CHAPTER 9 RESULTS: SHELL BEADS

9.1 Introduction

Beads manufactured from shells are the most frequently occurring objects in my sample. Not only do they appear in higher numbers, shell beads are more widely distributed than beads manufactured from other raw materials. This chapter will provide the classification and distribution of shell forms in my sample. The shell sample will be divided into the two main classes, then into forms and variations of forms. The relationship between forms is determined by shape, size and the method of stringing. The frequency and distribution of each form will be tabled and plotted on maps, first with Geoscience drainage division and, where smaller units are required, Horton's spatial units. Spatial distribution within locations will be discussed last. Tables that are too wide to display in the document will be placed in appendices. I will discuss the differences in spatial units in each section. From this chapter, I will determine the variation within shell beads and patterning in distribution of forms. I will provide metric analysis of shells and degree of decoration in Chapter 10.

9.2 Classes of shell beads

The sample contains 557 objects that have been manufactured from shell. This represents over half of the beaded ornaments recorded for the whole sample. The distribution of Class 1 (series) and Class 2 (pendant) shell objects is presented in Figure 9.1. The blue arrows indicate outliers. The location in the Timor Sea drainage division is Kimberley unprovenanced and is not a specific location. I nominated latitude and longitude for a central position within the Kimberley area and that position does not pin-point the exact location. However, the second arrow in Central Queensland points to a specific collection point.

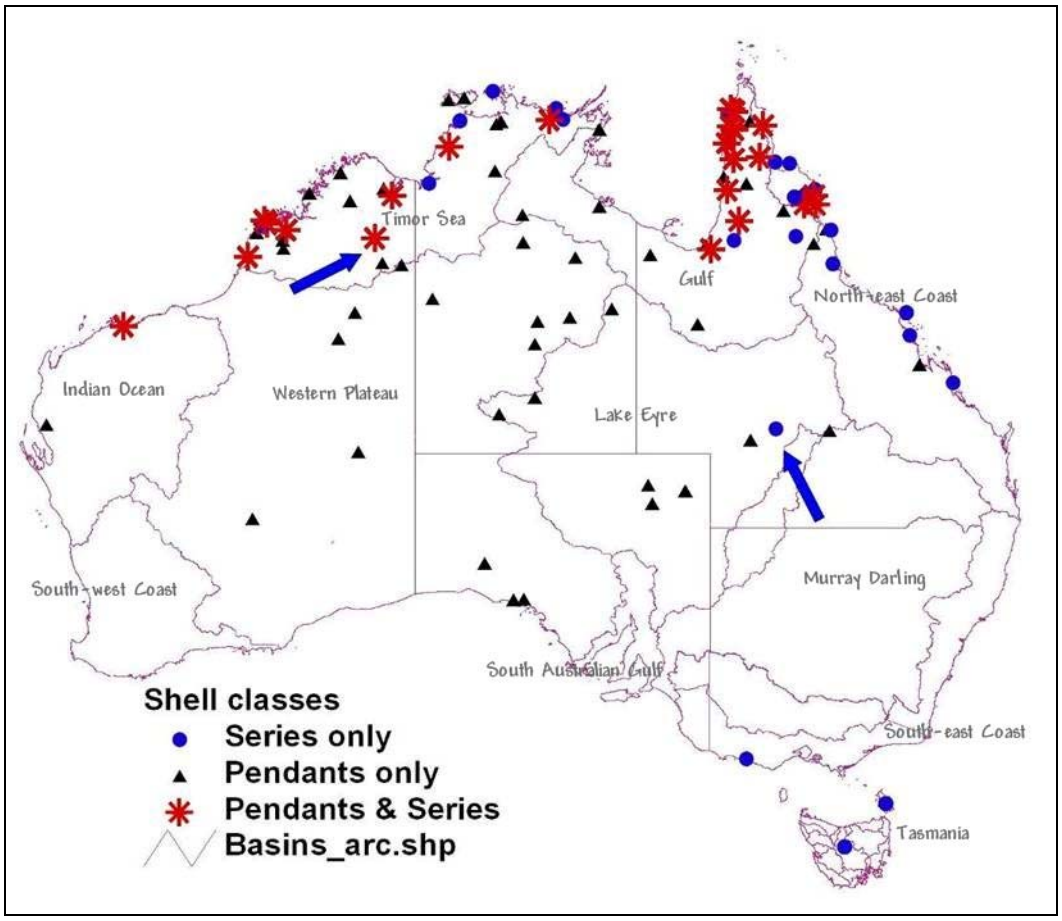

Figure 9.1. Distribution of shell classes

Pendant objects are more widespread across the continent than series but no shell pendants were collected from Tasmania. Series shell ornaments are mainly concentrated along the northern Australian coastal fringes and at the southern end of the continent - in Victoria and Tasmania. Locations with both series and pendants manufactured from shell are clustered in Cape York and along the north and north-western coastline of Australia. At the major class level, Class 1 (series) objects are not spread far from the coast. The spread of series around the coast could indicate they were used for local use and exchange over shorter distances. Distinct to that, pendants are distributed from the top of Australia, through the centre and down to the southern coast of South Australia. This could mean that the shell pendants were manufactured for a different purpose. Whether that applies to all raw materials and forms within those classes will be investigated in this work.

9.2.1 Classes and shell species

The sample contained nineteen different shell species. The frequency of shell species is presented in Table 9.1 (common and scientific names where possible). Materials

manufactured into both pendants and series only are listed first, followed by series only then pendants only.

Table 9.1. Frequency of classes and species

Material	Series only	Pendants only	Series & pendants
Pearl (pearl, oyster, mussel shells)	60	221	281
Nautilus sp.	43	10	53
Sundial (*Architectonica* sp.)	1	3	3
Tusk shell (Scaphopods – includes *Dentalium* sp.)	81	0	81
Olive shell (*Oliva* sp.)	18	0	18
Maireener (*Phasianotrochus* sp.)	12	0	12
Land snails	5	0	5
Rice shells (*Truncatella* sp.)	5	0	5
Black crows (*Nerita* sp.)	2	0	2
Strombus campbelli	2	0	2
Toothies (*Aninula* sp).	2	0	2
Ark shell (*Arca* sp.)	1	0	1
Cats teeth (*Rissonia* sp.)	1	0	1
Cerithiidae family	1	0	1
Crayfish legs	1	0	1
Penguin (*Austroginella* sp.)	1	0	1
Top snails (Trochidae family.)	1	0	1
Baler shell (*Melo* sp.)	0	74	74
Cone shell (*Conus* sp.)	0	12	12
Total	**237**	**320**	**557**

Both series and pendants are made with pearl shell, *Nautilus* sp. and sundial shells. The remaining species are either series or pendants. There is a lot more variation in species for objects manufactured into series than those made into pendants. Pendants add up to over 57% of the sample. Only pearl shell, tusk shell, *Nautilus* sp. and one sundial shell were used to manufacture both classes. Of the pendant objects, a high percentage (c. 69%), were manufactured from pearl shells. I have included the two series objects that have been identified at the Queensland museum as mussel shell (*Velesunio* sp. - QE.1787 & QE.749.5) with pearl shells. Those two objects were from Gilbert River and Mitchell River in the Gulf. I will note their difference within the forms for those objects. I included them in the pearly shell because there was nothing unusual about their form or distribution other than the fact that mussels are available inland.

The most frequently occurring species in the sample are pearl shell, tusk shell, baler shell, *Nautilus* sp., olive shell, maireener shell and cone shell. Two of the cone shell ornaments

(registered numbers X-44575 & X-44575) were listed in the Museum Victoria register as having been collected at Roebourne, Western Australia. However, Kim Akerman (comments in Museum Victoria register) has challenged this provenancing and believes this style of ornament is specific to Cape York. This will be considered when interpreting the distribution of the data.

The distribution of the most frequently occurring shell species is presented in Figure 9.2. When shell objects are plotted using the most dominant shell species, a distinct pattern emerges.

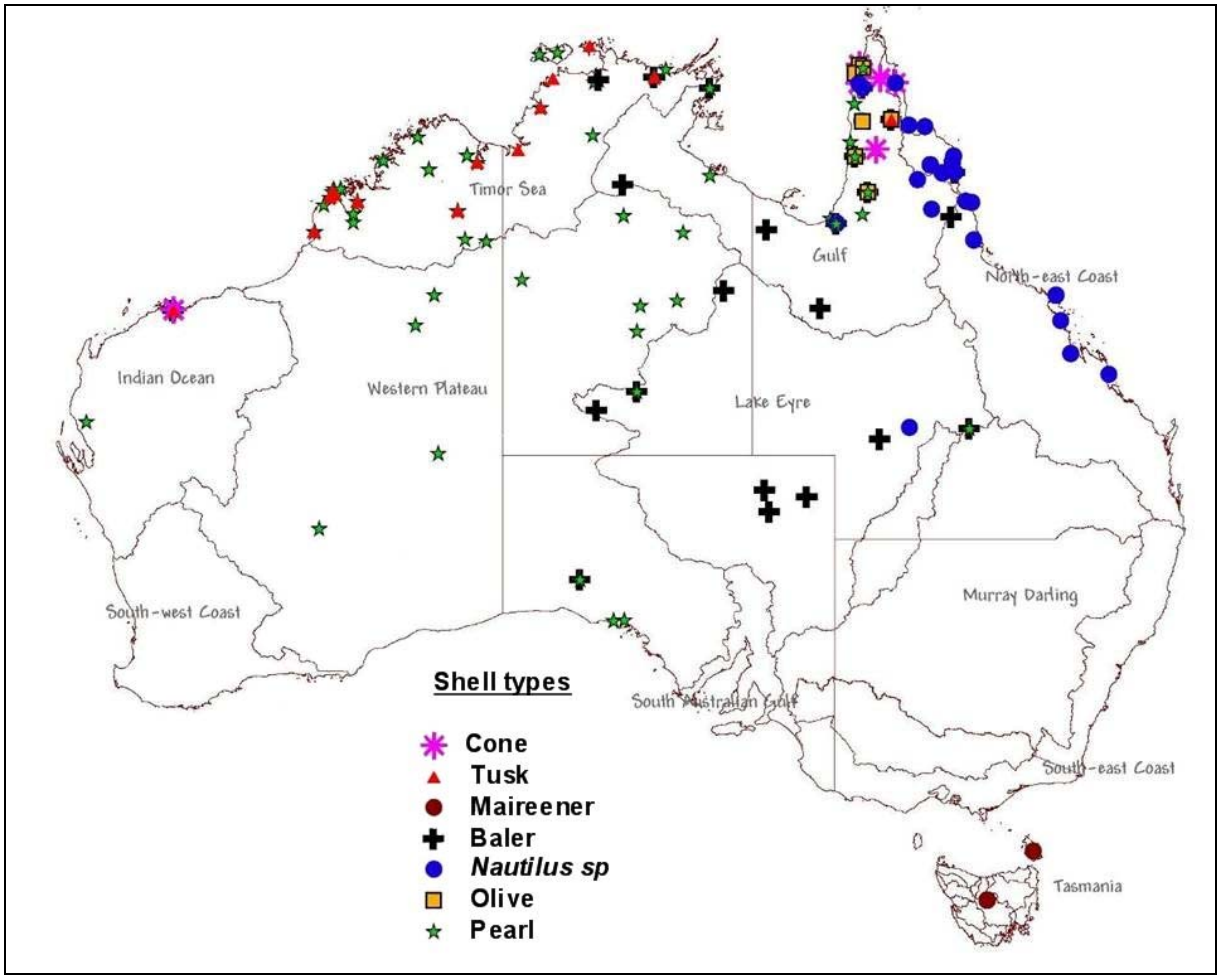

Figure 9.2. Distribution of most dominant shell species in sample

Patterning of shell species is evident from Figure 9.2. The distribution will be presented in more detail within the sections describing forms. The relationship of shell species and drainage divisions is summarised in Table 9.2 and with Horton's units in Appendix 11 and

locations in Appendix 12**.** From this point on, I will refer to Horton's units only when there is a distinct pattern within a drainage basin that is related to Horton's units. I consider Horton's units, particularly with Timor Sea (Arnhem, North, Fitzmaurice and Kimberley), a more useful way of looking at the spread of data rather than the larger drainage basin. Aside from the different language groups, Arnhem is different environmentally to the Kimberleys. Much of the patterning occurs in contiguous areas. I will describe the spread from the area with the highest frequency then through contiguous areas. I do not mean that the area with the highest frequency is the source, just that the numbers are smaller away from that area. I have persisted in using the drainage divisions throughout this work because of my interest from past studies about their use in material culture studies.

Table 9.2. Shell species and Geoscience drainage divisions

Shell species	Gulf	Indian Ocean	Lake Eyre	Murray Darling	North-east Coast	South-east Coast	Tas-mania	Timor Sea	Western Plateau	Total	No. of drainage divisions
Pearl shell	92	6	1	1	6	0	0	148	19	273	7
Tusk shell	3	1	0	0	0	0	0	77	0	81	3
Baler shell	26	3	23	1	1	0	0	19	1	74	7
Nautilus sp.	24	1	1	0	35	0	0	0	0	61	4
Olive shell	18	0	0	0	0	0	0	0	0	18	1
Cone shell	9	2	0	0	1	0	0	0	0	12	2
Maireener	0	0	0	0	0	0	12	0	0	12	1
Land-snails	0	0	0	0	0	0	0	5	0	5	1
Rice shell	0	0	0	0	0	0	5	0	0	5	1
Sundial shell	3	0	0	0	0	0	1	0	0	4	2
Black crow	0	0	0	0	0	0	2	0	0	2	1
Strombus sp.	1	0	0	0	1	0	0	0	0	2	2
Toothies	0	0	0	0	0	0	2	0	0	2	1
Ark shell	1	0	0	0	0	0	0	0	0	1	1
Cat's teeth	0	0	0	0	0	0	1	0	0	1	1
Cerithiidae.	0	0	0	0	0	0	1	0	0	1	1
Crayfish legs	0	0	0	0	0	1	0	0	0	1	1
Penguin shell	0	0	0	0	0	0	1	0	0	1	1
Top snail's	0	0	0	0	0	0	1	0	0	1	1
Total	**177**	**13**	**25**	**2**	**44**	**1**	**26**	**249**	**20**	**557**	**na**
No. of species in drainage division	**9**	**6**	**3**	**2**	**5**	**1**	**9**	**4**	**2**	**na**	**na**

Tasmania and the Gulf have the greatest variety of shell species and Southeast Coast the least variety. From Figure 9.2, Appendices 11 and 12, and Table 9.2, the raw material distribution is explained below.

Tusk shell - 81 ornaments were spread from West Cape York (West Cape) to Roebourne in Northwest region:

- **Drainage division (3 divs.)**. Most were collected from the Timor Sea drainage area and isolated examples from Gulf and Indian Ocean. Patterning is present at this level.
- **Horton's units (7 divs.)**. Tusk shell beads found in Timor Sea division are predominantly located in Kimberley area (64), with nine ornaments in Arnhem and only two each in North and Fitzmaurice. Patterning is present at that level.
- **Locations (15 locs.).** Tusk shell beads are predominantly from Lombadina Mission (20), Broome (13), and King Sound (12) in the Kimberley followed by Arnhem region (9). The major locations in Kimberley are within the Dampier Peninsula and tusk shell ornaments are clustered in that area.

Maireener shell (all series) confined to Tasmania and Furneaux Islands – patterning at drainage division level.

All **baler shell** beads are pendants and mainly distributed in contiguous regions from Arnhem (21), around the Gulf (17) to West Cape York (4).

- **Drainage divisions (7 divs.).** From the Gulf, baler shell ornaments appear to the south in Eyre and further west and south to the boundary of Lake Eyre and Western Plateau drainage divisions. Single items appear in Western Plateau, Northeast and Murray Darling. Three objects were collected from the coast of Indian Ocean. Examples are mainly within contiguous divisions Gulf, Lake Eyre and Timor Sea, with only a few objects crossing the watersheds into other divisions. Boundaries between Lake Eyre and neighbouring units may be a factor in some of the distribution.
- **Horton's divisions (9 divs.).** Almost all of the baler shell ornaments recorded in Timor Sea division were from Arnhem (21) with only two objects in adjacent North and none south of there. On the eastern side, adjacent areas Gulf had seventeen objects and only four in West Cape York. Patterning appears at this level for Arnhem and Gulf.
- **Locations (23 locs.)**. The majority of objects within Arnhem are unprovenanced (17) and four from Caledon Bay. Within Gulf the highest number were collected from Staaten River (11) and Normanton (3) to the south. Cooper Creek had ten baler shell objects. Small samples, generally one object, were collected from Ooldea in the southern end of Desert region, Roebourne in Northwest region, Minnie Downs on the boundary of Riverine and Eyre regions, and Bloomfield River in East Cape (East Cape). Patterning does not appear at local level.

***Nautilus* sp.** shell ornaments were collected from five drainage divisions but largely concentrated on Cape York and down the eastern Queensland coast.

- **Drainage divisions (4 divs.).** *Nautilus* sp. beads are almost exclusively in Gulf (24) and Northeast (35) with one example in each Indian Ocean and Lake Eyre. Without the two outliers, patterning across the watershed between the two divisions but not into other divisions.
- **Horton's divisions (7 divs.).** Once again, most are in contiguous regions with the numbers radiating away from East Cape (24). *Nautilus* sp. objects spread south to Rainforest (5) and coastal Northeast (6). Also, there is a cluster of objects to the west in West Cape (15), south to the Gulf (9) and further south to one object from Barcoo River in Eyre. One outlier was collected from Roebourne in Northwest region in Western Australia. Patterning is across northern Cape York more than within Horton's units. However, this species is confined to contiguous divisions.
- **Locations (25 locs.)**. The only location with high numbers of *Nautilus* sp. examples is Normanton in the Gulf. Otherwise the objects are spread throughout the distribution in small numbers although the spread is in contiguous areas with the exception of one inland Queensland object.

The distribution of **olive shell** examples is restricted to western Cape York between Staaten River and Port Musgrave.

- **Drainage divisions (1 div.)**. All specimens are within Gulf drainage division.
- **Horton (2 divs.)**. All within West Cape (16) except for two objects from Staaten River in Gulf. However, the two Gulf objects could be in either division as Horton's boundary is not clearly defined, dividing the river into both divisions. There is some patterning within this level.
- **Locations (7 locs).** Ten of the eighteen specimens were collected from the Mapoon/Pennefather River area. The remainder are spread throughout West Cape and perhaps Gulf. Olive shell examples are localised to restricted area within those divisions.

Cone shell examples are clustered in northern Cape York with the exception of the two examples recorded from Roebourne (mentioned earlier in this section). I will not include those two objects in this analysis but they are a good example of how objects travel and the influences of those objects on the sample. One object was collected from East Cape York at Pascoe River, Iron Range, and nine from West Cape York. The provenanced objects

(Mapoon, Moreton Electric Office, Weipa and Pascoe River) are within an area less than 150 km east-west and 60 km north-south. Although in different drainage divisions, the locations are adjacent and there is a narrow watershed (c. 5 km) separating the easterly flowing Pascoe River and westerly flowing Wenlock River (see Appendix 7). The Wenlock River connects to watercourses that flow to Mapoon and Weipa on the west coast. People would have had access through those waterways.

- **Drainage divisions (2 divs.)**. The distribution crosses the watershed but only for one object. Otherwise cone shell ornaments are confined to Gulf.
- **Horton's divisions (2 divs.).** Only one object is distributed east of the boundary of West and East Cape. Otherwise these species are confined to West Cape.
- **Locations (5 locs.).** Ten objects are in a relatively small localised area.

Pearl shells have a wider distribution than any other shell species. When plotted in isolation, the extent of the movement of pearl shells is obvious. The series objects are around the coastline while pendants have travelled across the centre and down to the southern end of the continent. The spread of series and pendant pearl shell ornaments is plotted in Figure 9.3.

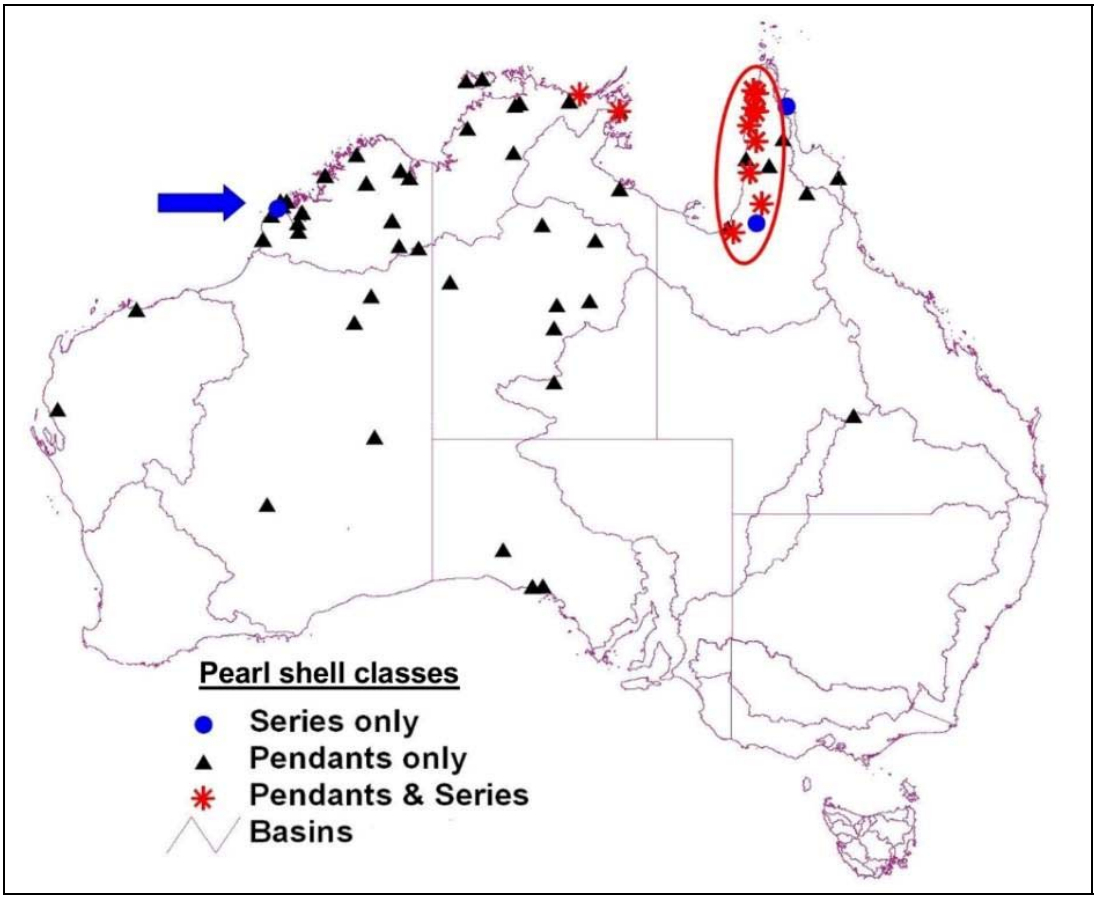

Figure 9.3. Distribution of pearl shell series and pendants

There is a cluster of locations with both series and pendants along the west coast of Cape York and the blue arrow identifies one outlier for series distribution. The number of pearl shell objects within drainage areas is summarised for drainage divisions in Table 9.3 and Horton's divisions in Table 9.4. Divisions containing both series and pendants are listed first.

Table 9.3. Frequency of pearl shell ornaments within drainage divisions

Drainage divisions	Series	Pendants	Total
Timor Sea	1	147	148
Gulf of Carpentaria	48	44	92
Northeast Coast	3	3	6
Western Plateau	0	19	19
Indian Ocean	0	6	6
Lake Eyre	0	1	1
Murray Darling	0	1	1
Total	**52**	**221**	**273**

The majority of pearl shells were collected from across northern Australia. Although widely distributed through the centre of Australia, smaller numbers were collected. One outlier is on the boundary of Murray/Darling and Lake Eyre Divisions in Central Queensland and two on the Central western coast of Western Australia. In general, the pearl pendants are confined to two areas: 1) Cape York; and 2) from Kimberley to Arnhem Land and south through Central Australia. The pearl pendants do not appear to cross the circumcision line from the west (with one exception).

- **Drainage divisions (7 divs.)**. Pearl shell objects cross many watersheds but are basically restricted to contiguous divisions Timor Sea, Gulf and Western Plateau. The highest numbers of pearl ornaments occur in Timor Sea drainage area (55%). All but one of the Timor Sea objects are pendants. The second highest number is found in the Gulf division (34%) where there is an almost equal division of both classes. The distribution of pearl ornaments from Western Australia appears to spread to the centre of Australia, whereas the pearl shells from the Gulf division do not. Gulf drainage division appears to be a factor influencing the distribution of pearl shell series. Not including the outliers, pendants have a wider distribution but appear to be confined mainly within the watersheds of Timor Sea, Gulf and Western Plateau.

Table 9.4. Frequency of pearl shell ornaments within Horton's (1996) divisions

Horton's (1996) divisions	Series	Pendants	Total
Kimberley	1	131	132
West Cape York	42	32	74
Desert	0	15	15
Gulf	6	9	15
Arnhem	0	8	8
North	0	8	8
East Cape York	3	3	6
Northwest	0	6	6
Spencer	0	5	5
Fitzmaurice	0	3	3
Riverine	0	1	1
Total	**52**	**221**	**273**

- **Horton's divisions (11 divs.)**. Within the Timor Sea division, almost all pearl shell ornaments were collected from the Kimberley (132). All except one of those objects are pendants. Within Timor Sea division, Arnhem, North and Fitzmaurice all have small samples of pearl shell pendants. Away from the Kimberley, the adjacent Desert area to the south has fifteen pearl shell pendants and Northwest has six pendants.
  - On the eastern side of Australia, West Cape York has the highest number of pearl shell ornaments (74) with fifteen in adjacent Gulf area to the south and six in East Cape York to the east. No pearl shell ornaments were collected from Horton's Eyre division. However, five examples were collected in Spencer to the south of Eyre - these might possibly have originated in Western Australia. Shell series are almost completely confined to around the Gulf.
- **Locations (63 locs.).** Lombadina Mission within Kimberley held the greatest number of pearl shell ornaments (36) with nearby King Sound next (23). Almost 70% of objects were collected from the Dampier Peninsula. The six objects from East Cape were from two locations. Three pendants were collected from Cooktown and three series from the Pascoe River area. Patterning is localised in that area. Four locations within Gulf held fifteen pearl shell ornaments but there was no clear patterning for pendants and series objects. The pearl shell ornaments cluster in Kimberley and around the Gulf, with lesser numbers in adjacent areas.

9.2.2 Summary of shell classes and species

The main results from this section are that, in my sample, shell series do not travel far from the coast and that available shell species determine the distribution and form. Excluding a few outliers, the only shell species that travel far inland are baler and pearl shell, and only when manufactured into pendants. Baler shell specimens are all pendants whereas ornaments made of pearl shell are both. However, the distribution for pearl shell pendants is independent from pearl shell series. Of the other species, only *Nautilus* sp. and sundial shells were manufactured into both series and pendants, cone shells were made into pendants only and the rest into series only.

In the main, objects from my sample that are manufactured from tusk shell do not travel far inland yet they have been found in Pleistocene archaeological sites that were 500 kilometres from the sea at the time they were deposited (Balme 2000; Balme and Morse 2006). Several tusk shell examples were recorded from the Kimberley region, however, the provenancing was too general to know at what distance from the coast these objects were collected.

There is a strong correlation between the movement of some shell species and major trunk trading routes (Chapter 3). *Nautilus* sp. shells are distributed along the eastern coast route, baler shells from Cape York and down to Lake Eyre and across to the watershed of Lake Eyre and Western Plateau drainage basins, and pearl shells appear to have two separate routes. Pearl shell objects from Cape York appear to be confined to coastal areas and down the Georgina River to Eyre region, whereas pearl shell from the Kimberley region travels through the desert region and down to Spencer region in the southern end of South Australia.

There is patterning within all three levels of spatial units for the distribution of shell species and classes but patterning is not the same for different species and classes. With the exception of pearl shell objects, the distribution for each species and class overlaps. Only pearl shell, *Nautilus* sp. and sundial shell are manufactured into both classes. That is, all the cone shell specimens are pendants; all the tusk shell specimens are series.

In the next section, I will nominate types or forms for shell objects recorded in this sample and investigate the distribution. Results of shell series ornaments are outlined first, then pendants.

9.3 Shell Class 1 (series) forms (SH01-SH05)

This class includes objects that consist of multiple whole shells or shell fragments that have been suspended in a series on one or more strands of fibre. I have defined five main forms for this class of shell ornaments (SH01 to SH05) with sub-forms assigned to variations within those forms.

9.3.1 Classification of SH01 form

One hundred and one SH01 forms were recorded. Objects categorised in the standard form SH01.00 display the following elements:

- whole shells or shell segments attached to a single continuous fibre by threading the fibre through an aperture that may be natural (e.g. tusk shell.) or modified (e.g. olive shell). This form is not exclusive to any particular shell species for specimens collected on mainland Australia. Because of the uniqueness of the sample from Tasmania, I have placed the objects from Tasmania in a separate category - SH05. I will give details of shell species as I discuss each form. Figure 9.4 illustrates a common SH01 form.

Figure 9.4. SH01 form tusk shell (WA-2689, Western Australian Museum)

9.3.1.1 Classification of SH01 sub-forms (SH01.01-SH01.04)

Variations to form SH01.00 include:

- **SH01.01:** pendant/s attached to series (Figure 9.5).
- **SH01.02:** composite materials (i.e. more than one main material) (Figure 9.6).
- **SH01.03**: manufactured from *Oliva* sp. and strung in a particular fashion. Roth (1910b: 38) describes the ornament 'The shells are strung vertically…upon a double top-string, and tightened together' (Figure 9.7).
- **SH01.04**: segments have been strung onto several strands of string that have tying strings attached at each end. The string may be one continuous strand that has been fixed permanently in place to appear as several separate strands (Figure 9.8).

Figure 9.5. SH01.01 tusk shell. with pearl pendant (A-3067, South Australian Museum)

Figure 9.6. SH01.02 olive, cone, crustacean shell and metal clips (E-6069, Queensland Museum)

Figure 9.7. SH01.03 olive shells (E-14676, Australian Museum)

Figure 9.8. SH01.04 tusk shells (E-14451, Australian Museum)

9.3.1.2 Distribution and frequency of SH01 forms

The frequency of SH01 sub-forms and species is summarised in Table 9.5

Table 9.5. Material species and SH01 sub-forms

Material species	SH01 00	SH01 01	SH01 02	SH01 03	SH01 04	Total
Crayfish legs	1	0	0	0	0	1
Tusk shell	63	13	2	0	3	81
Olive shell	6	1	5	4	2	18
Strombus campbelli	0	0	1	0	0	1
Total	**70**	**14**	**8**	**4**	**5**	**101**

The most dominant species for this form is tusk shell. The distribution of the sub-forms is shown in Figure 9.9.

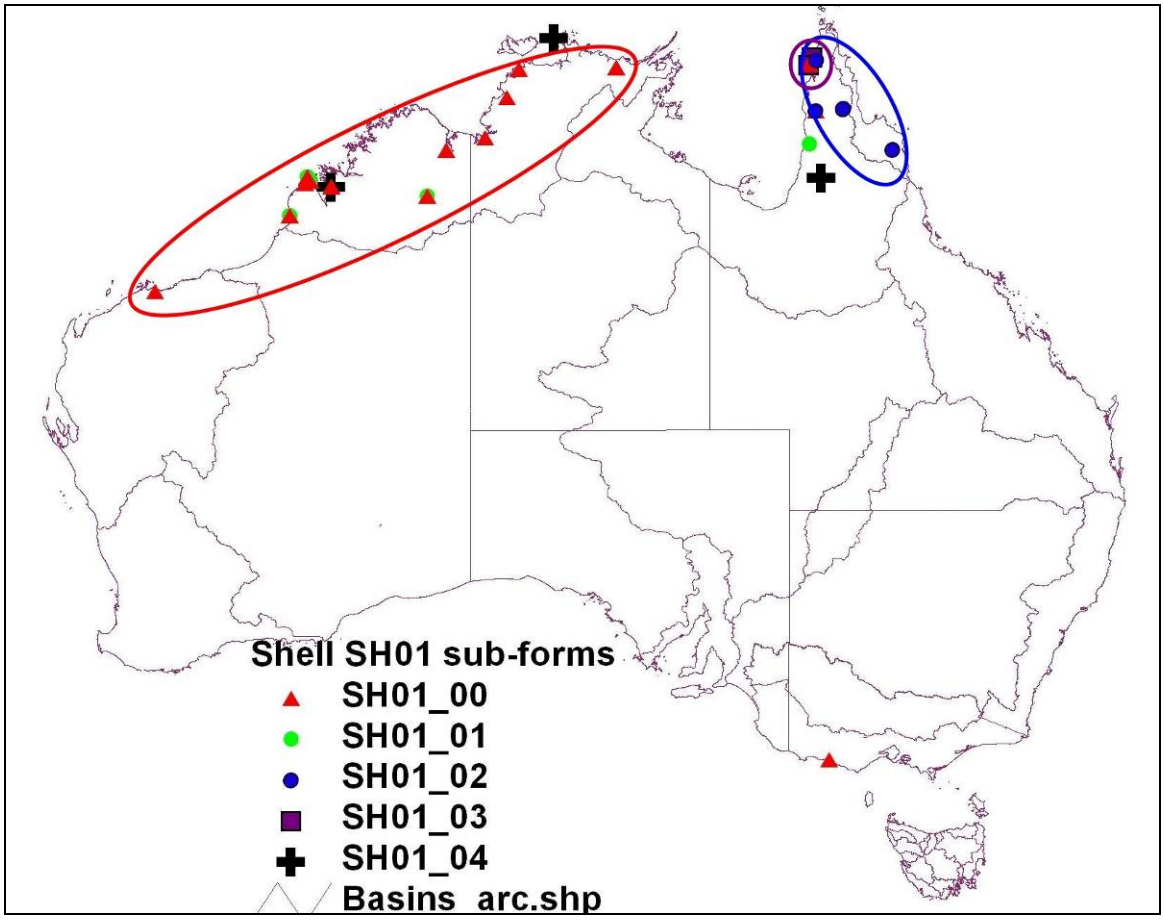

Figure 9.9. Distribution of SH01 forms

SH01 forms are predominantly located across the north of Australia. SH01.00 sub-forms are in the north and north western coastal areas of Australia, and the SH01.02 are in Cape York.

Frequency of sub-forms to drainage divisions is summarised in Table 9.6and to Horton's (1994) divisions in Table 9.7. The locations for each sub-form will be discussed after details of drainage basins and Horton's divisions.

Table 9.6. Frequency of SH01 sub-forms within drainage divisions

Drainage divisions	SH01 00	SH01 01	SH01 02	SH01 03	SH01 04	Total
Timor Sea	62	13	0	0	2	77
Gulf of Carpentaria	6	1	7	4	3	21
Indian Ocean	1	0	0	0	0	1
Northeast Coast	0	0	1	0	0	1
Southeast Coast	1	0	0	0	0	1
Total	**70**	**14**	**8**	**4**	**5**	**101**

Table 9.7. Frequency of SH01 sub-forms within Horton's (1996) divisions

Horton's divisions	Drainage division	SH01 00	SH01 01	SH01 02	SH01 03	SH01 04	Total
Kimberley	TS	50	13	0	0	1	64
West Cape	G	6	1	7	4	0	18
Arnhem	TS	8	0	0	0	1	9
Gulf	G	0	0	0	0	3	3
Fitzmaurice	TS	2	0	0	0	0	2
North	TS	2	0	0	0	0	2
East Cape	NEC	0	0	1	0	0	1
Northwest	IO	1	0	0	0	0	1
Southeast	SEC	1	0	0	0	0	1
Total	**na**	**70**	**14**	**8**	**4**	**5**	**101**

All of the SH01 forms were collected from coastal or near coastal areas. Those plotted within Kimberley in Timor Sea are provenanced to the broader level of Kimberley and may not be located as shown above. Each sub-form is discussed below in relation to locations.

9.3.1.2.1 SH01.00 distribution of form

Segments threaded onto a continuous loop.

The sample contained seventy SH01.00 forms. The frequency and distribution of SH01.00 forms is listed below in Table 9.8.

Table 9.8. Frequency and distribution of SH01.00 species

Locations	Horton (1996) & drainage division	Crayfish legs	Tusk shell	Olive shell	Total
Lombadina Mission	K (TS)	0	15	0	15
King Sound	K (TS)	0	11	0	11
Broome	K (TS)	0	10	0	10
Arnhem Land unprovenanced	A (TS)	0	8	0	8
Kimberley unprovenanced	K (TS)	0	4	0	4
Mapoon	WCY (G)	0	0	4	4
Wyndham	K (TS)	0	4	0	4
Cygnet Bay	K (TS)	0	3	0	3
Pender Bay	K (TS)	0	3	0	3
Darwin	N (TS)	0	2	0	2
Archer, Kendall & Holyrod Rivers	WCY (G)	0	0	1	1
Daly River	F (TS)	0	1	0	1
Pennefather River	WCY (G)	0	0	1	1
Roebourne	NE (IO)	0	1	0	1
Victoria River	F (TS)	0	1	0	1
Warrnambool	SE (SEC)	1	0	0	1
Total	**na**	**1**	**63**	**6**	**70**

The majority of SH01.00 objects (63) were manufacture with tusk shell and collected from the Kimberley and Arnhem areas within Timor Sea drainage division. No tusk shell objects were collected from Cape York, all the objects collected from the west coast of Cape York were manufactured with olive shells. The only object from southern Australia was manufactured with crayfish legs. The patterning is described:

- **Drainage divisions (4 divs.)**. Most SH01.00 forms (90%) were collected from the Timor Sea drainage division, followed by Gulf drainage. Three outliers have crossed the watersheds of Timor Sea and Gulf. Clustering appears within Timor Sea. The species is most important in determining the spread.
- **Horton's divisions (7 divs.)**. The form has crossed over divisions within Timor Sea but mainly confined to Kimberley (50) with eight specimens in Arnhem and six in West Cape. However, over 80% are within Kimberley. Horton's divisions are a factor affecting the distribution.
- **Locations (16 locs.)**. Localised patterning occurs on the Dampier Peninsula between Broome and Sunday Island within Kimberley where 77% of SH01.00 ornaments were collected. The olive shell forms were collected from a small area on the western side of Cape York.

9.3.1.2.2 SH01.01 distribution of form


Segments threaded on a continuous string with pendant/object attached.

Fourteen SH01.01 examples were recorded. Details of SH01.01 sub-forms with pendants are summarised below in Table 9.9.

Table 9.9. Frequency and distribution of SH01.01 species

Location	Horton (1996) & drainage division	Tusk shell	Olive shell	Total
Broome	K (TS)	3	0	3
Cygnet Bay	K (TS)	4	0	4
Kimberley unprovenanced	K (TS)	1	0	1
Lombadina Mission	K (TS)	5	0	5
Mitchell River	WC (G)	0	1	1
Total	**na**	**13**	**1**	**14**

One olive shell example was collected from the Mitchell River in West Cape division of Queensland. The rest of the SH01.01 forms (14) were collected from the Kimberley region and manufactured from tusk shell. The patterning of this form for tusk shell is similar to SH01.00, albeit more confined:

- **Drainage division (1 div.).** Timor Sea and one outlier in Gulf.
- **Horton's division (1 div.).** Kimberley predominantly.
- **Locations (5 locs.).** Patterning within Dampier Peninsular between Broome and Lombadina Mission.

9.3.1.2.3 SH01.02 distribution of form


Continuous string of segments (composite materials).

Eight SH01.02 examples were recorded. Details of SH01.02 specimens are in Table 9.10.

Table 9.10. Frequency and distribution of SH01.02 sub-forms

Location	Horton (1996) & drainage division	Tusk shell	Olive shell	*Strombus campbelli*	Total
Archer, Kendall & Holyrod Rivers	WC(G)	0	1	0	1
Coen River	EC(NEC)	2	2	0	4
Endeavour River	EC(NEC)	0	0	1	1
Mapoon	WC(G)	0	1	0	1
Port Musgrave, Wenlock & Ducie Rivers	WC(G)	0	1	0	1
Total	**na**	**2**	**5**	**1**	**8**

With one exception, all SH01.02 specimens were collected from West Cape York. The exception was collected from the opposite side of the Cape at Endeavour River. All SH01.02 sub-form include at least one marine specimen other than the dominant shell. The patterning is as follows:

- **Drainage divisions (2 divs.)**. The distribution crosses the watershed between Northeast Coast and Gulf, otherwise within one unit.
- **Horton's division (2 divs.)**. The distribution crosses the division between West Cape and East Cape, otherwise within one unit.
- **Locations (5 locs.)**. The object restricted to a small area at the northern tip of Cape York.

9.3.1.2.4 SH01.03 distribution of form

Series of olive shells strung vertically.

Four SH01.03 examples were recorded. Details of SH01.03 specimens are in Table 9.11. All examples were manufactured from olive shells.

Table 9.11. Frequency and distribution of SH01.03 sub-forms

Location	Horton (1996) & drainage divisions	Total
Mapoon	WC(G)	2
Pennefather River	WC(G)	2
Total	**na**	**4**

All of the SH01.03 examples were all manufactured with olive shells and were collected by Roth from two locations in West Cape York region, within thirty kilometres of each other.

Roth (1910b, Sect. 34) noted this object in the Pennefather River area as 'a very pretty shell waist-belt'. The patterning is as follows.

- **Drainage divisions (1 div.)**. The distribution is restricted to Gulf.
- **Horton's division (1 div.)**. The distribution is restricted to West Cape.
- **Locations (2 locs.)**. The object restricted to a small area at the northern tip of Cape York.

9.3.1.2.5 SH01.04 distribution of form

Series of segments threaded on multiple strings.

Five SH01.04 examples were recorded. The frequency and distribution of SH01.04 sub-forms are in Table 9.12.

Table 9.12. Frequency and distribution of SH01.04 sub-forms

Location	Horton (1996) & drainage division	Tusk Shell	Olive	Total
King Sound	K(TS)	1	0	1
Port Essington	A(TS)	1	0	1
Staaten River	G(G)	1	2	3
Total	**na**	**3**	**2**	**5**

The three examples from Staaten River were collected by Roth. This sub-form was manufactured from only two species. The patterning is random for these three locations. Material is scattered over the distribution. Tusk shell SH01.03 specimens were collected from non-neighbouring locations within Gulf, Arnhem Land and Kimberley. The olive shell objects were both from Staaten River.

9.3.1.3 Summary of SH01 forms

It appears that material species is an important factor in the distribution and variation of the SH01 sample. For example, within SH01.01 specimens, there are a much higher number of tusk shell objects with pendants attached than any one other material and those objects are almost exclusive to the Kimberley. Another example is that olive shells are the only species that have been threaded in the unusual method of SH01.03.

All but SH01.04 have spatial patterning of form at the three levels. However, the patterning is not the same for each form. Species and form determine the distribution. Patterning appears as clustered in neighbouring areas.

9.3.2 Classification of SH02 forms

One hundred and one objects were categorised as SH02. The basic form SH02.00 includes the following elements:

- a series of segments manufactured from *Nautilus* sp. or pearl shell;
- shell segments have been strung together by threading two strands of fibre in a chain-like fashion (Roth 1910b (15):, Sect 15, Fig. 16) through an aperture which has been drilled or bored into the centre of the object;
- shell sections have been cut or broken to form rectangular or square shaped segments; segment edges may be sanded or polished to smooth; and
- end segment/s may have an irregular shape relative to other segments in series (see Figure 9.11).

A typical SH02 ornament is illustrated in Figure 9.10.

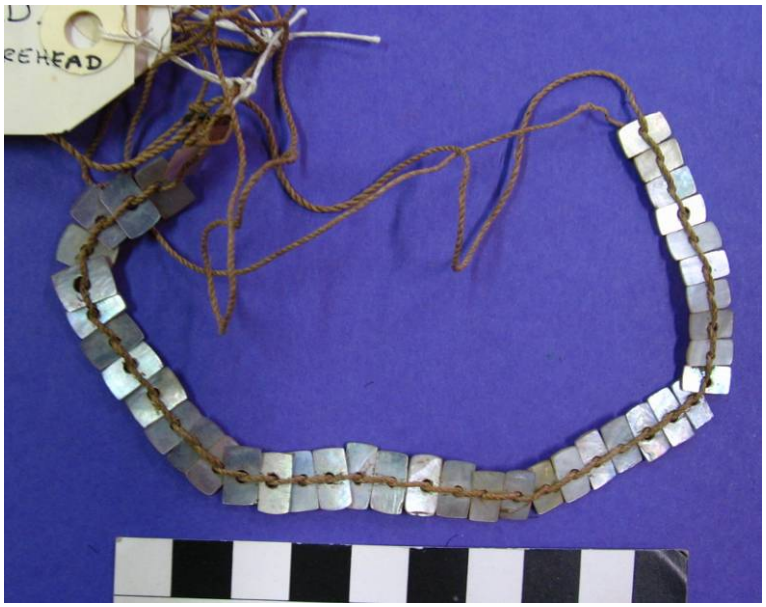

Figure 9.10. SH02 (E-14560, Australian Museum)

Figure 9.11. SH02.00 form with feature of shaped end segments (A-40896, South Australian Museum)

9.3.2.1 Classification of SH02 sub-forms (SH02.00-SH02.03)

Variations to form SH02.00 include:

- **SH02.01:** similar to SH02.00 except rectangular/square segments are overlapping. Ornament may have one or more shell attachments. See Figure 9.12 and pendant attached in Figure 9.13.
- **SH02.02:** Segment shapes have been formed into roughly oval shapes, not rectangular/square, strung in a chain pattern. See Figure 9.14.
- **SH02.03**: *Nautilus* sp. shell segments strung loosely side by side. See Figure 9.15.

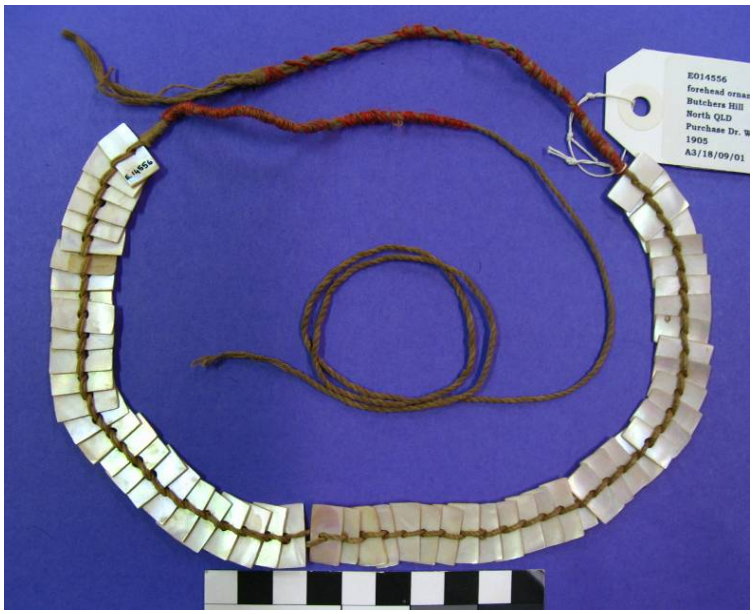

Figure 9.12. SH02.01 *Nautilus* sp. overlapping rectangular segments (E-14556, Australian Museum)

Figure 9.13. SH02.01 *Nautilus* sp. with abalone pendant (E-16700, Australian Museum)

Figure 9.14. SH02.02 pearl oval shaped segments (E14454, Australian Museum)

Figure 9.15. SH02.03 *Nautilus* sp. (E-14552, Australian Museum)

9.3.2.2 Distribution and frequency of SH02 forms

The frequency of materials for SH02 forms is listed in Table 9.13.

Table 9.13. Frequency of SH02 sub-forms and materials

Material Species	SH02 00	SH02 01	SH02 02	SH02 03	Total
Nautilus sp.	13	24	8	5	50
Pearl shell	41	0	10	0	51
Grand Total	**54**	**24**	**18**	**5**	**101**

There is little difference in the numbers of *Nautilus* sp. and pearl shell SH02 objects although the ratio is different for different forms. Pearl shell made up 76% of SH02.00 objects, 56% of SH02.02 sub-forms and none in the other two variations. More standard forms were manufactured from pearl shell while SH02.01 sub-forms (overlapping rectangular) are exclusively *Nautilus* sp. Mussel shell was used to manufacture one of the SH02.00 forms from Mitchell River and one SH02.02 form from Gilbert River. These two objects do not affect the distribution of the forms drastically, even though they are manufactured from a shell that lives in a different habitat. The distribution of materials is in Figure 9.16. The arrows indicate outliers for form or species – *Nautilus* sp. SH02.03 in Eyre and *Nautilus* sp. SH02.01 in Gulf.

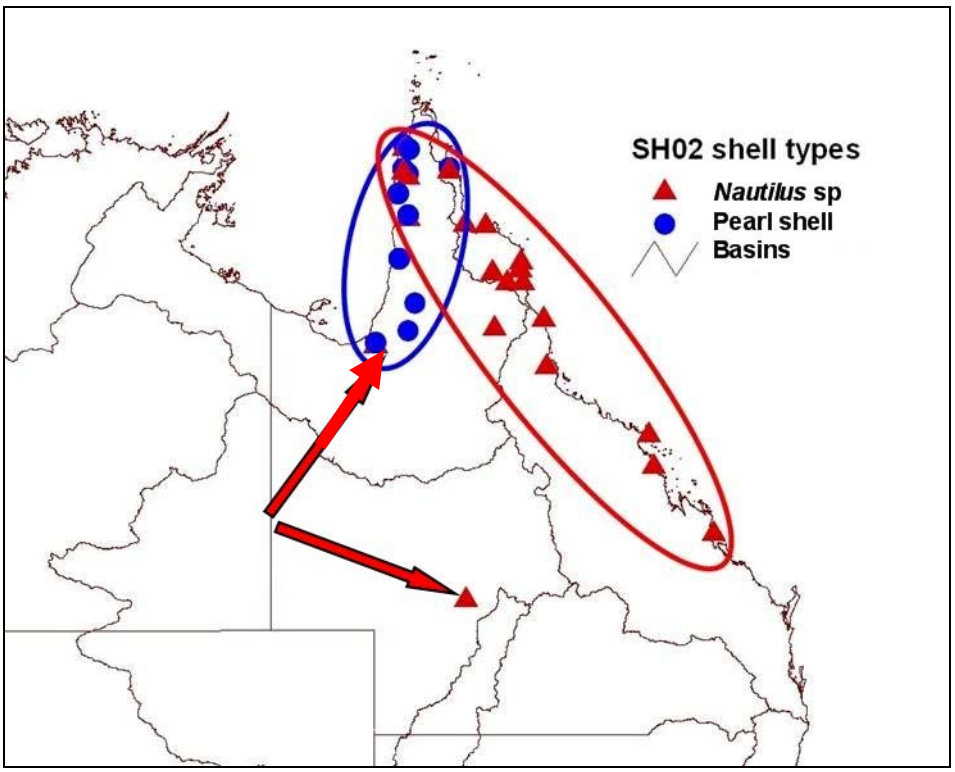

Figure 9.16. Distribution of shell types for SH02 forms

Nautilus sp. shells are mainly distributed down the east coast of Queensland and pearl shells down the west coast of Cape York with some overlap in the northern tip of Cape York. The frequency of SH02 sub-forms within drainage areas is summarised in Table 9.14 and Horton's divisions in Table 9.15.

Table 9.14. Frequency of SH02 sub-forms within drainage divisions

Drainage divisions	SH02 00	SH02 01	SH02 02	SH02 03	Total
Gulf of Carpentaria	49	4	17	0	70
Lake Eyre	0	0	0	1	1
Northeast Coast	5	20	1	4	30
Total	**50**	**24**	**18**	**5**	**101**

Table 9.15. Frequency of SH02 sub-forms within Horton's (1996) divisions

Horton's (1996) divisions	SH02.00	SH02.01	SH02.02	SH02.03	Total
East Cape	5	18	0	0	23
Eyre	0	0	0	1	1
Gulf	0	2	13	0	15
Northeast	0	0	1	2	3
Rainforest	0	2	0	2	4
West Cape	49	2	4	0	55
Total	**54**	**24**	**18**	**5**	**101**

SH02.00 is the most frequently occurring sub-form (c.54% of SH02 sample), followed by SH02.01 (c.24%) with smaller numbers of SH02.02 (c.18%) and SH02.03 (c.5%). The majority of objects were collected from the Gulf (c. 70%) and Northeast Coast (c. 30%) drainage division with one SH02.03 object from Lake Eyre. In Horton's divisions, fifty-five objects were recorded from West Cape and twenty-three from the contiguous East Cape. The distribution of SH02 sub-forms is plotted on Figure 9.17. The outliers are marked with arrows. SH02 forms are restricted to Queensland.

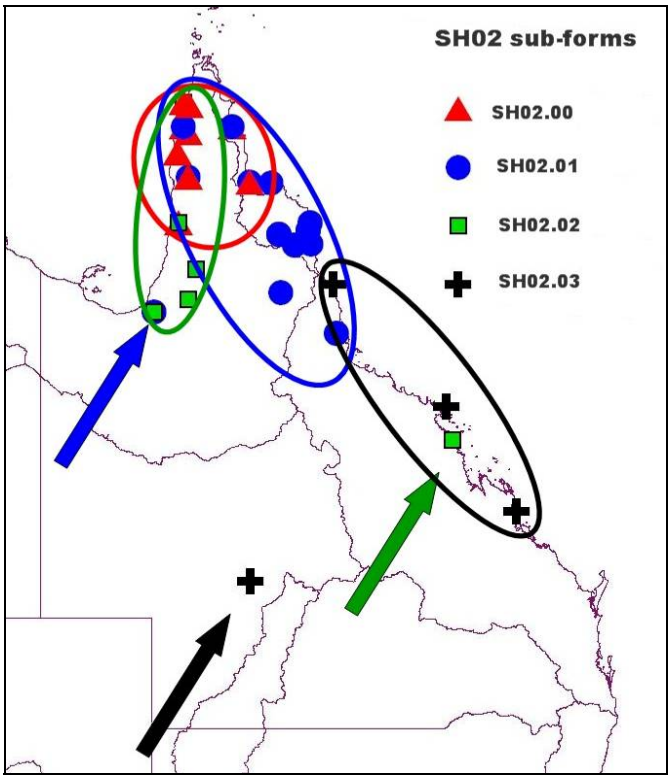

Figure 9.17. Distribution of SH02 sub-forms

The basic form SH02.00 is confined to northern Queensland, the *Nautilus* sp. overlapping forms (SH02.01) and the more robust SH02.03 forms are mainly spread across the north of Cape York and down the eastern coast of Queensland.

The outliers indicated with arrows in Figure 9.17 are not unusual in form, only in spatial distribution. One SH02.03 form (Queensland Museum QE-01798-0) is located in Central Queensland (Barcoo River), all others are on, or not relatively far from, the coast. The segments in the Barcoo River object are shaped truncated ovals, which is typical for this sub-form. The shell for the Barcoo River object must have come from the coast, so the reason for it being there and its slight anomalous nature means that it may be telling us something about exchange (e.g. slight variation marks identity of producers from the receivers). The frequency of SH02 sub-forms are summarised in each relevant section.

9.3.2.2.1 SH02.00 distribution of form

Series of rectangular shaped segments threaded side by side on fibre.

The sample contained fifty-four SH02.00 forms. The frequency and distribution of species of SH02.00 forms is listed below in Table 9.16.

Table 9.16. Frequency and distribution of SH02.00 species

Location	Horton (1996) & drainage division	*Nautilus* sp.	Pearl shell	Total
Archer, Kendall & Holyrod Rivers	WC(G)	7	6	13
Aurukun Mission	WC(G)	0	7	7
Embley River	WC(G)	2	3	5
Mapoon	WC(G)	2	5	7
Mitchell River	WC(G)	0	4	4
Pascoe River Iron R	EC(NEC)	1	3	4
Port Musgrave, Wenlock & Ducie Rivers	WC(G)	0	6	6
Port Stewart	EC(NEC)	1	0	1
Weipa	WC(G)	0	7	7
Total	**na**	**13**	**41**	**54**

The majority of SH02.00 sub-forms were manufactured from pearl shell (76%) and the rest from *Nautilus* sp. The Archer, Kendall and Holyrod Rivers area had the most examples followed by Aurukun Mission and Mapoon. Patterning is summarised below.

- **Drainage divisions (2 divs.)**. Majority of SH02.00 were collected from Gulf (45) with five objects from over the watershed within Northeast Coast - not outside those two drainage areas.
- **Horton's divisions (2 divs.)**. All SH02.00 forms were within two divisions – West Cape (49) and East Cape (5). No other divisions were crossed.
- **Locations (9 locs.)**. SH02.00 objects are confined to the northern end of Cape York. Patterning is localised.

9.3.2.2.2 SH02.01 distribution of form

Series of overlapping rectangular segments.

The sample contained twenty-four SH02.01 forms. The frequency and distribution of SH02.01 forms is listed below in Table 9.17.

Table 9.17. Frequency and distribution of SH02.01 sub-forms

Location	Horton (1996) & (drainage) divisions	Total
Archer, Kendall & Holyrod Rivers	WC(G)	1
Bloomfield River	EC(NEC)	1
Butchers Hill	EC(NEC)	2
Cape Bedford	EC(NEC)	2
Cardwell	R(NEC)	2
Chillagoe	G(G)	1
Cooktown	EC(NEC)	4
Flinders Is	EC(NEC)	1
Laura	EC(NEC)	5
Normanton	G(G)	1
Pascoe River Iron R	EC(NEC)	2
Port Stewart	EC(NEC)	1
Weipa	WC(G)	1
Total	**na**	**24**

All SH02.01 sub-forms were manufactured from *Nautilus* sp. The highest number of SH02.01 were collected from Laura (5) followed by Cooktown (4). Patterning is summarised below.

- **Drainage divisions (2 divs.)**. Majority SH02.01 were collected from Northeast Coast (20) with three objects from over the watershed within Gulf division - not outside those two drainage areas.
- **Horton's divisions (4 divs.)**. SH02.01 forms were within four divisions – East Cape (18), Rainforest (2), Gulf (2) and West Cape (2). No other divisions were crossed.
- **Locations (13 locs.)**. SH02.01 objects are confined to an area north of Cardwell on the east Queensland coast and Normanton in the Gulf. Patterning is localised to that area.

9.3.2.2.3 SH02.02 distribution of form


Series of oval segments.

The sample contained eighteen SH02.02 forms. The frequency and distribution of SH01.02 forms is listed below in Table 9.18.

Table 9.18. Frequency and distribution of SH02.02 species

Location	Horton (1996) & drainage division	*Nautilus* sp.	Pearl shell	Total
Gilbert River	G(G)	0	1	1
Mackay	NE(NE)	1	0	1
Mapoon	WC(G)	0	1	1
Mitchell River	WC(G)	0	3	3
Normanton	G(G)	7	4	11
Staaten River	G(G)	0	1	1
Total	**na**	**8**	**10**	**18**

SH02.02 sub-forms were manufactured from *Nautilus* sp. (8) and pearl shell (10). The highest number of SH02.02 were collected from Normanton (11) followed by Mitchell River (3). Patterning is summarised below.

- **Drainage divisions (2 divs.)**. Majority SH02.02 were collected from Gulf (17) with one outlier from over the watershed Northeast Coast division. Patterning within Gulf.
- **Horton's divisions (3 divs.)**. SH02.02 forms were within three divisions – Gulf (13), West Cape (4) and an outlier in Northeast (1). No other divisions were crossed.
- **Locations (6 locs.)**. All but one SH02.02 objects are confined to the western coast of Cape York. Patterning is localised to that area.

9.3.2.2.4 SH02.03 distribution of form


Series of irregular shaped segments.

The sample contained five SH02.03 forms. The frequency and distribution of SH01.03 forms is listed below in Table 9.19.

Table 9.19. Frequency and distribution of SH02.03 sub-forms

Location	Horton's (1996) & drainage divisions	Total
Barcoo River	LE(E)	1
Cape Grafton	R(NEC)	2
Keppel Island	NE(NEC)	1
Whitsunday Is	NE(NEC)	1
Total	**na**	**5**

All SH02.03 sub-forms were manufactured from *Nautilus* sp. The sample was made up of all single examples except from Cape Grafton (2). Patterning is summarised below.

- **Drainage divisions (2 divs.)**. All but one SH02.03 were collected from Northeast Coast (4) with one outlier from over the watershed in Lake Eyre division. Patterning within Northeast Coast.
- **Horton's divisions (3 divs.)**. SH02.03 forms were within three divisions – Northeast (2), Rainforest (2) and one in Eyre. No other divisions were crossed.
- **Locations (4 locs.)**. All but one SH02.03 objects are confined to the eastern coast of central and north Queensland. Patterning is localised to that area.

The distribution is widespread for a small sample.

9.3.2.3 Summary of SH02 forms

As for SH01 forms, material species is an important factor in the distribution and variation of the SH02 sample but on a smaller scale. Only two species were used for this form and they have different distributions. The *Nautilus* sp. specimens have more variation in form and are distributed over a larger area. Pearl shell specimens are confined almost entirely to West Cape and only in SH02.00 and SH02.02 forms.

9.3.3 Classification of SH03, SH04 and SH05 forms

Details of the forms SH03, SH04 and SH05 in this sample are presented in Table 9.20. As these categories consist of one or no sub-forms, I have grouped them in the same table and displayed their distribution on the one map (Figure 9.22).

9.3.3.1 Classification of SH03 forms

Objects categorised in the form SH03.00 were manufactured by passing string through a pierced hole in several whole marine shells to form a single loop of segments. The form is illustrated in Figure 9.18.

Figure 9.18. SH03 form *Strombus campbelli* (E-13813, Australian Museum)

One variation to the form: **SH03.01** was manufactured from land snails. See Figure 9.19.

Figure 9.19. SH03.01 land snails (DT-1216, The Donald Thomson Collection. On loan to Museum Victoria from the University of Melbourne)

9.3.3.2 Classification of SH04 form

Form SH04 is manufactured with three or more segments suspended from a single continuous thickly woven fibre. An example of SH04 is shown in Figure 9.20. I have included this object in the series because it is a similar form to teeth series objects discussed in Appendix 15.

Figure 9.20. SH04 *Nautilus* sp. sections attached to an armband (E-14740, Australian Museum)

9.3.3.3 Classification of SH05 form

This category includes the objects collected from Tasmania. The specimens display similar features to SH01 except the shell species used for manufacturing these objects are specific to Tasmanian objects in this sample and different from objects collected from mainland Australia (see Figure 9.21).

Figure 9.21. SH05 manufactured with penguin and maireener shells (M-8524, Tasmanian Museum & Art Gallery)

Maireener shells are the dominant species used to manufacture this form. Maireener shells are also found on the southern mainland of Australia, however, no series examples of this species were collected from the mainland.

9.3.3.4 Distribution and frequency of SH03-SH05 forms


SH03.00.


SH03.01.

SH04.

SH05.

Thirty-five objects fit into these categories. The number of SH03-SH05 forms in relation to species is summarised in Table 9.20.

Table 9.20. Frequency of raw materials and SH03, SH04 and SH05 forms

Material Species	SH03 00	SH03 01	SH04 00	SH05 00	Total
Arca sp.	1	0	0	0	1
Black crows	0	0	0	2	2
Cats teeth	0	0	0	1	1
Cerithiidae	0	0	0	1	1
Land snails	0	5	0	0	5
Maireener	0	0	0	12	12
Nautilus sp.	0	0	1	0	1
Pearl shell	0	0	1	0	1
Penguin shell	0	0	0	1	1
Rice shell	0	0	0	5	5
Strombus campbelli	1	0	0	0	1
Sundial shell	0	0	0	1	1
Toothies	0	0	0	2	2
Top snails.	0	0	0	1	1
Total	**2**	**5**	**2**	**26**	**35**

The most commonly occurring species is maireener shells (12) from Tasmania followed by rice shells (5), which were manufactured into SH05 forms, and land snails (5) manufactured into SH03.01 forms. Frequency is summarised within drainage basins (Table 9.21) and Horton's divisions Table 9.22.

Table 9.21. Frequency of SH03, SH04 and SH05 forms and drainage divisions

Drainage divisions	SH03.00	SH03.01	SH04.00	SH05.00	Total
Gulf of Carpentaria	2	0	0	0	2
Northeast Coast	0	0	1	0	1
Tasmania	0	0	0	26	26
Timor Sea	0	5	1	0	6
Total	**2**	**5**	**2**	**26**	**35**

Table 9.22. Frequency of SH03, SH04 and SH05 forms and Horton's (1996) divisions

Horton's divisions	SH03 .00	SH03 .01	SH04 .00	SH05 .00	Total
Arnhem	0	5	0	0	5
Kimberley	0	0	1	0	1
Northeast	0	0	1	0	1
Tasmania	0	0	0	26	26
West Cape York	2	0	0	0	2
Total	**2**	**5**	**2**	**26**	**35**

Only small numbers of SH03 and SH04 forms were recorded. Twenty-six SH05 forms were recorded and these were manufactured from a greater range of species than any other shell forms, however, only one style was manufactured. The distribution is shown in Figure 9.22.

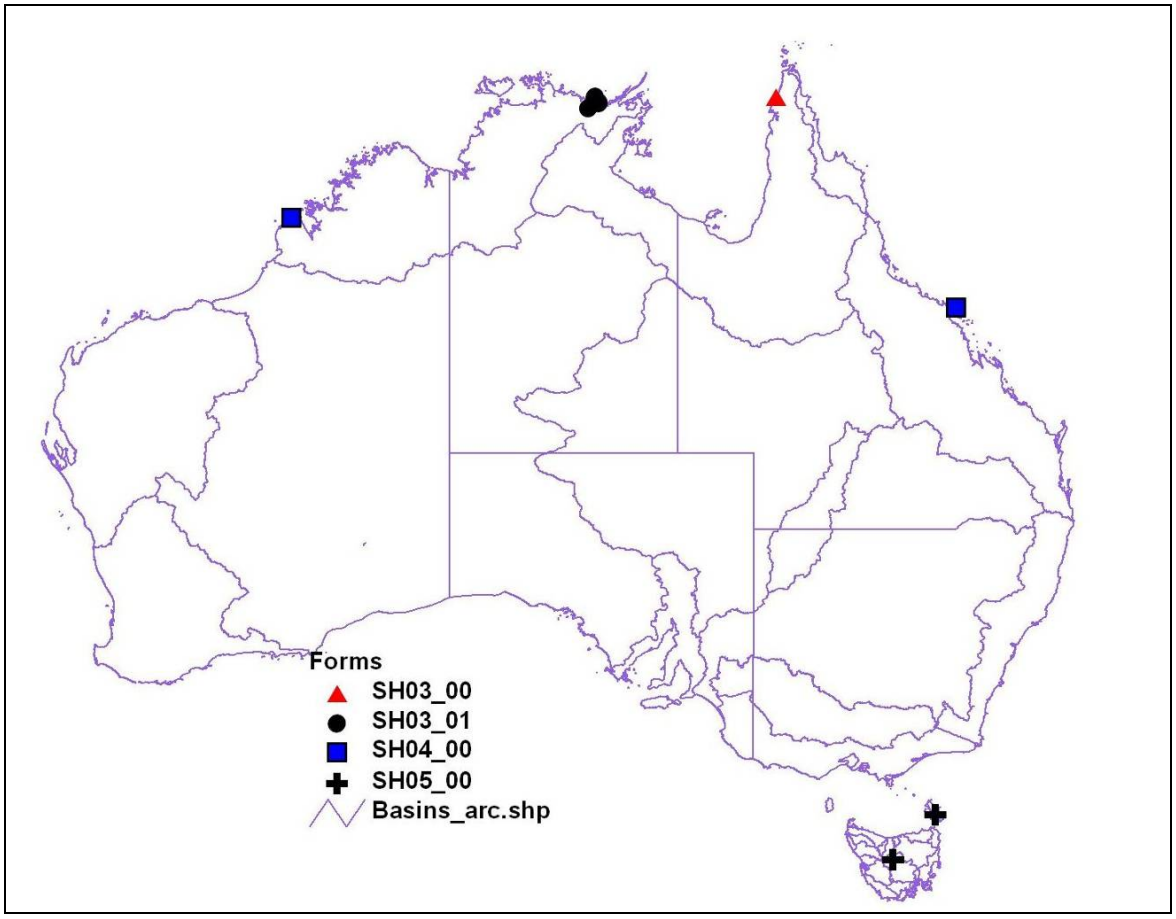

Figure 9.22. Distribution of SH03, SH04 and SH05 forms

On an Australian wide scope, SH03.00, SH03.01 and SH05 forms are constrained to small areas while SH04 forms are thousands of kilometres apart but situated on similar latitudes.

The land snail examples of SH03.01 were located in Arnhem while the marine shells were in West Cape York. Only two examples of SH04 were recorded in this sample. One example was manufactured from *Nautilus* sp. shell and collected from Whitsunday Islands off the Central Queensland coast. The other made example was made of pearl shell collected from the Kimberley coast in Western Australia.

9.3.3.5 SH03 to SH05 distribution of forms

Thirty-five objects were nominated as SH03 to SH05 forms. The frequency and distribution of SH01.03 forms is listed below in Table 9.23.

Table 9.23. Frequency and distribution of SH03, SH04 and SH05 forms in locations

Location	Horton (1996) & drainage divisions	SH03. 00	SH03. 01	SH04. 00	SH05. 00	Total
Arnhem Land unprovenanced	A(TS)	0	3	0	0	3
Cape Stewart	A(TS)	0	1	0	0	1
Darbilla Creek	A(TS)	0	1	0	0	1
Furneaux Islands	Tas(Tas)	0	0	0	7	7
Mapoon	WC(G)	2	0	0	0	2
Pender Bay	K(TS)	0	0	1	0	1
Tasmania	Tas(Tas)	0	0	0	19	19
Whitsunday Islands	NE(NEC)	0	0	1	0	1
Total	**na**	**2**	**5**	**2**	**26**	**35**

SH05.00 had the highest number of objects (26) and these occurred in Tasmania (19) and Furneaux Islands. SH03 forms included SH03.00 from Mapoon in West Cape and five from Arnhem Land. The two SH04 forms were collected from Whitsunday Islands (QLD) and Pender Bay (WA). Patterning is summarised below:

- **Drainage divisions**.
  - **SH03.00 (1 div.).** Gulf only.
  - **SH03.01 (1 div.).** Timor Sea only.
  - **SH04.00 (1 div.).** Timor Sea only
  - **SH05.00 (1 div.).** Tasmania only.
- **Horton's divisions**.
  - **SH03.00 (1 div.).** West Cape only.
  - **SH03.01 (1 div.).** Arnhem only.
  - **SH04.00 (2 divs.).** Kimberley and Northeast.
  - **SH05.00 (1 div.).** Tasmania only.
- **Locations**.
  - **SH03.00 (1 loc.).** Mapoon only.
  - **SH03.01 (3 locs.).** Across the top of Northern Territory only.
  - **SH04.00 (2 locs.).** Not restricted to an area.
  - **SH05.00 (2 locs.).** Localised to Tasmania and Furneaux Islands.

In all regions, locally available species were used for local styles of beading.

9.3.4 Summary of Class 1 (series) shell forms

The frequency of all five forms is listed in Table 9.24.

Table 9.24. Frequency of Class 1 (series) shell forms

Shell Form	No. of objects
SH01	101
SH02	101
SH03	7
SH04	2
SH05	26
Total	**237**

SH01 and SH02 are highly and equally represented followed by SH05 (26) and smaller numbers for SH04 and SH05. The distribution is plotted in Figure 9.23 (arrow marks outlier).

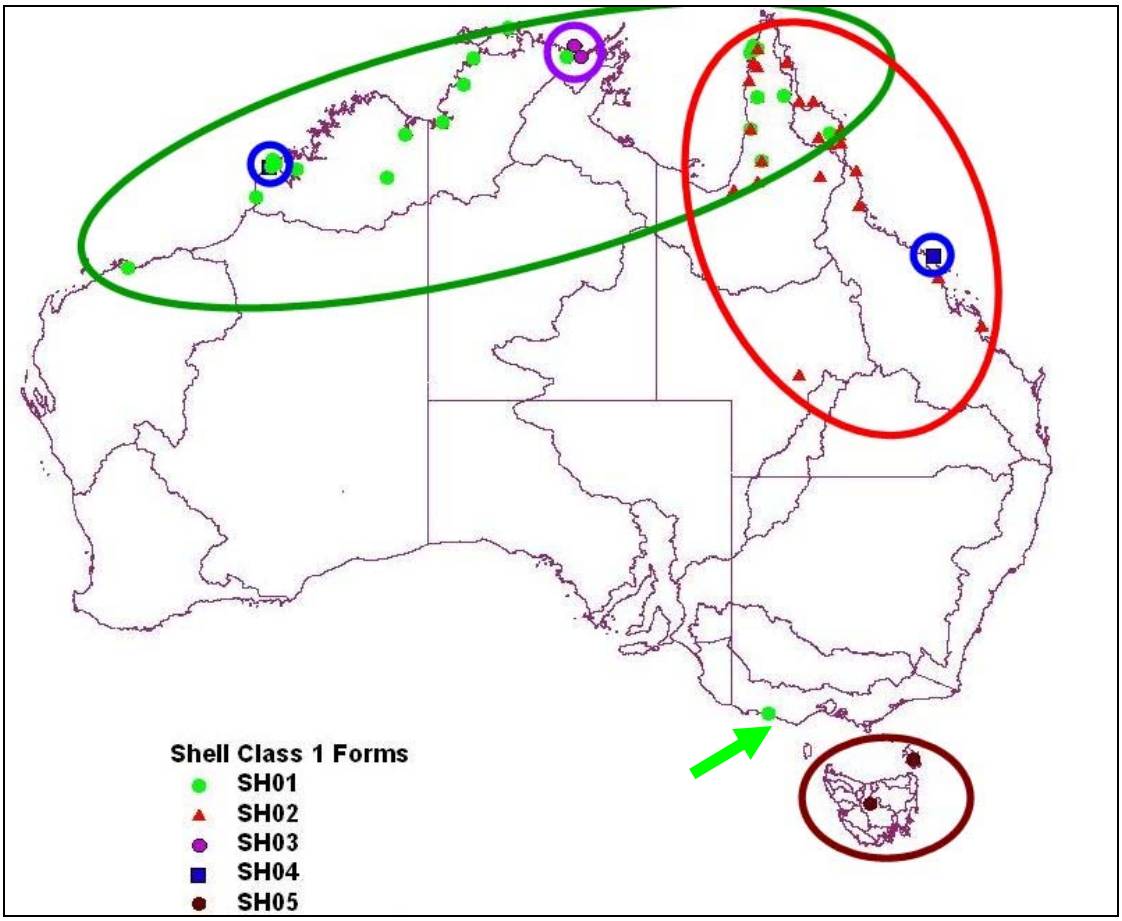

Figure 9.23. Distribution of Class 1 (series) shell forms

For shell series, there is apparent patterning of forms and shell species within some drainage basins, Horton's divisions and localised to a smaller region. However, not all forms have the same distribution and species often determines spread. Variations within forms are often localised. All but one object was collected from the coast or near the coast. SH01 is more widespread than the other forms mainly distributed across the northern end of Australia, in the Timor Sea drainage division with some clustering in West Cape, within Gulf drainage division. However, species was a major factor in dividing the sample into two areas. The outlier for SH01 was manufacture from crayfish legs. SH02 form is confined mainly to the Gulf and Northeast drainage divisions with one location inside Eyre. The majority of SH02 forms are in Horton's West and East Cape. SH03 is confined to a small area in coastal Arnhem Land. SH04 appears at the coast of Dampier Peninsula, Western Australia, and on the Central coast, Queensland. SH05 is in Tasmania and the Furneaux Islands.

The distribution of shell series does not coincide with that of pendants as will be discussed in the following section.

9.4 Shell Class 2 (pendant) forms (SHP01-SHP06)

Six forms have been categorised for this class of ornament. Each pendant form is described in this section and sub-forms allocated to objects that display slight variations to the typical form as for the series section.

9.4.1 Classification of SHP01 forms

Seventy-four SHP01 objects were recorded in this sample. All objects classified as this form were manufactured from baler shell (*Melo* sp.). Roth (Chapter VII: 182) described this form as:

> …more or less the shape of an oval, about 2 to 2 ½ inches in its longer diameter and fixed either by a small drilled aperture, or a piece of cement, to the neck-string. (Roth 1897, Ch. VII, Sect. 182).

The baler shell is found along the coast around Australian with the exception of New South Wales, eastern Victoria and Tasmania (Wilson and Gillet 1971: 138).

The form classed as SHP01.00 contains the following elements:

- single pierced baler shell object;
- shape is oval, egg or elongated oval;
- length is 100 mm or greater;
- width divided by length is greater than 0.30; and
- SHP01 forms may or may not be incised and ochred.

A typical SHP01 form is illustrated in Figure 9.24.

Figure 9.24. SHP01 baler shell incised (A-3300, South Australian Museum)

9.4.1.1 Classification of SHP01 sub-forms (SHP01.01-SHP01.03)

Forms that vary to SHP01.00 include:

- **SHP01.01**: object consists of more than one segment (Figure 9.25).
- **SHP01.02**: shape is not oval or as described for the standard form. Width/length = 0.30 or less (usually elliptical) (Figure 9.26).
- **SHP01.03:** length measures less than 100mm (Figure 9.27).

Photographs of SHP01 sub-forms are presented below.

Figure 9.25. SHP01.01 baler shell (1998-E-0264, Queen Victoria Museum & Art Gallery)

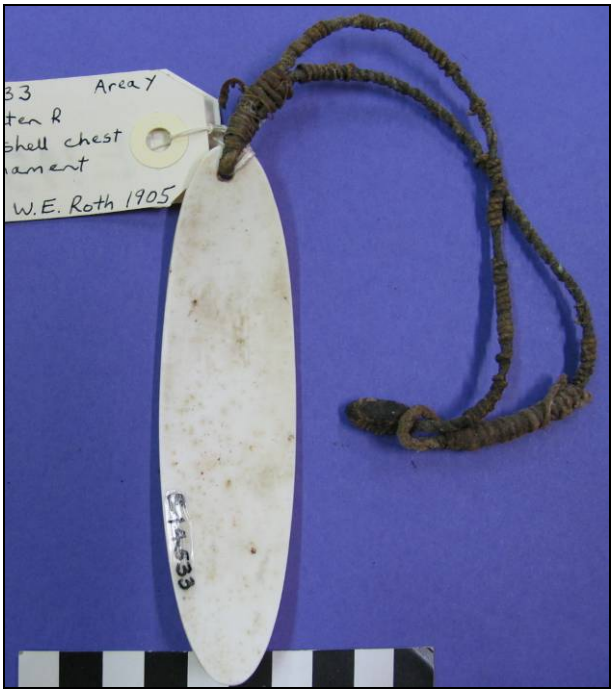

Figure 9.26. SHP01.02 baler shell elliptical shape (A-14533, Australian Museum)

Figure 9.27. SHP01.03 (A-34106, South Australian Museum)

9.4.1.2 Distribution and frequency of SHP01 forms

The frequency of SHP01 forms are summarised within drainage divisions in Table 9.25 and Horton's divisions in Table 9.26.

Table 9.25. SHP01 sub-forms within drainage divisions

Drainage divisions	SHP01. 00	SHP01. 01	SHP01. 02	SHP01. 03	Total
Gulf of Carpentaria	15	0	9	2	26
Indian Ocean	3	0	0	0	3
Lake Eyre	19	0	0	4	23
Murray Darling	1	0	0	0	1
Northeast Coast	1	0	0	0	1
Timor Sea	14	1	1	3	19
Western Plateau	0	0	0	1	1
Total	**53**	**1**	**10**	**10**	**74**

Table 9.26. SHP01 sub-forms within Horton's (1996) divisions

Horton's divisions	SHP01.00	SHP01.01	SHP01.02	SHP01.03	Total
Arnhem	15	1	3	2	21
Desert	5	0	0	2	7
East Cape York	1	0	0	0	1
Eyre	15	0	0	3	18
Gulf	9	0	6	2	17
North	1	0	0	1	2
Northwest	3	0	0	0	3
Riverine	1	0	0	0	1
West Cape York	3	0	1	0	4
Total	**53**	**1**	**10**	**10**	**74**

The Gulf of Carpentaria held the majority of SHP01 forms (26), followed by Lake Eyre (23) then Timor Sea (19). Only one location was recorded in the Northeast drainage division for this form. The Gulf division held the greatest percentage (90%) of elliptical shaped objects (SHP01.02). Within Horton's divisions, Arnhem had the highest number of SHP01 forms (21) followed by Eyre (18) and Gulf (17). The distribution of SHP01 forms is shown in Figure 9.28.

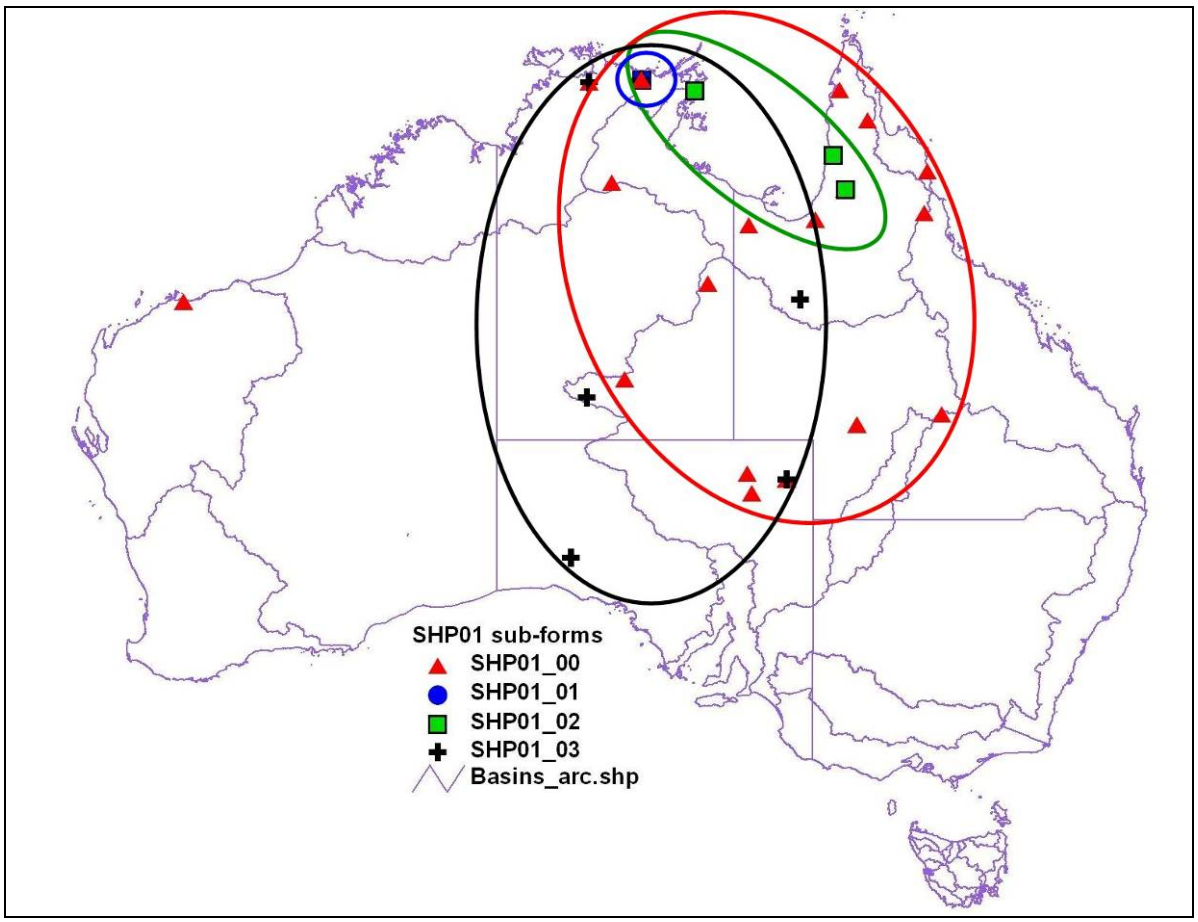

Figure 9.28. Distribution of SHP01 sub-forms

Most SHP01.00 locations are spread throughout Gulf and Lake Eyre, SHP01.01 confined to eastern Arnhem Land, SHP01.02 within Gulf and eastern Arnhem Land and SHP01.03 forms scattered through the centre from north to south. With the exception of Roebourne in Western Australia, the SHP01 forms are concentrated around the Gulf of Carpentaria, the Cape and down through Central Australia and Lake Eyre. I will discuss the patterning of sub-forms with the exception of SHP01.01 as there was only one example of that sub-form.

9.4.1.2.1 SHP01.00 distribution of form

Oval shaped baler shell pendant.

The sample contained fifty-three SHP01.00 forms. The frequency and distribution of SHP01.00 forms is listed below in Table 9.27.

Table 9.27. Frequency and distribution of SHP01.00 species

Location	Horton (1996) & drainage division	Total
Alice Springs Arrernte	D(LE)	2
Alligator River	N(TS)	1
Arnhem Land unprovenanced	A(TS)	13
Bloomfield River	EC(NEC)	1
Caledon Bay	A(G)	2
Coen River	WC(G)	1
Cooper Creek	E(LE)	7
Daly Waters	D(G)	1
Embley River	WC(G)	1
Irvinebank	G(G)	1
Minnie Downs	R(MD)	1
Mitchell River	WC(G)	1
Mungeranie Station	E(LE)	2
Normanton	G(G)	3
Ranken River	D(LE)	2
Roebourne	NW(IO)	3
Staaten River	G(G)	4
Turn-off Lagoon	D(LE)	1
Warburton Creek	G(G)	1
Windorah	E(LE)	5
Total	**na**	**53**

SHP01.00 is widely distributed in both coastal and inland areas. The highest number of SHP01.00 specimens was collected from Arnhem Land unprovenanced (13). All other locations contained less than ten objects. Patterning is summarised below:

- **Drainage divisions (6 divs.)**. SHP01.00 forms are disturbed mainly through Gulf and Lake Eyre divisions. Patterning does not appear to be affected by drainage divisions although this form was collected from along the watersheds of Eyre with Gulf, Murray

Darling and Western Plateau. Also along the watersheds of Gulf with Northeast Coast and Western Plateau. This may be associated with boundary maintenance.

- **Horton's divisions (9 divs.)**. Within Timor Sea drainage, SHP01.00 forms were mainly in Arnhem (15) with one object in North. Within Gulf drainage, most were collected in Gulf (9) with three from West Cape. There appears to be a relationship between patterning and Horton's divisions within Timor Sea.
- **Locations (20 locs.)**. The distribution of SHP01.00 objects are widely distribution across Cape York, the Gulf and down through Lake Eyre. There is patterning at that broad level but not localised. Of interest here is that 50% of SHP01.03 pendants (smaller baler shell ornaments) are distributed away from the source and may indicate that the objects were being reduced or reworked as they travelled further from the source.

9.4.1.2.2 SHP01.01 distribution of form

Two or more oval shaped baler shell pendants attached to one string.

Only one SHP01.01 form was recorded. That objects was collected in Arnhem Land within Timor Sea drainage division. The segments are SHP01.00 forms.

9.4.1.2.3 SHP01.02 distribution of form

Elongated or elliptical baler shell pendant.

The sample contained ten SHP01.02 forms. The frequency and distribution of SHP01.02 forms is listed below in Table 9.28.

Table 9.28. Frequency and distribution of SHP01.02 species

Location	Horton's (1996) & drainage divisions	Total
Arnhem Land unprovenanced	A(TS)	1
Caledon Bay	A(G)	2
Mitchell River	WC(G)	1
Staaten River	G(G)	6
Total	**na**	**10**

All SHP01.02 sub-forms is distributed around the coast of the Gulf and along the north coast of Arnhem Land. Staaten River held the most SHP01.02 forms. All other locations contained two or one examples. Patterning is summarised below:

- **Drainage divisions (2 divs.)**. SHP01.02 forms were collected from Gulf (9) and Timor Sea (1). Patterning appears to be related to the Gulf drainage.
- **Horton's divisions (3 divs.)**. Within Gulf drainage, most objects were from Gulf with only one in West Cape. Otherwise there does not appear to be a relationship.
- **Locations (4 locs.)**. The distribution of SHP01.02 objects is localised to the coastal area around the Gulf and north-eastern Arnhem. There is patterning at that level.

9.4.1.2.4 SHP01.03 distribution of form

Small baler shell pendants.

The sample contained ten SHP01.03 forms. The frequency and distribution of SHP01.03 forms is listed below in Table 9.29.

Table 9.29. Frequency and distribution of SHP01.03 species

Location	Horton's (1996) & drainage divisions	Total
Alligator River	N(TS)	1
Arnhem Land unprovenanced	A(TS)	2
Cloncurry	G(G)	1
Cooper Creek	E(LE)	3
Ooldea	D(WP	1
Staaten River	G(G)	1
Tempe Downs	D(LE)	1
Total	**na**	**10**

SHP01.03 sub-forms are scattered from the north coast of Arnhem Land, through the centre of Australia and down to almost the coast of South Australia. The highest number of SHP01.03 forms was collected from Cooper Creek (3). All other locations contained two or one examples. Patterning is summarised:

- **Drainage divisions (4 divs.)**. SHP01.03 forms were collected from contiguous drainage divisions Lake Eyre (4), Timor Sea (3), Gulf (2) and Western Plateau. Patterning does not appear to be related to drainage basins.

- **Horton's divisions (5 divs.)**. There does not appear to be a relationship between Horton's divisions and patterning of this form.
- **Locations (7 locs.)**. At a very broad level, the distribution of SHP01.03 objects is confined to the central section of Australia, from north to south. There is patterning at that very broad level but hard to nominate with this small a sample over such a large area.

9.4.1.3 Summary of SHP01 forms

The SHP01 forms have a wide distribution and patterning occurs within forms but at different scales. The SHP01.00 and SHP01.03 forms have travelled from the north of Australia down through the centre while other forms remained on, or close to, the coast in northern Australia. The form may have some influence on the distribution of baler shell objects as the elliptical shaped pendants are confined to two small coastal areas.

9.4.2 Classification of SHP02 forms

One hundred and seven SHP02 objects were recorded in this sample. The objects classified as SHP02 have been manufactured from pearl, oyster or abalone shell species (hereafter called pearl shell). The objects are generally sections that are have been cut from pearl shell and may include a portion of the shell rim.

SHP02.00 items include the following elements:

- single pierced pearl shell object;
- shape – crescent, irregular (shoehorn) or rounded rectangle, width <0.5 of length; and
- non-symmetrical shape longitudinally and often incorporates the rim from one side of the shell.

The typical form is show in Figure 9.29 (crescent shaped with lateral rim of shell).

Figure 9.29. SHP02 pearl shell (QE-529.1, Queensland Museum)

9.4.2.1 Classification of SHP02 sub-forms

Variations to SHP02.00 include:

- **SHP02.01**: object has more than one segment (usually SHP02.02 sub-forms) and shaped elliptical or elongated oval, generally symmetrical longitudinally, segments may be incised (Figure 9.30).
- **SHP02.02**: single object as for SHP02.01 edges smoothly finished, segments may be incised (Figure 9.31).
- **SHP02.03**: shape is not as for SHP01.00, SHP02.01 or SHP02.02 – may be triangular, semi-lunette, oval or disc shape cut from the shell. These objects overlap in form with SHP02 and the later described SHP06, not fitting neatly into either form. After much deliberation, I have chosen to keep these objects within the shaped pearl shell form (Figure 9.32 and Figure 9.33).
- **SHP02.04:** unique, disc shaped, pierced through the centre and attached to a bamboo cradle (Figure 9.34).

Figure 9.30. SHP02.01 pearl shell concave surface (WA-6250, Western Australian Museum)

Figure 9.31. SHP02.02 Pearl incised pierced and gummed (WA-3132, Western Australian Museum)

Figure 9.32. SHP02.03 pearl oval shaped, Newcastle Waters, NT. (A-3983, South Australian Museum)

Figure 9.33. SHP02.03 pearl triangular shape, Weipa, Qld. (QE-529.5, Queensland Museum)

Figure 9.34. SHP02.04 pearl ornament (185.59.349, National Museum)

9.4.2.2 Distribution and frequency of SHP02 forms

The frequency of SHP02 sub-forms for drainage basins is summarised in Table 9.30 and Horton's division in Table 9.31.

Table 9.30. SHP02 sub-forms and drainage divisions

Drainage division	SHP02.00	SHP02.01	SHP02.02	SHP02.03	SHP02.04	Total
Gulf of Carpentaria	26	0	1	5	0	32
Indian Ocean	1	0	0	0	0	1
Lake Eyre	0	0	0	1	0	1
Murray Darling	0	0	0	1	0	1
Northeast Coast	0	0	1	0	2	3
Timor Sea	5	10	30	14	0	59
Western Plateau	1	0	0	9	0	10
Total	**33**	**10**	**32**	**30**	**2**	**107**

Table 9.31. SHP02 sub-forms and Horton's (1996) divisions

Horton's (1996) divisions	SHP02.00	SHP02.01	SHP02.02	SHP02.03	SHP02.04	Total
Arnhem	2	0	1	2	0	5
Desert	1	0	0	5	0	6
East Cape York	0	0	1	0	2	3
Gulf	2	0	0	1	0	3
Kimberley	0	10	29	9	0	48
North	3	0	0	3	0	6
Northwest	1	0	0	0	0	1
Riverine	0	0	0	1	0	1
Spencer	0	0	0	5	0	5
West Cape York	24	0	1	4	0	29
Total	**33**	**10**	**32**	**30**	**2**	**107**

The majority of objects were collected from Timor Sea drainage (59), followed by Gulf (32) and Western Plateau (10). Horton's Kimberley held the most objects followed by West Cape and all other divisions had fewer than ten objects. The distribution is plotted in Figure 9.35.

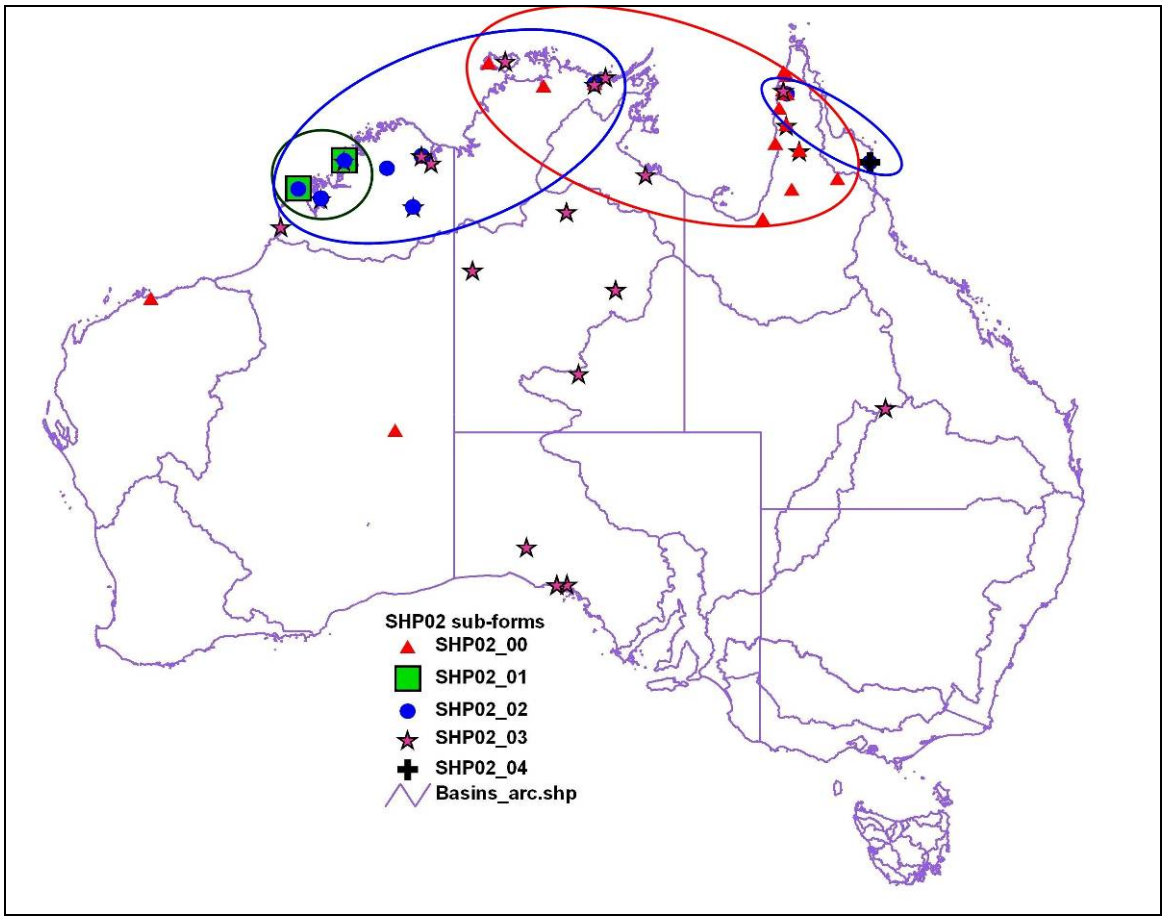

Figure 9.35. Distribution of SHP02 sub-forms

SHP02 forms are spread across the north and down through the centre. One object is located on the Murray Darling/Lake Eyre watershed. Also, another outlier at Roebourne is on the central Western Australian coast. The frequency of sub-forms and locations are summarised below.

9.4.2.2.1 SHP02.00 distribution of form


Crescent or 'shoe-horn' shaped pearl shell pendant.

The sample contained thirty-three SHP02.00 forms. The frequency and distribution of SHP02.00 forms is listed below in Table 9.32.

Table 9.32. Frequency and distribution of SHP02.00 form

Location	Horton's (1996) & drainage divisions	Total
Alligator River	N(TS)	2
Archer, Kendall & Holyrod Rivers	WC(G)	3
Arnhem Land unprovenanced	A(TS)	2
Aurukun Mission	WC(G)	1
Bathurst Is	N(TS)	1
Cape York West	WC(G)	1
Edward River	WC(G)	2
Embley River	WC(G)	2
Mapoon	WC(G)	9
Normanton	G(G)	1
Palmer River	WC(G)	1
Port Musgrave, Wenlock & Ducie Rivers	WC(G)	1
Roebourne	NW(IO)	1
Staaten River	G(G)	1
Warburton Ranges	D(WP)	1
Weipa	WC(G)	4
Grand Total	**na**	**33**

SHP02.00 forms are spread across the north coast of Australia, with outliers at Roebourne on the central Western Australian coast and Warburton Ranges in Central Australia. The highest number of SHP02.00 forms was collected from Mapoon (9). All other locations contained small examples. Patterning is summarised below:

- **Drainage divisions (4 divs.)**. The majority of SHP02.00 forms were collected from Gulf (26) with smaller numbers in contiguous drainage division Timor Sea (5) and one each in Western Plateau and Indian Ocean. Patterning does not appear to be related to drainage basins although there is a concentration around the Gulf.
- **Horton's divisions (6 divs.)**. Most objects (24) were collected from West Cape. There does not appear to be a relationship between Horton's divisions and patterning of this form.

- **Locations (16 locs.)**. At a very broad level, the distribution of SHP02.00 objects is mainly in the northern coastal area of Northern Territory and Cape York. There is patterning at that very broad level and clustered along the east coast of the Gulf.

9.4.2.2.2 SHP02.01 distribution of form


Multiple elliptical shaped pearl shell pendants tied together.

The sample contained ten SHP02.01 forms. All SHP02.01 forms were collected from the north western area of Western Australia. Patterning is summarised below.

- **Drainage divisions (1 div.)**. All SHP02.01 forms were collected from within Timor Sea.
- **Horton's divisions (1 div.)**. All SHP02.01 forms were collected from within Kimberley.
- **Locations (2 locs.)**. All SHP02.01 forms were collected from Lombadina Mission (9) and Port George IV to the north. Localised at that scale.

9.4.2.2.3 SHP02.02 distribution of form


Elliptical shaped pearl shell pendant.

The sample contained thirty-two SHP02.02 forms. The frequency and distribution of SHP02.02 forms is listed below in Table 9.33.

Table 9.33. Frequency and distribution of SHP02.00 form

Locations	Horton's (1996) & drainage divisions	Total
Arnhem Land unprovenanced	A(TS)	1
Cooktown	EC(NEC)	1
Cygnet Bay	K(TS)	2
Drysdale Mission	K(TS)	1
Embley River	WC(G)	1
Forrest River	K(TS)	3
Kimberley unprovenanced	K(TS)	2
King Sound	K(TS)	13
Kunmunya Mission	K(TS)	1
Lombadina Mission	K(TS)	7
Total	**na**	**32**

SHP02.02 forms appear in two small coastal areas in northern Australia – Kimberley and Cape York. The highest number of SHP02.02 forms was collected from King Sound (13). All other locations contained small samples. Patterning is summarised below:

- **Drainage divisions (3 divs.)**. All but three SHP02.02 forms were collected from within Timor Sea drainage division.
- **Horton's divisions (4 divs.)**. Majority of objects were collected from Kimberley (29). There appears to be patterning at that level.
- **Locations (10 locs.)**. SHP02.02 objects are clustered in two areas. The majority occur in along the Dampier Peninsula in north-western Western Australia. There is patterning at that level.

9.4.2.2.4 SHP02.03 distribution of form

Irregular shaped or small pearl shell pendant.

The sample contained thirty SHP02.03 forms. These objects are not standardised in form and do not fit into standard SHP02 or the later SHP06 pearl shell pendant forms. The frequency and distribution of SHP02.03 forms is listed below in Table 9.34.

Table 9.34. Frequency and distribution of SHP02.03 form

Location	Horton's (1996) & drainage divisions	Total
Alice Springs, Arrernte	D(LE)	1
Archer, Kendall & Holyrod Rivers	WC(G)	1
Arnhem Land unprovenanced	A(TS)	1
Broome	K(TS)	1
Cape York West	WC(G)	2
Elkedra to Tanami	D(WP)	1
Forrest River	K(TS)	2
Frew River	D(WP)	1
Kimberley unprovenanced	K(TS)	1
King Sound	K(TS)	1
Koonibba	S(WP)	2
McArthur River	G(G)	1
Melville Is	N(TS)	3
Millingimbi	A(TS)	1
Minnie Downs	R(MD)	1
Newcastle Waters	D(WP)	1
Ooldea	D(WP)	1
Penong	S(WP0	3
Port George IV	K(TS)	3
Weipa	WC(G)	1
Wyndham	K(TS)	1
Total	**na**	**30**

SHP02.03 forms are distributed more widely than any other SHP02 variations. They spread across the coastal northern end of Australia and down through the inland centre to the South Australian Bight. All locations have low numbers of this form. Patterning is summarised below:

- **Drainage divisions (5 divs.)**. The majority of objects were collected from Timor Sea (14) followed by contiguous areas Western Plateau (9) and Gulf (5). The distribution does not cross the watershed from the Gulf to the east coast but does spread from both east and west coasts to the inland and south. Not confined to drainage other than none east of the Great Dividing Range.
- **Horton's divisions (8 divs.)**. Majority of objects were collected from Kimberley (48) followed by West Cape (29). Frequency is less away from those two areas.
- **Locations (21 locs.)**. SHP02.03 objects are not localised. There is local patterning.

9.4.2.2.5 SHP02.04 distribution of form


Pearl shell shaped into a disc and pierced through the centre.

The sample contained two SHP02.04 forms. Both SHP02.04 forms were collected from Cooktown on the north western coast of Cape York, Queensland. The form is unique and patterning cannot be assessed with such a small sample.

9.4.2.3 Summary of SHP02 forms

SHP02 forms were collected from thirty-eight locations. The majority of SHP02 forms were collected from adjacent locations on the Dampier Peninsula at Lombadina Mission (16) and King Sound (14). Mapoon in West Cape York held the next highest number (9). All other locations held very small samples. Only eight locations (11 specimens) are a substantial distance from the coast.

There are two groups of SHP02.00 forms, one in western Cape York within the Gulf drainage area and the other stretching across from Arnhem Land to Bathurst Island within the Timor Sea region. The main form (SHP02.00) has not travelled long distances from the coast but SHP02.03 sub-form has been transported long distances through the centre of Australia and down to the south coast of South Australia. These are mainly shaped oval or rounded whereas the crescent or elliptical are distributed around the coast. Form is a factor in the distribution of these pearl shells.

9.4.3 SHP03, SHP04 and SHP05 forms

I have grouped these three forms together as they have one or no sub-form and can be tabled and plotted together without providing too much information to interpret on maps and tables.

9.4.3.1 Classification of SHP03 forms

Fifteen SHP03 objects were recorded in this sample. This form has been manufactured from the base of *Conus* sp. (cone shells). A disc has been removed from the base of the shell then pierced at the top for attaching string. The form is illustrated in Figure 9.36.

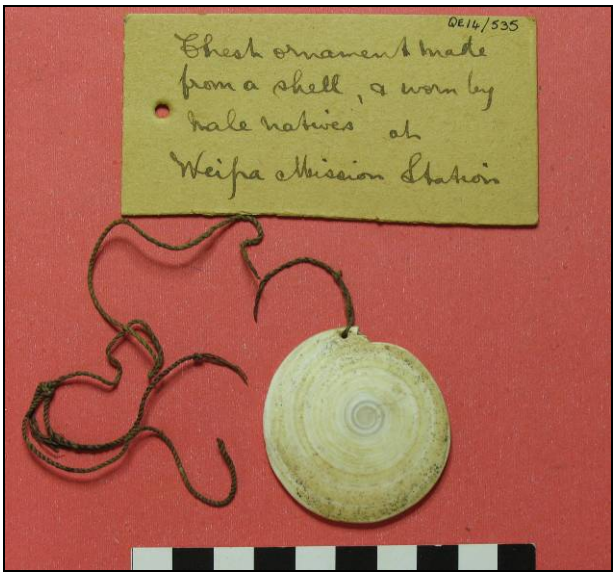

Figure 9.36. SHP03 cone shell (QE-535, Queensland Museum)

The variation to SHP03.00 has the following characteristics:

- **SHP03.01**: the shell species is different. Three almost identical examples were recorded in this sample. Each ornament consists of a single, whole sundial shell that has been pierced through the centre (see Figure 9.37). I have included those objects in the form SHP03 because their upper outer shell is similar in appearance to that of a pierced *Conus* sp. base. Although the shells have been tied together in the image, the shells were probably strung separately.

Figure 9.37. SHP03.01 sundial shells (1986.70.41, National Museum)

9.4.3.2 Classification of SHP04 form

Fifteen SHP04 objects were recorded in this sample. Objects in this category retain the original natural shape of the shell. Usually the shell rim is not modified. The object has a pearly inner surface and has been modified for suspension by piercing or notching (Figure 9.38).

Figure 9.38. SHP04 pearl shell natural shape retained (E-14517, Australian Museum)

9.4.3.3 ClassificationSHP05 forms

Ten SHP05 objects were recorded in this sample. This form is manufactured from *Nautilus* sp. shell. SHP05.00 has been cut from the deep section of the *Nautilus* sp. shell giving a deep cross section and is generally a truncated oval shape in plan form as shown in Figure 9.39.

Figure 9.39. SHP05 *Nautilus* sp. with deep section (E-14509, Australian Museum)

The only variation to SHP05.00 recorded in this sample is:

- **SHP05.01**: the shape is flatter in cross section than SHP05.00 and a different shape - usually disc or oval shaped in plan form. An image of SHP05.01 sub-form is given in Figure 9.40.

Figure 9.40. SHP05.01 *Nautilus* sp. (QE-1797, Queensland Museum)

The specimen shown above has been labelled *Melo* sp. but this is incorrect. Incorrect labelling was not unusual within museums (see Chapter 7) when early curators lacked familiarity with materials.

9.4.3.4 Distribution and frequency of SHP03-SHP05 forms

Frequency of SHP03 to SHP05 forms is summarised within drainage basins in Table 9.35and Horton's divisions in Table 9.36.

Table 9.35. Frequency of SHP03, SHP04 and SHP05 sub-forms and drainage divisions

Drainage division	SHP03.00	SHP03.01	SHP04.00	SHP05.00	SHP05.01	Total
Gulf of Carpentaria	9	3	9	2	0	23
Indian Ocean Div	2	0	2	0	1	5
Northeast Coast	1	0	0	5	2	8
Timor Sea	0	0	4	0	0	4
Total	**12**	**3**	**15**	**7**	**3**	**40**

Table 9.36. Frequency of SHP03, SHP04 and SHP05 sub-forms and Horton's (1996) divisions

Horton's divisions	SHP03.00	SHP03.01	SHP04.00	SHP05.00	SHP05.01	Total
Arnhem	0	0	2	0	0	2
East Cape York	1	0	0	4	0	5
Fitzmaurice	0	0	1	0	0	1
Gulf	0	0	4	0	0	4
Kimberley	0	0	1	0	0	1
North	0	0	2	0	0	2
Northeast	0	0	0	0	2	2
Northwest	2	0	2	0	1	5
Rainforest	0	0	0	1	0	1
West Cape York	9	3	3	2	0	17
Total	**12**	**3**	**15**	**7**	**3**	**40**

Most of these objects were collected within Gulf (23). None of Horton's division held more than ten of any objects. Patterning of sub-forms is explained below. I have displayed the above three forms on the one map because these forms have one or no sub-forms and their spread can be identified on a single map (Figure 9.41).

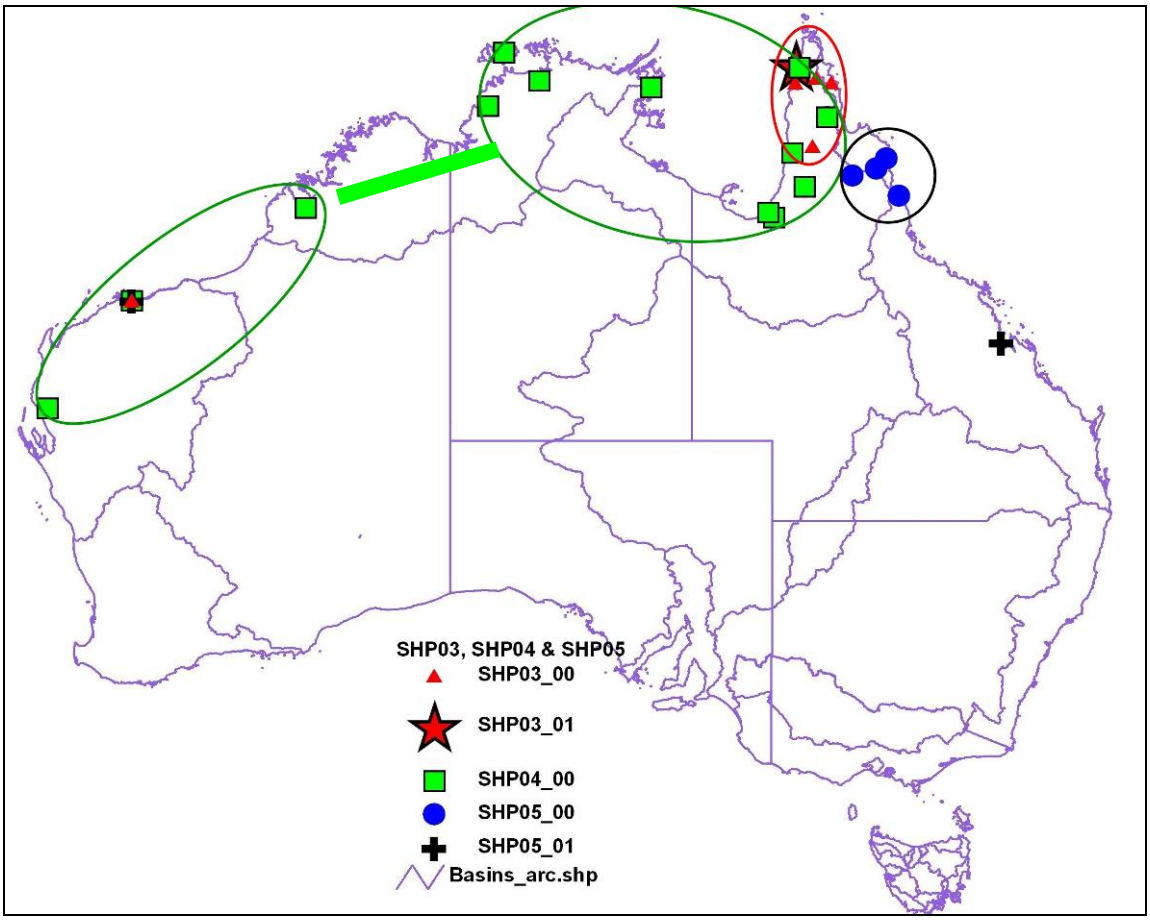

Figure 9.41. Distribution of SHP03, SHP04 and SHP05 forms

All of these forms were located near or on the coast. The SHP03 and SHP05 objects are clustered in Cape York. The provenancing of SHP03.00 in Western Australia has been questioned. SHP04 is spread around the coast from Cape York to half way down the Western Australian coast. The frequency within locations is summarised for SHP03-SHP05 forms in Table 9.37.

Table 9.37. Frequency of SHP03, SHP04 and SHP05 forms in locations

Location	SHP03 00	SHP03 01	SHP04 00	SHP05 00	SHP05 01	Total
Butchers Hill	0	0	0	2	0	2
Cairns	0	0	0	1	0	1
Caledon Bay	0	0	2	0	0	2
Cape York West	1	0	0	0	0	1
Coen River	0	0	1	1	0	2
Cooktown	0	0	0	2	0	2
Daly River	0	0	1	0	0	1
Derby	0	0	1	0	0	1
Gascoyne District	0	0	1	0	0	1
Kaparlgoo Mission	0	0	1	0	0	1
Karumba	0	0	1	0	0	1
Mapoon	5	3	0	0	0	8
Melville Is	0	0	1	0	0	1
Mitchell River	0	0	1	0	0	1
Moreton Electric Office	2	0	0	0	0	2
Normanton	0	0	2	0	0	2
Palmer River	0	0	0	1	0	1
Pascoe River Iron Range	1	0	0	0	0	1
Port Musgrave, Wenlock & Ducie Rivers	0	0	1	0	0	1
Roebourne	2	0	1	0	1	4
St Lawrence	0	0	0	0	2	2
Staaten River	0	0	1	0	0	1
Weipa	1	0	0	0	0	1
Total	**12**	**3**	**15**	**7**	**3**	**40**

SHP04 forms were the most numerous (15), followed by SHP03 forms (12). The remaining forms have small samples. No location has more than ten objects, the highest number of objects occurring at Mapoon.

9.4.3.4.1 SHP03.00 and SHP03.01 distribution of form


SHP03.00. Cone shell pendant.


SHP03.0. Sundial shell pendant.

The sample contained twelve SHP03.00 and three SHP03.01 forms. These forms cluster in the northern tip of Cape York. Two objects were collected from Western Australia but the provenancing is probably incorrect. These objects are common in Torres Strait and Cape York but may have been taken to Western Australia by visiting Torres Strait Islander pearlers (comments made by K. Akerman, 7/01/2003, from notes attached to label in Museum

Victoria). I have kept these objects in the sample as an indication of how patterning can be affected by poor provenancing. SHP03.00 is a highly stylised object with a limited distribution. Patterning is summarised below.

- **Drainage divisions (3 divs.)**. SHP03 forms were collected from Gulf (12), Northeast Coast (1) and Indian Ocean (2). The form has crossed the divide in Cape York but mainly concentrated in Gulf.
- **Horton's divisions (3 divs.)**. Most SHP03.00 and SHP03.01 forms were collected from West Cape (9) within Gulf. Patterning at that level.
- **Locations (5 locs.)**. Eight of the SHP03 forms were collected from Mapoon. The same style of SHP03.00 was collected from nearby locations. Localised to that small area in northern Cape York.

9.4.3.4.2 SHP04.00 distribution of form


SHP04. Natural shaped pearl shell pendant.

The sample contained fifteen SHP04.00 forms. These forms are spread around the coastline from the western side of the tip of Cape York, Queensland to Roebourne in Western Australia. Only 20% (3 specimens) SHP04 forms have had the convex side of the shell completely cleaned in comparison with almost 50% (109 of 219) of pearl shells for the sample. By cleaning, I mean that the outer crust of the shell has been fully or partially removed. Figure 9.42 illustrates a partially cleaned pearl shell.

Figure 9.42. Partially cleaned pearl shell

Patterning of SHP04 form is summarised below.

- **Drainage divisions (3 divs.)**. SHP04.00 forms were collected from contiguous basins Gulf (9), Timor Sea (4) and Indian Ocean (2). The form has crossed two divides but has not crossed the Great Dividing Range to East Cape.
- **Horton's divisions (7 divs.)**. No patterning at this level.
- **Locations (13 locs.)**. All thirteen locations held small samples. No patterning at this level.

9.4.3.4.3 SHP05.00 distribution of form


SHP05.00. 
SHP05.01. *Nautilus* sp. pendant.

The sample contained seven SHP05.00 forms. This form is contained in a small area in Cape York. Patterning is summarised below.

- **Drainage divisions (2 divs.)**. SHP05.00 forms were collected from contiguous basins Norheast Coast (5) and Gulf (2). The form crosses the Great Dividing Range.
- **Horton's divisions (3 divs.)**. No patterning at this level.
- **Locations (5 locs.)**. The objects were from a small area around Cooktown not influenced by the above divisions.

9.4.3.4.4 SHP05.01 distribution of form

The sample contained three SHP05.00 forms. This form was collected from two locations (St. Lawrence in Queensland and Roebourne, Western Australia.) These locations are at opposite sides of the continent but on similar latitudes. No patterning exists for this form.

9.4.3.5 Summary of SHP03-05 forms

With the exception of SHP04 and SHP05.01, these objects are localised in distribution but the spatial patterning of these forms is not necessarily the same. The drainage and Horton's divisions have little influence on the spread, but more localised distribution for most of these forms.

9.4.4 SHP06 forms

Ninety-nine SHP06 forms were recorded in this sample. This category of shell has been manufactured from large pearl shells. Generally the whole shell has been used, retaining the basic shaping but cut to a smooth and almost symmetrical outline longitudinally, usually oval or egg-shaped. Mountford and Harvey (1938) refer to Stirling from the South Australian Museum for a description of the manufacture of these objects. Stirling had noted 'the rough surface of the shell was covered with hot ashes and then removed by grinding with sand and water' (Mountford and Harvey 1938: 115). Quite often one or both surfaces have been incised and red or black colouring added.

9.4.4.1 Classification of SHP06 form

The basic SHP06.00 form displays the following elements:

- single, shaped, pierced pearl shell; and
- the shape is generally oval or elongated oval.

The standard SHP06 form is illustrated in Figure 9.43.

Figure 9.43. SHP06 pearl shell with human hair belt (WA-6208, Western Australian Museum)

9.4.4.2 Classification of SHP06.01 sub-form

A variation to SHP06.00 is:

- **SHP06.01**: object has more than one segment. Two examples only from Lombadina Mission and Broome.

9.4.4.3 Distribution and frequency of SHP06 forms

The frequency of SHP06 forms is summarised within drainage in Table 9.38 and Horton's divisions in Table 9.39.

Table 9.38. Frequency of SHP06 forms and drainage divisions

Drainage divisions	SHP06 00	SHP06 01	Total
Gulf of Carpentaria	3	0	3
Indian Ocean Division	3	0	3
Timor Sea	82	2	84
Western Plateau	9	0	9
Total	**97**	**2**	**99**

Table 9.39. Frequency of SHP06 forms and Horton's (1996) divisions

Horton's (1996) divisions	SHP06.00	SHP06.01	Total
Arnhem	1	0	1
Desert	9	0	9
Fitzmaurice	2	0	2
Gulf	2	0	2
Kimberley	80	2	82
Northwest	3	0	3
Total	**97**	**2**	**99**

SHP06 forms represent almost one third of the pendant population in this sample. As shown above, the form spreads across contiguous basins with the majority of SHP06 forms collected from Timor Sea (84). The distribution of SHP06 forms is displayed in Figure 9.44. Only two SHP06.01 forms were recorded and they were from Kimberley.

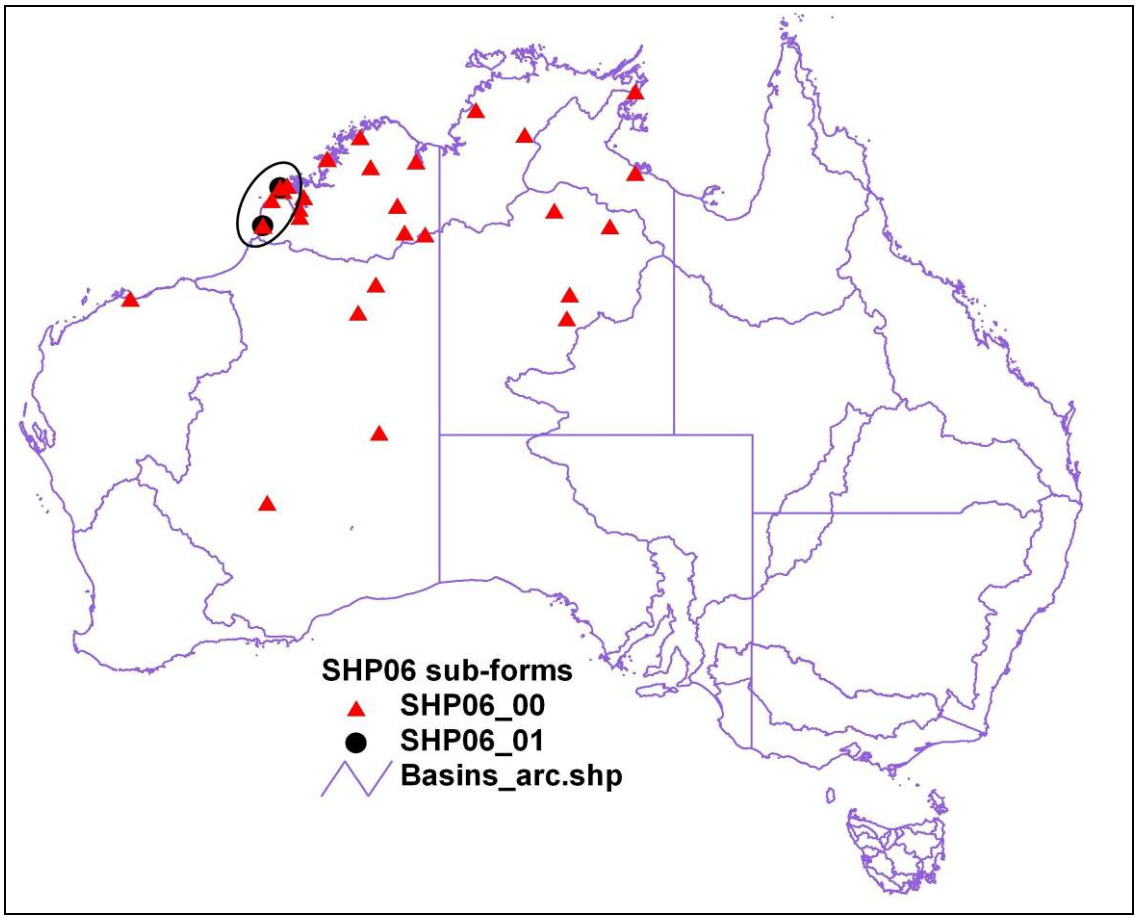

Figure 9.44. Distribution of SHP06 forms

The majority of locations with SHP06 forms are in north-western Australia and through the centre within the drainage areas of Timor Sea and Western Plateau. This form has travelled long distances across the western and central interior of Australia as did the SHP02.03 but with a different pattern of distribution. The form does not cross over into Eyre or the eastern side of Australia. The number of locations does not reflect the concentration of objects within those locations. Frequency of objects within locations is summarised in Table 9.40. The two SHP06.01 examples were collected from Broome and Lombadina Mission on the Kimberley coast.

Table 9.40. Frequency of SHP06.00 form in locations

Location	Horton (1996) & drainage division	Total
Admiralty Gulf	K(TS)	4
Anthony Lagoon Police Station	D(WP)	1
Barrow Creek	D(WP)	1
Barrow & Tennant Creeks	D(WP)	1
Beagle Bay	K(TS)	2
Broome	K(TS)	15
Caledon Bay	A(G)	1
Cape Leveque	K(TS)	1
Cygnet Bay	K(TS)	3
Daly River	F(TS)	1
Derby	K(TS)	1
Drysdale Mission	K(TS)	3
Flora Vale	D(WP)	1
Godfrey Tank Canning Stock Route	D(WP)	1
Halls Creek	K(TS)	1
Katherine River	F(TS)	1
Kimberley unprovenanced	K(TS)	6
King Sound	K(TS)	9
Kunmunya Mission	K(TS)	3
Laverton	D(WP)	1
Lombadina Mission	K(TS)	19
McArthur River	G(G)	2
Newcastle Waters	D(WP)	1
Port George IV	K(TS)	1
Roebourne	NW(IO)	3
Sunday Island	K(TS)	7
Warburton Ranges	D(WP)	1
Well 42 Canning Stock Route	D(WP)	1
Wyndham	K(TS)	4
Yeeda Station	K(TS)	1
Total	**na**	**97**

The majority of SHP06.00 forms were collected from Lombadina Mission (19), Broome (15) and King Sound (9). These are all on the Dampier Peninsula in the Kimberley. All other locations held small samples. Patterning is summarised below.

- **Drainage divisions (4 divs.)**. SHP06 forms are distributed mainly within two divisions (Timor Sea & Western Plateau). The form spreads just into contiguous areas of the Gulf and Indian Ocean do not cross over to Eyre.
- **Horton's divisions (6 divs.)**. Horton's divisions are not a factor in the distribution patterning of SHP06 forms, but it is a factor in the frequency of the form.
- **Locations (30 locs.)**. The majority of SHP06 forms were collected the Dampier Peninsula in Kimberley. Patterning is localised for frequency to this area but not to spread.

Most objects were collected from a small area but the spread is broad.

9.4.4.4 Summary of SHP06 forms


Large pearl shell pendant.

The SHP06 form was highly prized and traded across to the centre of Australia. The form is not distributed east of the Western Plateau/Lake Eyre watershed.

9.4.5 Summary of Class 2 (pendant) shell forms

Frequency of all six forms and species is listed in Table 9.41.

Table 9.41. Material species and pendant forms

Material Species	SHP01	SHP02	SHP04	SHP04	SHP05	SHP06	Total
Cone shell	0	0	12	0	0	0	12
Baler shell	74	0	0	0	0	0	74
Nautilus sp.	0	0	0	0	10	0	10
Pearl shell	0	107	0	15	0	99	221
Sundial shell	0	0	3	0	0	0	3
Total	**74**	**107**	**15**	**15**	**10**	**99**	**320**

The highest number of forms was SHP02 followed by SHP06 – these forms are manufactured from pearl shells. Baler shell was the next highest material used to manufacture SHP01 forms. All forms are plotted in Figure 9.45

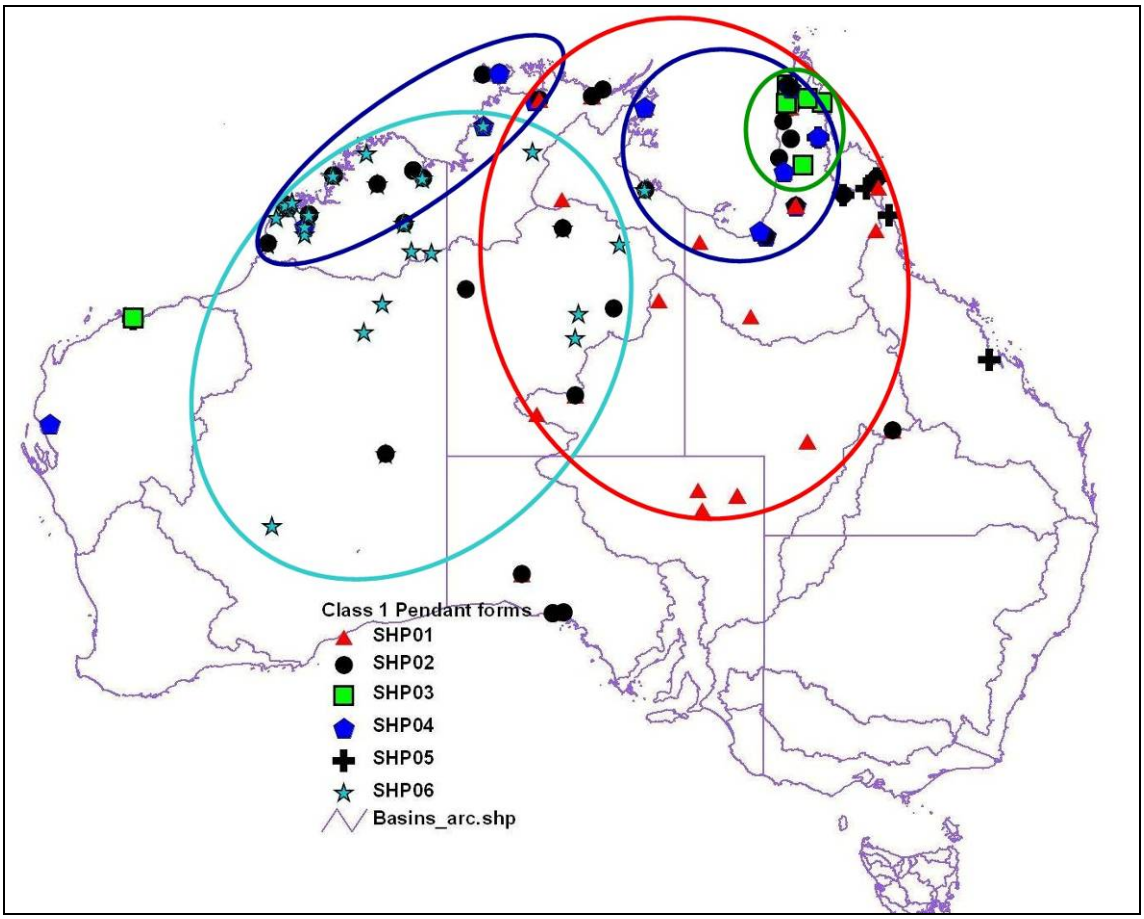

Figure 9.45. Distribution of Class 2 (pendant) shell forms

Each form has its own distribution. No two forms have the same spread. Most Pendant forms appear to be confined to within one or two major drainage areas. There is some overlapping of SHP01, SHP02 and SHP06 forms in areas that coincide with the drainage divides between the Gulf, Lake Eyre and Western Plateau. As shown in Table 9.41, these three forms are the most prolific and represent over 87% of the shell pendant sample.

9.5 Summary of shell classes and forms

In this chapter I have nominated two major classes for shell beads, identified eleven forms or styles and variations to those forms. I have tabled the frequency of forms and mapped their distribution and investigated the spatial patterning of shell beads at three different levels. Some shell ornament forms represent equal portions of the sample but no two forms have the same distribution. There is a difference in the distribution of shell classes. Class 1 (series) shell ornaments were collected around the coastline while the Class 2 (Pendant) shell

ornaments were more widespread, both coastal and inland. Species type determines the form in the sample and there is a correlation between patterning of species and form.

In addition to the forms of series and pendants, many of the pendants also have extractive and/or additive decoration. The spatial patterning of their decoration is an important part of the understanding of these body ornaments. Also, metric variations were obvious within some forms. In the next chapter, I investigate the decoration and standardisation of shell beads together with beads manufactured from other raw materials. The results of classification and distribution of raw materials other than shell are presented in Appendices 14-16. The results from this chapter, Chapter 10 and Appendices 14-16 will be discussed in Chapter 11, in context with evidence from literature and archaeology.

CHAPTER 10 RESULTS: METRIC ANALYSIS, DECORATION AND CLASSIFICATION

10.1 Introduction

In this chapter, I will assess the richness of sub-forms within locations. Then I will investigate the standardisation of ornaments by comparing the metric variables of selected forms and raw materials. After that, I will consider the degree of decoration imposed on ornaments to assess the value added to objects and how this manifests spatially. The object of this chapter is to assess the degree of spatial variation of beads and to investigate whether features imposed on forms vary between those intended for local use or for those objects that travel long distances. I will include the results of the previous chapter about shells, and raw materials other than shell from Appendices 14-16.

10.2 Richness of sub-forms

In total, forty-one forms and seventy-four sub-forms were nominated for the sample. Richness of forms for each site within the sample is diverse. Twenty-eight percent of categories in the sample contained only one type of ornament. The number of different sub-forms within drainage divisions is listed in Table 10.1 and within Horton's (1996) divisions in Table 10.2. The distribution according to number of sub-forms within sites is plotted in Figure 10.1.

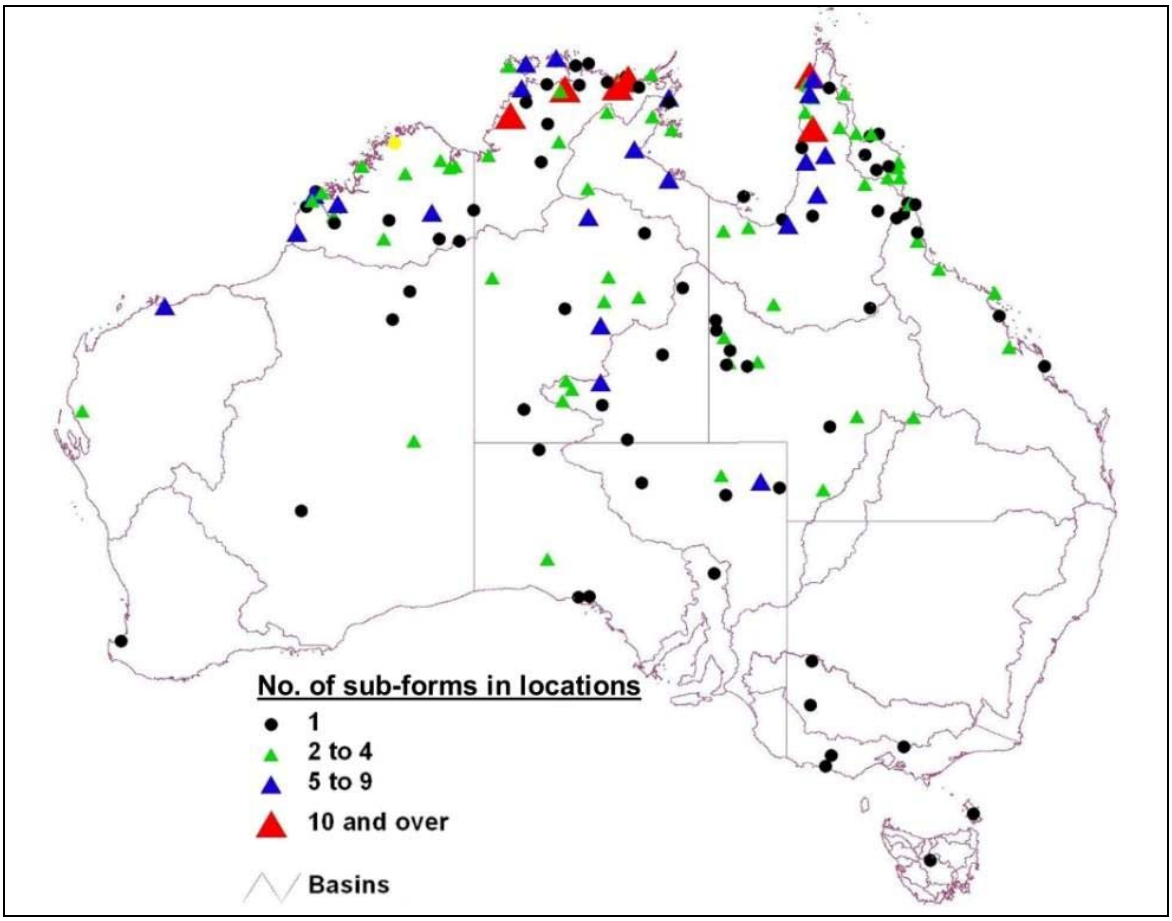

Figure 10.1. Number of different sub-forms in locations

With the exception of the locations containing ten or more sub-forms across the northern end, generally the further south, the fewer the number of objects and there is a large gap in New South Wales and south-east Queensland. Locations with 5-9 objects are spread around the northern coastal edges and also inland to the Centre and Lake Eyre. Also, Roebourne on the central coast of Western Australia has between 5-9 sub-forms.

Table 10.1. No. of sub-forms within drainage divisions

Drainage divisions	No. of objects	No. of sub-forms
Timor Sea	451	49
Gulf	265	32
NE Coast	86	18
Western Plateau	62	16
Lake Eyre	92	14
Indian Ocean	15	8
Murray Darling	5	5
SE Coast	3	3
SW Coast	1	1
South Australian Gulf	1	1
Tasmania	26	1
Total	**1007**	**74**

Timor Sea has the most variation in the number of sub-forms with 66% of the sample sub-forms represented. Next is Gulf divisions with 46% of the sample represented. These two divisions also have the highest number of ornaments. Some of the sites with fewer specimens have a higher ratio of sub-form (e.g. Indian Ocean has 15 objects with 8 sub-forms). Tasmania has the least number of sub-forms (only 1) although there is variation in species.

Table 10.2. No. of sub-forms within Horton's (1996) divisions

Horton's divisions	No. of objects	No. of sub-forms
Arnhem	154	33
West Cape York	148	24
North	77	22
Desert	102	19
Gulf	91	19
Kimberley	219	18
East Cape York	54	12
Fitzmaurice	23	12
Eyre	51	11
NW	15	8
NE	11	6
Rainforest	21	6
Riverine	5	5
SE	3	3
Spencer	6	2
SW	1	1
Tasmania	26	1
Total	**1007**	**74**

When using Horton's spatial divisions, Arnhem has the highest number of sub-forms (45% of the total sample of sub-forms), followed by West Cape York (32%), North (30%), Desert (26%), Gulf (26%) and Kimberley (24%). Kimberley has the highest number of objects but only eighteen sub-forms. The number of sub-forms for raw materials within Horton's divisions is summarised in Table 10.3.

Table 10.3. No. of sub-forms for each raw material within Horton's (1996) divisions

Horton (1996) units	Bone	Bugles	Cara-pace	China	Gum	Integu-ment	Seed	Shell	Teeth	Verte-brae	Total	No. of materials
Arnhem	2	52	0	0	0	3	1	43	25	28	154	7
Desert	2	6	0	0	0	1	32	22	39	0	102	6
East Cape	0	18	0	0	0	0	2	33	0	1	54	4
Eyre	4	23	0	1	0	0	2	19	2	0	51	6
Fitzmaurice	0	6	0	0	0	0	0	5	12	0	23	3
Gulf	0	34	0	0	0	0	3	44	10	0	91	4
Kimberley	0	6	0	0	0	0	1	196	15	1	219	5
North	0	28	1	0	0	0	0	12	36	0	77	4
Northeast	0	5	0	0	0	0	0	6	0	0	11	2
Northwest	0	0	0	0	2	0	0	13	0	0	15	2
Rainforest	2	13	0	0	0	0	1	5	0	0	21	4
Riverine	1	1	0	0	0	0	1	2	0	0	5	4
Southeast	0	1	0	0	0	0	0	1	1	0	3	3
Southwest	0	0	0	0	0	0	0	0	1	0	1	1
Spencer	0	0	0	0	0	0	1	5	0	0	6	2
Tasmania	0	0	0	0	0	0	0	26	0	0	26	1
West Cape	0	18	0	0	0	0	2	125	0	3	148	4
Total	**11**	**211**	**1**	**1**	**2**	**4**	**46**	**557**	**141**	**33**	**1007**	**12**

Arnhem contained the greatest range of materials (at a gross level), followed by Desert and Eyre, then Kimberley. Tasmania had the least with twenty-five objects all manufactured with shell. However, there is variation in Tasmania with nine different species of shell used to produce one form. A comprehensive breakdown of the richness of sub-forms within spatial units is in Appendix 13.

10.2.1 Summary of richness of sub-forms

Variation in form and raw material exists across the continent of Australia. Tasmania has only one form and one material but nine different species used to manufacture the one form. The sites richest in number of sub-forms are across the northern end of the mainland, most within Timor Sea drainage division. Horton's Kimberley area contained the highest number of objects yet Arnhem contained the most variation in sub-forms and the highest number of materials. Although the locations richest in variation of form were spread around the northern coastline, Desert and Eyre both contained comparable variation in sub-form and materials. This could be the result of collection preferences, with collectors choosing the range of styles they considered appealing in appearance more than representative of an area.

10.3 Metric analysis

From the previous results chapters, I have noted the spatial distribution is different for different forms. I will investigate the variation between classes and within classes by examining selected metric variables within shells. For example, SHP06 pearl shells have a different distribution to SHP02 or SHP01 shells. Is the SHP06 shell more important? Is it more standardised? Does the size of the shell ornament change over distance from the source?

10.3.1 Metric analysis of shells

In this section, I will examine the relationship between spatial units and variables for size of series and pendants. I will focus on shells for this analysis because there is a large enough sample of shell forms to make comparisons such as:

- same raw material with different classes of beads; and
- same class with different raw material.

To do this, I will compare:

a) series – same form manufactured with different materials (SH02 – pearl shell and *Nautilus* sp.).
b) pendants - pearl shell pendants – same material, different forms (SHP02 and SHP06).
c) pendants - pearl shell pendants and baler shell pendants – similar forms, different material (SHP01 and SHP06).
d) pendants – same form and material (SHP02) – standardisation of size within spatial units.

I have selected metric variables that I consider will show discrete variations within and between forms. I will table the mean, standard deviation (SD) and coefficient of variation (CV) for shells to describe the spread. Bin size will be 1 SD. Because of the variability in forms, my approach has been to calculate the descriptive statistics for the combined variables and then recalculated for specific raw materials or forms. For example, in the comparison of pearl shell SH02 and *Nautilus* sp. shell SH02, I have calculated mean, standard deviation (SD) and coefficient of variation (CV) for both materials together, then recalculated separately for each material (Table 10.4). The data for these objects is lodged with the museums.

The CV is defined by the ratio of the SD to the mean expressed as a percentage and adds context to SD by comparing it to the mean. It is calculated by dividing the SD by the mean. For example if SD=10, Mean = 100, (10%) - this is a greater spread around the mean than SD=10, mean =1000 (1%). The higher the percentage, then the greater the variation. Some objects could not be measured for various reasons (e.g. object may have been on display at time of recording). All measurements are in mms.

10.3.1.1 a) Series SH02.00 and SH02.01

SH02.00. Series of rectangular shaped segments threaded side by side on fibre.

SH02.01. Series of overlapping rectangular segments.

Table 10.4 provides the descriptive statistics for two different shell species within one class and two forms. SH02 objects are manufactured from pearl and *Nautilus* sp. shell and confined in distribution to Queensland (mainly around the coast).

Table 10.4. Descriptive statistics for SH02.00 and SH02.01 and two species.

Material	Variable	Number of objects	Mean	SD	CV
Pearl & *Nautilus* combined	No. of segments	75	37.1	8.9	24.00%
Pearl	No. of segments	41	37.4	9.5	25.40%
Nautilus sp.	No. of segments	34	37.1	8.9	24.00%
Pearl & *Nautilus* combined	Length of series	75	223.5	43.3	29.30%
Pearl	Length of series	41	220.6	38.4	17.40%
Nautilus	Length of series	34	223	43.3	19.40%
Pearl & *Nautilus*	Length of segment	75	11.5	4.1	35.60%
Pearl	Length of segment	41	9.6	2.7	27.70%
Nautilus	Length of segment	34	11.5	4.1	35.60%
Pearl & *Nautilus*	Width of segment	75	6.9	2.2	32.00%
Pearl	Width of segment	41	5.8	1.4	23.80%
Nautilus	Width of segment	34	6.7	2.2	32.00%

The degree of variation for spread from the mean for number of segments and length of segments is about the same for pearl and *Nautilus* sp. *Nautilus* sp. has greater variation for

the length and width of segments. The percentage of pearl and *Nautilus* sp. within one SD of the mean is summarised in Table 10.5.

Table 10.5. Percentage of objects within 1 SD of mean for SH02 raw materials

Material	No. of examples	No. of segs	Length of series	Length of segments	Width of segments
Pearl shell	41	73%	78%	78%	78%
Nautilus	34	76%	73%	73%	65%

Pearl shell series has a greater percentage within 1 SD of the mean than *Nautilus* sp. examples for all variables except number of segments. Pearl shell series are more standardised metrically than *Nautilus* sp. but not to a great degree.

10.3.1.2 b) Pearl shell pendants

Table 10.6 summarises the descriptive statistics for SHP02 and SHP06 pearl shell pendants. Thumbnails of forms show the objects discussed.

 ..SHP02.00. .  ..SHP02.02.   ..Two SHP02.03 forms

 ..SHP06. Large pearl shell pendant.

Table 10.6. Variation for SHP02.00 and SHP06 – two forms, one species

Forms of pearl shell	Variable	Number	Mean	SD	CV
SHP02 & SHP06	Length of segment	199	128.6	42.6	33%
SHP02	Length of segment	104	105.3	37.6	36%
SHP06	Length of segment	95	154.2	31.8	20.6%
SHP02 & SHP06	Width of segment	199	72.7	41.5	57%
SHP02	Width of segment	104	38.5	18	46.8%
SHP06	Width of segment	95	110.2	23.6	21.3%

SHP02 forms have more variation than SHP06 forms in length and width. SHP06 are less variable than the overall pearl pendants. When the SHP02 and SHP06 forms are plotted

together, there is a grouping on the scatterplot which contains specimens from both SHP02 and SHP06 that overlaps with both forms and could fit into either.

Looking at the SHP02 and SHP06 forms more closely, the sub-forms nominated give a clearer picture of the distribution. In Figure 10.2, I have plotted the length and width of SHP02 and SHP06 to compare dimensions.

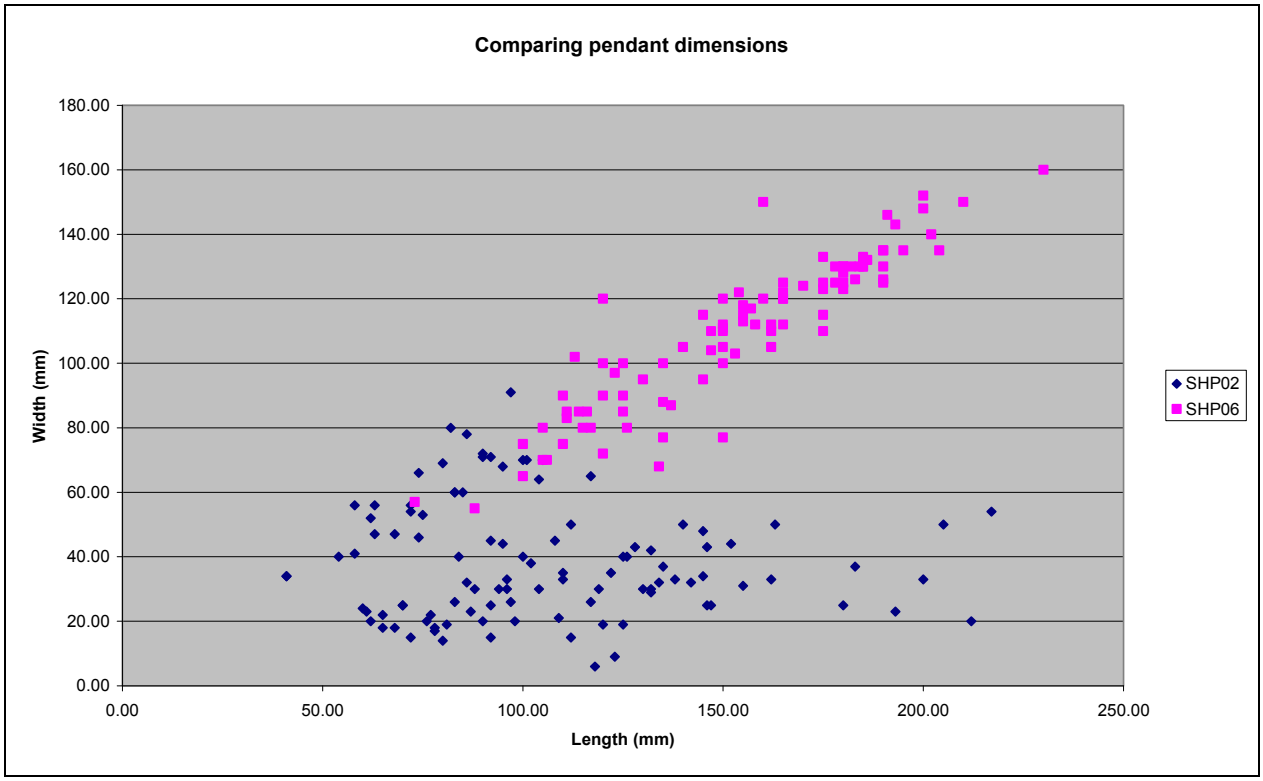

Figure 10.2. SHP02 and SHP06 - lengths and widths

The SHP02 specimens fall into separate clusters, one aligned with the SHP06 specimens and the other narrower than the previous cluster. Figure 10.3 shows the SHP02 forms split into sub-forms.

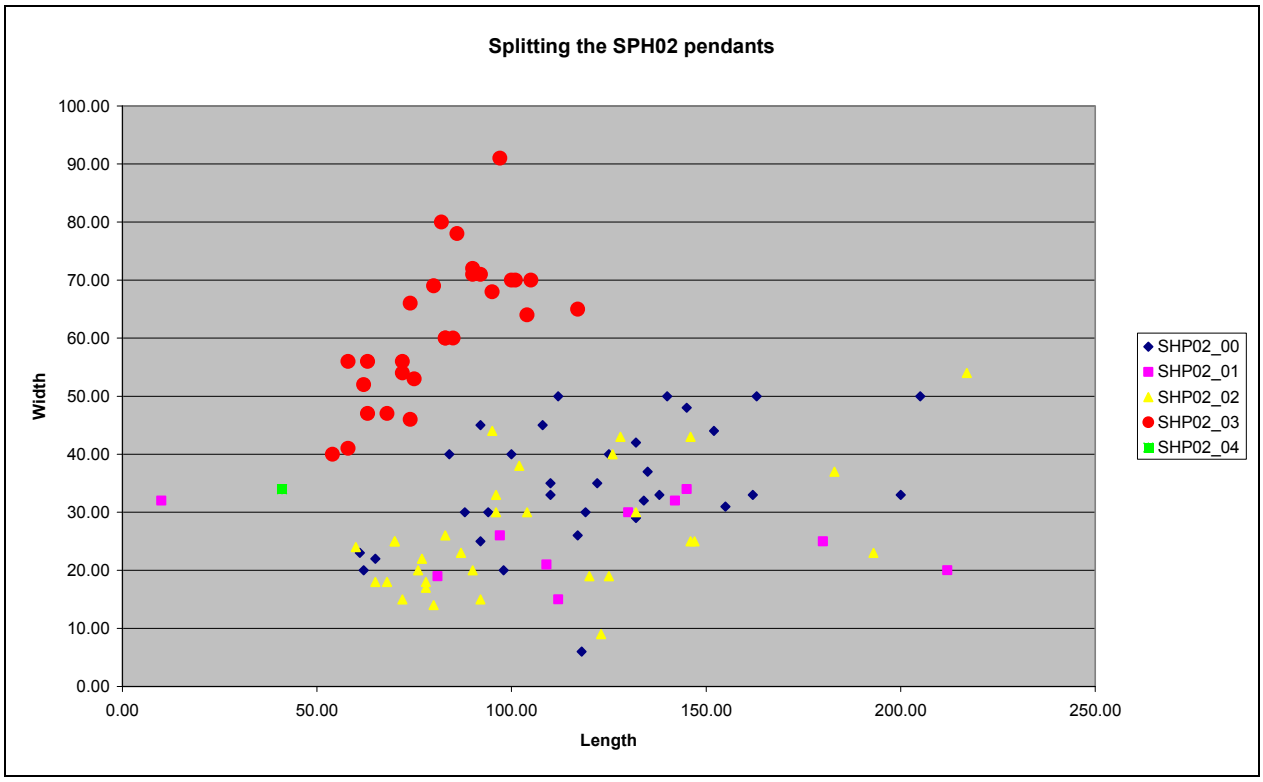

Figure 10.3. SHP02 sub-forms - length and width

Figure 10.2 shows a group of SHP02 which seem to have the same length/width ratio as SHP06. Figure 10.3 shows that almost all of these specimens are SHP02.03. The distribution of SHP02.03 and SHP06 are plotted in Figure 10.4.

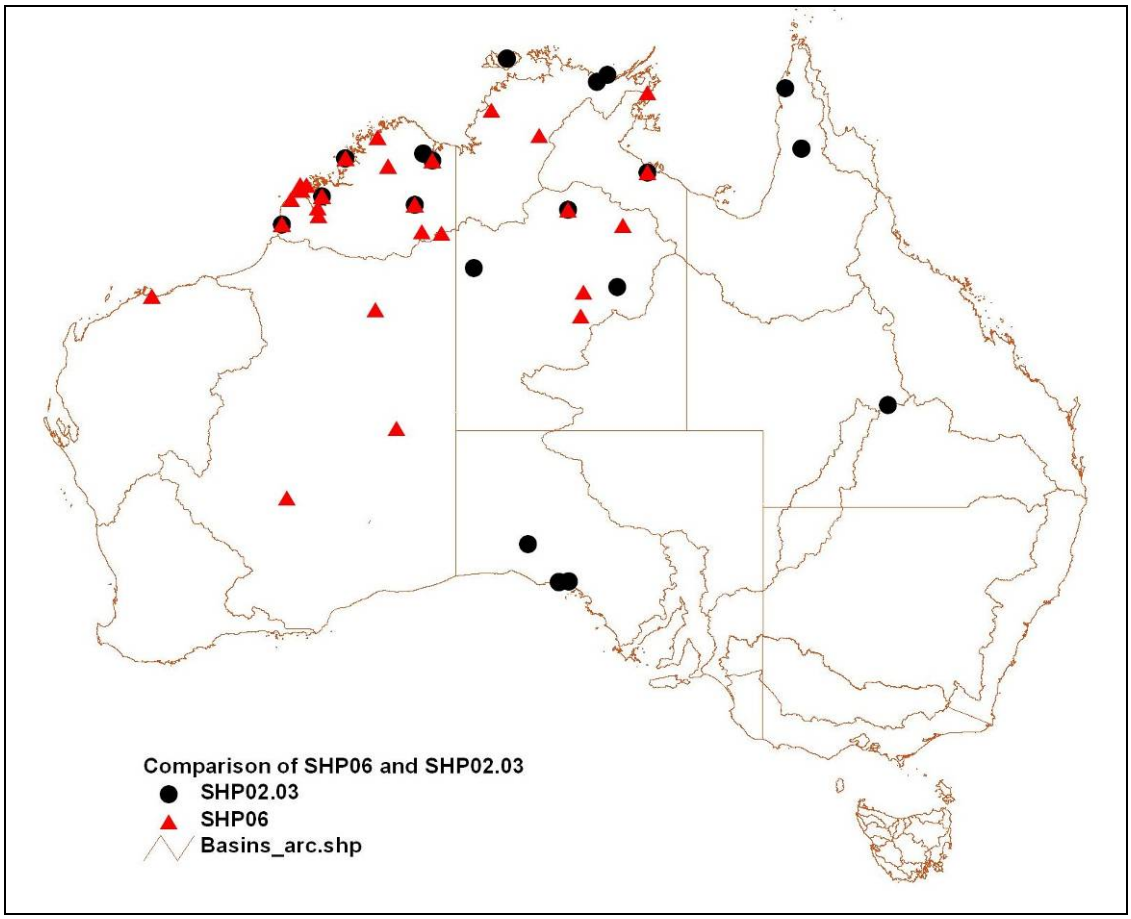

Figure 10.4 Distribution of SHP06 and SHP02.03

From Figure 10.4, those SHP02.03 forms are distributed within the larger SHP06 forms and through the centre of Australia. There are SHP02.03 forms in Queensland, which is outside the distribution for SHP06. My definition of objects as SHP02.03 was as variations to the smaller SHP02 forms because they did not fit morphologically or metrically into SHP02 or SHP06 criteria and I identified that there were more similarities with SHP02 than with the larger, more distinct SHP06 forms. To investigate the possibility that the SHP02.03 forms are not allocated to the right form and should really be included in SHP06, I have separated the SHP02.03 forms into those that, in my analysis, are modified or cut down larger pearl shells or whether the object has been manufactured from a smaller shell (see Figure 10.5). The possibility was suggested that these smaller shells were originally SHP06 forms that have been reworked as they travel from the source. That would imply that as the pendants might become damaged, they were reworked to maintain the same form.

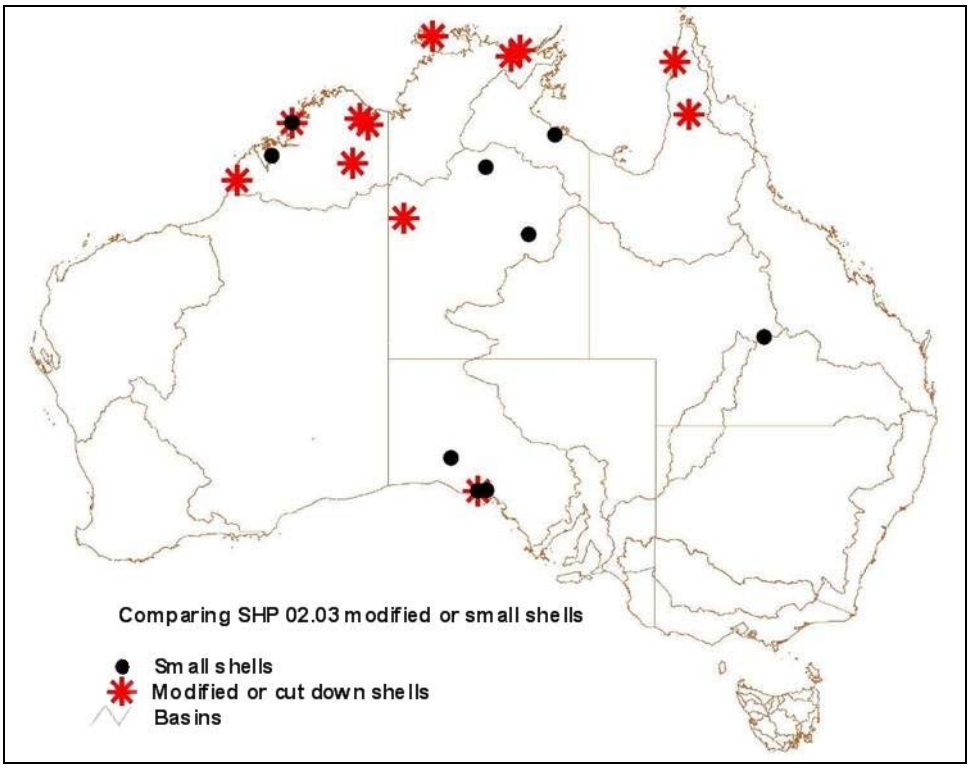

Figure 10.5. SHP02.03 forms manufactured from small shells or modified from larger shells.

But the distribution is almost the complete opposite of that expected if the SHP02.03 forms were predominantly reduced and reworked versions of SHP06. Those that are furthest from the marine source of shells are generally made on small shells; those that could be modified from large shells are mainly close to the coast. Those I have identified as small shells do not display any evidence that they have been modified from a large pearl shell. The edges on small shell specimens are often chipped and some shaping has occurred. However, many still display the scar on the concave surface from where the living tissue was removed and still retain a high percentage of the rim. Other than those with the natural shape, these ornaments do not resemble the large SHP06 forms. While I recognize that all the SHP02 and SHP06 forms are manufactured from pearl shell, the SHP06 forms are large and the original shape of the shell is retained although the edges may be smoothed to give a more symmetrical shape longitudinally.

In my opinion, neither the smaller shells nor the modified shaped SHP02.03 are similar to the large SHP06 form. This apparent similarity of dimensions between SHP02.03 with SHP06 may be worth further investigation at a later date by undertaking chemical analysis to find the source of the shells.

10.3.1.3 c) Pearl shell and baler shell pendants


…SHP06. Large pearl shell pendant. 

…Oval shaped baler shell pendant.

SHP01 and SHP06 are similar forms manufactured with different raw materials and distributed in different areas. SHP01 (baler shell) is along and east of the Eyre/Western Plateau drainage divisions while SHP06 (pearl) is to the west of that division. The spread is described in Table 10.7.

Table 10.7. Variation for SHP01.00 and SHP06 – similar form, two species

Forms of baler and pearl shell	Variable	Number	Mean	SD	CV
SHP01.00 & SHP06 combined	Length of segment	147	145.3	31.7	21.8%
SHP01.00 baler shell	Length of segment	52	129.1	24.4	18.9%
SHP06 pearl shell	Length of segment	95	154.2	31.8	20.6%
SHP01 & SHP06 combined	Width of segment	147	94.6	30.1	32.6%
SHP01.00 baler shell	Width of segment	52	66.1	20.4	30.1%
SHP06 pearl shell	Width of segment	95	110.2	23.6	21.5%

There is not much difference in the CV of length of the pendant for the two raw materials but pearl shell specimens (SHP06) shows a much smaller spread around the mean for width. In comparison with the whole sample of SHP01 and SHP02 forms, the SHP06 forms are more standardised in size. Table 10.8 summarises the statistics for coefficient of variation for baler and pearl shell pendants from inland and coastal drainage divisions. Inland divisions include Lake Eyre, Murray Darling and Western Plateau.

Table 10.8. Variation for SHP01.00 and SHP06 – inland and coastal divisions

Forms of baler and pearl shell	Variable	Number	Mean	SD	CV
SHP06 pearl ALL	Length of segment	95	154.2	31.8	20.6%
SHP06 coastal divisions	Length of segment	87	155.1	32.3	20.8%
SHP06 inland divisions	Length of segment	8	127.8	53	41.5%
SHP01.00 baler shell ALL	Length of segment	52	129.1	24.4	18.9%
SHP01 baler inland	Length of segment	19	127.15	43.5	34%
SHP01 & SHP06 inland	Length of segment	28	127.3	45.7	35.9%
SHP06 pearl ALL	Width of segment	95	110.2	23.6	21.5%
SHP06 coastal divisions	Width of segment	87	111.1	23.4	21%
SHP06 inland division	Width of segment	8	89.2	42.1	47%
SHP01.00 baler shell	Width of segment	52	66.1	20.4	30.1%
SHP01 inland divisions	Width of segment	19	73.4	27.6	37.6%
SHP01 & SHP06 inland	Width of segment	28	78.3	32.9	42%

The pendants from inland spatial divisions made from baler shell are more standardised in length than those manufactured from pearl shell. Both forms have more variation for objects collected away from coastal divisions. However, in contrast to the previous results, baler SHP01 pendants from inland are more standardised in size than SHP06 examples. Both raw materials are longer and wider (more standardised) on the coastal divisions than inland divisions. This may be the result of reworking the object. There is more work to be done on the causes of these statistical variations and the nature of the raw material.

10.3.1.4 d) Pendants SHP02

The inland and coastal coefficient of variation for pearl SHP02 forms is in Table 10.9. The inland divisions (Western Desert, Spencer and Riverine) include fewer examples. The distribution of SHP02 forms is plotted on Table 10.9.

Table 10.9. Variation for SHP02 - coastal and inland areas

Forms of baler and pearl shell	Variable	Number	Mean	SD	CV
SHP02 All	Length of segment	104	105.3	37.6	36%%
SHP02 coastal divisions	Length of segment	93	107.8	38.7	36%
SHP02 inland divisions	Length of segment	11	84.5	15.6	18%
SHP02 All	Width of segment	104	38.5	18	46.8%
SHP02 coastal divisions	Width of segment	93	35.5	15.8	44.5%
SHP02 inland divisions	Width of segment	11	64	15.7	24%

The inland SHP02 shells have much less variation away from the source for both length and width than those from the coast. The inland SHP02 objects are shorter and wider. This agrees with the distribution for sub-form SHP02.03. The other sub-forms are more stylised and distributed regionally around the coast.

10.3.1.5 Summary of metric analysis of shells

From this analysis, shell pendants, are more standardised in coastal divisions than inland, although the larger SHP06 and SHP01 forms are longer and wider in coastal divisions while SHP02 forms are longer and narrower in coastal divisions. Series (SH02.00 & SH02.01) are highly standardised but they are in a more confined distribution. The result for SH02 series could reflect local preference in manufacture. Seed series was the only one other raw material that showed spatial pattering for metric elements. That will be discussed in the following section.

10.3.2 Metric analysis of seeds

Length of series is the only variable that I have investigated for seeds. Five of the objects could not be included in this table because they were too fragile to handle in the museum. Figure 10.6 displays the distribution of seed ornaments according to length of series.

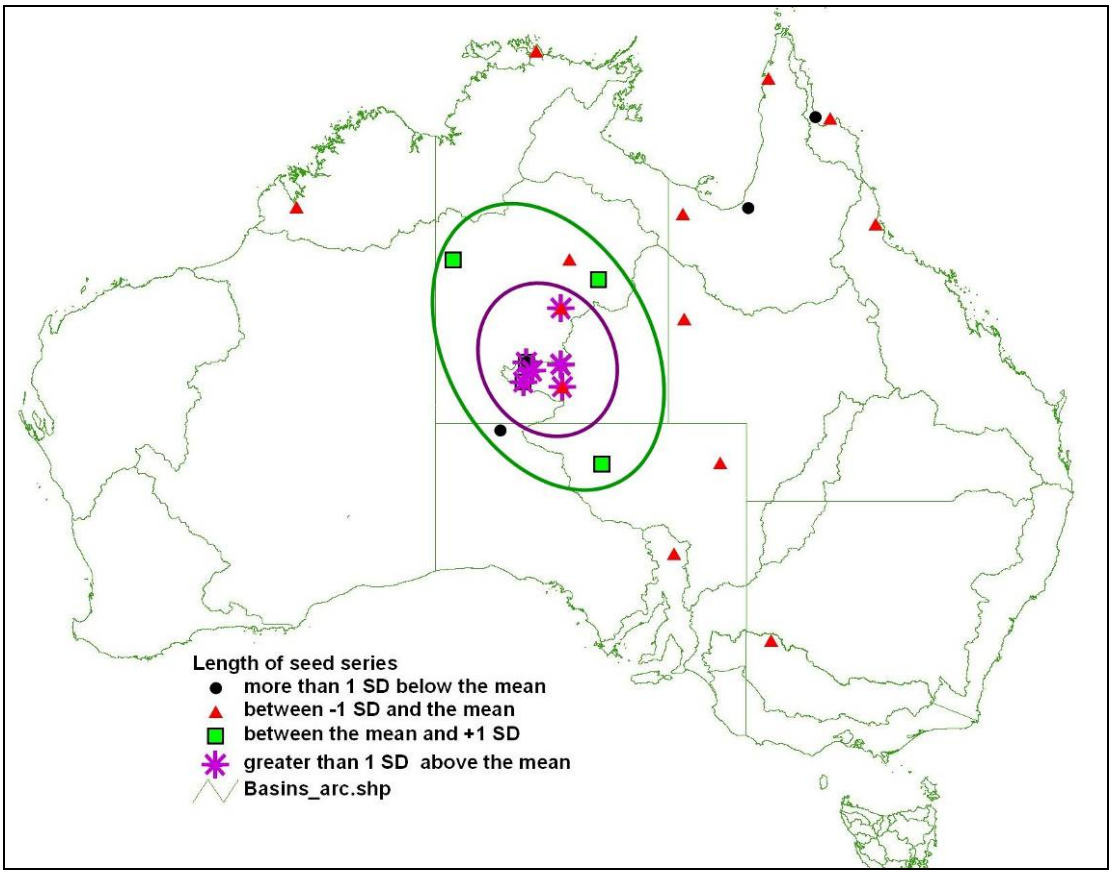

Figure 10.6. Distribution of seed ornaments according to length of series

Clear patterning in Figure 10.6 shows that while the two shorter lengths ranges are throughout the distribution of seed series, longer objects are concentrated in Central Australia. The length decreases in size with distance away from the centre. All longer objects were manufactured with *Erythrina* sp. seeds, which grows throughout the sample distribution for seeds with the exception of the most southerly location. The specimen from that location was manufactured with quandong seeds, which is native to that area.

10.3.3 Summary of metric analysis

Metric results of shells have indicated there is standardisation in shell and seed ornaments for those variables investigated. The most important result for this study is that shell pendants from coastal divisions have less variation metrically and are larger in size statistically than shell pendants away from the coast. SHP02 is an exception being narrower on the coastal divisions than inland divisions. Series manufactured from pearl shell are more standardised than those manufactured from *Nautilus* sp. Seed series are longest in the centre of Australia. This shows variation between and within classes. However, morphology and metric variables are not the only indicators of variation for beads. Another source is the value added in the form of decoration.

10.4 Decoration

Many of the objects have been decorated using additive and/or extractive methods. For example, a shell may be incised with a geometric pattern that has been infilled with red ochre and fat (Akerman and Stanton 1994). In some cases, a pattern has been composed in a series by arranging segments according to species, size of segments or in blocks of colours. For example, Figure 9.21 (Chapter 9) shows a pattern that has been formed by using regular spacing between two differently coloured shell species. In addition, designs have been imposed on shells. I will investigate the distribution of techniques for decorating shells in Section 10.4.1 and designs in Section 10.4.1.1.

10.4.1 Decorated shell forms

Decorative techniques imposed on shell species are listed in Table 10.10. Examples of decorative techniques are shown in thumbnail pictures.


….Combined extractive & additive.


….Extractive only


….Additive only


....Colour or species composed into pattern

Table 10.10. Frequency of shell species and decoration techniques

Material Species	Extractive & additive	Extractive only	Additive only	Pattern with materials	No decoration	Total Decorated
Arca sp.	0	0	0	0	1	**0**
Black crows	0	0	0	2	0	**2**
Cat's teeth	0	0	0	1	0	**1**
Cerithiidae	0	0	0	1	0	**1**
Cone shell	0	0	0	0	12	**0**
Crayfish legs	0	0	0	0	1	**0**
Land snails	0	0	2	0	3	**2**
Maireener	0	0	0	12	0	**12**
Melo (baler)	5	0	3	0	66	**8**
Nautilus sp.	0	0	0	0	61	**0**
Olive shell	0	0	0	0	18	**0**
Pearl	60	19	1	0	193	**80**
Penguin	0	0	0	1	0	**1**
Rice	0	0	0	5	0	**5**
Srombus campbelli	0	0	0	0	2	**0**
Sundial	0	0	0	0	4	**0**
Toothies	0	0	0	2	0	**2**
Top snails	0	0	0	1	0	**1**
Tusk shell	1	0	0	0	80	**1**
Total	**66**	**19**	**6**	**25**	**441**	**116**

More pearl shell ornaments are decorated than any other raw material, making up 68% of all decorated objects. Sixty pearl shell objects display both extractive and additive decoration, nineteen with extractive and one with additive. That represents almost 30% of the pearl shell items. Ten per cent of baler shell ornaments are decorated and all of the maireener shells have been threaded in a pattern or mixed with other shells to form designs. Some species never appear to have been decorated. For example, no *Nautilus* sp., olive shell, cone shell or sundial shells in this sample are decorated. One tusk shell specimen is recorded as decorated but it is the attached pearl pendant that has been incised and painted. I have included the

SH01 object in Table 10.11 but will not include that object in the rest of this analysis on decoration. The shell forms and decorative techniques imposed are listed in Table 10.11.

Table 10.11. Shell forms and decoration

Form	Extractive & additive	Extractive only	Additive only	Pattern with materials	None	Total Decorated
Series						
SH01	1	0	0	0	100	**1 (pendant)**
SH02	0	0	0	0	101	**0**
SH03	0	0	2	0	5	**2**
SH04	0	0	0	0	2	**0**
SH05	0	0	0	25	1	**25**
Pendants						
SHP01	5	0	3	0	66	**8**
SHP02	10	7	1	0	89	**18**
SHP03	0	0	0	0	15	**0**
SHP04	1	0	0	0	14	**1**
SHP05	0	0	0	0	10	**0**
SHP06	49	12	0	0	38	**61**
Total	**66**	**19**	**6**	**25**	**441**	**116**

Six forms are decorated. SH03 and SH05 are the only series objects decorated. SH03 snail shells are simply covered with red ochre. SH05 were decorated by stringing segments according to different species or size to form a pattern. Of the pendants, the decorated form with highest number of objects is SHP06 (pearl shell) with over 60% displaying some form of decoration. Next, is SHP02 (pearl shell), with 20% (18) of objects decorated, then SHP01 (baler shell) with 12% (8) decorated.

The frequency of decorated series is summarised for drainage divisions in Table 10.12 and Table 10.13 for Horton's (1996) divisions.

Table 10.12. Frequency of decoration techniques for series within drainage divisions

Drainage division	Extractive & additive	Extractive only	Additive only	Pattern with materials	Total decorated
Tasmania	0	0	0	25	25
Timor Sea	1	0	2	0	3
Total	**1**	**0**	**2**	**25**	**28**

Table 10.13. Frequency of decoration techniques for series within Horton's (1996) divisions

Horton (1996) divisions	Extractive & additive	Extractive only	Additive only	Pattern with materials	Total decorated
Arnhem	0	0	2	0	2
Kimberley	1	0	0	0	1
Tasmania	0	0	0	25	25
Total	**1**	**0**	**2**	**25**	**28**

Decorated series were collected from two drainage divisions. Twenty-five objects from Tasmania were decorated by creating designs with the colours, species or shape of the shells. Tasmania held the only shell ornaments decorated with this technique. One series object from Timor Sea exhibited both extractive and additive techniques, while two from that division had additive only. The breakdown within Timor Sea shows the additive technique was used in Arnhem and the one object with both extractive and additive was from Kimberley.

The frequency of decorated pendant objects is summarised in Table 10.14 for drainage divisions and in Table 10.15 for Horton's (1996) divisions.

Table 10.14. Frequency of decoration techniques for pendants within drainage divisions

Drainage divisions	Extractive & additive	Extractive only	Additive only	Pattern with materials	Total decorated
Gulf of Carpentaria	1	0	2	0	3
Indian Ocean	2	1	0	0	3
Lake Eyre	4	0	0	0	4
Timor Sea	54	16	1	0	71
Western Plateau	4	2	1	0	7
Total	**65**	**19**	**4**	**0**	**88**

Table 10.15. Frequency of decoration techniques for pendants within Horton's (1996) divisions

Horton's (1996) divisions	Extractive & additive	Extractive only	Additive only	Pattern with materials	Total decorated
Desert	9	2	1	0	12
Gulf	0	0	2	0	2
Kimberley	54	16	0	0	70
North	0	0	1	0	1
Northwest	2	1	0	0	3
Total	**65**	**19**	**4**	**0**	**88**

Decorated pendants were collected from five drainage divisions, the majority from Timor Sea (80%) of which the majority exhibit a combination of extractive and additive methods (54 of 71 objects). Within Timor Sea division, all of the objects that display extractive techniques

were collected from Kimberley. The distribution of decorated ornaments is shown in Figure 10.7.

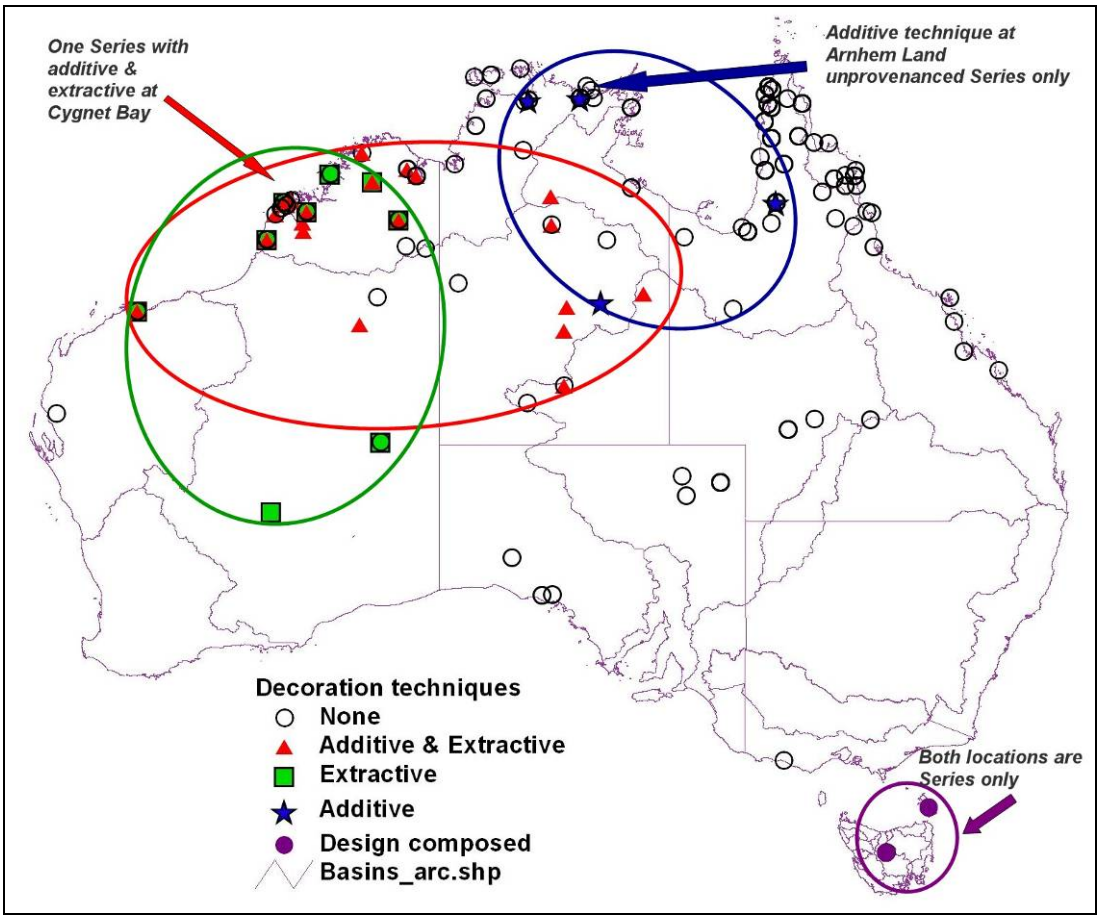

Figure 10.7. Distribution of decorated shell beaded ornaments

With the exception of the locations marked with arrows in Figure 10.7, all decorated objects are pendants. There is patterning in the distribution of decoration techniques. No decorated objects were recorded as being collected from east of the Great Dividing Range. Apart from one item in western Cape York, there are no decorated objects on the mainland east of those objects bordering the boundary between Lake Eyre and Western Plateau. The one object at the south-eastern corner of the Gulf is the only location that breaks that pattern. Objects with additive techniques only are separate from those with extractive techniques only, with objects displaying both techniques overlapping and between those areas. The decorated objects from Tasmania and Furneaux Islands are series only. The frequency of decorated series objects within locations is summarised in Table 10.16.

Table 10.16. Frequency of decoration techniques for series in locations

Location	Extractive & Additive	Additive only	Design composed wtih material	Total decorated objects
Arnhem Land unprovenanced	0	2	0	2
Cygnet Bay	1	0	0	1
Furneaux Islands	0	0	7	7
Tasmania	0	0	18	18
Total	**1**	**2**	**25**	**28**

With the exception of examples from Cygnet Bay, the provenancing for these objects is not precise. Tasmania and Furneaux Islands are the only locations in the sample with this form of decoration. The frequency of decorated pendants within locations is summarised in Table 10.17.

Table 10.17. Frequency of decoration techniques for pendants in locations

Location	Extractive & Additive	Extractive only	Additive only	Total decorated objects
Admiralty Gulf	3	0	0	3
*Alice Springs Arrernte	2	0	0	2
Alligator River	0	0	1	1
*Barrow Creek	1	0	0	1
*Barrow & Tennant Creeks	1	0	0	1
Beagle Bay	1	0	0	1
Broome	11	4	0	15
Cape Leveque	1	0	0	1
Cygnet Bay	2	0	0	2
*Daly Waters	1	0	0	1
Derby	2	0	0	2
Drysdale Mission	3	1	0	4
Forrest River	1	0	0	1
*Frew River	0	0	1	1
Kimberley unprovenanced	5	2	0	7
King Sound	4	2	0	6
Kunmunya Mission	0	1	0	1
*Laverton	0	1	0	1
Lombadina Mission	12	5	0	17
*Newcastle Waters	1	0	0	1
Port George IV	1	1	0	2
Ranken River	2	0	0	2
Roebourne	2	1	0	3
Staaten River	0	0	2	2
Sunday Island	6	0	0	6
*Warburton Ranges	0	1	0	1
*Well 42 Canning Stock Route	1	0	0	1
Wyndham	1	0	0	1
Yeeda Station	1	0	0	1
Total	**65**	**19**	**4**	**88**

Decorated pendants were collected from 29 locations. Thirty-three specimens (38%) came from Broome and Lombadina Mission, very close to Broome (on the scale of this project). I have placed an asterisk before nine names of locations that are a considerable distance from the coast. Ten objects (1.7% of the total shell sample) were decorated from those nine locations compared to the whole shell sample of 21% decorated objects from thirty-two locations. Other than Cygnet Bay, locations with decorated objects have either pendants only or series only. Only three techniques were used for pendants. Patterning of decorative techniques for pendants is summarised below.

Additive and extractive technique together:

- **Drainage divisions (5 divs.)**. The majority of objects were collected from Timor Sea with widely distributed small samples spreading into contiguous areas and their neighbouring divisions. Watersheds appear no barrier along the western distribution but there appears to be some connection between limit of distribution and the watersheds of Western Plateau with Gulf and Lake Eyre. The eastern distribution coincides with the western distribution of baler shell SHP01 ornaments and the western distribution of pearl SHP06 forms.
- **Horton's divisions (3 divs.)**. Horton's boundaries do not necessarily comply with boundaries of the drainage divisions. The objects within Gulf, Lake Eyre and Western Plateau are condensed into one unit (Desert). Also, all objects recorded from Timor Sea are within Kimberley. This shows a tighter pattern than the drainage divisions. The decorated pendants cluster within Kimberley and this technique is more common than other techniques.
- **Locations (23 locs.)**. The majority of objects (c. 85%) showing this technique were collected from the Dampier Peninsula in the Kimberley division (mainly Lombadina Mission and Broome). Patterning is localised for frequency to this area but the distribution is spread into neighbouring areas over the north-western section of Western Australia and into Central Australia.

Extractive technique only:

- **Drainage divisions (3 divs.)**. As for combined extractive and additive technique, the majority of objects decorated with extractive methods only were collected from Timor Sea (16) small samples into contiguous areas. Watersheds appear not to be barriers.

- **Horton's divisions (3 divs.)**. The majority of objects are from Kimberley (16) within Timor Sea with two in adjacent Desert and one only in Northwest. The technique does not flow into Horton's northern divisions in that drainage basin but it does appear in other drainage areas.
- **Locations (10 locs.)**. There is a more confined distribution for this technique, only within Western Australia. Majority of objects displaying this technique were collected from the Dampier Peninsula.

Additive technique only:

- **Drainage divisions (3 divs.)**. This is a small sample with only four pendants displaying this technique alone. The majority of objects were collected from Timor Sea (2) small samples into contiguous areas (Gulf and Western Plateau). Watersheds seem no barrier.
- **Horton's divisions (3 divs.)**. Unlike the previous two techniques, three objects displaying this technique are from Arnhem and North within Timor Sea. The technique does not flow into Horton's southern divisions in that drainage area but it does appear in other drainage areas. Objects decorated with additive only are not found in Kimberley.
- **Locations (6 locs.)**. The distribution for this technique is scattered around the coast between Staaten River (Gulf) and Alligator River in (Northern Territory). There is one pendant with additive only at the Frew River in Central Australia.

Design composed with material:

- All of the objects displaying this technique were from Tasmania and Furneaux Islands, only one object in the sample from Tasmania division has not been strung with this technique.

The distribution of objects that display both additive and extractive design coincides somewhat with that of SHP06 forms. SHP06 objects and decoration have been plotted in Figure 10.8.

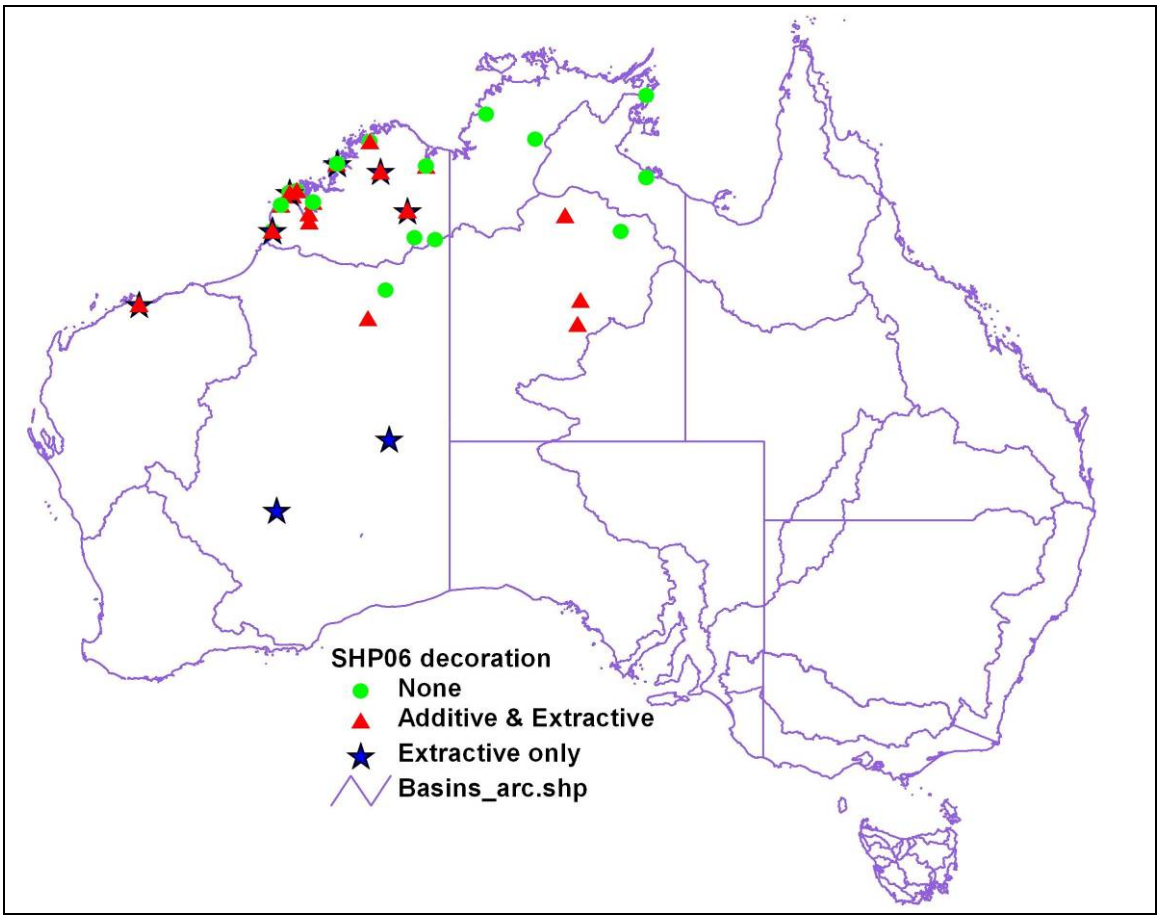

Figure 10.8. Distribution of decorated SHP06 objects

It can be seen that decorated SHP06 items are clustered around the Kimberley region in Western Australia and down through the Western Plateau area. Within the Western Plateau area, only two of the nine sites do not contain decorated objects.

Locations containing objects with geometric and figurative designs are plotted on Figure 10.9.

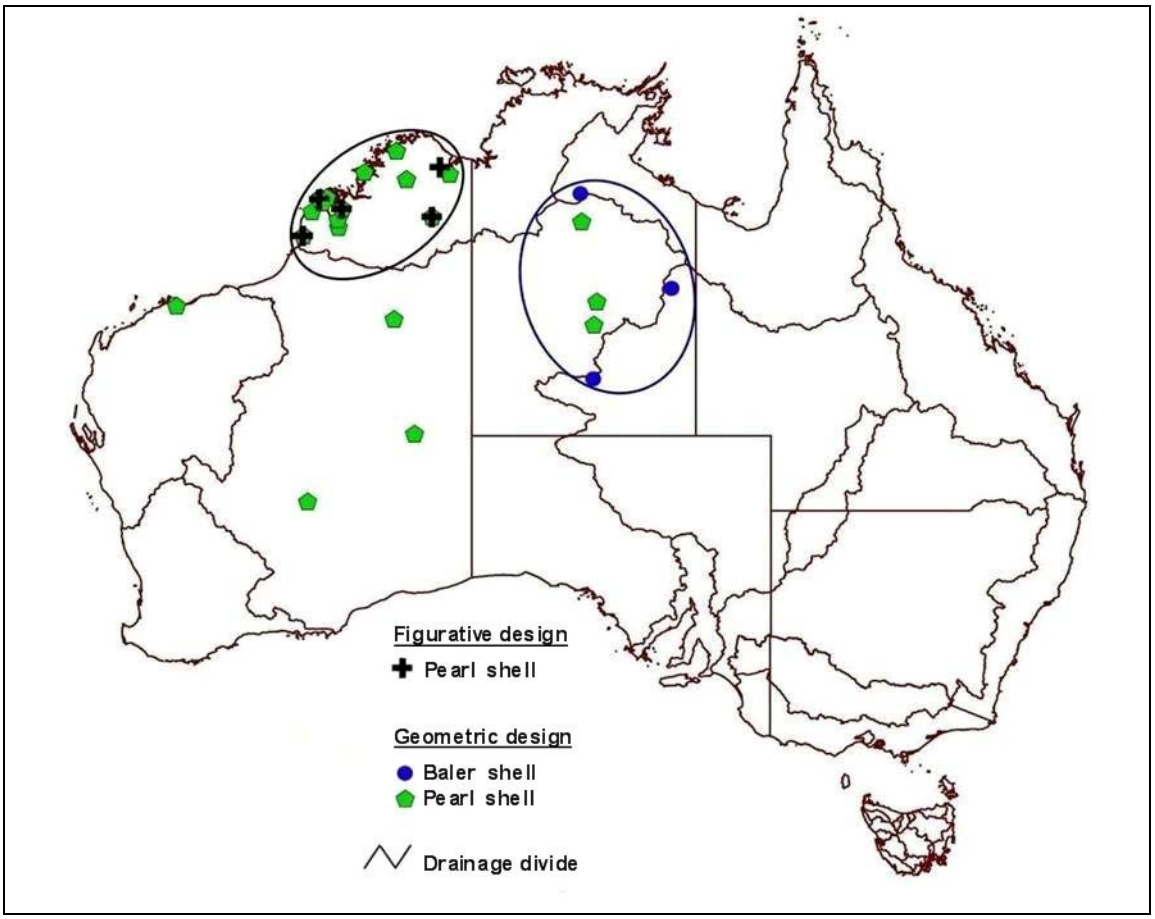

Figure 10.9. Locations containing objects with geometric designs

The majority of decorated objects are manufactured from pearl shell. There is patterning for designs. Objects with figurative designs are all pearl shell and confined to the Kimberley District and Roebourne. Geometric designs are more widespread but still mainly in the Timor Sea and Western Plateau drainage areas. Baler shell objects are grouped on the boundaries of Eyre/Western Plateau and Western Plateau/Gulf drainage areas. The distribution of the pearl shell objects is not the same as that of the baler shells and no pearl shells with figurative or geometric designs are present east of the Western Plateau and Lake Eyre watershed.

10.4.1.1 Designs on shell forms

Table 10.18 summarises the frequency of decorated forms according to the designs nominated by Mountford and Harvey (1938) and discussed in Chapter 5. I have reproduced the figure (now Figure 10.10).

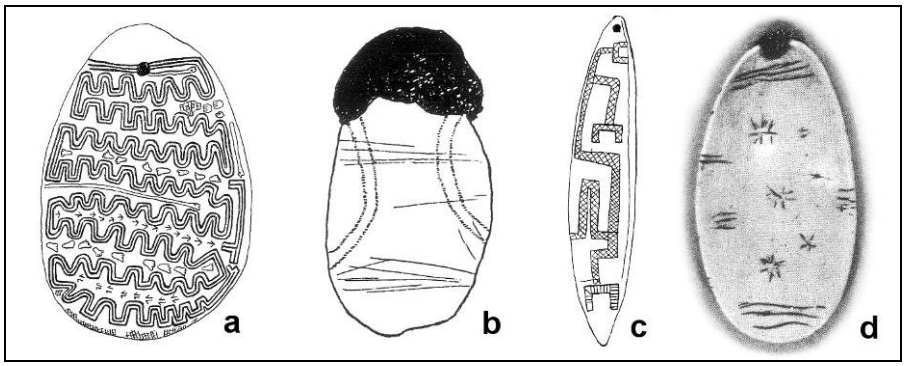

Figure 10.10. Geometric design patterns according to Mountford & Harvey (1938: 129-130)

I have added my own definition of the designs to compare with those of Mountford and Harvey:

a) Zig-zag
b) Meandering, zig-zag or other - lines or signs with no identified pattern.
c) Lattice or ladder.
d) Lines and stars.

To those I have added:

- Figurative.
- Figurative and geometric.

Table 10.18. Frequency of forms with designs (Mountford & Harvey 1938)

Sub-style	Zig-zag	Meandering, zig-zag & other	Lattice or ladder	Lines & stars	Figurative	Figurative & geometric	Total with designs
SHP01 00	0	0	0	5	0	0	5
SHP02 01	1	1	0	0	1	3	6
SHP02 02	2	3	2	0	1	1	9
SHP02 03	0	2	0	0	0	0	2
SHP04 00	0	1	0	0	0	0	1
SHP06 00	46	5	4	2	3	0	60
SHP06 01	0	0	1	0	0	0	1
Total	**49**	**12**	**7**	**7**	**5**	**4**	**84**

Seven pendant forms displayed designs. Over 70% of the objects with designs were pearl shell SHP06 forms, followed by pearl shell SHP02 forms (20%) and baler shell SHP01 forms (c. 6%). The frequency of objects with designs within drainage basins is summarised in Table 10.19 and Horton (1996) divisions in Table 10.20.

Table 10.19. Frequency of shell objects with designs within drainage divisions

Drainage Division	Zig-zag	Meandering, zig-zag & other	Lattice or ladder	Lines & stars	Figurative	Figurative & geometric	Total with designs
Gulf of Carpentaria	0	0	0	1	0	0	1
Indian Ocean Div	3	0	0	0	0	0	3
Lake Eyre	0	0	0	4	0	0	4
Timor Sea	42	12	7	0	5	4	70
Western Plateau	4	0	0	2	0	0	6
Total	**49**	**12**	**7**	**7**	**5**	**4**	**84**

Table 10.20. Frequency of shell objects with designs within Horton's (1996) divisions

Horton (1996) divisions	Zig-zag	Meandering, zig-zag & other	Lattice or ladder	Lines & stars	Figurative	Figurative & geometric	Total with designs
Desert	4	0	0	7	0	0	11
Kimberley	42	12	7	0	5	4	70
Northwest	3	0	0	0	0	0	3
Total	**50**	**12**	**7**	**7**	**5**	**4**	**84**

Over 83% of the shells with designs were collected in Horton's Kimberley within Timor Sea division. The distribution is plotted in Figure 10.11.

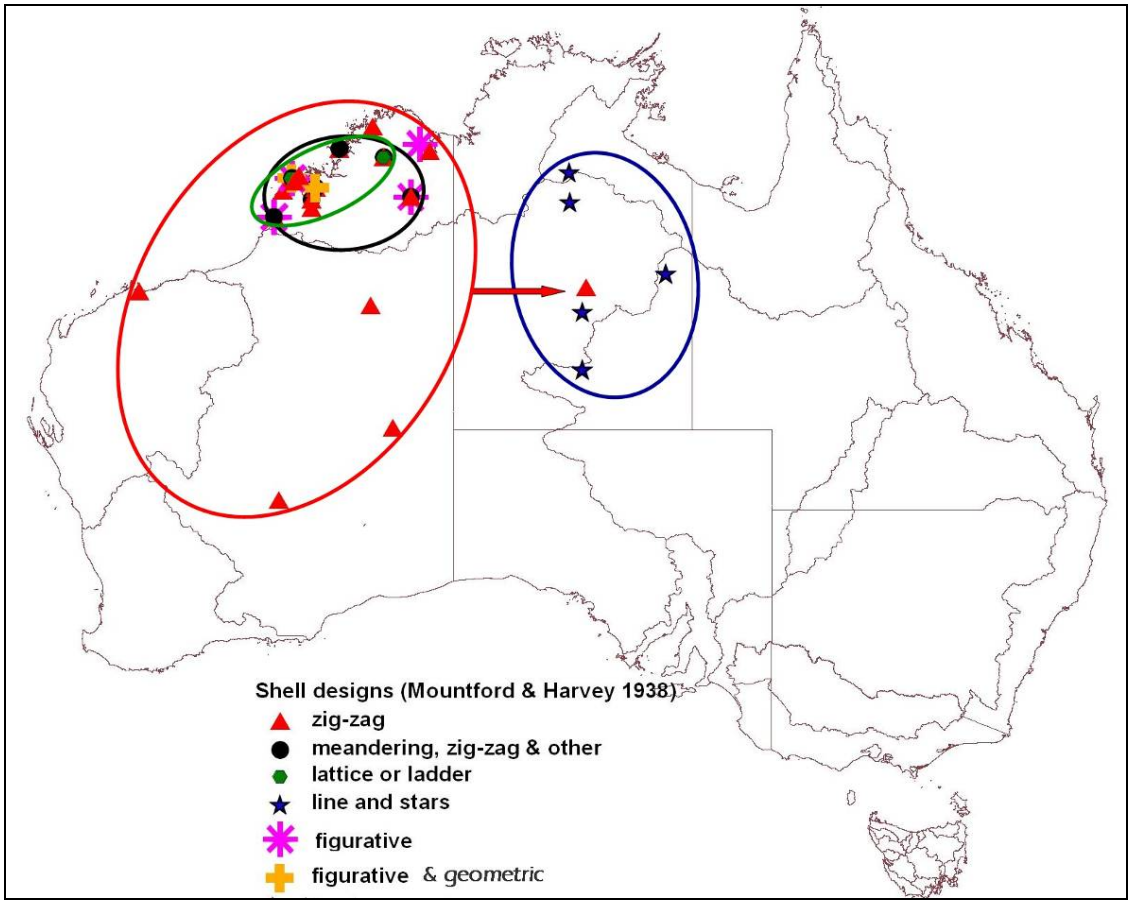

Figure 10.11. Distribution of designs (Mountford & Harvey 1938)

There is clear patterning of objects in the sample that display Mountford and Harvey's designs:

- Zig-zag designs occur in Kimberley of Timor Sea drainage, Western Plateau and an outlier in Roebourne. The design crosses watersheds and is more concentrated within Horton's Kimberley.
- Objects with meandering lines, zig-zags and other lines are concentrated in the Kimberley. The design is confined within drainage and Horton's divisions and at a localised level.
- Objects with lattice or ladder designs restricted to western Kimberley. Patterning is evident. The design is confined within drainage and Horton's divisions and at a localised level.
- Objects with lines and stars are found in Central Australia, generally close to the drainage line boundaries of Western Plateau with Eyre and Gulf divisions. The design is patterned along the north eastern watershed of Western Plateau. The design is displayed on both baler and pearl shells. All baler shells along the watershed are decorated and they are the only baler shells decorated in the sample.
- Figurative designs are restricted to Kimberley.
- Four objects were collected that exhibited both figurative and geometric designs from Lombadina Mission/King Sound area in Kimberley.

With the exception of objects that exhibit both lines and stars in Western Plateau division, all designs appear most frequently within the Kimberley division in the Timor Sea drainage. There is patterning in decorated shell ornaments but that patterning is not the same for different designs and/or techniques.

10.4.1.2 Degree of cleaning of convex surface of pearl shells

Of interest from a value added point of view, is the degree of cleaning of the convex surface of pearl shells. The cleaning takes more energy than leaving a shell uncleaned. Of all the pearl shell forms, 43% are fully cleaned and 40% are partially cleaned. Figures 10.12 -10.15 show the distribution. The following occurs in selected forms:

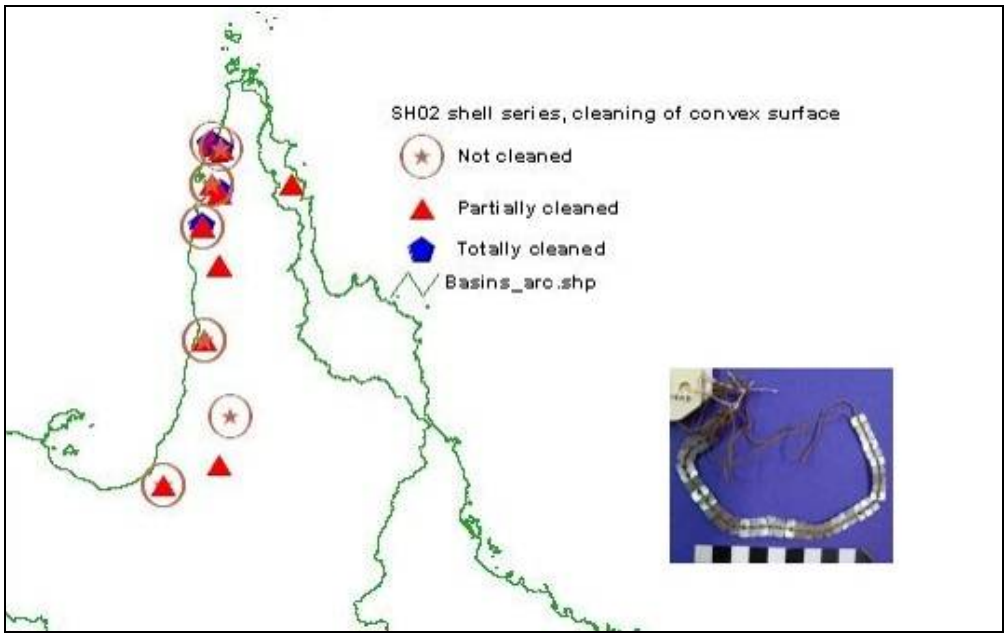

Figure 10.12. Degree of cleaning, shell series SH02

- SH02 series (Figure 10.12) – only 14% fully cleaned and 51% partially cleaned (c. 65% cleaned). Three objects only from East Cape and 33% in the Gulf. West Cape has the highest number with 17% fully cleaned and 67% partially cleaned. The fully cleaned objects are clustered along the far north-western region of West Cape York.

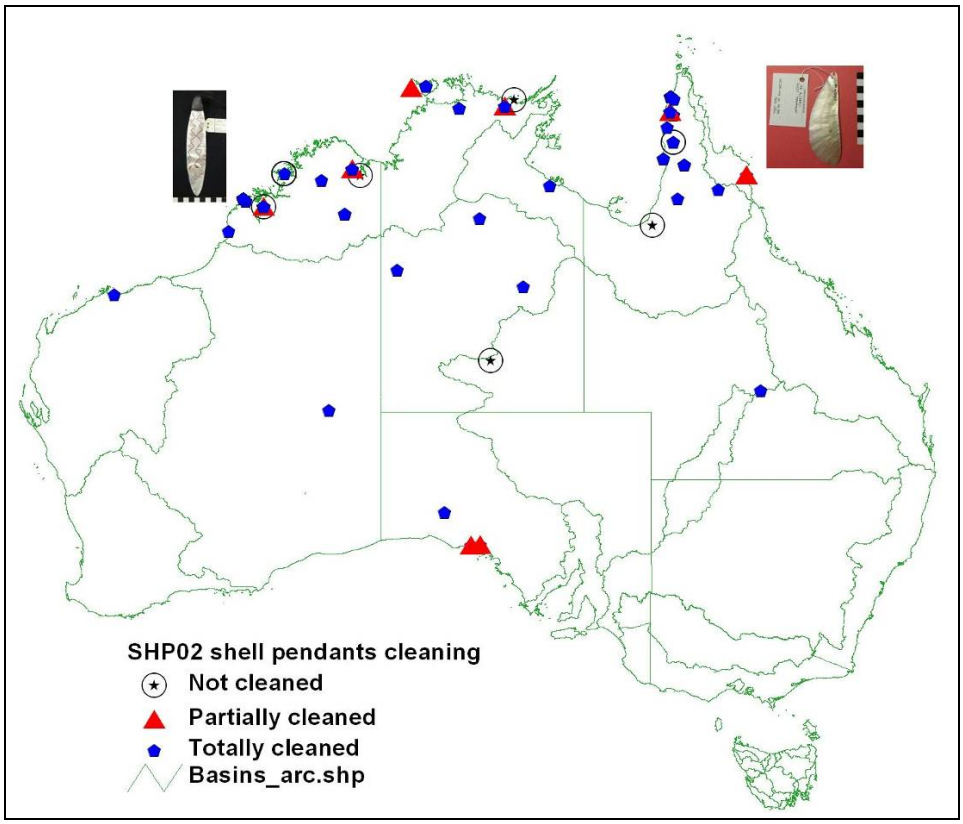

Figure 10.13. Degree of cleaning, shell pendants SHP02

- SHP02 pendants (see Figure 10.13) – totally cleaned 78% and approximately 9% partially cleaned. Of these:
  - West Cape has c. 89% fully cleaned and 3% partially cleaned.
  - Kimberley has c. 81% fully cleaned and 6% partially cleaned.
    - All incised SHP02 objects are from the Kimberley and all are totally cleaned. There has been a good degree of value added to these objects.
  - Desert (small sample) has 40% fully cleaned.

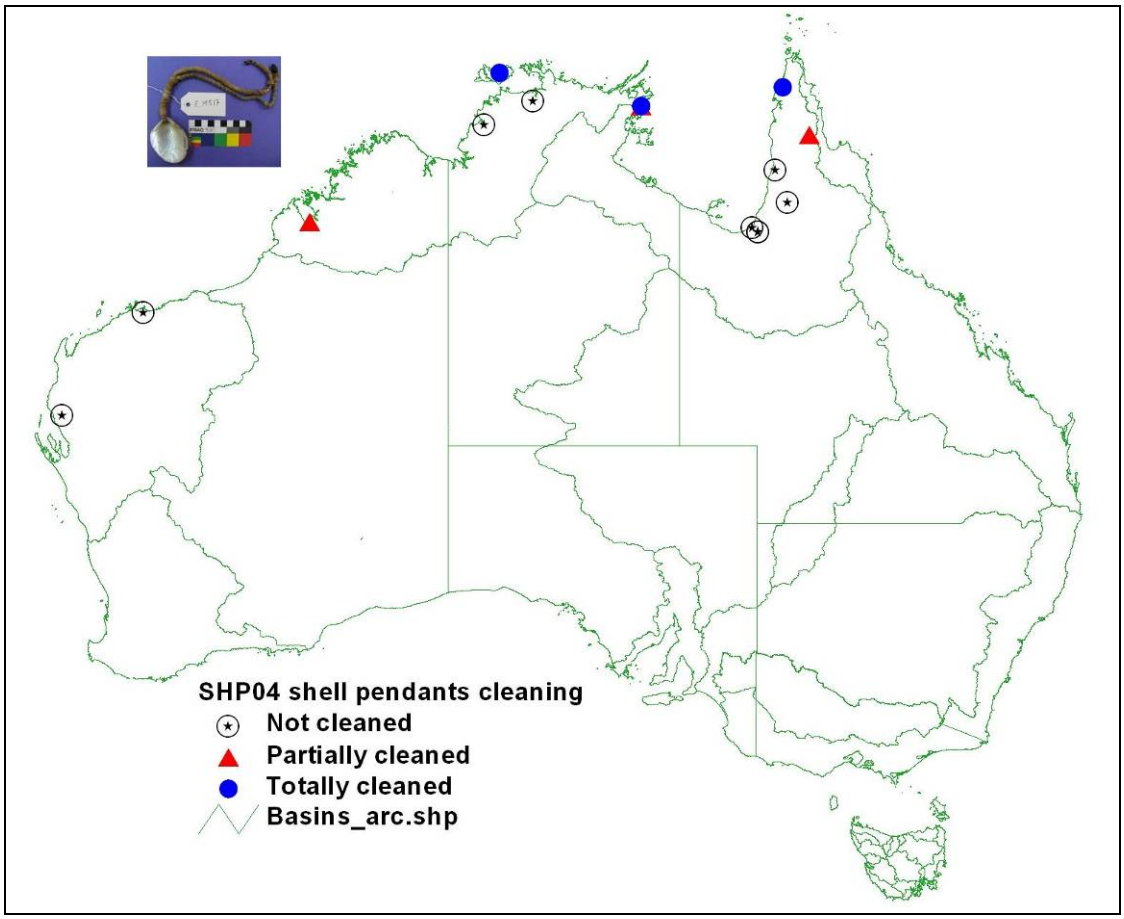

Figure 10.14. Degree of cleaning, SHP04 shell pendants

- SHP04 pendants (Figure 10.14) – 20% fully cleaned and 20% partially cleaned. Majority of SHP04 pendants were not cleaned except for the far north-western area of Cape York West. The SH02 series and SHP02 pendants were also fully cleaned in that same area. SHP04 pendants on the southern end of Cape York West have not been cleaned.

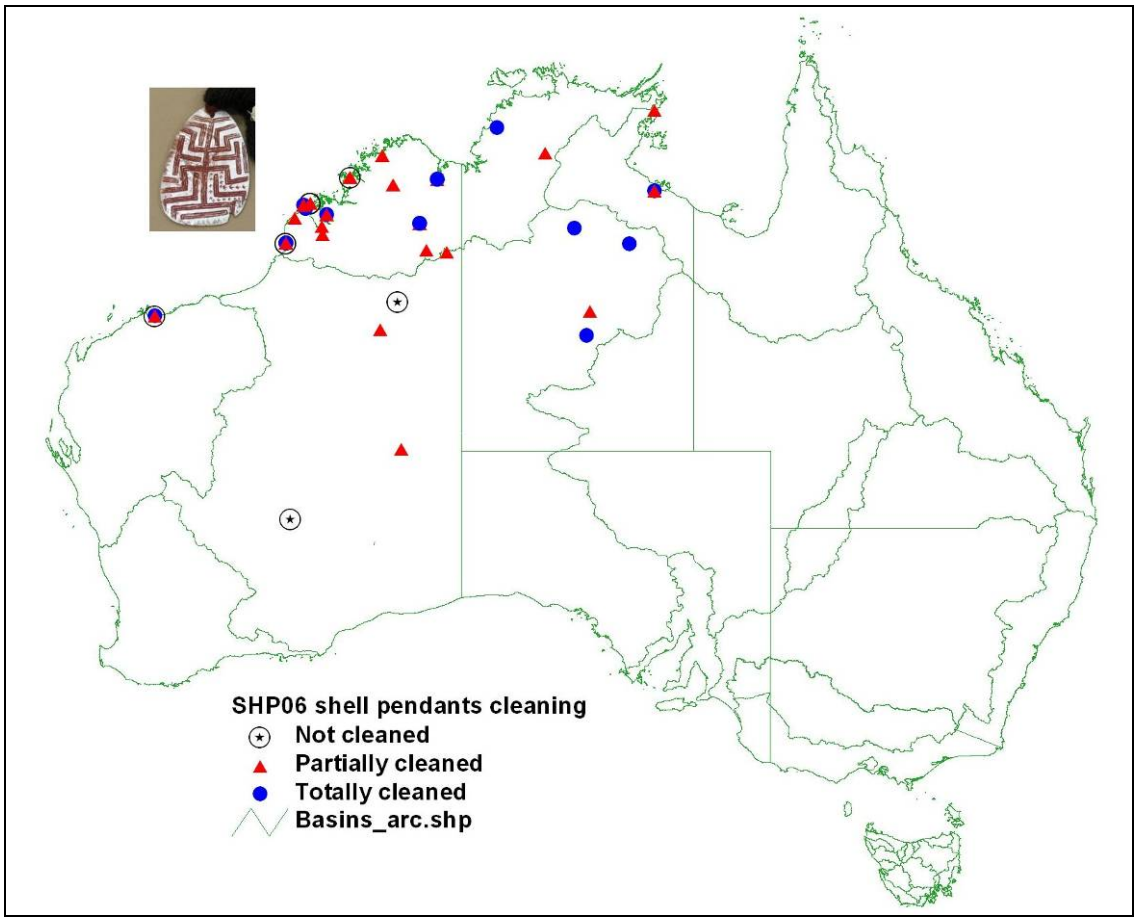

Figure 10.15. Degree of cleaning, SHP06 shell pendants

- SHP06 pendants – totally cleaned 22%, partially cleaned 68%.
  - Kimberley fully cleaned 19% and partially cleaned 72%.
    - Of the incised SHP06 objects from Kimberley, 17% were fully cleaned and 73% were partially cleaned – almost the same total either decorated or undecorated.
  - Desert (small sample) fully cleaned 33% and partially cleaned 44%.
    - Similar percentages for decorated and undecorated.

Fewer series pearl shell objects have been cleaned than pendants. Within the pendants, more SHP02 objects have been fully cleaned than partially cleaned while the opposite occurs for SHP06 objects. Over 80% of SHP02 objects have been fully cleaned in both West Cape and in Kimberley. All incised SHP02 objects from the Kimberley (there are no incised SHP02 in West Cape) have been fully cleaned. Not as much effort has been put into cleaning the SHP06 and SHP04 pendants. The SHP06 pendants have a similar percentage of cleaning for both incised and undecorated objects. The extra care taken in cleaning of SHP02 pendants could indicate they were of special significance to Aboriginal people.

10.4.2 Decorated bugle forms

Fewer than 10% of bugle ornaments were decorated with extractive, additive or material composition other than adding materials such as bird's head (see Table 10.21 for frequency in drainage basins & Table 10.22 for Horton's units). Eight locations have ornaments that display decoration (see Figure 10.16). Extractive methods involved multiple incisions encircling each bugle in the series. Additive techniques generally involved adding red ochre to the bugles.

Table 10.21. Frequency of method of decorated bugle ornaments in locations

Location	Extractive & additive	Extractive only	Additive only	Design composed with material	Total
Alligator River	0	1	0	4	5
Barcoo River	0	1	0	0	1
Cape York West	0	3	0	0	3
Cooper Creek	0	5	1	0	6
Elkedra to Tanami	0	0	0	1	1
Innamincka	0	2	0	0	2
Staaten River	0	0	1	0	1
Wilson River	1	0	0	0	1
Total	**1**	**12**	**2**	**5**	**20**

Table 10.22. Frequency of method of decorated bugle ornaments within drainage divisions

Drainage divisions	Extractive & additive	Extractive only	Additive only	Design composed with material	Total
Gulf of Carpentaria	0	3	1	0	4
Lake Eyre	1	8	1	0	10
Timor Sea	0	1	0	4	5
Western Plateau	0	0	0	1	1
Total	**1**	**12**	**2**	**5**	**20**

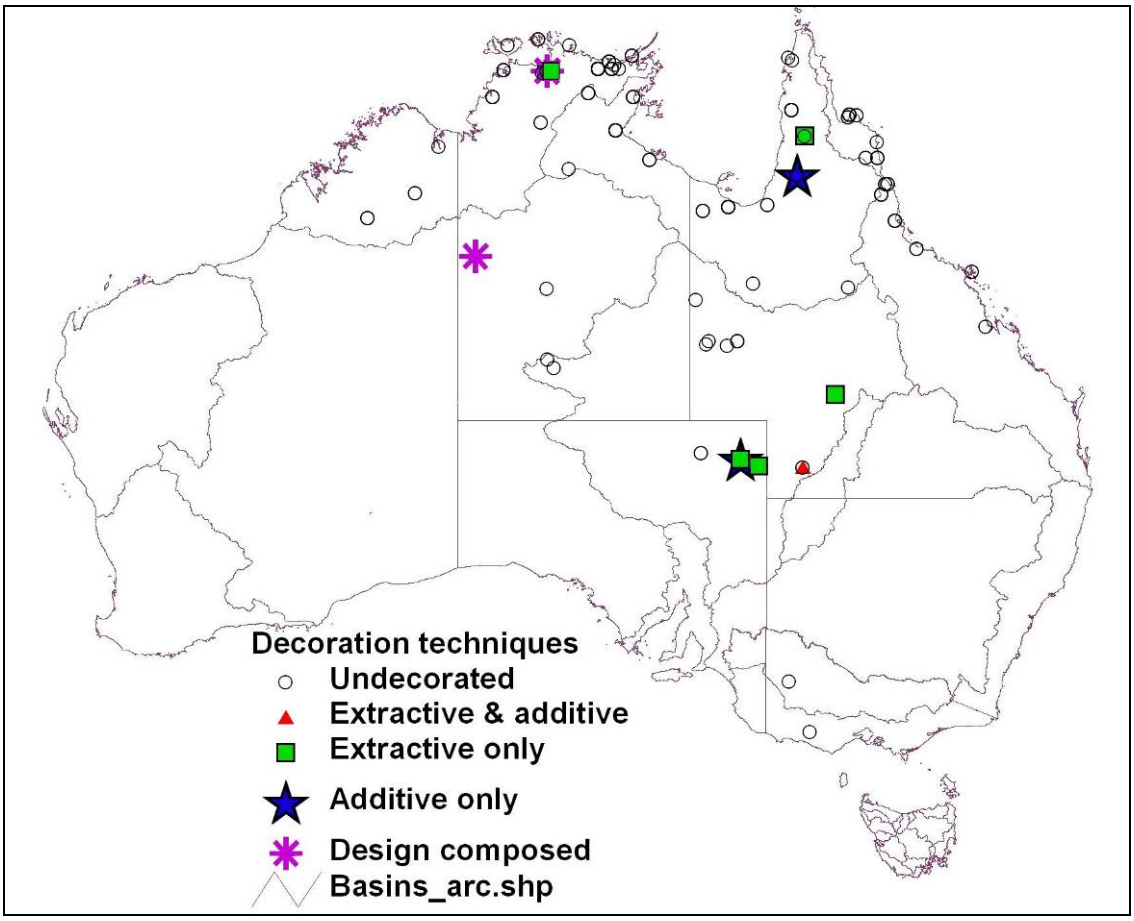

Figure 10.16. Locations with decorated bugle forms

The locations with the highest number of decorated bugle forms were within the Lake Eyre division where extractive technique was the most prominent form of decoration. Extractive techniques were also used on bugles in Cape York and in north-western Northern Territory. The only object with both extractive and additive was in Lake Eyre. Cooper Creek in Eyre and Staaten River in Gulf divisions were the only locations with additive only techniques of decoration.

Only one object with material added was decorated. One BUG03.01 example from Alligator Creek with a parrot's head attached also displayed composed design by alternating different colours of bugles to form a pattern.

A total of eighteen ornaments were decorated by adding material. Only one location exhibited the technique of attaching additional material with other forms of decoration.

Thirty-eight objects from eighteen locations displayed some form of with decoration, approximately 18% of the bugle sample. The patterning of decoration is random. The location with the highest number of decorated bugle beads was Cooper Creek.

10.4.3 Decorated teeth series and pendants

Teeth objects were decorated with incisions and painted (see Table 10.23).

Table 10.23. Decorated teeth series and pendants

Class	Extractive & additive	Additive	Undecorated	Total
Series (Class 1)	0	35	13	48
Pendant (Class 2)	2	73	18	93
Total	**2**	**108**	**31**	**141**

Seventy-eight percent of teeth objects were decorated. The majority of decoration was from additive techniques (>75%). Only two objects were incised and both of those were from Tennant Creek in Western Plateau drainage basin. The distribution of the decorated series is shown in Figure 10.17 and pendants in Figure 10.18.

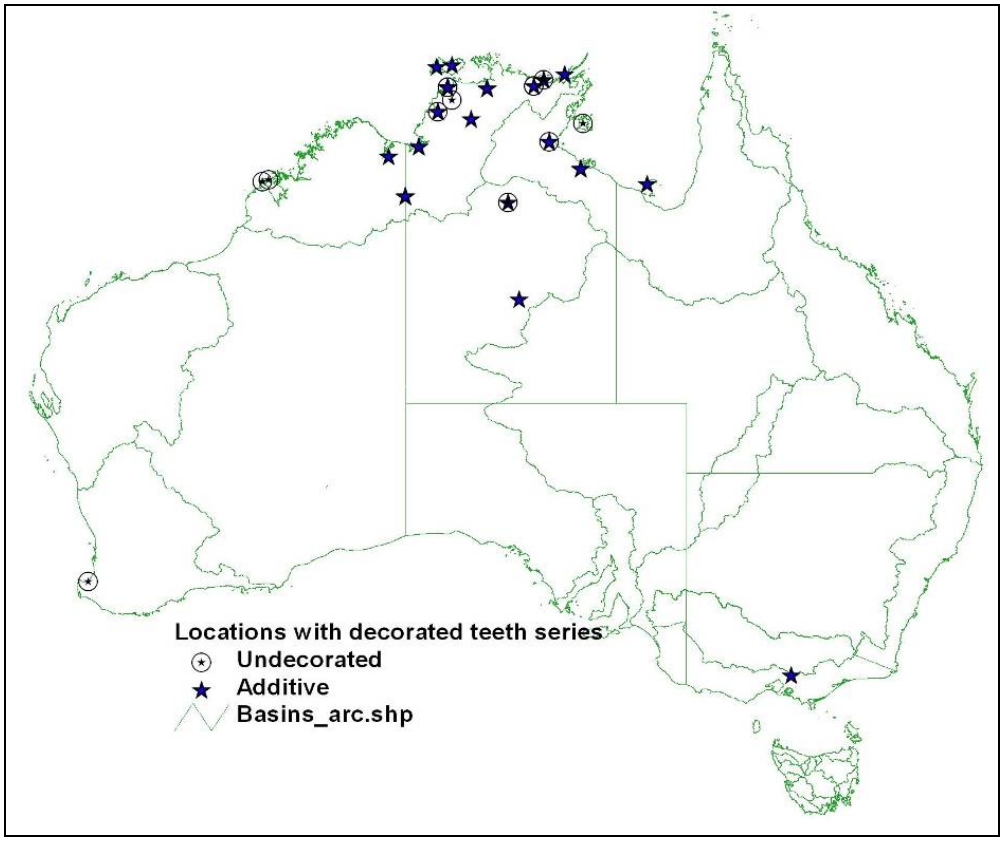

Figure 10.17. Decorated teeth series

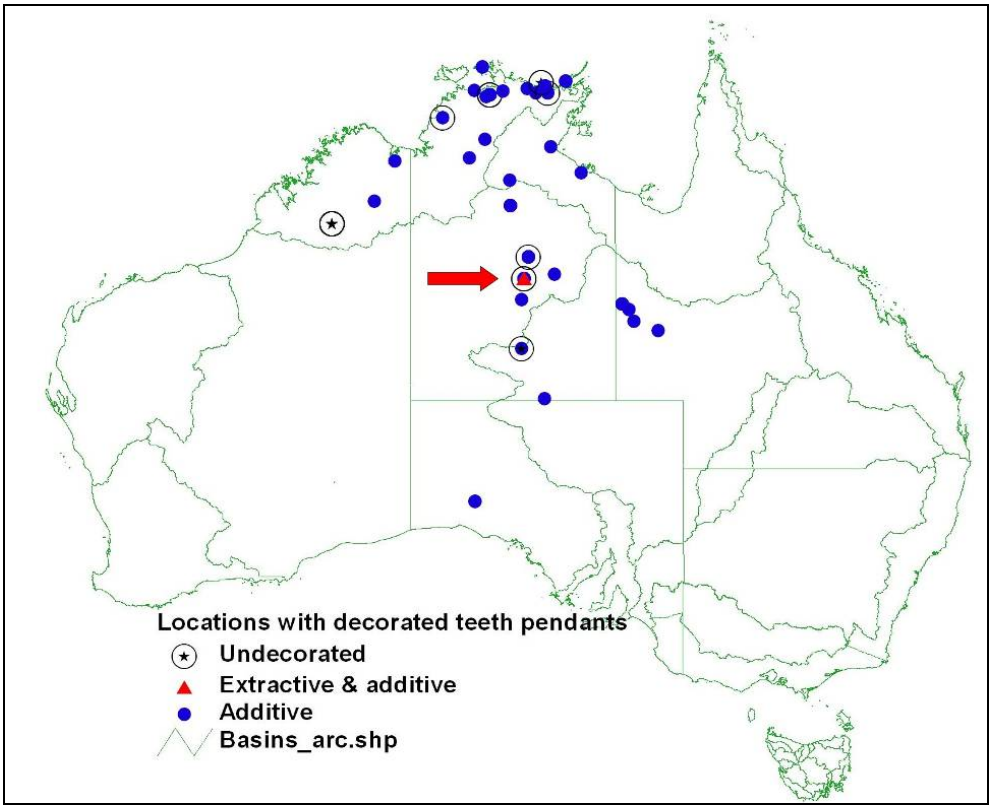

Figure 10.18. Decorated teeth pendants

My sample did not have decorated teeth in Western Australia from south of western Kimberley. Table 10.24 summarises the decoration technique for teeth species and series.

Table 10.24. Techniques for decorated teeth series

Teeth species	Additive	Undecorated	Grand
Bovine	1	0	1
Crocodile	0	1	1
Dolphin	0	3	3
Human	0	2	2
Macropod	33	7	40
Sawfish	1	0	1
Total	**35**	**13**	**48**

The only decorating technique used on teeth series was additive and the majority of decorated teeth series were manufactured with macropod teeth. Bovine and sawfish teeth were the only other series decorated. Teeth pendant decoration techniques and species are summarised in Table 10.25.

Table 10.25. Techniques for decorating teeth pendants

Teeth species	Extractive & additive	Additive	Undecorated	Total
Crocodile	0	7	2	9
Macropod	2	65	16	83
Marsupial (native cat) jaw	0	1	0	1
Total	**2**	**73**	**18**	**93**

Macropod was the dominant species used for teeth pendants, followed by seven objects with crocodile teeth. All decoration techniques used are additive except for two macropod objects that were incised and ochred. Almost 80% of teeth ornaments were decorated in some way and almost all of those were macropod (108 of 110). Only two macropod teeth pendants displayed extractive methods, these were incised with crossed lines. Seventy percent of crocodile teeth were coloured, and the single examples of marsupial jaw, bovine teeth and sawfish teeth were also coloured. Dolphin and human teeth objects were not decorated.

Value was added to most teeth ornaments by adding colour or painted designs. Colours included red, yellow and white pigments, and black charcoal. Figure 10.19 shows an example of a decorated pendant.

Figure 10.19 Example of decorated macropod teeth pendant

Objects displaying all colours I have named 'ALL'. The only designs on the teeth objects were lines and dots. Red *Abrus* sp. seeds were attached to some objects. The scale has been calculated:

- 1 = 1 element present (e.g. red ochre). The simplest form of decoration;
- 2 = 2 elements present (maybe 2 colours or a design in one colour); and
- 3 = 3 elements present (maybe 3 colours or a design and 2 colours) etc.

The highest number in the scale is five (lines and dots painted with black, red, white and yellow). The scale of decoration for objects within locations is tabled in Appendix 17. The scale of decoration to teeth forms is summarised for series in Figure 10.20 and pendants in Figure 10.21.

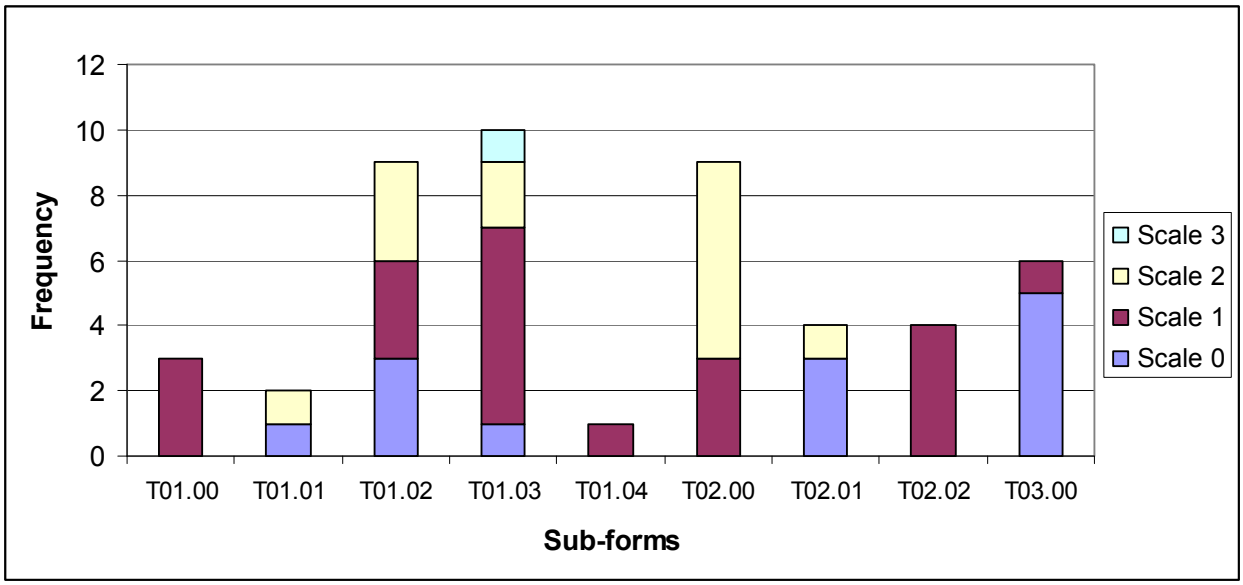

Figure 10.20. Teeth series and scale of decoration

All sub-forms of teeth series ornaments had at least one scale of decoration except T03.01. Only T01.03 had more than two scales of decoration.

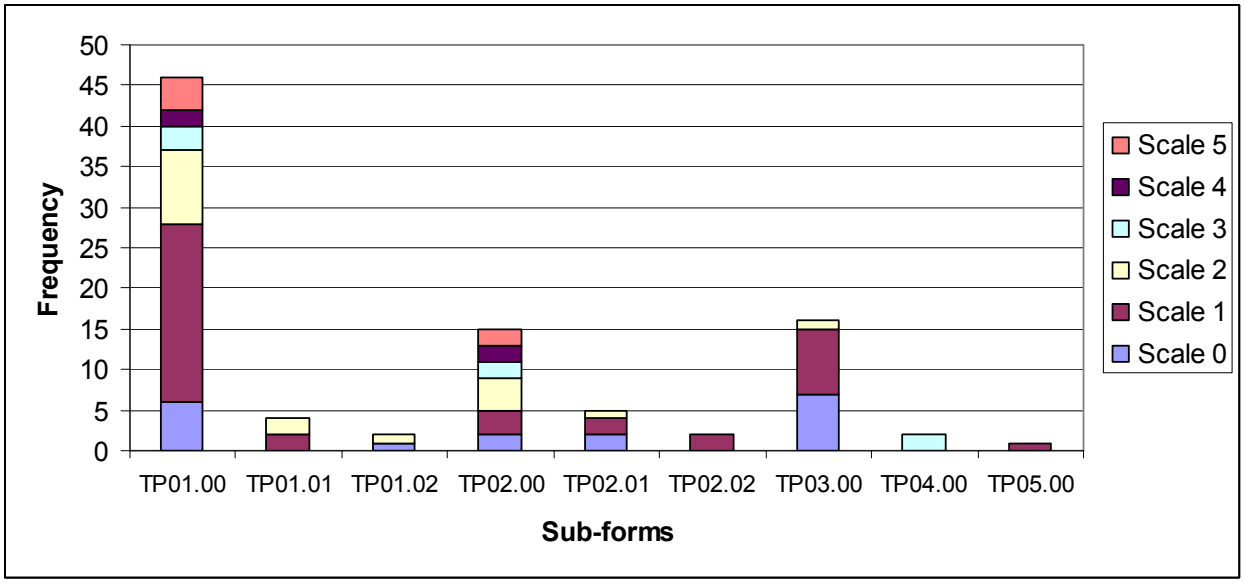

Figure 10.21. Teeth pendants and scale of decoration

All teeth Pendants had at least one scale of decoration. TP01.00 had the most value added in the form of decoration, followed by TP02.00. These two forms are the only pendants with objects displaying both Scale 4 and 5. The lowest ratio of undecorated forms to decorated forms was shown with TP03 objects. The scale of decoration for series within drainage divisions is summarised in Table 10.26 and Horton's divisions in Table 10.27.

Table 10.26. Scale of decoration for teeth series within drainage divisions

Drainage divisions	Scale 3	Scale 2	Scale 1	Scale 0	Total
Gulf of Carpentaria	0	4	2	2	8
Southeast Coast	0	0	1	0	1
Southwest Coast	0	0	0	1	1
Timor Sea	1	17	18	9	35
Western Plateau	0	2	0	1	3
Total	**1**	**13**	**21**	**13**	**48**

Table 10.27. Scale of decoration for teeth series within Horton's (1996) divisions

Horton's divisions	Scale 3	Scale 2	Scale 1	Scale 0	Total
Arnhem	0	2	1	3	6
Desert	0	2	0	1	3
Fitzmaurice	1	4	1	2	8
Gulf	0	4	2	2	8
Kimberley	0	0	4	2	6
North	0	1	12	2	15
Southeast	0	0	1	0	1
Southwest	0	0	0	1	1
Total	**1**	**13**	**21**	**13**	**48**

Timor Sea division has the highest number of series with more than one scale of decoration. The Gulf is next with a much lower number of objects. Within Timor Sea, North has the highest number of objects that have more than one scale of decoration. The scale of decoration for pendants within drainage divisions is summarised in Table 10.28 and Horton's divisions in Table 10.29.

Table 10.28. Scale of decoration for teeth pendants within drainage divisions

Drainage divisions	Scale 5	Scale 4	Scale 3	Scale 2	Scale 1	Scale 0	Total
Gulf of Carpentaria	0	0	0	1	2	0	3
Lake Eyre	0	0	0	1	8	1	10
Timor Sea	6	4	7	14	8	14	53
Western Plateau	0	0	0	2	22	3	27
Total	**6**	**4**	**7**	**18**	**40**	**18**	**93**

Table 10.29. Scale of decoration for teeth pendants within Horton's (1996) divisions

Horton's divisions	Scale 5	Scale 4	Scale 3	Scale 2	Scale 1	Scale 0	Total
Arnhem	5	2	2	2	5	3	19
Desert	0	0	0	3	29	4	36
Eyre	0	0	0	0	2	0	2
Fitzmaurice	0	0	0	2	1	1	4
Gulf	0	0	0	1	1	0	2
Kimberley	1	0	1	0	0	7	9
North	0	4	4	10	2	3	21
Total	**6**	**4**	**7**	**18**	**40**	**18**	**93**

The highest degree of decoration on teeth pendants occurs in Arnhem within Timor Sea drainage division with approximately 18% of pendants displaying Scale 3 or higher decoration.

Eighty percent of pendants and 73% of series have at least one scale of decoration. All divisions except Southwest Coast (only 1 example) have at least one scale of additive decoration. Objects within divisions display the following ratio of additive decoration:

- Timor Sea - >70% of 88 objects. The most variation occurs in this division with all scales represented. The highest numbers have one to three elements of decoration added. North has the highest number of objects that are decorated but Arnhem has the highest number with Scales 4 and 5 decoration. Within Timor Sea, Kimberley has the lowest percentage of decorated teeth objects (40%). This is in contrast with the shell objects.
- Western Plateau - c. 86% of 30 objects. Only Scales 1-3 are present.

- Eyre – 80% of 10 objects. Majority are Scale 1 with one object displaying two elements.
- Gulf – 81% of 11 objects have almost equal ratio of Scales 1 and 2 decoration. Southeast and Southwest Coasts have only one example from each.

Objects with the highest scales of decoration (Scales 4 & 5) represent approximately 6% of the teeth population. These objects are all pendants manufactured from macropod teeth with painted lines and/or dots, and using four different pigment colours. All ten objects are from Timor Sea drainage division. One object was collected within Kimberley, two from North and the others from Arnhem. Four objects are TP02.00 forms from Elcho Island and Darbilla Creek. Six objects are TP01.00 forms from Ord River, Alligator River, Millingimbi and Oenpelli. All objects with Scale 3 decoration are also from Timor Sea.

Pendants make up a high proportion of the decorated teeth sample. The most highly decorated teeth ornaments were collected from Arnhem and other Timor Sea divisions.

10.4.4 Decorated seed series

No additive or extractive techniques were imposed on the seed ornaments. Four of the objects had material attached as shown in Table 10.30.

Table 10.30. Seed ornaments with material attached

Location	Style	Seed species	Attached material
Cape York West	SDP01	*Entada* sp. beans	Grass bugles
Oodnadatta	SD01	*Erythrina* sp. seeds	Plastic bead
Flinders Island	SD01	*Erythrina* sp. seeds	*Abrus* sp. seed
Musgrave Ranges	SD02	*Eucalyptus coolibah* seeds	Bandicoot tails

There is no apparent spatial patterning affected by this characteristic on these forms.

10.4.5 Decorated vertebrae series

Nine (27%) of the V01 and V02 series are decorated with additive and one has a design composed by arranging large and small segments to form a pattern (see Table 10.31).

Table 10.31. Decoration techniques for vertebrae beaded ornaments

Location	Additive	Design composed with material	None	Total
Archer, Kendall & Holyrod Rivers	1	0	1	2
Arnhem Land unprovenanced	2	0	13	15
Caledon Bay	0	0	4	4
Cape York East	0	0	1	1
Crocodile Island	1	0	2	3
King Leopold Ranges (snake)	0	1	0	1
Mapoon	1	0	0	1
Millingimbi	4	0	1	5
Trial Bay	0	1	0	1
Total	**9**	**2**	**22**	**33**

All but one of the decorated objects were manufactured with fish/shark vertebrae. The snake vertebrae example from King Leopold Ranges has a cowry shell attached and a pattern formed has been formed arranging light and dark colours (possibly stained) of the vertebrae. Two fish/shark series (Arnhem Land unprovenanced & Millingimbi) had feathers attached. The Millingimbi example had also been painted. Four of the five Millingimbi objects had been decorated. The distribution of the decorated objects is illustrated in Figure 10.22.

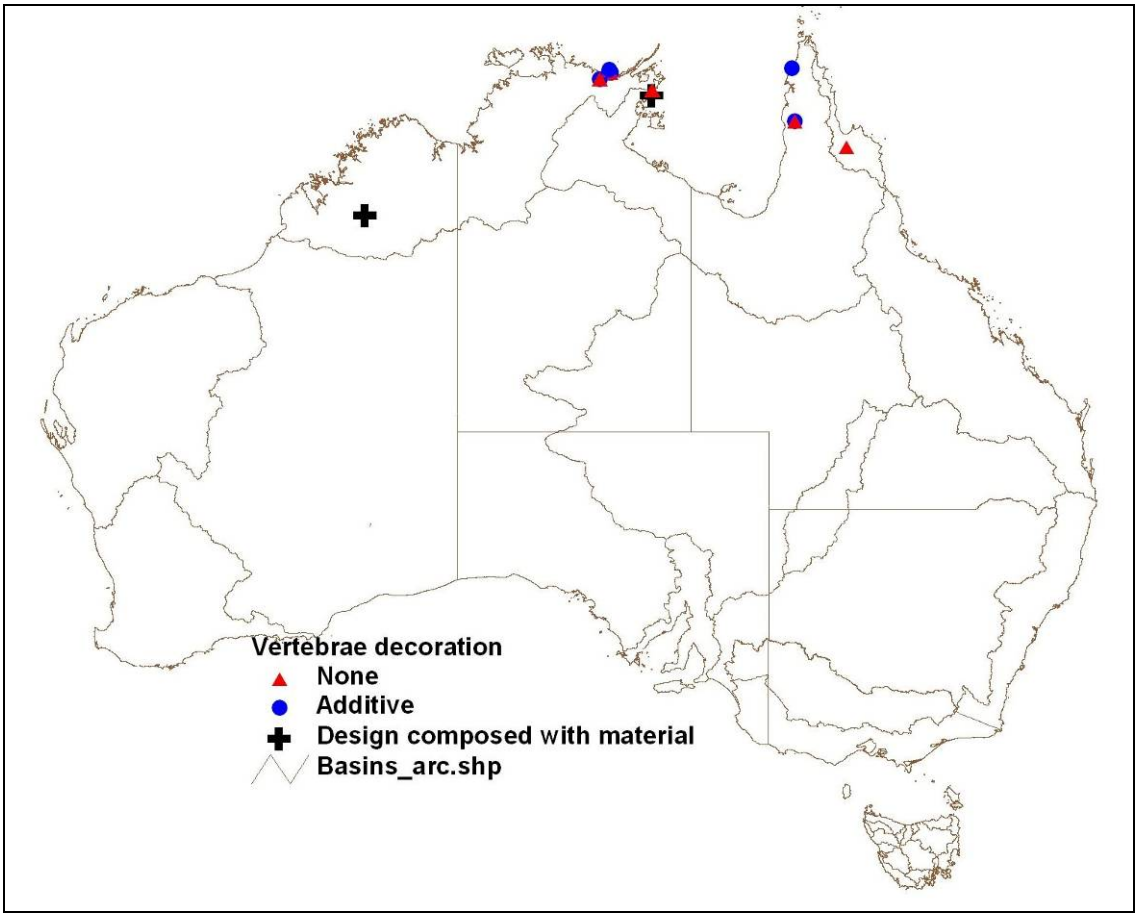

Figure 10.22. Distribution of decorated vertebrae beaded ornaments

The decoration techniques appear random for ornaments manufactured with vertebrae. Millingimbi stands out as having a higher percentage of decorated objects.

10.4.6 Decorated bone, integument and other forms

The frequency of decorative techniques applied to forms is summarised in Table 10.32 and the distribution illustrated in Figure 10.23.

Table 10.32. Decoration techniques for bones and other forms

Style	Attached material	Additive	None	Total
B01	1	1	0	1
B02	0	0	2	2
BP01	0	0	6	6
BP02	0	0	1	1
BP03	0	1	0	1
CARP01	0	0	1	1
CHP01	0	0	1	1
INT01	0	0	1	1
INT02	0	0	1	1
INTP01	0	1	0	1
INTP02	0	0	1	1
MIS01	2	2	0	2
Total	**3 (also coloured)**	**5**	**14**	**19**

Only five objects have been decorated by additive techniques. There are three objects with material (bandicoot tails) attached - one B01 form and two MIS01 forms.

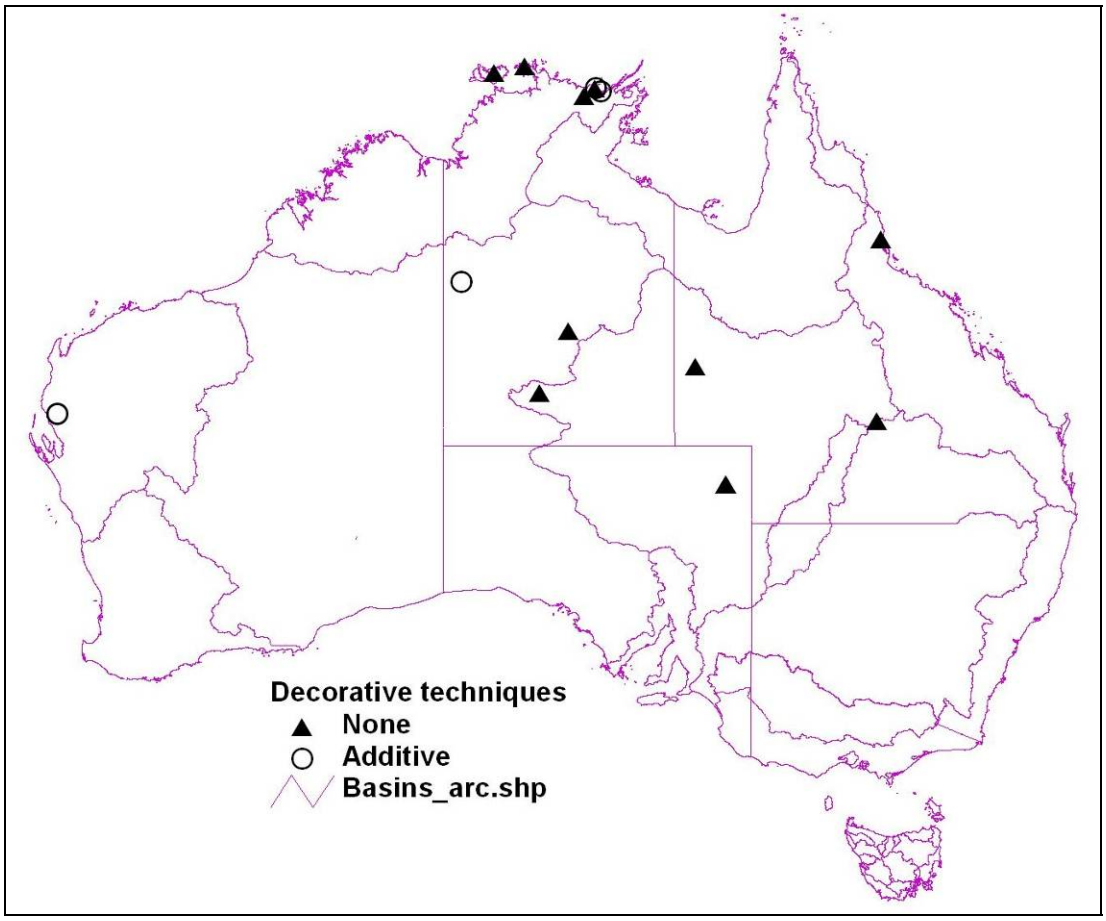

Figure 10.23. Distribution of decorated bones, integument and other forms

The decorated objects are scattered widely across the western side of Australia. It is difficult to argue for patterning in this distribution.

10.4.6.1 Replacement raw materials

Roth (1897, Ch. VII, Sect. 182) commented on chest pendants worn at Roxburgh in western Queensland that were traditionally made from shell: 'I have observed this shell ornament being imitated by grinding and chipping down pieces of broken chinaware'. In fact, there is one such pendant made from china in my sample and referred to in Appendix 16 (see Figure 10.24).

Figure 10.24. China pendant (Queensland Museum QE-6039)

The pendant was collected from Glenormiston in western Queensland by A. Meston. From the analysis of bone, integument and other materials (Appendix 16), a high number of these forms are mimics of the same form manufactured from other raw materials. For example, pendants manufactured from bone within the Lake Eyre drainage division are almost replicas of SHP01 (baler shell) objects. Echidna spines and shaped fish bones have been manufactured into pendants and series similar to those manufactured from teeth in the same area. Emus' claws are manufactured into the same form as T02 in Arnhem Land. Teeth for manufacturing T02 forms include macropod, crocodile and sawfish. This could reflect the importance of the form, where available raw material was substituted.

10.4.7 Summary of decoration

Not all raw materials are decorated and the degree of decoration varies with different raw materials and sub-forms. Only 15% of shells are decorated and most are from the Kimberley within Timor Sea drainage division. Spatial patterning is apparent for designs on shells. Only selected forms and shell species are decorated. The distribution for most decorated shell ornaments is not determined by coastal/non-coastal environments. Seventy-eight percent of teeth ornaments were decorated; almost all locations have objects that are decorated to some degree. The most highly decorated objects were collected from Arnhem. Thirty-three percent of vertebrae are decorated; the distribution of decoration is random. Decorated bugles represented less than 10% of the bugle sample and the patterning is random.

10.5 Summary of analysis

From this chapter, variation has been shown in different classes, raw materials and forms for standardisation of metric variables and degree of decoration. Shell beads appear to be treated differently from other raw materials with particular species more valuable either as exchange items or for local use. The shells have a more distinct patterning not related to local availability. Selected shells have travelled, other materials are available locally.

In Chapter 8, two major classes were identified. Both classes are distributed widely across mainland Australia but the distribution is not the same for both classes. The ratio of pendants to series within locations is higher from the Kimberley area and south into South Australia. There are more series than pendants north of the Kimberleys and across the northern coastal areas of Australia. There is some patterning of raw material at a gross level determined by both class and raw material.

In Chapter 9, shells were classified and distribution mapped. Different patterning is apparent for classes, raw materials and forms of shell beads. Form is determined by raw material. The most distinctive outcome is that pendants travelled inland, series did not. Patterning is associated with drainage basins on occasions, a higher degree of patterning is associated with Horton's units but most patterning is associated with locations or areas not dependent on either drainage basins or Horton's units. Some forms are widely distributed while others are confined to restricted locations.

From this chapter, I have established there is standardisation of metric variables of shells. In particular, pendants are more standardised for length and width for those around the coast than pendants collected inland. Most SHP02 pearl shell forms appear to have been more standardised in size and more localised in spread than the SHP06 forms. SHP02 forms have two distinct distributions while SHP06 appears to originate in the Dampier Peninsula and spreads out from there to the north, south and east. SHP01 (baler shell) pendants are limited to east of the boundary of Western Plateau/Lake Eyre drainage divisions while SHP06 (large pearl shell) pendants are limited to west of that boundary. Series ware also standardised in form and size with raw material a factor in the final form. For SH02 objects, pearl shell series displayed less variation than *Nautilus* sp. for the same form.

Only pearl and baler shells show decoration and the distribution is confined. No decoration is evident east of the boundary of Western Plateau and Lake Eyre drainage divisions. Distribution of designs on shell are patterned, most designs are present in Dampier Peninsular, then lessening in varieties with distance away from that area. Baler shells displaying geometric designs appear only on the east side of the Western Plateau/Lake Eyre watershed and pearl shells with geometric designs appear west of that boundary.

From Appendix 14, bugle forms are spread throughout most of the mainland but not in Tasmania. There is a degree of patterning in bugle forms but not as pronounced as for shells. The distribution of bugles down the eastern coast of Queensland is almost exclusively BUG01. The other main factor coming out of the bugle distribution is that the objects with other materials attached (e.g. parrot's head) or with more detailed string work, are from the northern end of the Northern Territory. The location with the highest number of decorated bugle ornaments is Cooper Creek.

From Appendix 15, teeth series are mainly around the northern coastline with a few inland locations, pendants are more widely distributed inland. Teeth series are almost all distributed around the coast from the western side of the Gulf in Northern Territory to the Dampier Peninsula, Western Australia. Two outliers are from Victoria and the south-western corner of Western Australia. Most of the teeth series are manufactured from macropod and none of the species is exotic to where it was collected.

The highest number of teeth pendants was collected from Alligator Creek in Horton's North, Northern Territory, followed by the area around Newcastle Waters, Barrow and Tennant Creek within Horton's Desert division in the Northern Territory. This distribution spreads out from the north-western corner of Northern Territory and down through the centre. Only the double macropod teeth TP03 objects were collected in Central Queensland, the rest are confined to Northern Territory and a few locations in northern Western Australia. Teeth ornaments are manufactured from species that are locally available. A high percentage of teeth are decorated, with the highest degree of decoration in Arnhem Land, decreasing in degree of decoration with distance away from that area.

The patterning of seeds in series is determined by the availability of species (Appendix 16). All seed ornaments have been manufactured from locally available resources although there is some preference shown for particular seeds. For example, *Erythrina* sp. is available across the northern section of Australia as well as through the centre and across to southern New South Wales. Despite the wide distribution, the sample contains only one specimen manufactured from these seeds from across the north and none from down the eastern side of the continent. Metric analysis for length of series of seeds has shown a preference for longer *Erythrina* sp. seed ornaments in the centre of Australia (Arrernte group), decreasing in size away from that centre.

Of the remaining forms discussed in Appendix 16, all species used for bead making are local. In some cases, bone, integument or other materials were manufactured into replicas of objects principally made from a dominant raw material such as baler shell or macropod teeth. Patterning was apparent for seeds and vertebrae, but that patterning is not related to either drainage or Horton's divisions. The distribution of bone pendants is within Lake Eyre drainage basin. The sample for the remaining objects is too small to determine patterning.

This chapter has shown the variation within and between classes, raw materials and forms. Interpretations and explanations for the variation will be given in the next chapter.

CHAPTER 11 DISCUSSION AND CONCLUSION

11.1 Introduction

In Chapter 1, I expressed how my interest in this project evolved from previous work I had undertaken on the spatial patterning of styles of boomerangs. The aim of this work has been to survey Aboriginal beads held in major Australian museums, and to consider environmental and behavioural explanations for their geographic distribution. During that process, I have set up a classification system for Aboriginal beads, mapped the distribution, listed the archaeological evidence and surveyed the ethnohistoric accounts for Aboriginal use of beads in Australia. I proposed several questions regarding the geographic distribution of Australian Aboriginal beads and offered the hypothesis:

- Spatial patterning of Australian Aboriginal beads will differ between different classes of beads and much of that patterning will be affected by behavioural variation.

As a follow on from that argument, I argued that:

- Inferences about beads in early prehistory may be made from a study of ethnographic beads in Australia.

I considered an investigation of Aboriginal beads in Australia could address Vanhaeren and d'Errico's (2006) argument that patterning of beads across a region can reflect the ethnolinguistic diversity of early populations. Also, I wanted to investigate Wiessner's (1989) theory that individual, social and ethnic status could be identified from patterning in material culture and to consider trade as an explanation for similarities and differences in beads.

In this chapter, I will review these questions considering the results of my analysis of museum beaded ornaments, the archaeological evidence and ethnohistoric accounts of Australian Aboriginal beads. The value of the three levels of spatial units I have used to describe patterning of ornaments will be assessed and behaviours that may be associated with patterning of the sample will be deliberated. In Chapter 6, I compared the function of beads across the Australian continent with the results of Vanhaeren's (2005) investigation into ethnographic use of beads and tabled the type of ornaments within drainage basins in Appendix 4. Here I will discuss the function of beads in my sample and the results of my analysis with existing theories for explaining the patterning of beads.

11.2 Results and interpretations

My results have shown a great deal of variation in Australian Aboriginal beads and the patterning of forms, raw materials and decoration. The foremost result is that shell beads were being treated differently from other raw materials and there is a difference between the distribution of shell series and pendants. Shell series are distributed around the coastal areas (with the exception of one example) while shell pendants have travelled long distances inland. Of the shell ornaments, only pendants manufactured from pearl or baler shell were collected long distances away from the coast and the form into which the pendant has been made is an important factor in the distribution. My shell sample indicates that shell series were produced for local use or short distance exchange, while some pendants, depending on form and raw material, were made for local use, and both short and long distance exchange.

With regard to the function of beads, information from the ethnohistoric literature indicated that this varied within and between groups depending on the value placed on the object and gender, age or status. Some forms are found only in one ethnolinguistic group while others may include several adjoining groups. The common theme among groups is that people did not dress for every day functions generally but dressed for special occasions, and beads are part of that dress.

11.2.1 Shells

Shell ornaments have clear patterning based on species and form. Early European accounts were often not specific about the species or form of shell ornaments being used by Aborigines. However, I will discuss the major bead forms in relation to what information I have. This analysis of the museum collections and the distribution of the collection sites allows a more detailed understanding of both species and form. For example, William Buckley (Morgan 1980: 54, 78) mentioned necklaces manufactured with shell were being worn in Victoria but he did not describe them in detail. He did, however, point out that ornaments were worn in battle and considered 'fashionable and attractive'. Ornaments do not appear to have been regularly worn in everyday hunting and gathering activities. Unfortunately, few collections were made in Victoria and archaeology and ethnohistoric accounts are important resources for evidence of the use of beads in prehistory in that State.

11.2.1.1 Shell series

Within series, people were producing standard products but the distribution of forms and species does not correspond. The basic series form (SH01) of threading shells end to end onto a single thread is spread throughout the distribution for the series sample. However, there are clusters of species confined to particular areas. Tusk shell series are confined to north-western Western Australia, with the main cluster in the Dampier Peninsula, spreading out into adjacent areas. Kim Akerman (in prep.) has pointed out that the tusk shell in Kimberley is sturdier and whiter than tusk shells from Cape York, and perhaps these were qualities that made the Kimberley tusk shell desirable. The colour of shells has been used by others (Kuhn et al. 2001: 7642) to argue that there was a preference for luminous white or brightly coloured or patterned shells at archaeological sites (>40,000 years old) in the Near East. In Cape York, there was a preference for making strings of shells with olive shells or composite materials and wearing such objects could be restricted to gender or age (Roth 1910b, Bulletin 15, Sect. 25). The one SH01 specimen collected from coastal Victoria was manufactured from crayfish legs.

11.2.1.1.1 Tusk shell

The tusk shell series collected from the Dampier Peninsula are a standard form with the longest specimens clustered around Lombadina Mission and the pearling centre of Broome.

Many of these forms had a pearl shell pendant attached, either plain or incised but always with the convex surface scraped clean and shaped, generally an elliptical form. In my sample, tusk shell beads do not feature away from Timor Sea drainage basin, except in one composite object and one multi-stranded object in West Cape York. Yet Roth (1910bB. 15, Sect. 25) mentioned they were worn, as what I call SH01 forms, by small children in West Cape York. Again in West Cape York, Thomson's photographs show women in mourning wearing tusk shell beads in single strings across the chest and under the arms and possibly coiled around the neck. This is an example of how one line of evidence can be misleading and that material evidence does not always reflect what was happening in the past, even within a small timeframe.

Other ethnohistoric accounts refer to tusk shell necklaces. Thomson also photographed a young girl in Arnhem Land dressed for ceremony and wearing strings of tusk shell beads in coils around the neck. Peggs (1903: 346), while living in Broome, Western Australia, described women wearing tusk shell necklaces around the neck to 'annex' a man and that after the marriage was consummated, the necklace was put aside for special occasions. Peggs also wrote that the tusk shell beads were worn across the chest and under the arms (as in Cape York) and was informed by a male that this was a 'fanciful decoration and does not signify anything'. Other researchers have referred to other functions for the tusk shell. For example, Schall (1985: 19) mentions that *Dentalium* (tusk shell) necklaces were recovered from a burial site at Mornington Island in the Gulf - I could not obtain a primary source for that excavation.

The tusk shell ornament appears to have had multiple functions. Meggitt (1962: 295, 296) described the use of strings of tusk shells in rituals in Central Australia. Power was embedded in the tusk shell ornaments and that power was transferred to young men from older men during initiation ceremonies. It was believed that sighting the shells could be fatal to women. This example shows that tusk shells were transported to the centre of Australia and is consistent with Wiessner's (1983: 259) hypothesis that goods gain in value as they move away from the source. The tusk shell beads on the coast where children or women could wear the object in different ways for different reasons became a highly valued object of male power inland.

The tusk shell has not been traded as readily as the pearl shell but its function certainly was important. Of note here, is that the pearl shell pendant is a well documented exchange object from Western Australia but it is the tusk shell that has been recovered from inland archaeological sites (Balme and Morse 2006) that are dated well into the Pleistocene and those tusk shell segments had been strung. This shows that the same type of object had travelled long distances over 30,000 years ago. Tusk shells found in archaeological sites away from the coast may, in fact, have been used for a similar purpose as those Meggitt described in Central Australia. Scaphopada fragments have been recovered from the coastal area of Mandu Mandu, Western Australia, dated to c. 21,000 years old. Moya Smith, from the Western Australian Museum, has witnessed these shells being manufactured into beads by an Aboriginal woman from the Dampier Peninsula in modern times (M. Smith 2006, pers. comm.).

11.2.1.1.2 Cone shell

Other evidence for early use of shell series comes from Mandu Mandu in Western Australia (Balme and Morse 2006; Morse 1993), where modified cone shells have been recovered and dated to over 30,000 years. These shells were thought to have been strung into a series. The only cone shell ornaments in my sample have been large, circular, flat pendants manufactured from the base of large shells (possibly *Conus millipunctatus* now *leopardus*) (Khan 2003: 28). Cone shells prefer tropical waters and this species was common on the eastern Queensland coast (Wilson and Gillet 1971: 140-144).

The distinctive cone shell pendants were worn as chest ornaments (Roth 1910b (15), Sect. 30). The pendants were collected from a very restricted area in West Cape York and an adjacent linguistic area in East Cape York (Roth 1910b (15), Sect. 30). The same ornament was worn in the Torres Strait (Haddon 1912: 43, 44) and may have been traded down from there or from eastern Queensland. In the Mapoon area, this objects was worn for ceremonial purposes by both men and women (Roth 1900: 45 in Schall 1985: 31) and male initiation (Thomson 1934b: 228). In Figure 6.30, I presented a photograph, taken by Thomson, of a man from East Cape York who was wearing a cone shell pendant for ceremony. The scarcity of these objects in my sample could indicate their value to the people wearing them (Thomson 1934: 228). Cone shells do not feature in Australian archaeologically and they are referred to in the literature from Cape York only (see Chapter 6).

11.2.1.1.3 Nautilus sp.

I have recorded only one other shell series specimen that was collected a long distance from the coast. That object, manufactured from *Nautilus* sp., was collected from Central Queensland and was not a standardised product (QE-01798, Queensland Museum, collected Barcoo River).

The *Nautilus* sp. was used to manufacture both series and pendants - as was pearl shell. The *Nautilus* sp. SHP05.00 pendant form is confined to a very small area on the north-east coast of Cape York between Cairns and Cooktown, and neighbouring inland linguistic areas. All *Nautilus* sp. objects are restricted to coastal or near coastal areas except for the one series that was collected in Lake Eyre drainage basin. Figure 11.1 shows the distribution of SH02 series beads (figure from Chapter 9).

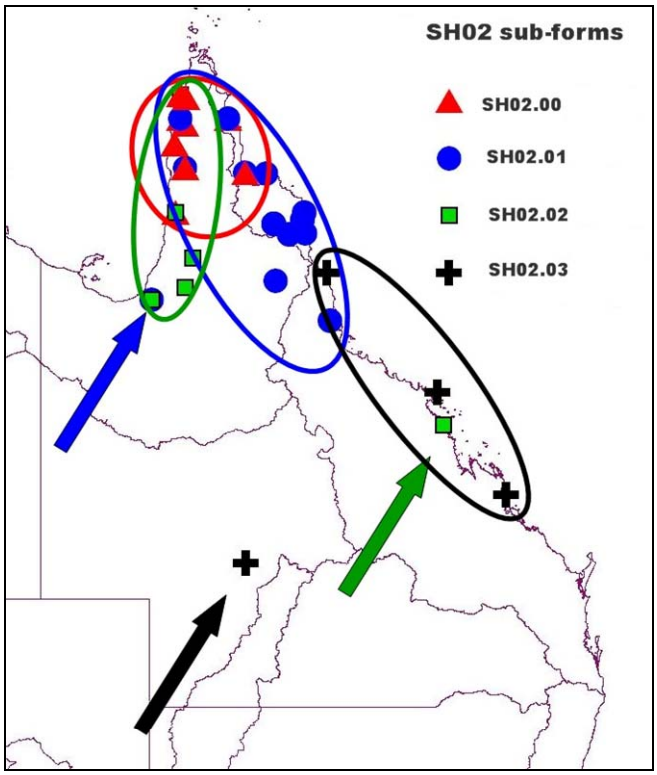

Figure 11.1. Distribution of SH02 series

There is patterning within drainage basins with *Nautilus* sp. series. The standard series form SH02 (rectangular segments) are found in West Cape York with two specimens from adjacent linguistic areas in East Cape York. The dominant form for *Nautilus* sp. is SH02.01

(overlapping rectangular segments) and these are clustered in East Cape York, spreading to adjacent areas in West Cape York and Gulf. The overlapping form is only manufactured with *Nautilus* sp. Living *Nautilus* sp. shells prefer deep water and are common across northern waters of Australia. *Nautilus* sp. can be found in the Gulf but is more prevalent on the eastern side of Cape York (Akerman 2008 pers. comm.). That form (SH02.01) may have been traded or exchanged across Cape York to those areas. *Nautilus* sp. objects in Cape York are more standardised in form than those away from the Cape. *Nautilus* sp. ornaments were collected further down the east coast of Queensland but in a different form (irregular rounded shapes). An object manufactured from *Nautilus* sp. was collected from the Whitsunday Islands off the Central Queensland coast. This object is similar in form to the SH04 manufactured from pearl shell collected from the Kimberley. This form is closer to the series form manufactured from teeth (T02) on the western side of Australia.

11.2.1.1.4 Nautilus sp. and pearl shell

The same form (SH02.00) has been manufactured from both *Nautilus* sp. and pearl shell and those distributions overlap but are not the same. McConnel (1953: 16) described the preferential use of necklaces from small, fragile pearl shell that were available on the shores of the Gulf of Carpentaria instead of the more 'robust' *Nautilus* sp. Other shell species could be suitable for manufacturing this form but I have no specimens in my sample. For example, the large baler shell could be shaped into rectangular segments but I have not encountered any such objects in the museums. People probably preferred *Nautilus* sp. and pearl shell for this form, possibly because of the nacreous finish on those shells. Figure 11.2 gives the distribution of SH02 series (same as those shown in Figure 11.1), divided into pearl shell and *Nautilus* sp. series.

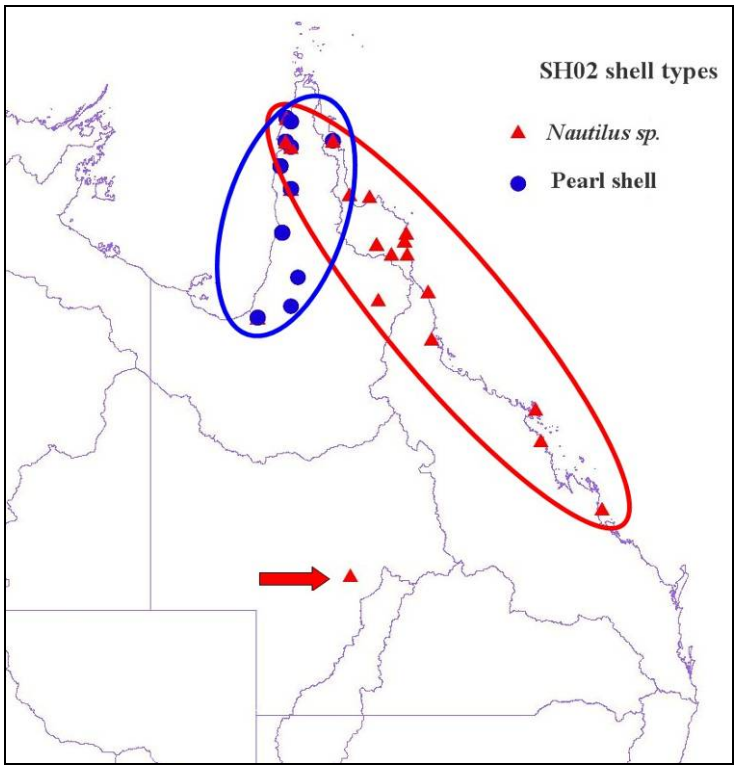

Figure 11.2. Distribution of *Nautilus* sp. and pearl shell SH02 series

Hale and Tindale (1934: 141, 142) observed that people valued pearl shell pendants over any other in Princess Charlotte Bay, East Cape York, which resulted in pearl shell pendants being more plentiful. My sample does reflect that scenario for pendants but not for series. At East Cape York, series made from pearl shell are scarce.

Pearl shell was manufactured into both series and pendants. Different species of pearl shell are found all around the northern coastline but pearl shell series ornaments are found almost exclusively in West Cape York. Only one location each in East Cape York and Kimberley in Western Australia contained pearl shell series. The one object in Kimberley is a unique form. All pearl series are clustered along West Cape York except for three examples collected by Thomson at the Pascoe River, which is an adjacent linguistic area. The pearl shell series is manufactured into one main form (rectangular segments strung side by side) and one variation within that form (oval segments). *Nautilus* sp. shells were also manufactured into that form. Roth (1910b, Bulletin 15, Sect. 25) described this object as being worn by women around the neck and by men around the forehead for decorative purposes. However, a photograph in Chapter 6 (Figure 6.16) shows a young man from Bloomfield, East Cape York, wearing this form of object both around the neck and the head. Thomson (1936: 383) described the

wearing of pearl shell series (probably SH02) in West Cape York during ceremonies related to presenting a child to its father for the first time.

11.2.1.1.5 Summary of shell series

From the literature examined in this project, the wearing of shell series could be in association with special occasions and ceremonies, marking the many phases of life including: birth; rites of passage into adulthood; marriage; and death. They were also worn for purely decorative purposes – dressing for an occasion. Specific shell series forms and materials in my sample did not travel far from the source in comparison to pendants and there appears to be regional and ethno-linguistic patterning. The importance of series as trade items has been recorded by Roth (1910b (15), Sect. 2, 4) yet, away from Cape York, only *Nautilus* sp. series appear down the eastern coast and hinterland (with one exception). There is little mention in the literature of shell series inland. One account describes shell necklaces being worn by men and women at Cloncurry, and the display of that ornament was said to protect white men against 'wild' Aborigines (Curr 1886: 331).

Archaeologically, the only confirmed series objects recovered were manufactured from cone and tusk shell (Scaphopod) from Western Australia. Those objects are very old (Balme 2000; Balme and Morse 2006; Morse 1993). Other archaeological finds may have been series objects. The 32 pierced shells (species was not identified) found in a cremation pit at West Point, Tasmania (dated < 2,000 years) (Jones 1966b), may have been part of a series object. The black periwinkle shells from Bundeena rockshelter in New South Wales, dated 1,000 to 2,000 years (Harper 1899) were possibly part of a series. McCarthy (1964) claimed that one mussel shell was part of a series, but this is hard to justify on the evidence of just one shell segment. However, for my sample, the mean length for pearl segments for series was approximately 10mms and 38.5 mms for small shell pendants. The length of McCarthy's mussel shell was 18mms and this could mean it was part of a series object that had large segments, or it could have been a broken pendant. No *Nautilus* sp. segments have been found archaeologically. Pearl shell segments have been recovered, but it is not certain if they were pendants or part of a series.

11.2.1.2 Shell pendants

11.2.1.2.1 Nautilus sp.

The specimens of *Nautilus* sp. pendants in my sample were restricted in distribution to a small area of East Cape York. Women wore these pendants between their breasts and men wore them on their back (Roth 1910a, Bulletin 15, Sect. 30). Roth explained that the *Nautilus* sp. objects were not traded far inland because of their fragile nature. On the other hand, McConnel has argued that *Nautilus* sp. was sturdier than the pearl shell in West Cape York. Aborigines were recorded wearing *Nautilus* sp. pendants as far south as the Richmond River Valley in New South Wales, where large oval *Nautilus* sp. pendants were traded from the coast (McBryde 1974: 195). In south-eastern Queensland McNiven (1992) and Mathew (1887) described how the *Nautilus* sp. shell ornaments were valuable as markers of status and sought after for inland trade. The crescent shape of the pendant they describe is more like the SHP02 pearl shell pendants that I have recorded in my sample, which are much thicker and more robust. Mulvaney (1976) has noted the problems with identification of species in museums and I have found many objects in the museum that have been labelled '*Nautilus* sp.' are, in fact, pearl shell. I agree with Roth's idea that the *Nautilus* sp. was too fragile for long distance trade. There does not appear to be any *Nautilus* sp. series or pendants recovered archaeologically and there is only one *Nautilus* sp. object in my sample found a long distance from the coast.

11.2.1.2.2 Baler shell

In my sample, baler shell was manufactured into pendants only. Baler shell pendants are distributed along the northern coastline and down through the centre of Australia. The main trading route for these objects was from East Cape York, down through the Gulf and south to the Georgina River and beyond. Baler shell pendants are also distributed down the Queensland coast. Elliptical and smaller sub-forms are distributed away from Cape York and may be reworked shells or they may be the style preferred by particular groups. Only one baler shell ornament was found west of Alligator River in north-western Northern Territory.

Baler and pearl shell pendants are the only shell objects that have been decorated in my sample. The decorated baler shell objects appear along the watershed of Lake Eyre and Western Plateau and no decorated pearl or baler shell ornaments were collected east of that

division. Whether this indicates some type of boundary marker is not clear. From my sample, drainage basins are not a big factor in marking cultural areas from beads and the patterning of the baler shells is more likely to be associated with the trunk trading routes. I do agree with Mountford and Harvey (1938: 132) that the Central Australian design must have been added at its destination. The thumbnail below shows a baler shell with the distinctive Central Desert design.

In my sample, the pattern incised on the baler shell is only found on those baler shells collected along the watershed of Lake Eyre and Western Plateau and on two pearl shell pendants from the same area. Decorated objects are shown in Figure 11.3 and I have reproduced McCarthy's map showing major trunk routes in Figure 11.4 .

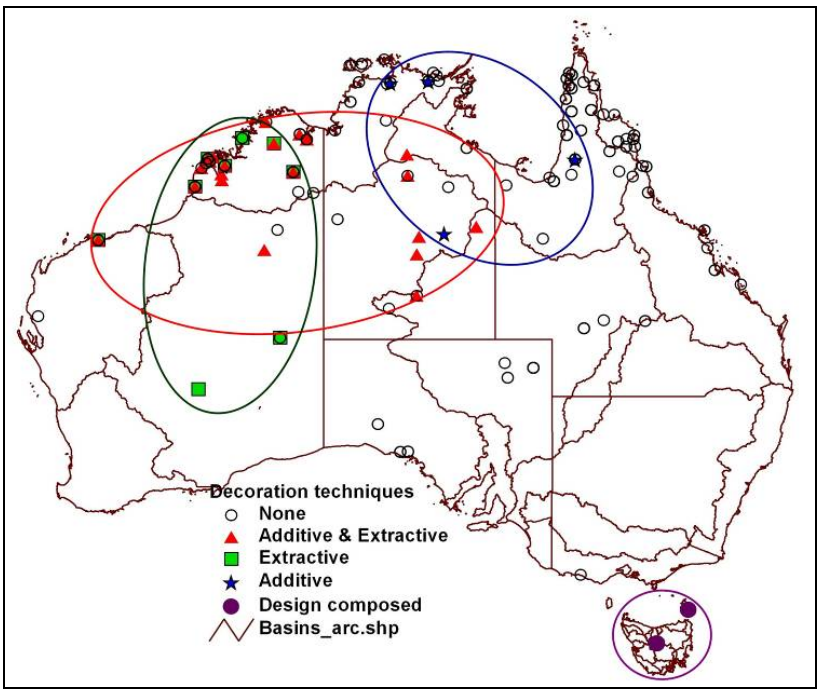

Figure 11.3. Distribution of decorated shell objects

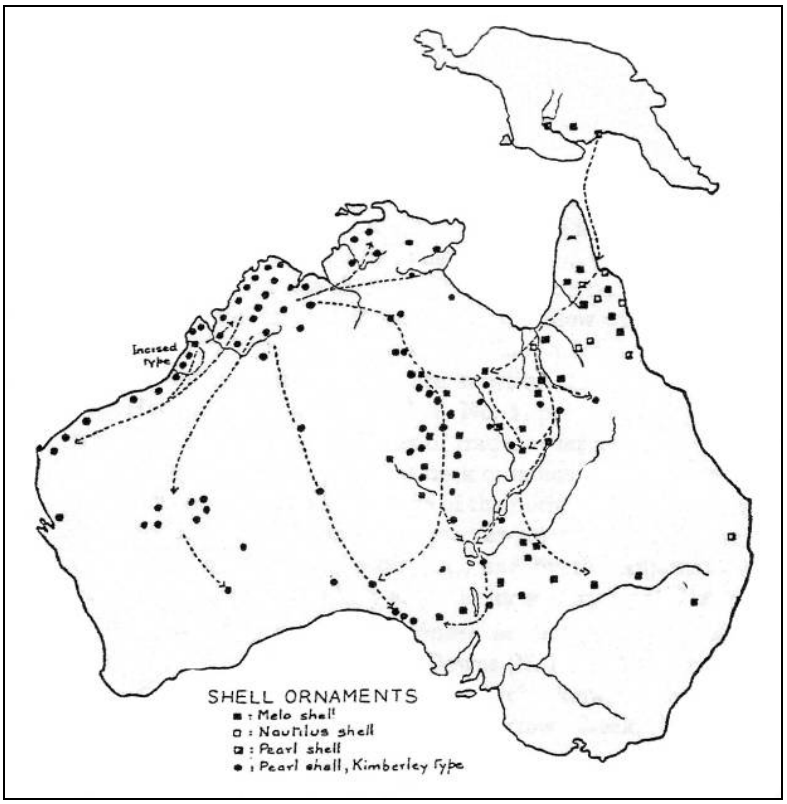

Figure 11.4 McCarthy's (1939: 93) trade routes (from Chapter 3)

There is a possibility that these objects came from Western Australia although it is probably more likely they were traded over from Cape York. Baler shell is not nacreous or as colourful as *Nautilus* sp. but baler shell pendants were preferred for long distance exchange, probably because of their durability for travel. McCarthy (1939: 182) believed the baler shell 'phallocrypt' was traded from the Fly River in Papua New Guinea, through Torres Strait to East Cape York and eventually down the trunk route as far as Lake Cobham, western New South Wales. Schall (1985) has argued that the baler shell was found in the Gulf and that the shell was not as sought after. This may be so. From my sample, many of both the pearl and baler shell pendants that have travelled inland are not the standard form and might in fact have been traded on because they were not wanted at the source.

The function of baler shell pendants varied. In the Boulia district, the baler shell pendant could be worn on the chest or forehead and the form (also manufactured with pearl shell) was imitated by chipping chinaware into a similar form (Roth 1897, Ch. VII, Sect. 182). Baler shell features in rock art in the Carnarvon Ranges to the east of Boulia and must had some importance to be depicted there. Stencils and depictions of baler shell (or possibly pearl shell) are found in rock art in Cape York, the Selwyn Ranges and Arnhem Land.

Horne and Aiston (1924: 47) wrote of baler shell pendants in initiation ceremonies in Lake Eyre. The baler shell was later replaced with mussel shell for that purpose – possibly using the local shell once the traditional trade routes were disrupted by European colonisation. Spencer and Gillen (1899: 573) observed that baler and pearl shell pendants were used in Central Australia for charming women or for warding off sickness. At the source in Cape York, the baler shell had a utilitarian and ornamental purpose but became more valuable as ornaments in a ceremonial or magical context. From her study, Schall (1985) argued that baler shell was less valuable at the source than pearl shell and for that reason was traded south of the Gulf. This argument does not fit in well with the distribution of pearl shell pendants in my sample. Archaeologically, apart from the rock art, the only evidence for pierced baler shell ornaments I have found is from Cape Range Peninsula, Western Australia (Przywolnik 2003).

11.2.1.2.3 Pearl shell

 ..SHP02.00.  ..SHP02.02.   ..Two SHP02.03 forms

 ..SHP06. Large pearl shell pendant.

Pearl shell pendants appear to have two distinct distributions, one from Cape York on the eastern side of Australia and the other from Dampier Peninsula on the western side, similar to the two distributions identified by Davidson (1937) (see Figure 3.16). The forms of two pearl shell pendants are different for the two distributions. The larger SHP06 pearl shell pendant is clustered within Dampier Peninsula and then spreads out in neighbouring areas and on to the centre and southern end of Australia. The large SHP06 form does not cross to the eastern side of the circumcision line. This may be explained by Akerman and Stanton's (1994: 17) argument that the easterly distribution of pearl shell pendants coincided with the expansion of the practice of the use of pearl shells in initiation ceremonies. Figure 11.5 shows the

distribution of SHP06 forms on the left and the circumcision/subincision distribution on the right (Peterson et al 2005: 98).

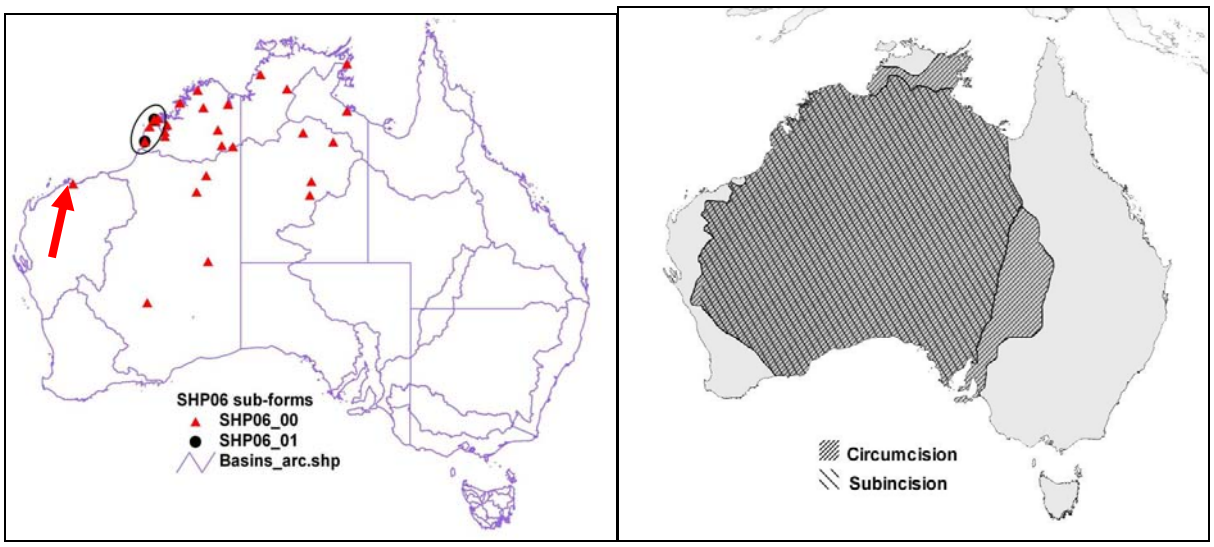

Figure 11.5. Distribution of SHP06 and circumcision/subincision

Only one specimen on the Western Australian coast is outside the circumcision/subincision lines. The SHP02 (narrow pearl pendants) form appears to have two distributions. One distribution appears to originate in Cape York, Queensland, and the other from Dampier Peninsula, Western Australia. Each of the two SHP02 distributions has a separate standardised style. The SHP02.02 sub-form that clusters within Dampier Peninsula is more standardised in form and often decorated with incisions and multiple segments attached together. The SHP02 from Dampier Peninsula is more standardised than the SHP06 from the same area or the SHP02 form from Cape York.

The variation (SHP02.03) pearl shell pendant may or may not be a retouched version of either the SHP02 or the SHP06 forms. These objects are usually outside the main clusters and travel through the centre of Australia. My analysis suggests that these pearl shells did not fit in form with either SHP02 or SHP06. The shells may have been standardised at the source with exchange in mind, but, in my sample, the pearl shell pendants that have travelled long distances are not standardised. This may be due to reworking of the pendant. Having said that, many specimens are small, almost complete pearl shells, indicating that small shells were preferred or what was available. The larger shells may have in fact been more valuable at the

source for local use or exchange. Another explanation may be that the traded objects were not needed at the source.

Included in the SHP02.03 forms is the small triangular pieces of pearl that are described by Roth (1903, Bulletin 5, Sect. 90) from Boulia to Leichardt-Selwyn Districts and used for charms or magic. There are no examples from that area in the Roth collection in the Queensland or Australian Museum but there are examples from West Cape York and Kimberley, which are areas where pearl shells are available. This indicates that people were making those smaller shapes or were reusing larger shells at the source. Roth (1910b, Bulletin 15, Sect 30) does note that in West Cape York, shorter, rounder pieces of pearl shell were worn by mothers on the death of her infant or by other females attending the corpse. Also, children wore broken shells.

From my research - who, when and why people were wearing pearl shell pendants was variable, depending on location. For example, in West Cape York, Roth points out two types of pearl shell pendants for that area although my sample does not agree with that. I have found a variety of forms and sizes from West Cape York and around the Pennefather River area. Roth observed that men could wear the longer SHP02 pearl shell pendants on their chest for ceremonies and special occasions. Yet the longer form is shown worn by a young girl (Figure 6.20) from that area, and Roth (1903, Ch. 5) indicated that she had undergone a ceremony associated with marriage suitability. McConnel (1953: 24) argued that the oblong pearl shell pendants were worn mostly be men in West Cape York and traded from the east coast and Torres Strait. On another occasion, Thomson photographed a woman from West Cape York dressed for mourning wearing a crescent shaped pearl shell pendant (Figure 6.29). This shows a range of functions for the pearl shell pendant in Cape York.

Roth talked about ‘phallocrypts’ or ‘penis concealers’ made from pearl shell from below the Gulf and down the Georgina River being used by males at corroborrees (Roth 1897, Ch. VII, Sect. 184). My sample contained only one pearl shell pendant within that drainage area, from Minnie Downs on the border of Lake Eyre and the Murray Darling drainage basins. Two other objects were collected from that location, one manufactured from baler shell and the other from bone. All three objects have a similar form and possibly a similar function. Archaeologically, pearl shell is not well represented but there is evidence for their use over

extensive temporal and spatial distribution. Pearl shell was found at Mandu Mandu, Western Australia, with an estimated date of 21,000 BP (Morse 1993), an undated pierced abalone shell from Bunbury, Western Australia (Akerman 2003) and a pierced oyster shell at Roonka, South Australia, dated 4,000-7,000 years BP (Pretty 1974). Both shell types have shiny concave surfaces.

There has been more written about the movement and function of the large SHP06 pearl shell pendants from north-western Western Australia than any other object. They are spectacular, particularly those that are incised and infilled with colour. Records of their function vary from meaningless ornaments or symbols of mourning, marriage, courtship, mark of status as an initiate or warrior, magic, medicine and charms against sickness or evil spirits, and as exchange items in gift reciprocity and ceremonial exchange (Akerman and Stanton 1994: 19-32). The shimmer of pearl shell was associated with water and was highly valued for use in rain making ceremonies in Central Australia. The pearl shell pendant was a multi-functional object that operated as a symbol of individual, social and ethnic identification. In comparison with the pearl shell from north-western Australia, not much is known about the function of shells used off the mainland in Tasmania.

11.2.2 Tasmanian beads

Tasmania was isolated from Australia for 14,000 years (Lambeck and Chappell 2001) and the range of ornaments recorded when Europeans first arrived was very small. The Tasmanian example shows people were using many species of shell to manufacture the same form and often made patterns by arranging different species or sizes. However, other than teeth and shells, Tasmanians did not appear to use as wide a range of bead forms as the mainland. For example, ethnohistory records that reed or grass bugles were worn by Aborigines in most areas on mainland Australia but does not mention the wearing of bugles in Tasmania - even though the raw material would have been available to people living in Tasmania. Also, Victorian Aborigines had the maireener shell but apparently did not use them for making ornaments. Not much is recorded about the function of beads in Tasmania. The evidence from my study suggests:

- Beaded ornaments that were common to Tasmania and the mainland may be an ancient phenomenon.

- Beaded ornaments in Tasmanian but not on the mainland may be an innovation post 14,000 years BP.
- Beaded ornaments on the mainland that were not in Tasmania may be an innovation post 14,000 BP.

As mentioned earlier in this chapter, 32 pierced shells recovered archaeologically from West Point, Tasmania, could have been from a series ornament.

11.2.3 Raw materials other than shell

From my sample, it appears that previous researchers have quite rightly focused on shell ornaments as there is not as much information available about Australian Aboriginal beads made from other raw materials. Many of the raw materials are perishable and would not survive a very long deposition. For example, it is highly unlikely that reed bugles or many of the seed ornaments would survive. However, there is archaeological evidence that people were making ornaments with teeth for thousands of years.

11.2.3.1 Teeth

Archaeological evidence of teeth used as ornaments in burial sites has shown the teeth were an important raw material for the manufacture of ornaments. Macropod teeth are the most highly represented species in my teeth sample and those objects are distributed across the northern coastal area and down the centre of the continent (with one exception in Victoria). Series are shown in Figure 11.6 and pendants in Figure 11.7. I have plotted the distribution of the teeth objects that have been recovered archaeologically on the series map – all of which appear to be series.

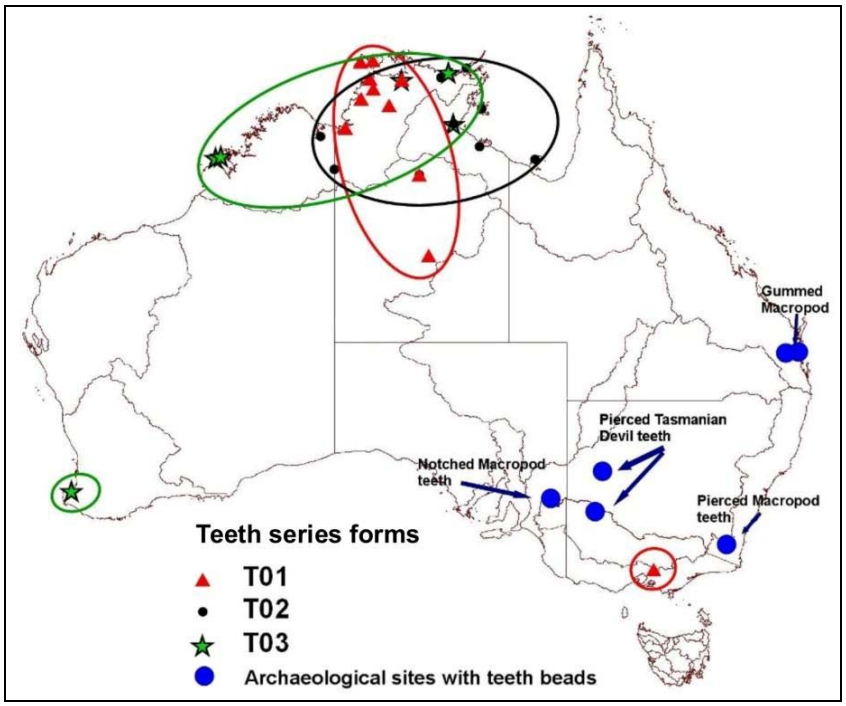

Figure 11.6. Distribution of teeth series

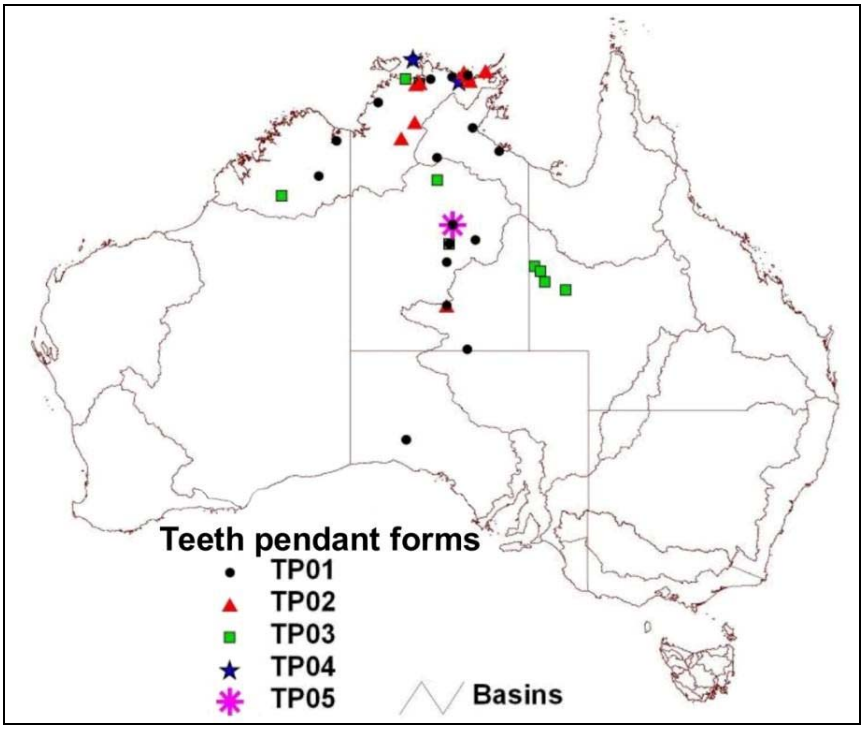

Figure 11.7. Distribution of teeth pendants

Figure 11.6 shows that the archaeological evidence and the ethnohistoric evidence do not agree. Ethnohistoric accounts have recorded macropod teeth ornaments along the coast and inland New South Wales, Tasmania, Victoria, north-western Queensland, and throughout northern Western Australia and Northern Territory and in Central Australia. The cluster of

archaeological sites with teeth along the Murray/Darling River and the adjacent Southern Highlands shows the use of teeth as necklaces over thousands of years. The technology for attaching the teeth to resin may be a later development. If the dating for Kow Swamp is right for the Pleistocene, then that is not the case. By approximately 7,000 years ago, people at Lake Nitchie were piercing teeth from *Sarcophilus harrisii*, an animal that is now extinct. By 4,000 years ago, macropod teeth were being notched and possibly cemented, although there is one pierced macropod tooth from an upper level at Nawomoyn rockshelter in Northern Territory (Schrire 1982: 126-129).

All ethnographic teeth ornaments in my sample were manufactured by using cement to tie to strings except one specimen from Victoria. It is recorded that in Victoria the attachment technology was by attaching each tooth to a strip of animal hide with sinew and no cement used. The one specimen from Victoria in my sample has that technique. This shows a technique, which was widespread in a region, disappeared within a very short time after the arrival of Europeans. This also reflects the fact that museums do not hold Aboriginal ornaments from the areas first colonised in south-eastern Australia.

The teeth ornaments recovered from Cooma, the Murray/Darling and Roonka was obviously involved with mortuary practices. Both male and female were associated with the Tasmanian devils' teeth ornament at Cooma, around 7000 years ago, and at around the same time, a male burial at Lake Nitchie. In the later burial at Roonka (c. 4,000 years ago) the man was adorned with notched macropod teeth and the child with snake vertebrae and a bird's skull. Whether age and sex are important in these burials we can only speculate but it does seem that these individuals must have had a high status to have these rare types of grave goods interred with them. The scarcity of burials accompanied by beads could indicate the high status of those interred with the beads. Dawson (1881: 81) reported that 'Chiefs' wore headbands with kangaroo teeth pendants in western Victoria. Yet, in Central Australia, photographs taken by Gillen (Chewings 1936: 106) show teeth ornaments were worn by women.

Teeth ornaments in my sample are mainly clustered in Arnhem Land and spread out south along the Gulf coast and south-west to the border of Northern Territory and Western Australia. Teeth ornaments were worn in areas outside the distribution of my sample. For example, series of teeth cemented objects recovered from south-east Queensland (McNiven

1992). None of the ornaments collected from inland were manufactured with teeth of marine species. A high percentage of teeth ornaments were decorated. Within Timor Sea drainage basin, the highest percentage of teeth objects decorated were in Arnhem and the least in Kimberley – the opposite distribution to pearl shells.

Without the ethnohistoric and archaeological evidence, I would have argued that teeth ornaments were not found along the eastern coast of Australia. The paradox here is that the museum specimens I encountered are not pierced so they might not show up in the archaeological record as ornaments – allowing the prehistoric distribution to fill in beyond the South East. But the fact that pierced teeth occurred in the South-east suggests that the museum collections should contain some pierced teeth. The absence is probably related more to the paucity of collection than anything else.

11.2.3.2 Bone and stone

Bone and stone beads dated to the Pleistocene have been recovered from south-western Western Australia (Dortch 1979, 1980, 1984), Graman in New South Wales dated to around 4,500 years (McBryde 1968; 1974: 320-322, 375) and Sister's Creek in Tasmania (Jones 1965: 195), but I have no bone or stone specimens in my sample that are similar to those objects. The ethnohistoric accounts I have surveyed have mentioned bone ornaments (animal and human) but the technology for attachment was generally by cementing with gum, beeswax or resin. My sample has bone series objects from Northeast Coast and Western Plateau and bone pendants from Lake Eyre, Murray Darling and Timor Sea. Evidence from archaeology and early literature (Appendix 4) shows that bone was used over all drainage divisions but Timor Sea and Gulf. While these of lines of evidence do not agree, when combined they show that bone ornaments were used over most of Australia.

11.2.3.3 Seeds and beans

Because they are perishable, it is unlikely that seed ornaments will be recovered from archaeological sites that have any time depth. My sample of seeds is small but there is literature that mentions the Aboriginal use of seed ornaments, particularly *Erythrina* sp. in Central Australia. The seed series are generally associated with women and there is no

specific function noted for them. Hale and Tindale (1934: 140) observed half goa nuts worn as dance rattles and for ornaments at Princess Charlotte Bay. Men wore coloured beans along the eastern coast of New South Wales (McBryde 1974: 12). Edge-Partington (1898: Part 3: 131) mentions A*brus* sp. and coix seed necklaces in Cape York with no mention of their function but he does write that matchbox seeds were used by 'doctors' at the Barkley tablelands (Edge-Partington 1898: 140). Carnegie (1898b: 395) mentioned red beans from the Kimberley and that Aborigines in the Gibson Desert carried seed necklaces (Carnegie 1898a: 269).

11.2.3.4 Grass or reed bugles

Grass or reed bugles were distributed throughout the area for the whole sample. I have reproduced the distribution of bugle forms from Appendix 14 in Figure 11.8.

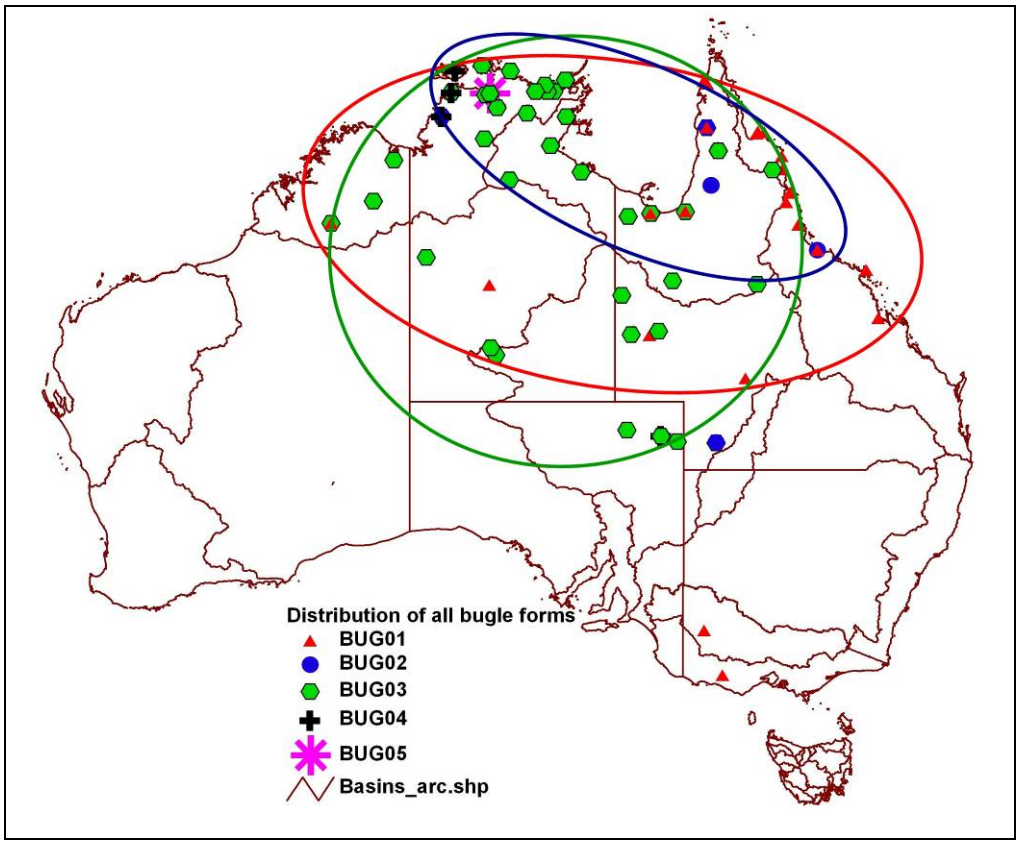

Figure 11.8. Distribution of bugle forms

These objects were multi-functional and were important identifiers of individual status. Kleepe's (1989) argument that grass necklaces worn by a person of high status in the Sudan

showed that the object was made for the one occasion does not seem to fit in the Australian scene. However, he was right in arguing that ornaments must be placed in context to understand their function. Grass bugle necklaces could be markers of initiation, worn in mourning or just as decoration and were often age and gender restricted. They were reported worn throughout New South Wales by young initiates at Lachlan River (Mathews 1905: 65) and men along the coast (McBryde 1974). Roth (1897, Ch. VII, Sect. 111) noted that grass or reed bugle necklaces were worn everywhere and usually by women. Roth described different forms of bugle necklaces were worn in different ways in different areas. Petrie (Campbell-Petrie 1975: 19, 20) observed that men wore them at the Bunya festivals and that they were traded between coastal and inland groups. Lumholtz (1908: 222) observed them worn as ornaments by men and women on the north Queensland coast. Although they were worn in most States in Australia, there is no mention of these objects for Tasmania.

11.2.3.5 Vertebrae

My sample of fish or shark vertebrae is concentrated in Cape York and Arnhem Land. Only two snake specimens were found – one in Cape York and one in the Kimberley. The specimen from the Kimberley (A-11583) has a cowry shell attached. Literature about the function of series made from vertebrae is poor but one account notes that vertebrae of a cetacean was used to identify a medicine man on the Western Australian coast around the Pilbara (Clement 1903). At the opposite end of the continent, a snake vertebrae series was recovered with the skeleton of a boy from Roonka in the Lower Murray, and dated to around 4,000 years old.

11.2.4 Summary of raw materials other than shell

One of the points that emerged from my results was the similarity of form between different raw materials. For example, fish bone in Arnhem has been shaped to a point and set in gum in a similar fashion to that commonly manufactured with macropod teeth in the same area. The two objects are displayed in thumbnails.


…Fish bone pendant 

…Macropod teeth pendant

Other materials in my sample have been manufactured into forms that are commonly made by a dominant material. These include: emu claws (T02), echidna spines (TP01 and TP02), chinaware (SHP02) and turtle carapace (SHP01). The form appears to be important and replicas were made with materials on hand.

11.3 Assessment of spatial units

Overall, the distribution of bead forms does not appear to be closely associated with drainage basins although some species (shells) and forms (e.g. shell series) do have patterning within basins. I found less patterning related to drainage basins for ornaments than I found for boomerangs (McAdam 2001), cicatrices (Brady 2005) or for the categories of objects studied by Best (1999). However, Horton's (1996) linguistic and geographic boundaries appeared to be more reliable markers for the patterning of several bead forms or raw materials, remembering that Horton based his map on drainage boundaries. The areas within Horton's drainage boundaries appear to be more relevant markers. Many forms are clustered within one or more of Horton's units with smaller numbers in neighbouring linguistic units. From my sample, many forms appear to be clustered within one or more linguistic areas with numbers of objects lessening with distance away from that area. For example, *Erythrina* sp. seed series are clustered in Central Australia with the number of specimens decreasing with distance from the centre. Also, bugle series are concentrated in Arnhem and spreads out from there towards the Kimberley and Gulf regions with less numbers in the adjacent areas than Arnhem and the least numbers in non-adjacent areas. Yet, Roth noted that these ornaments were throughout Queensland. My sample is probably a result of the collection practices at the time.

While the shell ornaments at a major level (e.g. Class 2, pendants) are standardised at the source, the pendants collected inland do not conform to standard size, form or decoration. It appears that the pearl shell objects furthest from the Dampier Peninsula source did not share a consistent form. Some of the pendants were manufactured from small shells and others from

a larger pearl shell reshaped into irregular shapes and sizes. The baler shell ornaments had a more easterly distribution and were more standardised in size along the coast. Some baler shell pendants may have been reworked to reshape. The inland distributions of pearl shell and baler shell did not overlap although pendants manufactured from both baler and pearl shell clustered along the watershed between Lake Eyre and Western Plateau.

Other beads in the sample, including shell series, were manufactured from species that could be obtained locally (with the possible exception of large cone shells) and often, raw material was available but a particular species was used for manufacturing beads. This means that people were making decisions relating to raw material selection, form production, and which objects were suitable for exchange.

How does this relate to theories about the patterning of beads and how do those functions relate to the world-wide synthesis of bead functions assembled by Vanhaeren (2005)?

11.4 Patterning and function of Australian beads

The archaeological evidence for beads is concentrated in the south-east of Australia but I have found that the ethnographic material and early literature are scarce for that area. From my study, I have found that Australian Aboriginal beads were multi-functional and one object could have more than one function, which supports Vanhaeren's (2005) argument. When comparing to the functions listed by Vanhaeren (2005), many forms could be used for all functions by different genders, age or status depending on the context. For example, large pearl shells from north-western Australia could be worn by children, used in men's initiation ceremonies, women could wear them for attracting males and they could be used for magic and in rain making ceremonies. Authors have pointed out that the value of ornaments increased with distance from the source (McBryde 1974, Mountford & Harvey 1985) or the change of function may increase the value of the object. There does appear to be more value placed upon the shell pendants that travelled away from the coast.

Vanhaeren (2005: 542) interpreted the spatial patterning of beads in Africa and Europe and the Middle East as signifying different functions. Vanhaeren used ethnographic accounts to

argue that in Africa standardisation was an important factor in warranting the exchange value of beads manufactured. Beads were used for exchange in a gift-giving system to maintain socio-economic networks. In Europe and the Middle East, greater variation of beads indicated to Vanhaeren that regional patterning marked social, ethnic and personal identity. My study does not support that argument. Vanhaeren did not distinguish between pendants and series and my study shows that this may be important. In my sample, there is variation in object forms, raw materials and classes at the source but there are also standardised products. Shell pendants traded inland belong to one class but they are not standardised in form, decoration or size. The two raw materials used for shell pendants are more standardised on the coast than inland suggesting that people were producing a standard product (with series as well) for local use or exchange.

Gamble's (1982) idea that homogeneity would exist in isolated areas is both right and wrong for Australian Aboriginal beads. Gamble's argument suggests that beads in Central Australia and areas away from permanent water should be standardised. I have found variation with beads collected inland but there are homogeneous types of ornaments. For example, it is the same class of shell pendant type found in harsher inland areas as on the coast but often the pendants are not the same material, form or size. However, there is standardisation in seed necklaces in arid Central Australia and the same form of pendants manufactured with sets of macropod teeth.

My results show some support for Vanhaeren and d'Errico's (2006) argument that ethno-linguistic diversity may be an explanation for spatial patterning of beads. For example, McConnel's (1930: 4) explanation that linguistic division in northern Cape York seems correct for the patterning of some bead categories. Geographic factors do not appear to influence the distribution of the Australian material. The main factors that influence the composition of my sample include trade, bias of collectors and past behaviours of Aborigines. Davidson's (1928: 28) argument that goods and ideas diffuse from core locations does seem plausible with some categories of beads, although the objects may not be diffusing so much as spreading out. Also, McCarthy's (1940: 246) theory that objects will be made from locally available material and that inheritance and introduced ideas were an explanation for the form of objects is also not without merit. However, there is little information with the museum specimens that would allow any new inferences about this. This could be true for all objects

except shell pendants. For example, all beads made with marine species such as crocodile teeth or fish vertebrae were collected near the coast.

According to Wiessner (1983; 1984; 1985; 1989; 1990), I should have found standardised beads relating to social and boundary information and more variation within groups to indicate personal identity. Added to that, objects with more transformations should store more information. I did find that the only decorated baler shells were along the boundary of two drainage divisions but I do not find that was as important as the fact that they were collected along the trunk trade route and in an area that features the designs incised on the shells. My sample showed variation in objects within all major regions but shells in particular were standardised for local use. From my study, Wiessner's theory works at one level but not for all aspects of bead patterning. The variation in shell pendants suggests that those who wore pendants were able to signal to others something about their ethnic identity but within the group of pendant wearers, there was enough variation to mark individual identity.

As for more information being stored with more transformations, I cannot be sure. Objects were transported decorated and undecorated and there did not seem to be any patterning. Although shells that have travelled long distances did become more valuable away from the source. Early literature has suggested that this is the case. For example, Daisy Bates (Bates 1985: 285) wrote about the value of ornaments increasing away from the source in Western Australia. Many of the objects in my sample from that area have not been subjected to modification different from those at the source, although the amount of times the object changes hands may be important.

The interpretation of the function of prehistoric beads should be approached with caution. Akerman and Stanton (1994) have written that the function of decoration on pearl shells may have changed from 1936 when Elkin had noted that plain shells were for fully initiated men and engraved shells for initiation rites. By the 1950s, the engraved shells were for older men and the plain shells for younger men. If this cross-over of functions has occurred in so a short time, this leaves one to wonder at the extent of changes that may have occurred over thousands of years. For example, the woman from Bruny Island in Tasmania was wearing a necklace with an English penny and a metal button from Bligh's trip in 1792 when Baudin

encountered her in the early 1800s (Bonnemains et al. 1988: 57). What function did that necklace serve – was it just a trophy?

11.5 Research questions

My research questions were designed to address the hypothesis that spatial patterning of Australian Aboriginal beads will differ between different classes of beads and much of that patterning will be affected by behavioural variation. To repeat my main research questions:

- What is the spatial patterning of stylistic variation of Australian Aboriginal beads?
    - Is the spatial patterning the same for different classes of beads?
    - What are the other dimensions of variation?
- What behavioural variation is associated with the patterns?
- To what extent can our knowledge of ethnographic beads in Australia allow inferences or hypotheses about beads in early prehistory?

To answer the above questions, I addressed the following issues: what degree of variation in raw materials, morphology and decoration occurs? What is the function of discrete categories of beads? Can distributional boundaries be identified within the variation of discrete categories? Will exchange be an important factor in determining the production of categories? Is patterning different for different categories of ornaments? A secondary line of enquiry was the use of spatial units as cultural identifiers.

The initial aim of this work is to:

- assess the significance for theories of stylistic variation of spatial patterning using beaded ornaments across Australia.

I have recorded all Aboriginal beaded ornaments held in major Australian museums that were available to me at the time of recording. I have placed objects within a classification system based on two major classes and then broken down into forms based on raw materials. The distribution of the beads was then mapped using drainage division, Horton's (1994, 1996) divisions and general locations. In this chapter, I have investigated the relationship of discrete classes of beaded ornaments using ethnographic material, ethnohistoric resources and archaeological evidence. I found that most of the theories only work partially.

I have answered the secondary lines of enquiry for addressing the principal research questions:

- What degree of variation in raw materials occurs?
  - My sample showed distinct areas for most species of shell. Other than shell, most materials were confined to raw materials at the source. For example, macropod teeth were found in coastal and non-coastal areas whereas fish vertebrae and marine teeth were found in coastal areas only.
- What degree of variation in morphology occurs?
  - Variation in morphology was recorded in raw materials, forms and sub-forms. I found a high degree of variation between forms and less degree within forms.
- What degree of variation in decoration occurs?
  - Designs (Mountford & Harvey 1938) on shells had patterning otherwise decoration was not a big factor in distribution. Having said that, particular forms and materials were selected for decoration. Teeth had a high proportion decorated but the distribution of decorated teeth was random. The highest degree of decoration occurred in Kimberley on shell and in Arnhem Land for teeth – both of these Horton divisions are within Timor Sea drainage division but not adjacent.
- What is the function of discrete categories of beads?
  - From the ethnohistoric accounts, it can be seen that different beads have different functions, many are multi-functional and function may be different in different areas and may change as the beads are moved between groups.
- Can distributional boundaries be identified within the variation of discrete categories?
  - Clear patterning was identified for variation within many forms.
- Is exchange an important factor in determining the production of categories?
  - Exchange is a major factor in the production of discrete forms of beads. Class, raw material and form are all important factors in the role of beads in exchange. From my sample, I found that shell pendants were the most desirable exchange object and particular forms of pendants travelled long distances. However, pendant forms that travelled long distances were more standardised in size at the source along the coast than inland. In contrast, all but one shell series were confined to smaller areas along the coast. Shell series forms were highly standardised yet more localised in distribution.
- Is patterning different for different categories of ornaments?

- Different classes, raw materials, forms and sub-forms displayed different patterning. No two forms had the same patterning.

The most important thing to come out of this research is that different categories of beads have different distribution, in particular, shell pendants were exchanged inland, shell series were not. Added to that, shells hold more prestige than other materials and were more standardised for local use than for long distance trade. For beads overall, it appears that patterning is affected by both behaviour and environmental factors. Beads made from locally available materials are more common than beads made with exotic material. People were choosing raw materials with particular qualities and producing favourite forms. For example, writers have noted that, in Cape York, pearl shell was preferred (possibly because of the sheen) over other shells and the crescent or longer rectangular shape was preferred. In Western Australia, an elliptical shape that was symmetrical longitudinally was preferred.

11.6 Hypothesis

My original argument was:

- Spatial patterning of Australian Aboriginal beads will differ between different classes of beads and much of that patterning will be affected by behavioural variation.

From my study, I have shown there is a great deal of variation between different classes, forms and materials of beads. This supports Best's (1999: 328) conclusions that 'distribution patterns of different classes of object are not necessarily uniform'. Best (1999: 330) also concluded that the 'possibility exists that style may have a social as well as geographical limit'. I have considered the explanations for the spatial patterning of beads, including environmental factors (such as topography or availability of material) and/or behavioural factors.

While the environment plays an important part in hunter gatherer lifestyles, from my study, it does not fully explain the distribution of Aboriginal beads. I have found that drainage basins did not play a major role in patterning of beads across Australia in general, whereas patterning

does coincide with Horton's units for some forms. Clustering appeared in localised areas, at times spreading out into neighbouring linguistic areas.

It appears that some objects were made for local use and trade while others (some pearl shell and baler shell pendants) were traded over long distances. While there was a class preference for pearl shells, the shell pendants were more standardised on the coast. In my thesis on boomerangs, I found that the greatest variation of style was around Boulia – a large trading centre in Central Queensland. I did not find the same for beads. In fact, very few objects were collected from along the trunk trading route south of the Gulf of Carpentaria. This could be a result of the preferences of collectors and/or the production of beads for collectors. All of the objects except the pearl shell and baler shell pendants (and one *Nautilus* sp. series) could be manufactured from locally available materials. There are clusters of object forms around a few centres. For example, tusk shell series and large pearl shell pendants are mainly concentrated in the Dampier Peninsula where there were missions including Beagle Bay (from 1891), Sunday Island (1898) Lombadina Mission and Port George IV (1910) and the great pearling centre of Broome. In Cape York, early missions existed at Bloomfield River (1886), Mapoon (1891), Weipa 1896, Aurukun (1904) and Mitchell River (1904).

The spatial patterning is related to variation in behaviour. People were choosing to use particular raw materials to produce particular forms of objects. Even in regards to added vale in the form of decoration, I found that the most highly decorated shells were in Kimberley while the most highly decorated teeth were in Arnhem Land. Also, people were choosing to use more effort cleaning the convex surface of particular forms of shell pendants within the same area. Classes of shells were treated differently with highly standardised series used for local and neighbouring use, while pendants were used in local and long distance use. Shell pendants that travelled long distances did not necessarily have a standard form.

I also hypothesised that inferences about beads in early prehistory may be made from a study of ethnographic beads in Australia. I consider this study does have implications for studies of beads from early prehistory. I have shown that caution is needed when interpreting archaeological material. My results did not support nor deny Wiessner's arguments about standardisation reflecting inter-group relationships. I have found that it is more complex than that. Added to that, I have shown here that one line of evidence does not give a complete

story of beads in Australia. A combination of archaeology, ethnographic resources and early literature have given a picture, although not absolute, of what beads may have been used by Aborigines in the past and what their functions may have been.

11.7 Possibilities for future research

Perhaps the biggest problem with a geographic investigation this large is that the investigation is undertaken at a broad level and therefore the results are general. One of the observations I have made during this study was that drainage basins were not a useful tool for investigating the patterning of Australian Aboriginal beads but that Horton's linguistic and geographic areas appear to be more effective. A future study could test those perceived differences by examining the material culture variation between Horton's units (e.g. Arnhem and Kimberley) within one drainage basin (Timor Sea). A study of that kind could closely examine the linguistic areas within a region to address Vanhaeren and d'Errico's (2006) argument about the ethno-linguistic diversity explanation for patterning of beads or other forms of material culture.

Added to that, although I found no significant relationship between drainage basins and beads, an investigation into other forms of material culture and the role of drainage basins may give a different result and add to the work undertaken by Best, Brady and myself.

11.8 Conclusion

In this study, I have used Wiessner's (1989) and Vanhaeren and d'Errico's (2006) theoretical frameworks to examine the spatial patterning of Australian Aboriginal beads. Vanhaeren and d'Errico (2006) looked at beads on a continental scale to conclude that patterning of specific bead types not explained by raw material availability or chronological differences were related to ethno-linguistic diversity. In Australia, where we have much better information about the use of beads from ethnohistory, would we reach the same conclusion?

While a class of shell ornaments travelled long distances, my sample does not support the argument that any particular form was produced specifically for long distance exchange. It appears that the only non-local materials traded long distances were shell pendants but they

were more standardised at the source. However, I did find evidence for the argument that some forms become more valuable with distance away from the source. Also, beads were multi-functional and the function varied geographically depending on gender, age and status of the individual and generally not worn for everyday hunting and gathering. In other words, beads could be considered a form of 'dress'. Added to that, some of my results support Vanhaeren and d'Errico's hypothesis (2006) that patterning of beads reflects ethno-linguistic diversity - but not in all cases. From my sample, I have identified different distributions for different classes of beads (shell pendants and series) and Vanhaeren (2005) has not distinguished that.

Of importance is that it is not possible to predict that certain prehistoric beads are distributed by certain behaviours. In Australia, during the time of early European contact, shell was highly prized by Aborigines for making series and pendants. I have proved in this study that there is a difference in the distribution of shell pendants and series. Mainly shell pendants have travelled long distances and only two species, yet archaeology and early literature have proved that specific styles of series travelled long distances from the coast. Both series and pendants are highly standardised at the source and along the coastal areas but they have been treated differently. Series are patterned in distribution either in small localised areas or in larger contiguous areas. Both series and pendants appear to have been standardised for local use or exchange while selected pendants were used for local use and also exchanged over long distances. There is less standardisation metrically for shell pendants that have travelled long distances than for local or coastal pendants. This may be because they have been broken in transport or the shape has been reworked.

I emphasise here there is variation in distribution for different objects within and between classes, raw materials and forms. D'Errico and others also argued that 'ethnographic data also indicate that individual beads, the most common occurrence in excavations, rarely convey meaning' (D'Errico et al 2003: 51). My sample has shown that single objects, such as shell pendants, were often the only evidence for a class of objects away from the coast and that those objects conveyed meaning to Australian Aborigines.

Wiessner's argument that the standardisation can identify whether objects are meant for local use or for long distance exchange has not been confirmed in this study. Whilst this is not on

ethnographic study in the sense of studying with informants from an indigenous group, it does provide a continental distribution of things that are localised and traded, standardised and non-standardised and suggests that elements for series which are standardised may be distributed locally rather than being objects of long distance exchange.

Pendants are more complex than either Wiessner or Vanhaeren and d'Errico have acknowledged. Wiessner's evidence about exchange implies things acquire value with trade and that the value is not necessarily manifest in anything material but more to do with the interactions of individuals – in the mind of the players. This would be demonstrated by the tusk shell example in Central Australia where the power of the tusk shell series is transformed from one individual to another during ritual ceremonies (Meggitt 1962), bearing in mind these were series objects, not pendants. Perhaps the form is not as important as the trade itself and more work is needed on prehistoric exchange. The objects of exchange were individual objects, which have some similarity of form but were not standardised in the same way that elements of series were and, again, some of the assumptions by which prehistoric beaded objects are now considered need to be argued more carefully in the light of this.

Wiessner's patterns of marking, that is local variation within styles and regional variation between styles, are demonstrated by series localisations and with pendant distribution. This shows that explanations of beaded objects are unlikely to be straight forward in archaeology, especially as there is strong evidence that exchange of beads, as elsewhere, transforms the significance of them, without altering their form.