Although these forms of archaeological evidence highlight the symbolic importance of cattle, their utility in producing secondary food sources and as traction for large scale landscape transformations also ensured their long-term recognition as animals integrated within social life in Northern Karnataka (Bauer 2007). The rock art of the prehistoric period may have been part of a means of communicating ideas about the transformative role of cattle in the social lives of humans, physically acknowledging that transformative role by interacting with preceding cattle motifs in specific landscape contexts.

Additionally, the rock art at Maski highlights a deliberate placement of singular anthropomorphic forms over bovine motifs. As this thesis argues that rock art is one process of communicating information in specific landscape settings (McDonald 2016, Domingo-Sanz et al. 2016), it is likely that the deliberate placement of singular human anthropomorphic forms over bovine motifs may indicate a shift in attitudes about what rock art was intended to communicate, and what this meant for changes occurring during the prehistoric period in South India. As demonstrated in Chapter two, section 2.2.1, transformations in the nature of megalithic construction (Bauer 2011), spatial evidence for the control over specific resources (Johansen and Bauer 2018) and controlled routes of movement within habitation settlements (Johansen, 2011;
Morrison et al., 2016; Sinopoli et al., 2009), attest to the development of social inequalities during the South Indian Iron Age, based on the ability of segments of social groups to control these elements of human-landscape activities.

As deliberate superimposition or layering of motifs on a rock surface highlights a connective engagement with the past by interaction and modification of the motifs that precede them (Coles 2002; Recalde and Navarro 2015). With regards to the Argentinian example, presented in Chapter two, section 2.4.3, pp 64-67, the superimposition of new motif forms utilising existing design schemes is argued to represent a calming of social tensions by bringing new social information under the control of pre-existing rock art communication methods (Recalde and Navarro 2015). Therefore, it could be argued that the deliberate change in motif production content was based upon communicating wide ranging social information using pre-existing techniques (such as rock art production), changing the focus from communicating concerns about the social relevance of cattle, to one explicitly directed to anthropomorphic concerns, emerging due to the development of social inequalities mentioned above. Further research into deliberate placement of motif forms over pre-existing designs may provide further evidence in how the production of rock art within Northern Karnataka was integral to communicating shifting social attitudes during the prehistoric periods.

The presence of a range of motif forms and panel combinations at Maski suggests that rock art had a range of communicative purposes, in addition to displaying the long-term significance of cattle. Although the more varied forms of motifs are difficult to sequence chronologically, they suggest how rock art was produced and interacted with, in both formalised and spontaneous ways, arguably by multiple groups of people in an inhabited landscape. The production of a rock art motif in an accessible setting has the physical capacity to be encountered by a wide range of people. Subsequent interactions with motifs post-production may have different meanings for the people who encountered them through time, than the producer originally intended.

Whilst a limitation to the conclusions drawn in this thesis is that they are reflective of one small region in Northern Karnataka, focusing on bruisings as a specific technique of rock art production, the methodology in this thesis can be incorporated into other known prehistoric sites in Karnataka. The identification of rock art accumulation areas have been briefly observed at sites such as
Tekkalakota, Piklihal, Kadebakale and Budihal in the Karnataka region, and the methodology advocated in this thesis could be adapted to document rock art at each location in a more detailed capacity. Furthermore, there is a degree of published archaeological survey material for all these sites in question. A multi-scalar effort of rock art documentation would provide comparative information for the conclusions drawn in this thesis, enhancing archaeological understanding about the role of rock art production processes as landscape interactions in South India. Additionally, an investigation of rock art sites along the boundaries of geological zones would provide a means of assessing if geomorphological and environmental factors shape rock art production practices within the Indian subcontinent. As advocated by Korisettar (2014), this would contribute to an enhancement of rock art studies beyond modern state boundaries.

Finally, this thesis was constructed as part of an umbrella project investigating the intangible heritage of the Indian subcontinent. There is a continually growing number of rock art sites being documented in the Indian subcontinent. Coinciding with increased documentation are numerous attempts to access the underlying meaning of enigmatic motifs, with an awareness that the meaning of rock art production is often intangible to modern audiences. This thesis has presented the tangible aspects of rock art at a small region in South India, utilising spatial archaeological information and thorough, objective recording practices. It has found evidence of complex rock art interaction phases and suggested possible reasons for its significance as a long standing practice situated within transformative understandings of landscape.

The rock art at Maski is a physical remnant of repeated intangible events, occurring from the Neolithic to modern periods. It is a form of human landscape interaction that may increasingly become intangible due to the speed of resource extraction in the Maski area. The continued cataloguing of rock art remains a significant concern for the documentation and archival survival of complex intangible heritage present within the subcontinent, integral to visualising how past human groups developed relationships with their situated landscapes. An element of future work at Maski could involve revisiting documented rock art sites to assess the extent of continued panel existence, noting any enhanced concerns for its continued survival.
Rock art sites around the world constantly juggle the delicate balance of continued existence and adequate conservation of sites, against the divergent views of landowners, landscape developers and overarching factors of globalisation. Whilst sites are constantly being rediscovered and publicised, many others will be destroyed. Focused, technical documentation of rock art sites at multiple scales, demonstrated in this thesis, gives future researchers and local communities the tools to publicise the complexity of human interaction with images in landscape settings, indicative of patterned and idiosyncratic ways that people inhabit their lived landscapes through time. The motifs and their production locations demonstrate that the visual material remnants of human activity are continually charged and complex, often ambiguous in their interpretations yet profound in their potency.
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