Across the first frontier: The behavioural ecology of the Sydney region aborigines

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Across the First Frontier:
The Behavioural Ecology of the Sydney Region Aborigines

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Doctor of Philosophy

APPENDICES

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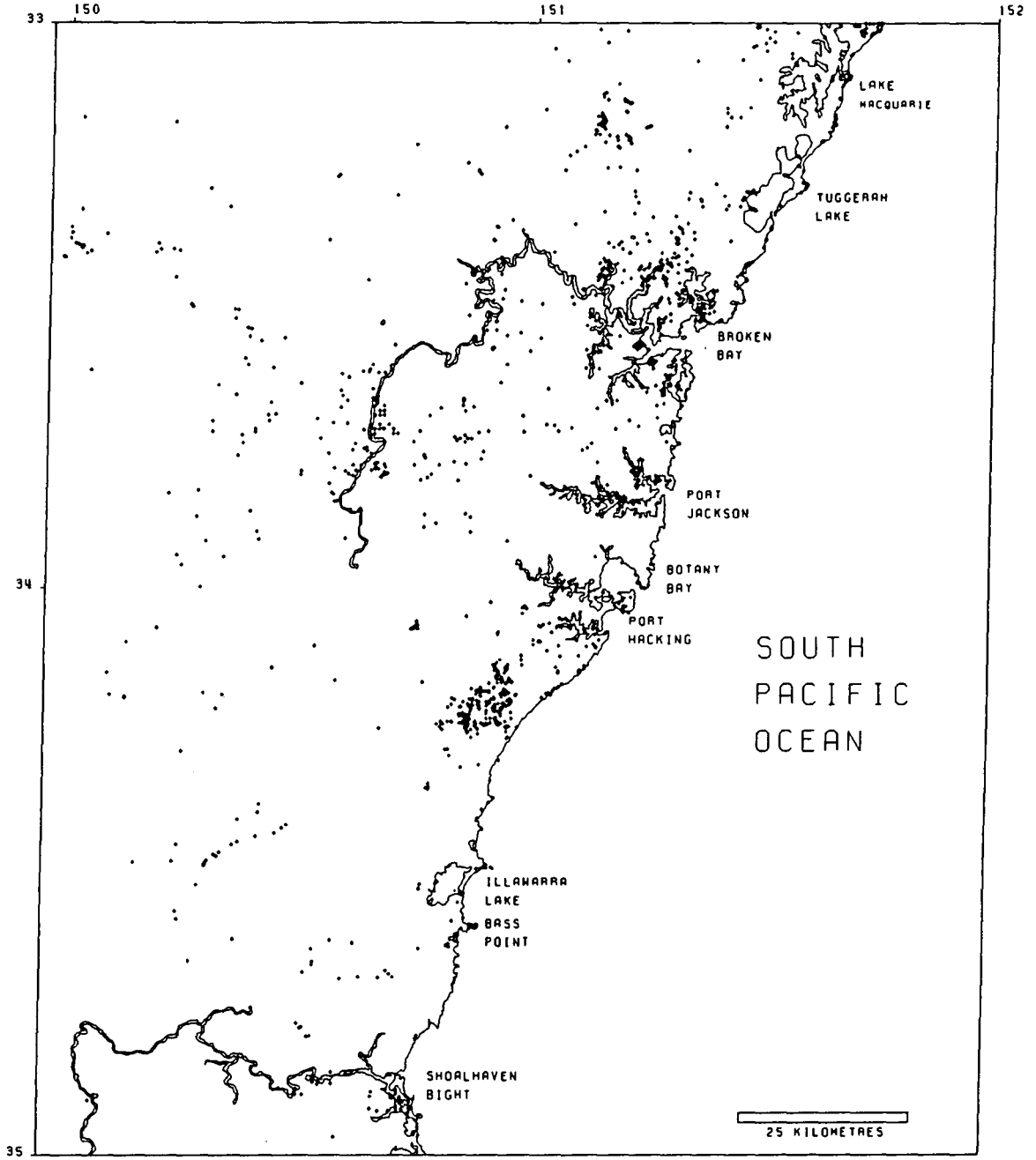
APPENDIX CONTENTS

Appendix A

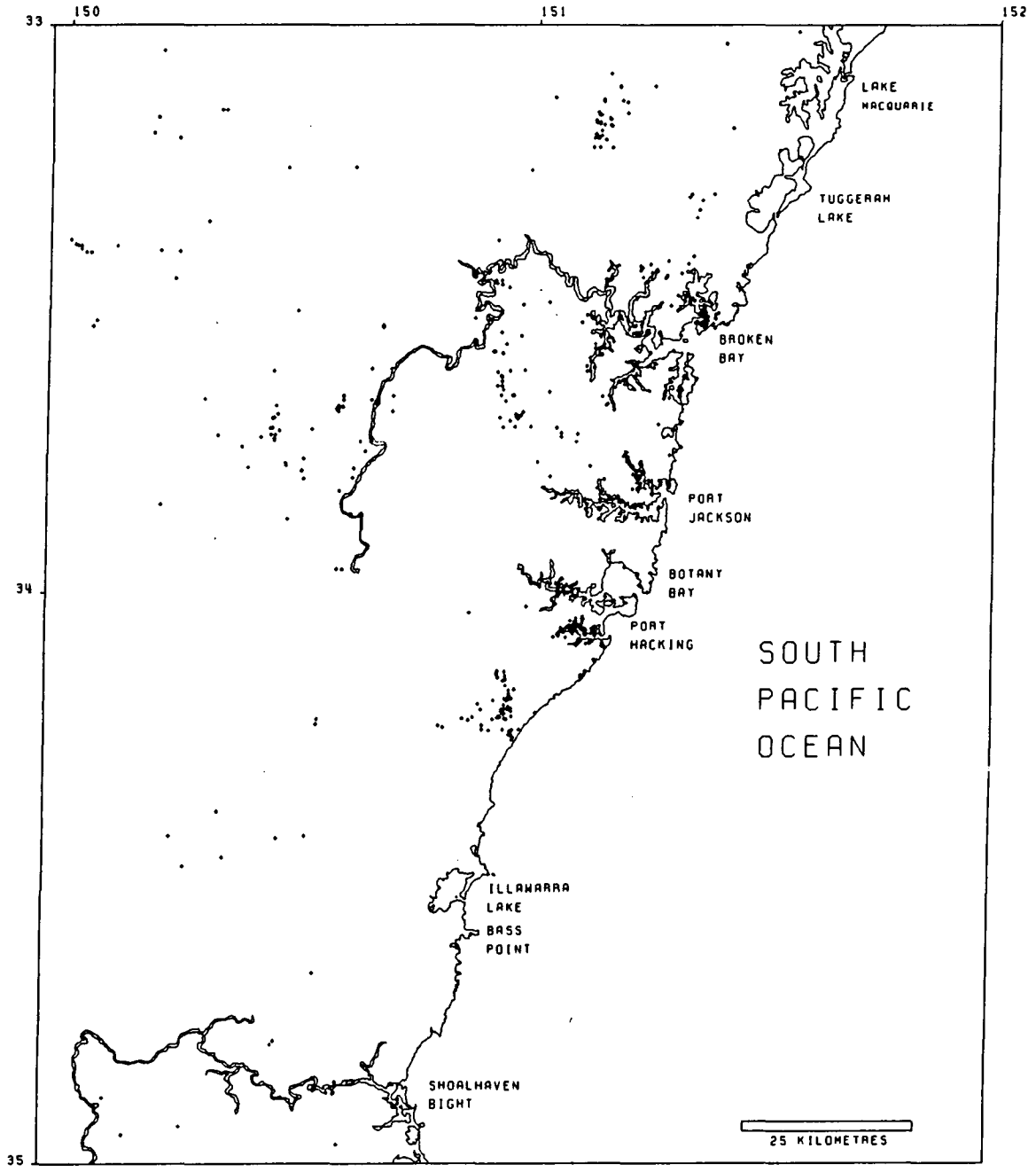
THE DISTRIBUTION OF ABORIGINAL SITES IN THE SYDNEY REGION

Upon the following pages, distribution maps of the principal sets of data utilized in this study are presented. These are:

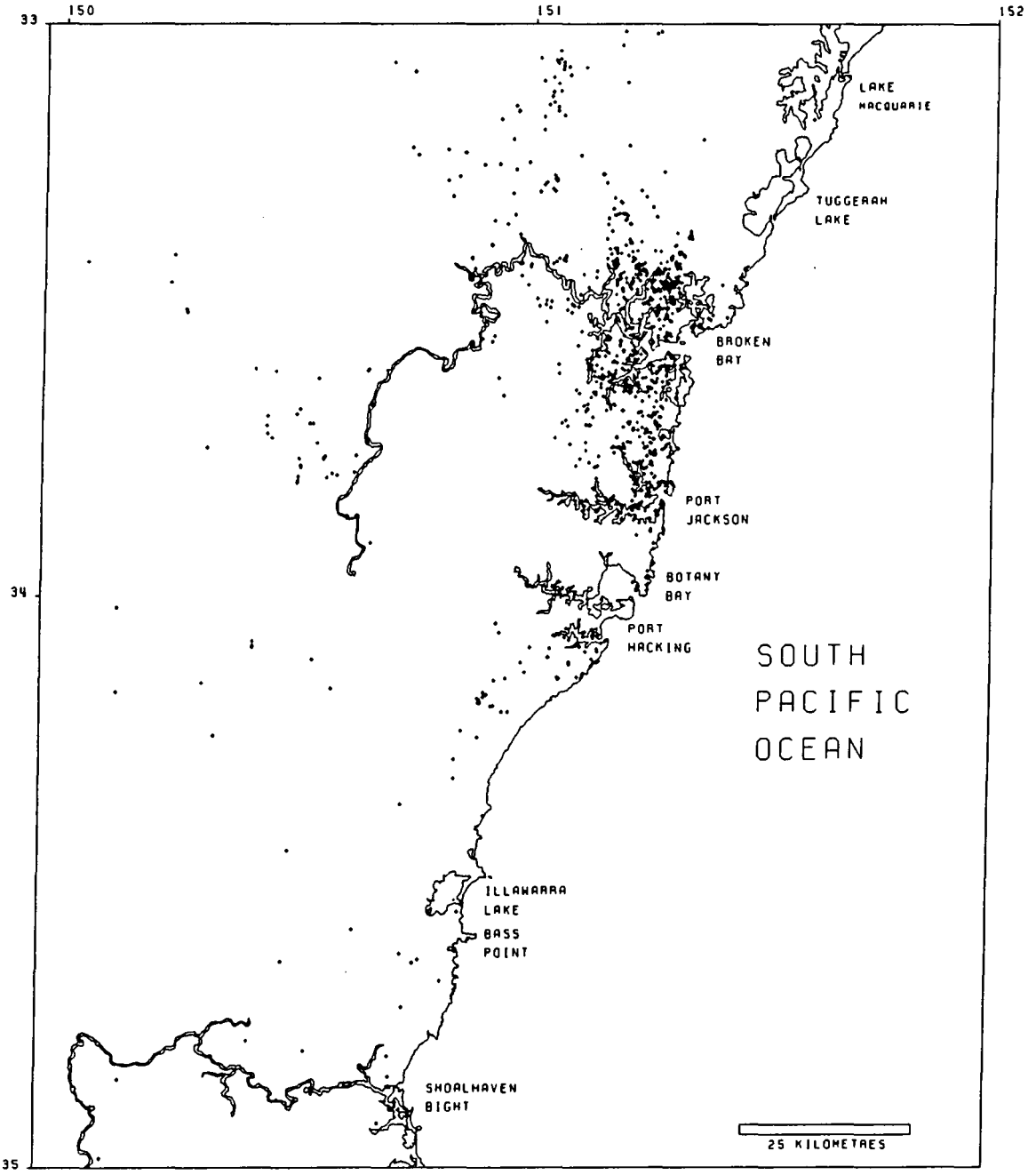
1. Function Open sites
2. Function Shelter sites
3. Style Open sites
4. Style Shelter sites
5. Function/Style sites
6. Grinding groove sites
7. Shell midden sites



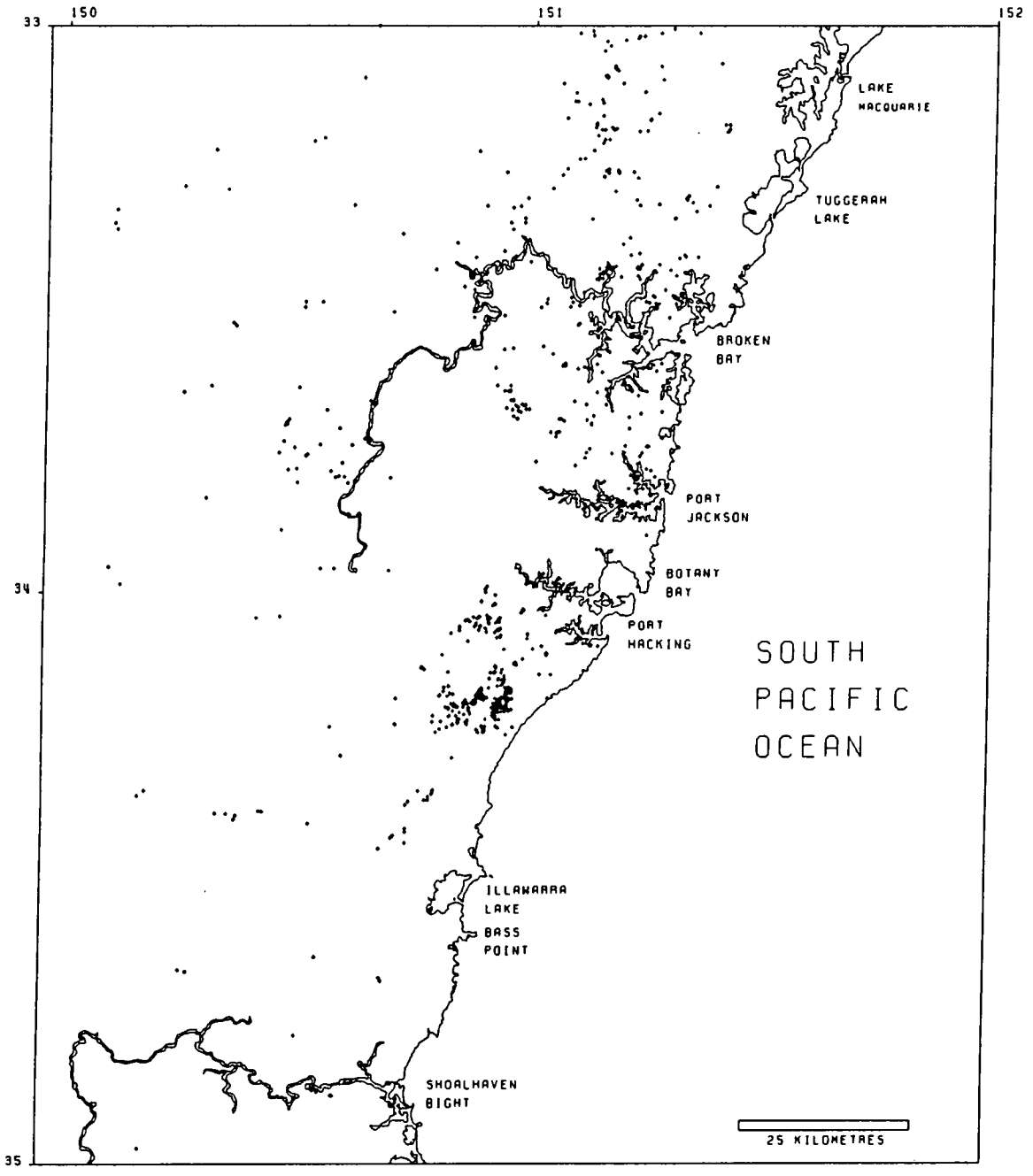
Map A.1: The distribution of Function Open sites in the Sydney region.



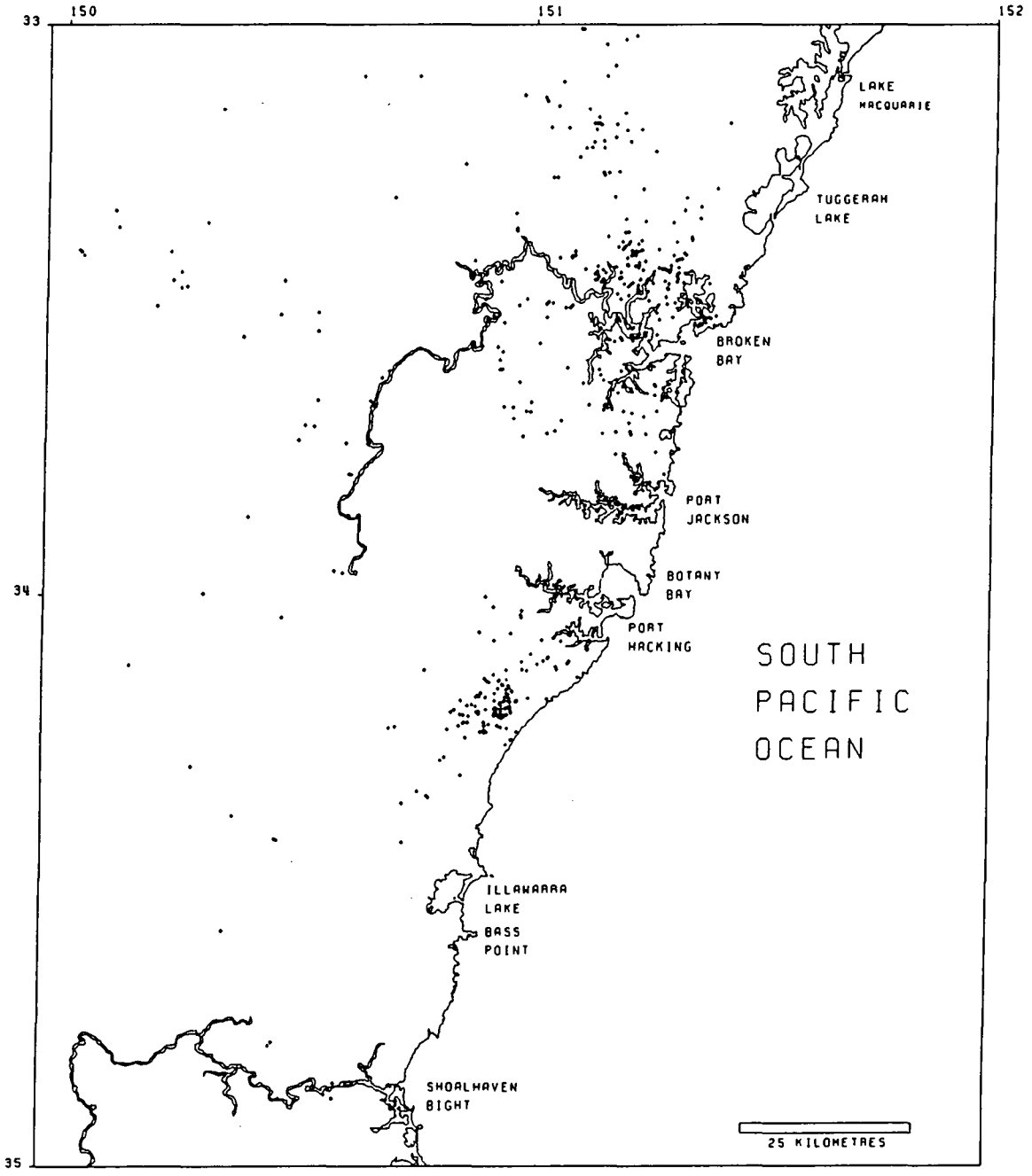
Map A.2: The distribution of Function Shelter sites in the Sydney region.



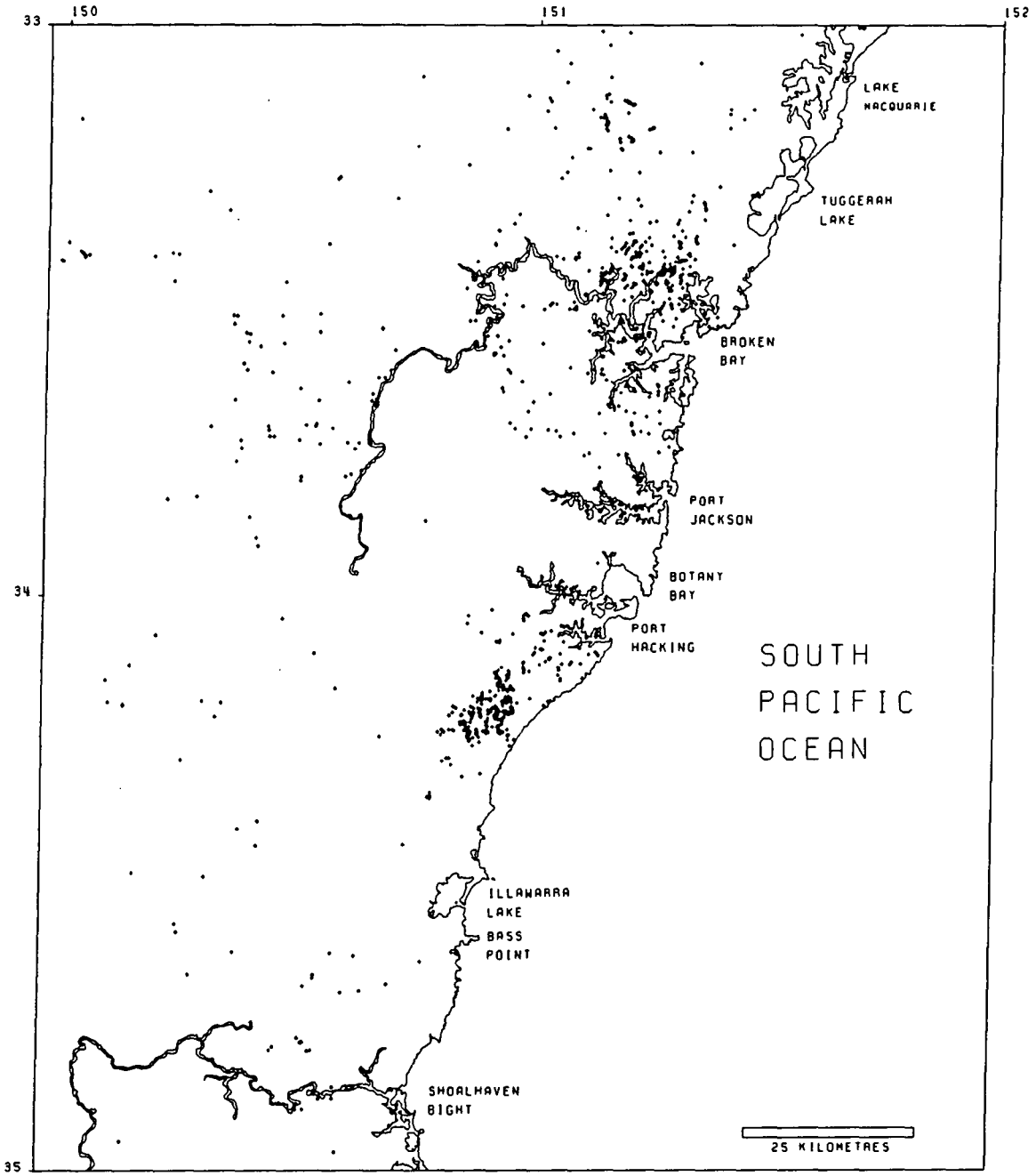
Map A.3: The distribution of Style Open sites in the Sydney region.



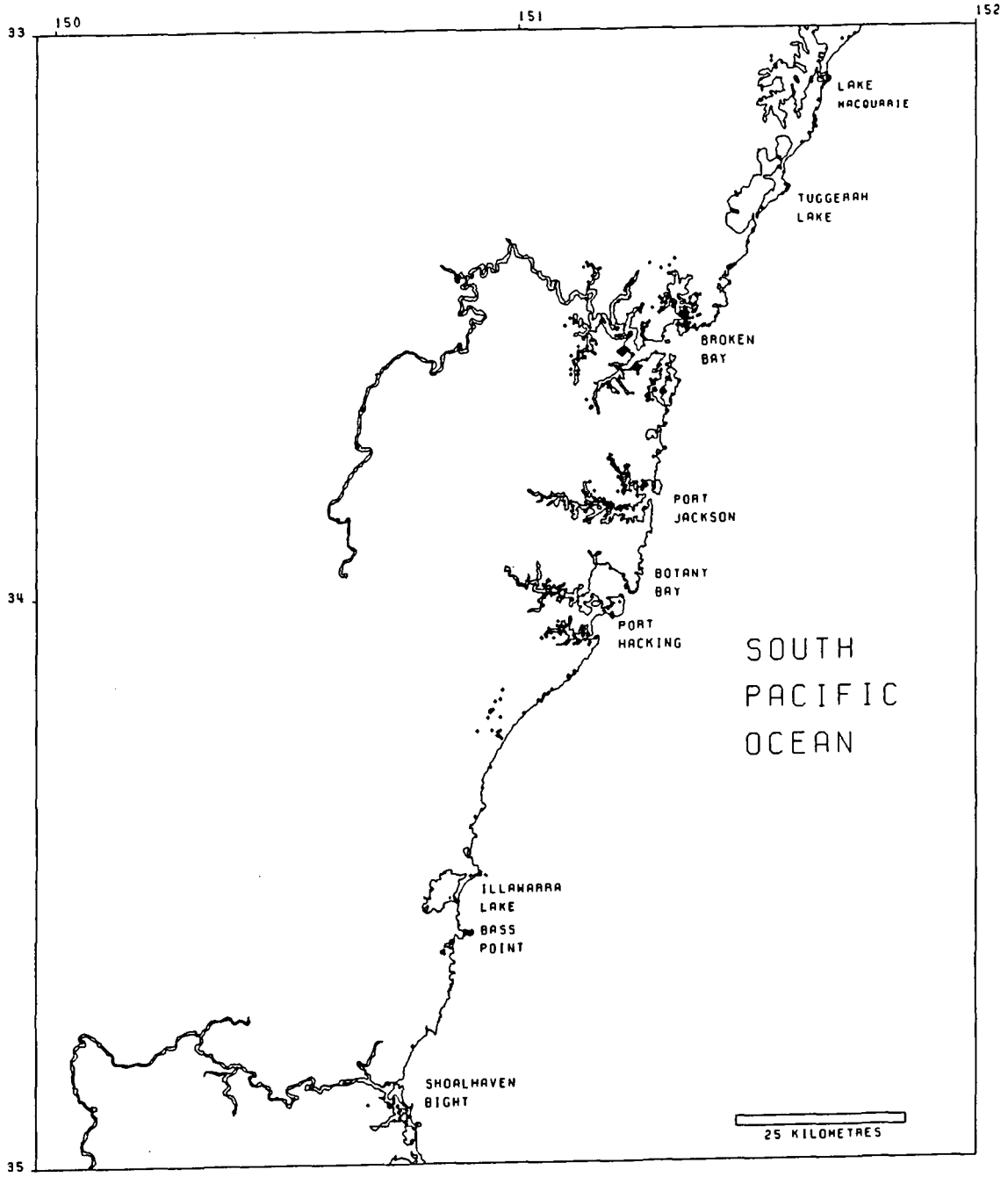
Map A.4: The distribution of Style Shelter sites in the Sydney region.



Map A.5: The distribution of Function/Style sites in the Sydney region.



Map A.6: The distribution of grinding groove sites in the Sydney region.



Map A.7: The distribution of shell midden sites in the Sydney region.

Appendix B

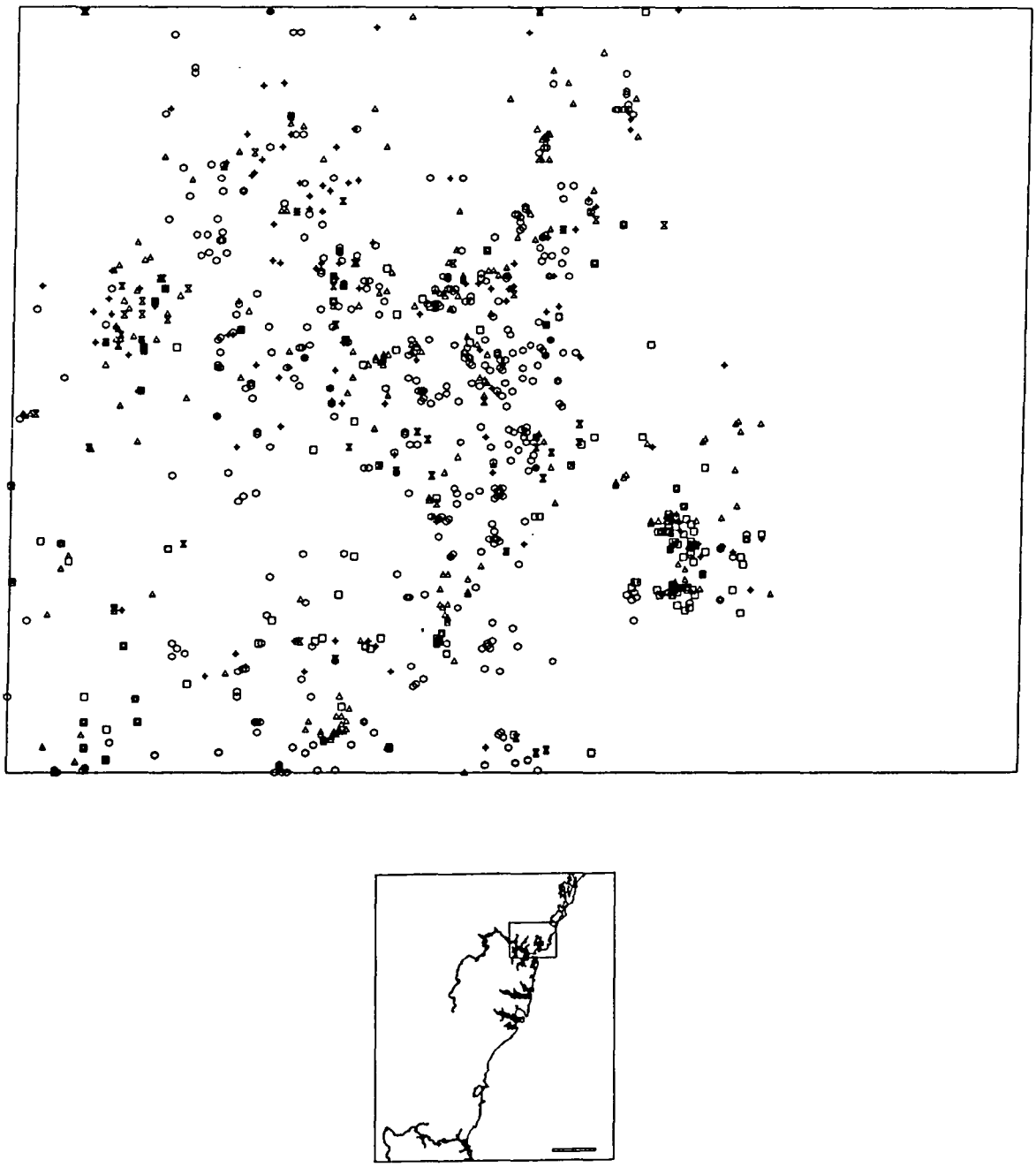
THE DISTRIBUTION OF SUB-REGIONAL DATA

The distribution of site types within the sub-regions is illustrated in a series of maps:

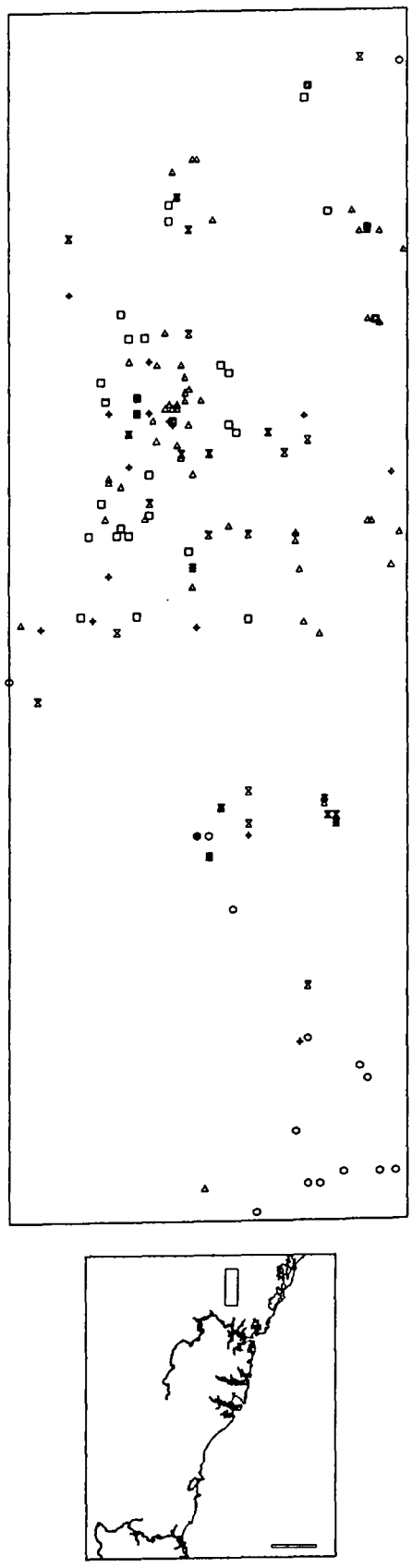
1. Gosford-Wyong
2. Upper Mangrove Creek
3. The Cumberland Plain
4. The Blue Mountains
5. Cataract Dam
6. The Royal National Park

The key to the symbols used on these maps is presented below.

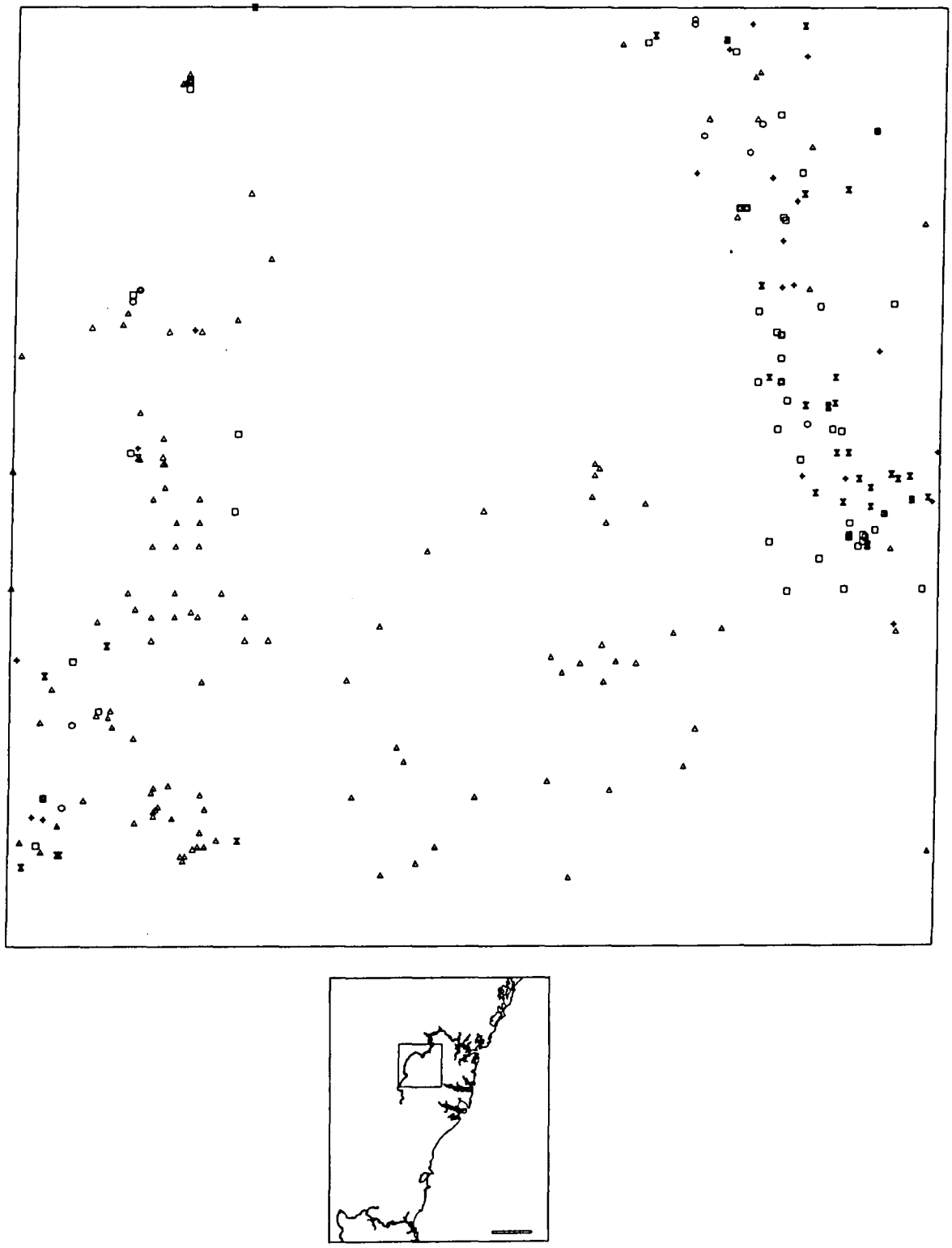
Key	
	FUNCTION
△	open
□	shelter
	STYLE
✧	open
O	shelter
⧖	FUNCTION/ STYLE



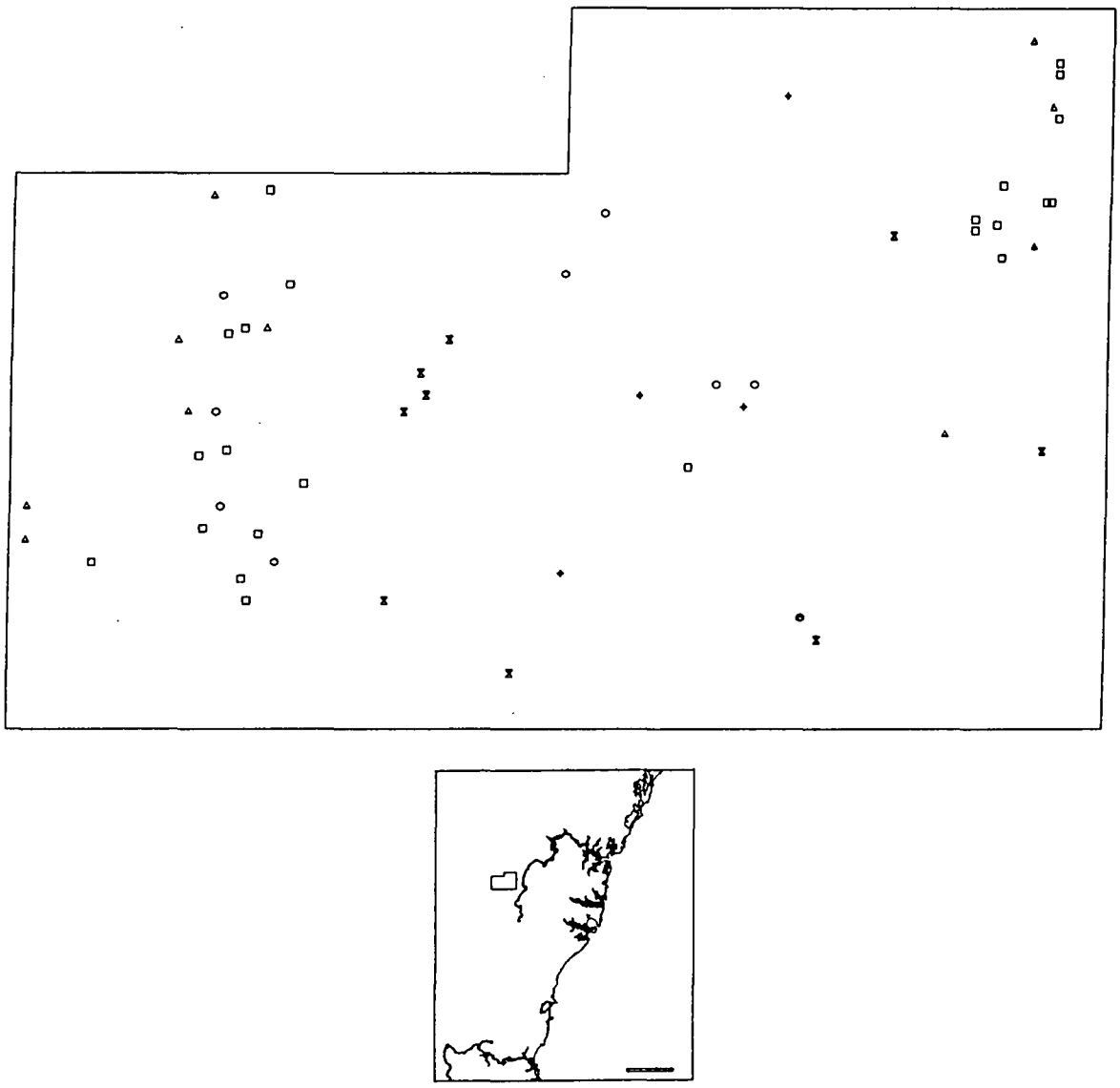
Map B.1: The distribution of sites within the Gosford-Wyong sub-region.



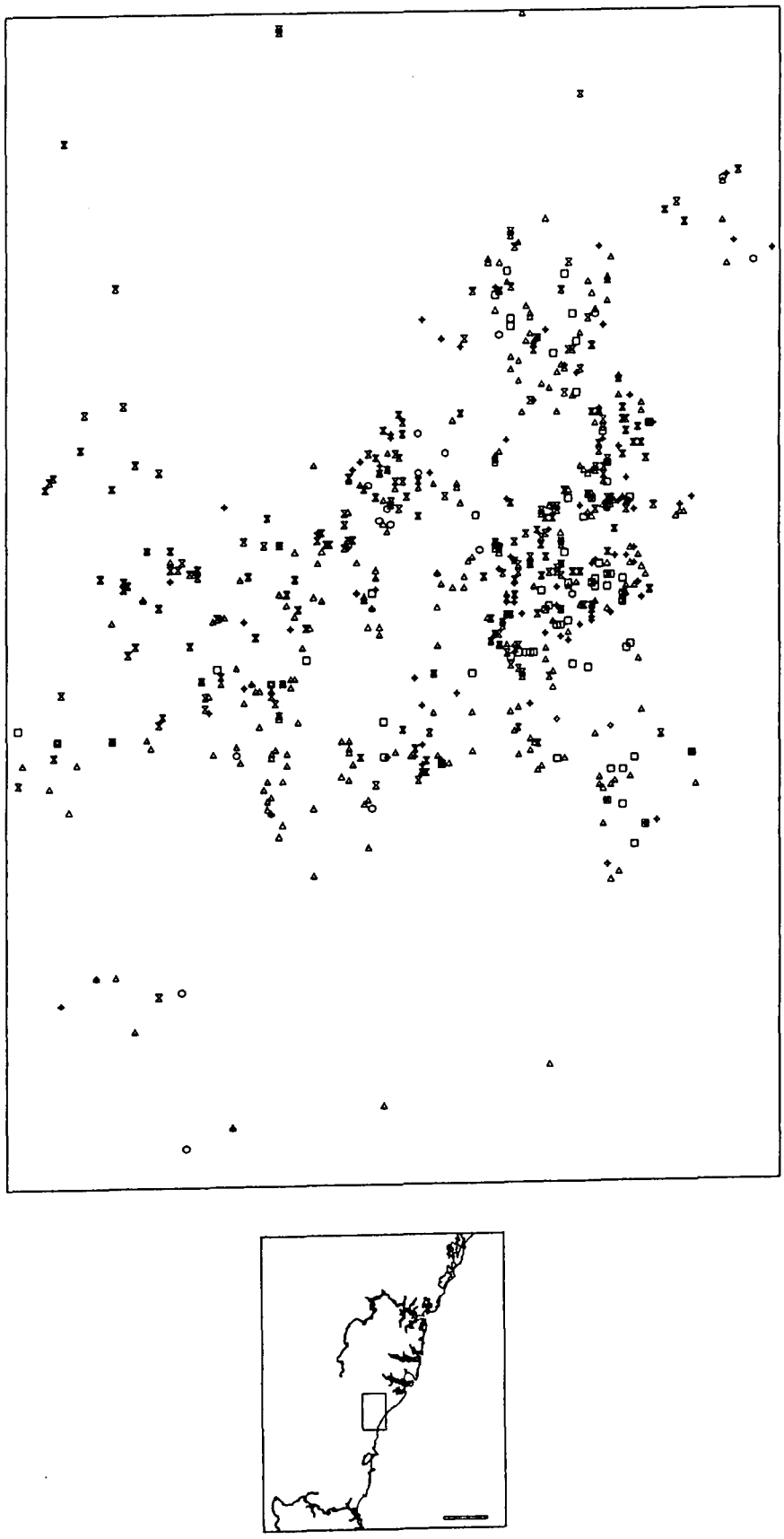
Map B.2: The distribution of sites within the Upper Mangrove Creek sub-region.



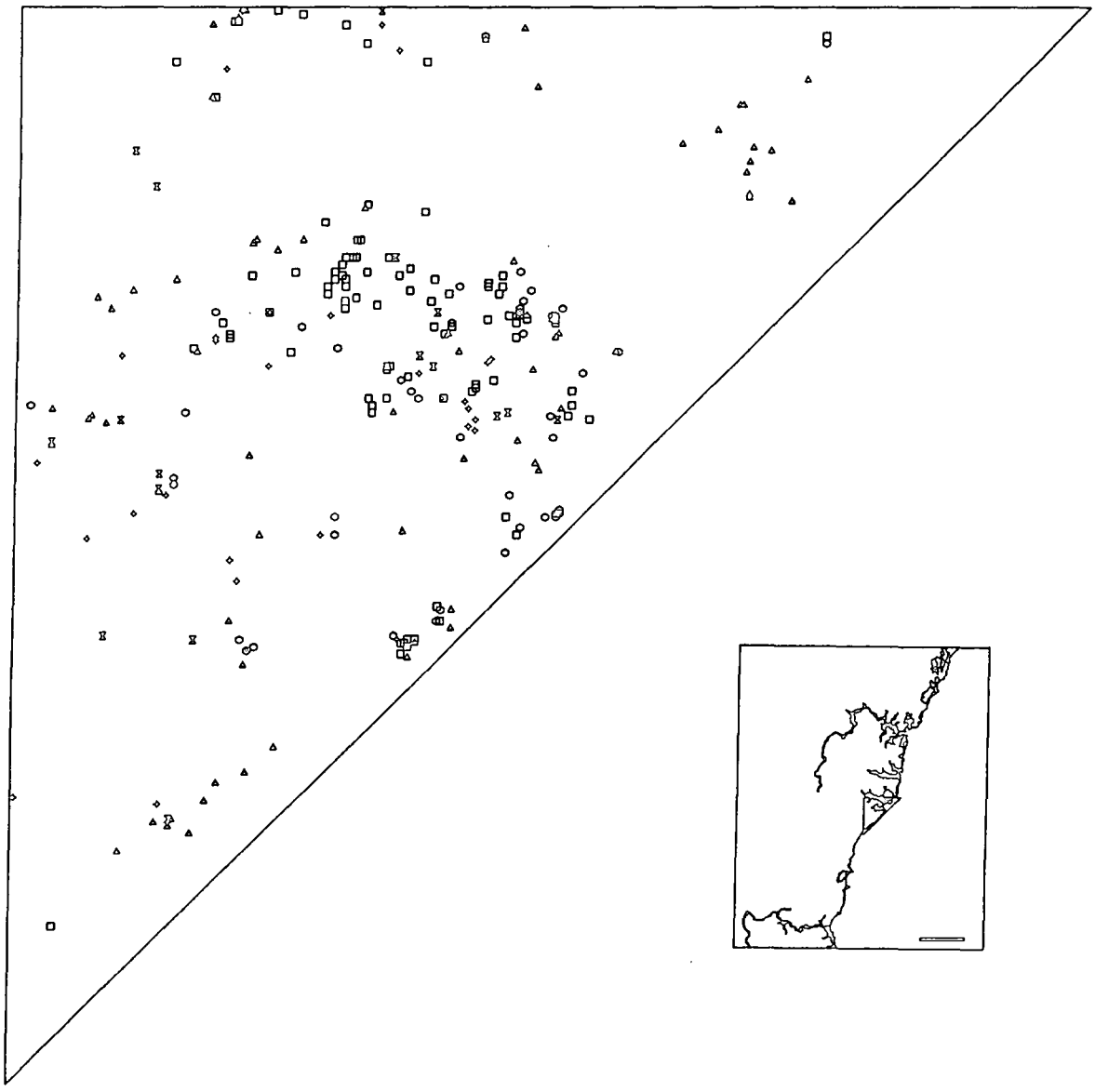
Map B.3: The distribution of sites within the Cumberland Plain sub-region.



Map B.4: The distribution of sites within the Blue Mountains sub-region.



Map B.5: The distribution of sites within the Cataract Dam sub-region.



Map B.6: The distribution of sites within the Royal National Park sub-region.

Appendix C

THE RELATIONSHIP BETWEEN ABORIGINAL SITE POPULATIONS AND SUB-POPULATIONS

The relationship between Aboriginal site populations and sub-populations are presented below for the region as a whole and for each of the sub-regions. The number of sites is also given in order to demonstrate the size of the sample available for the analysis.

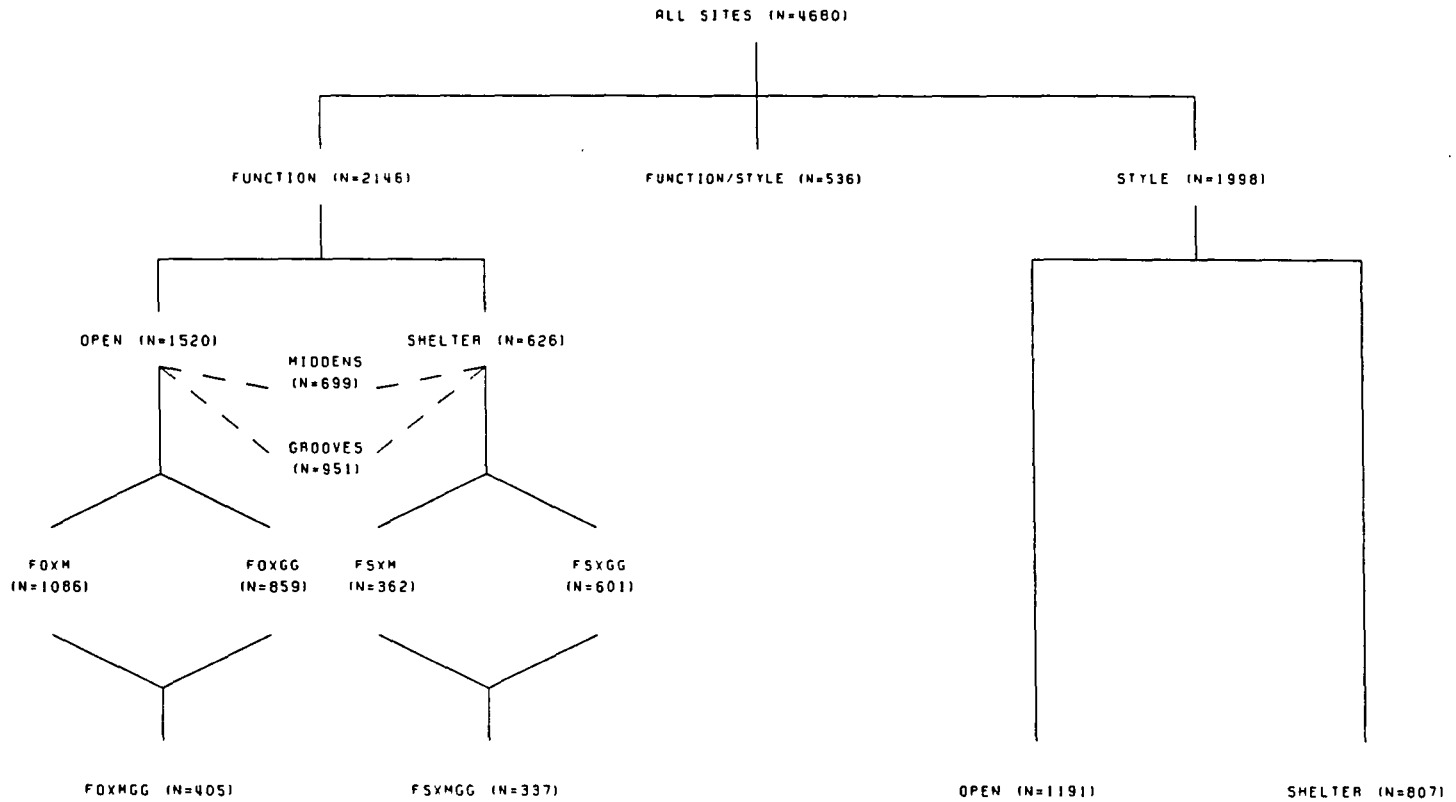


Figure C.1: The numerical relationships between Aboriginal site populations and sub-populations in the Sydney region.

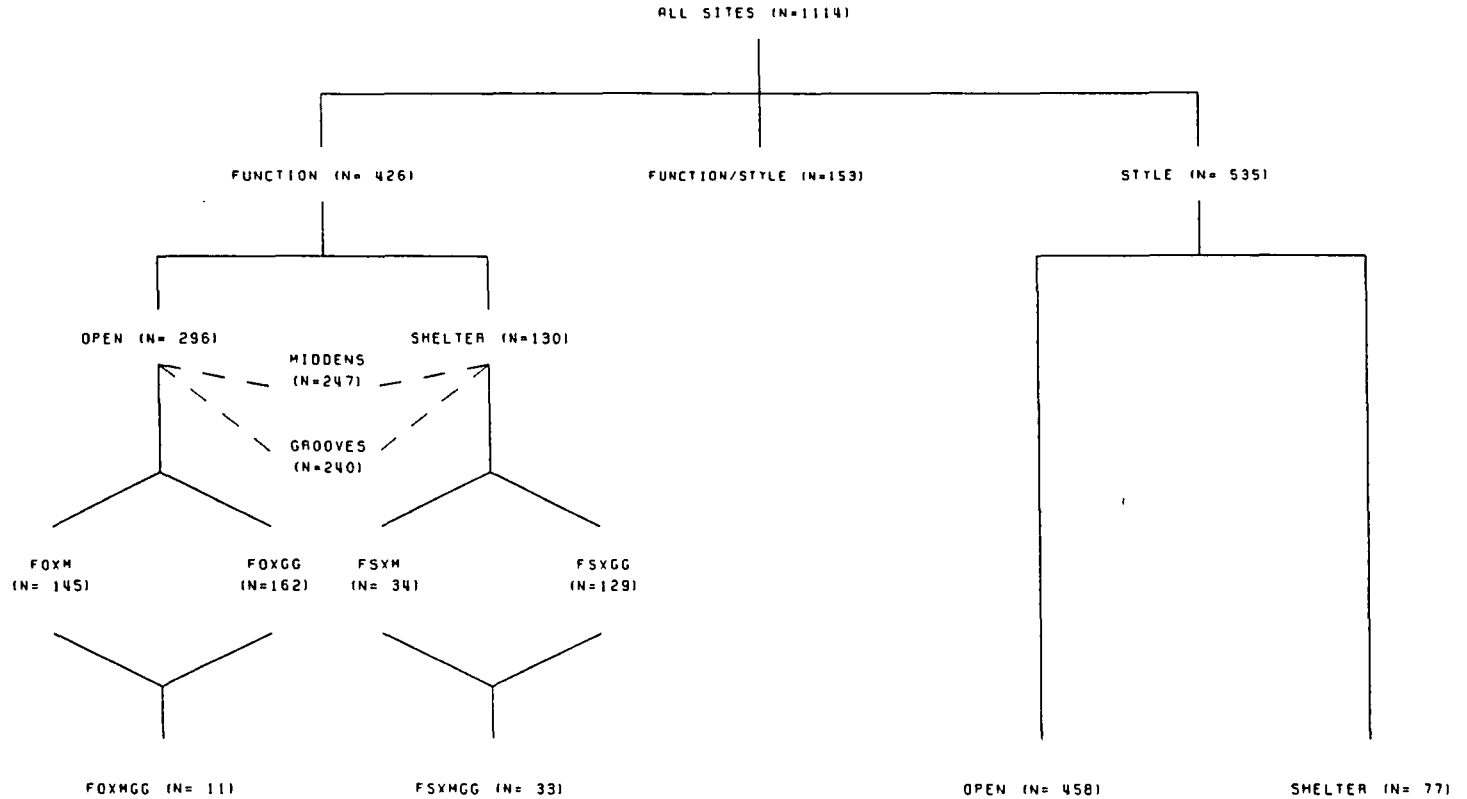


Figure C.2: The numerical relationships between Aboriginal site populations and sub-populations in the Gosford-Wyong sub-region.

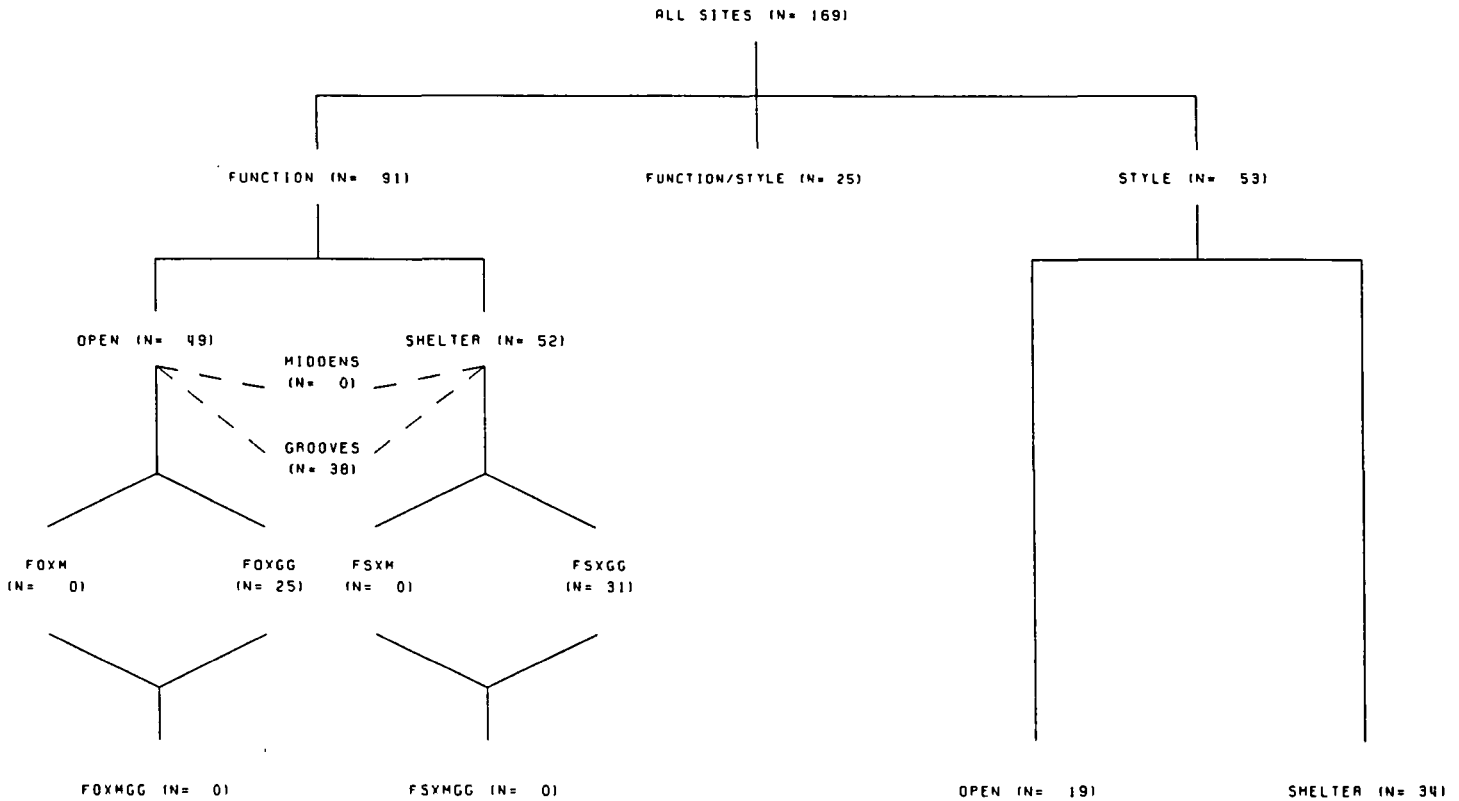


Figure C.3: The numerical relationships between Aboriginal site populations and sub-populations in the Upper Mangrove Creek sub-region.

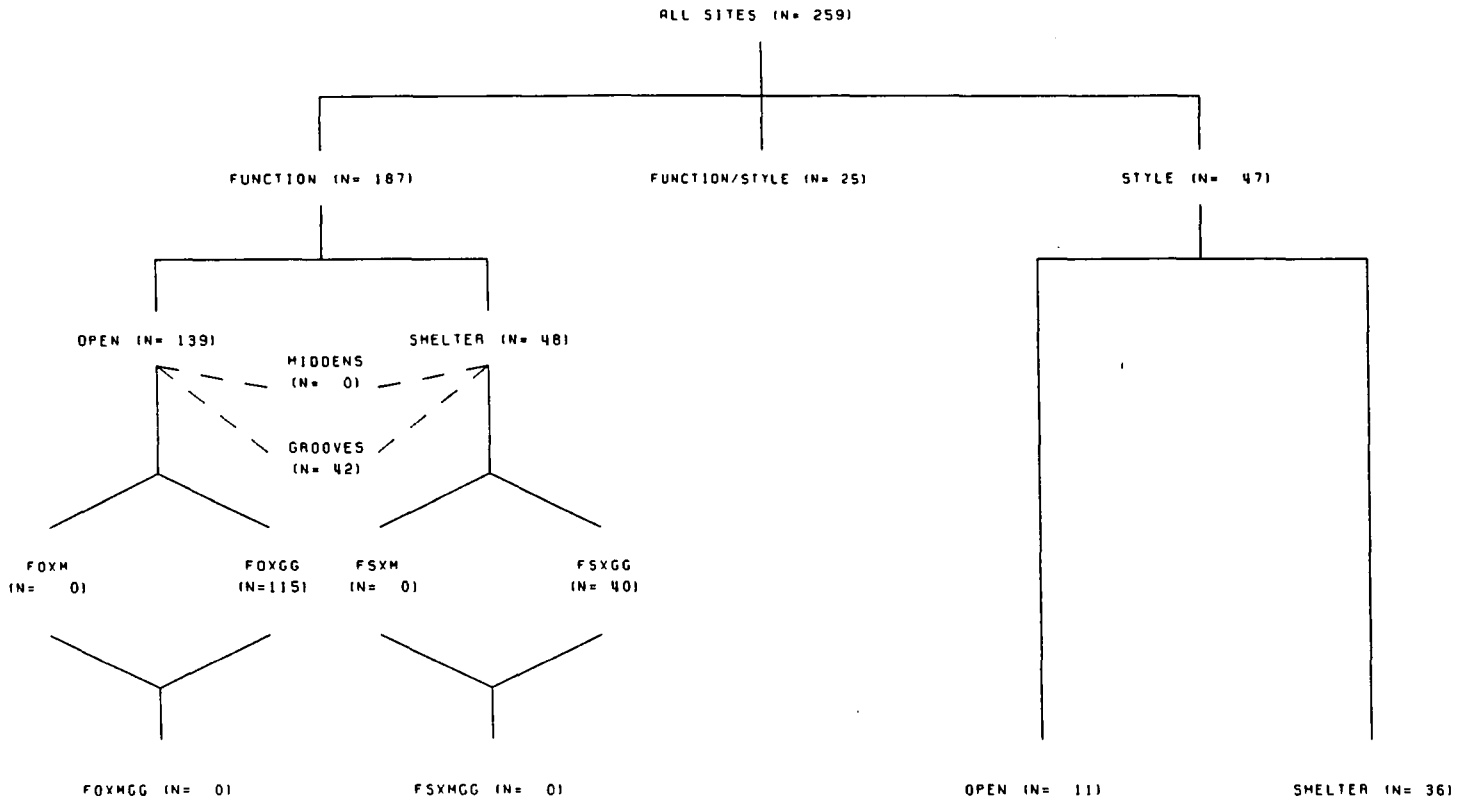


Figure C.4: The numerical relationships between Aboriginal site populations and sub-populations in the Cumberland Plain sub-region.

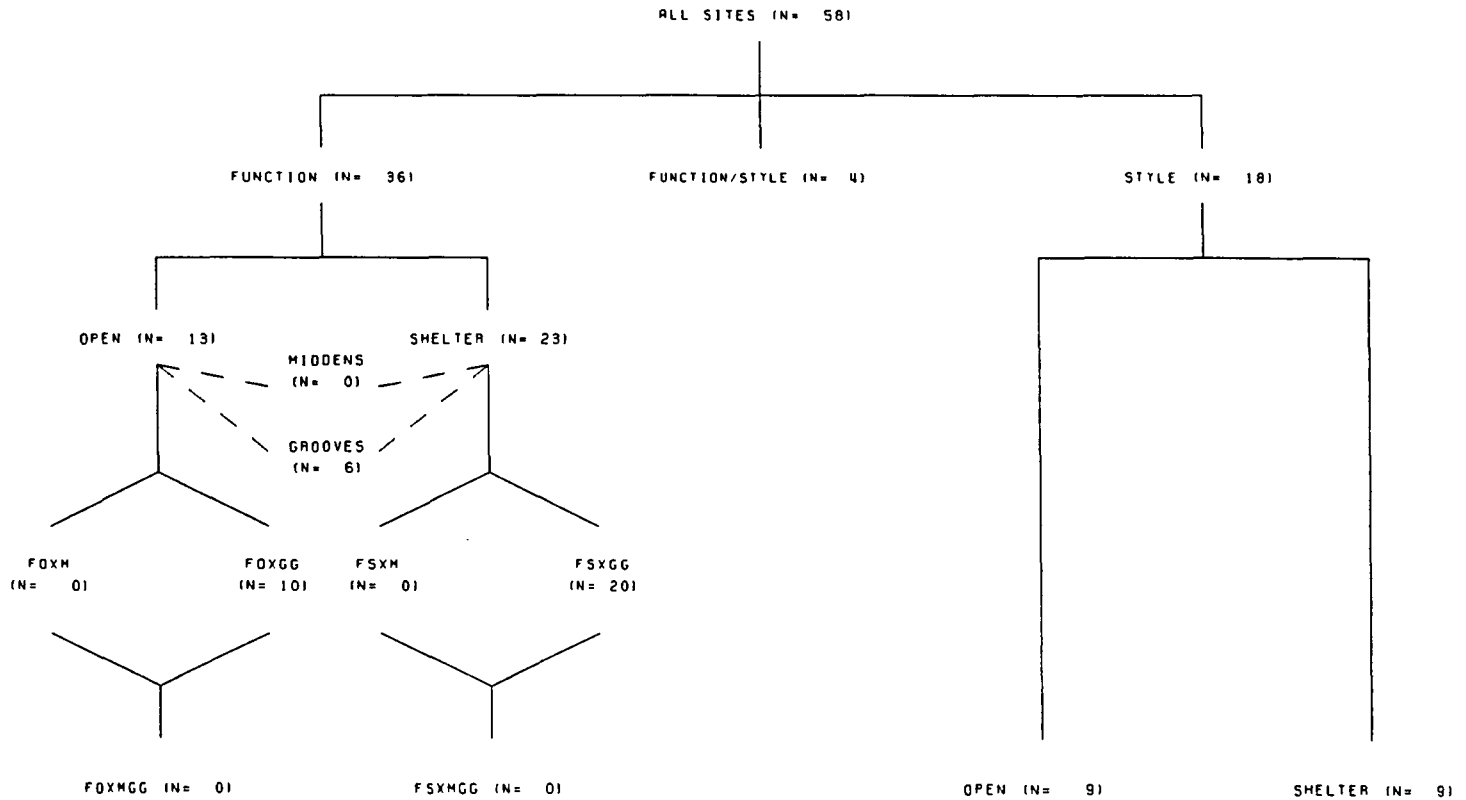


Figure C.5: The numerical relationships between Aboriginal site populations and sub-populations in the Blue Mountains sub-region.

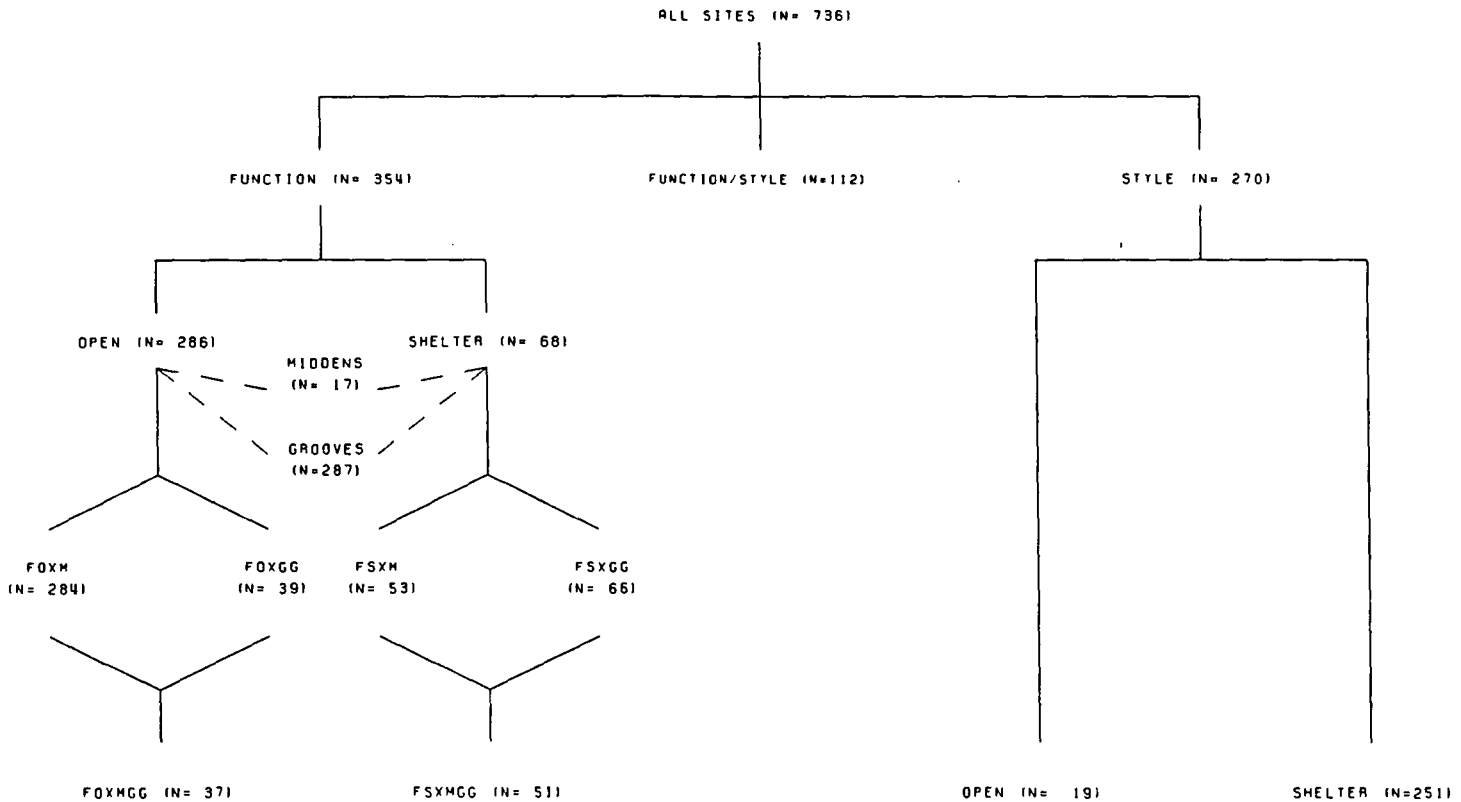


Figure C.6: The numerical relationships between Aboriginal site populations and sub-populations in the Cataract Dam sub-region.

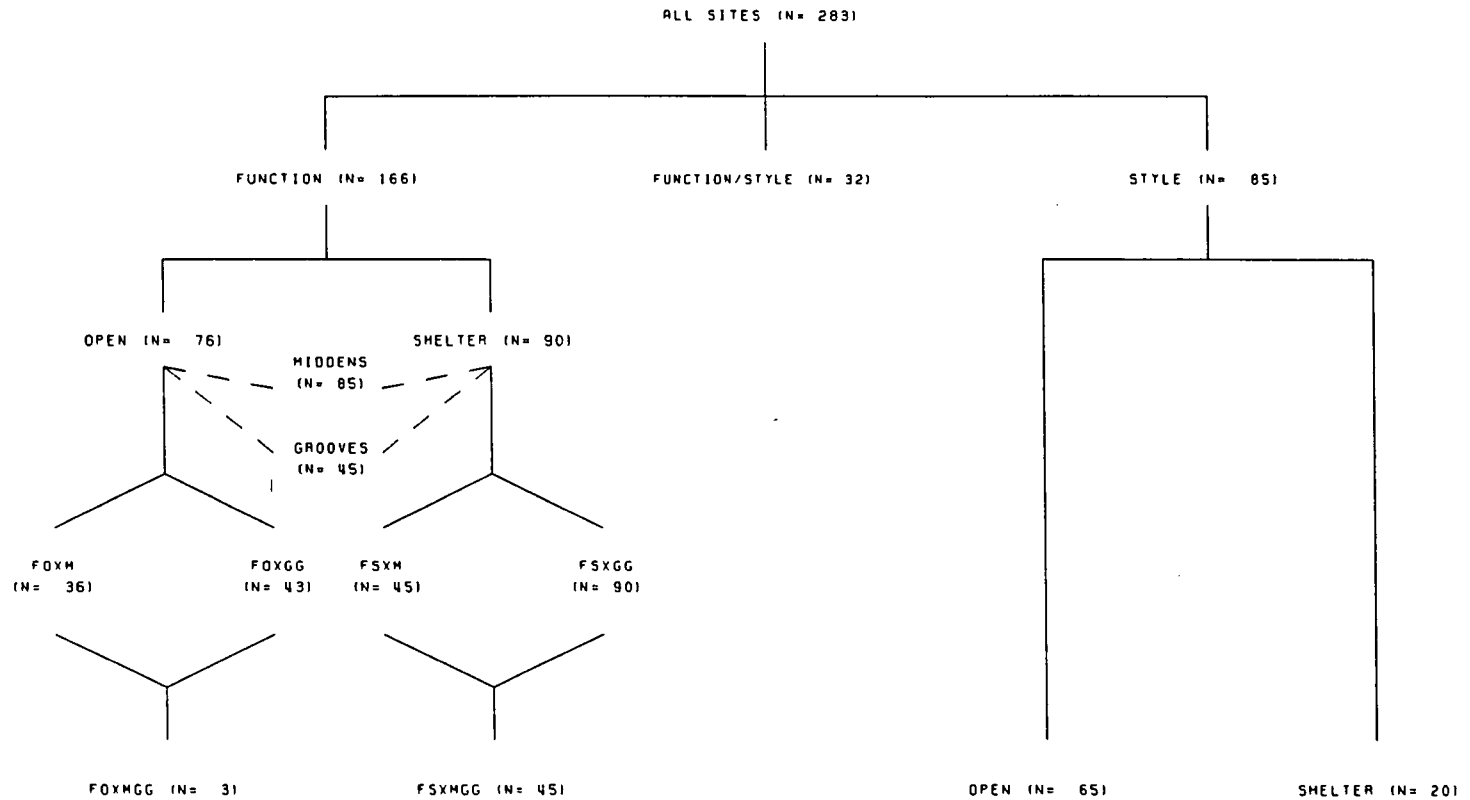


Figure C.7: The numerical relationships between Aboriginal site populations and sub-populations in the Royal National Park sub-region.

Appendix D

FUNCTION VERSUS STYLE - A STATISTICAL COMMENTARY

In this appendix the tables and figures which are the basis of the discussion in Chapter Seven are presented together with some interpretive notes. This Appendix follows the order of presentation within the main text and is divided into three parts; terrestrial structure; aquatic structure; and climatic structure. (Note that Table 5.1 - which lists the abbreviations used in the analysis and their definition - is repeated here for the convenience of the reader.)

D-1 TERRESTRIAL STRUCTURE

The terrestrial structure variables analysed below are: surface geology; topography; and height above sea-level.

D-1.1 Surface Geology

The Sydney region is dominated by the presence of Hawkesbury sandstone, which underlies approximately 80% of the area. Of the remaining land, 15% is underlain by Wianamatta shale and 5% by Narrabeen series, Permian series, alluvium, clay or sand.

Figures D.1 to D.7 illustrate the percentages of each rock type associated with the Function and Style populations and their sub-populations for the region as a whole and for each sub region. Table D.1 presents the results of the statistical analysis of the Function and Style populations for the whole region together with an assessment (Y or N) of whether the results are significant at the 0.01 level.

Abbreviation	Definition
F	All sites with archaeological deposits or grinding grooves.
S	All art sites and 'ceremonial' and 'natural mythological' sites
F/S	Sites containing archaeological deposits and art.
FO	As for F but only open sites
FS	As for F but only shelter sites
SO	As for S but only open sites
SS	As for S but only shelter sites
FOXM	As for FO but excluding middens
FOXGG	As for FO but excluding axe grinding grooves
FSXM	As for FS but excluding middens
FSXGG	As for FS but excluding axe grinding grooves
FOXMGG	As for FO but excluding both middens and grinding grooves
FSXMGG	As for FS but excluding both middens and grinding grooves

Table 5.1 "Abbreviations and definitions of Aboriginal site sub-populations used in the analysis" is repeated here for the convenience of the reader.

Key to abbreviations - geology

RH	Hawkesbury sandstone
RWL	Wianamatta shale
RN	Narrabeen series
QALL	Quaternary alluvium
QSAND	Quaternary sand
QGRAV	Quaternary gravel
TALL	Tertiary alluvium
TS	Sand, silt, clay
PSB	Permian sandstone and shale (Berry formation)
PSN	Permian sandstone and shale (Shoalhaven group)
PI	Permian sandstone and shale (Illawarra group)
PN	Permian sandstone and shale (Newcastle group)
TV	Basalt, dolerite and other igneous rocks.

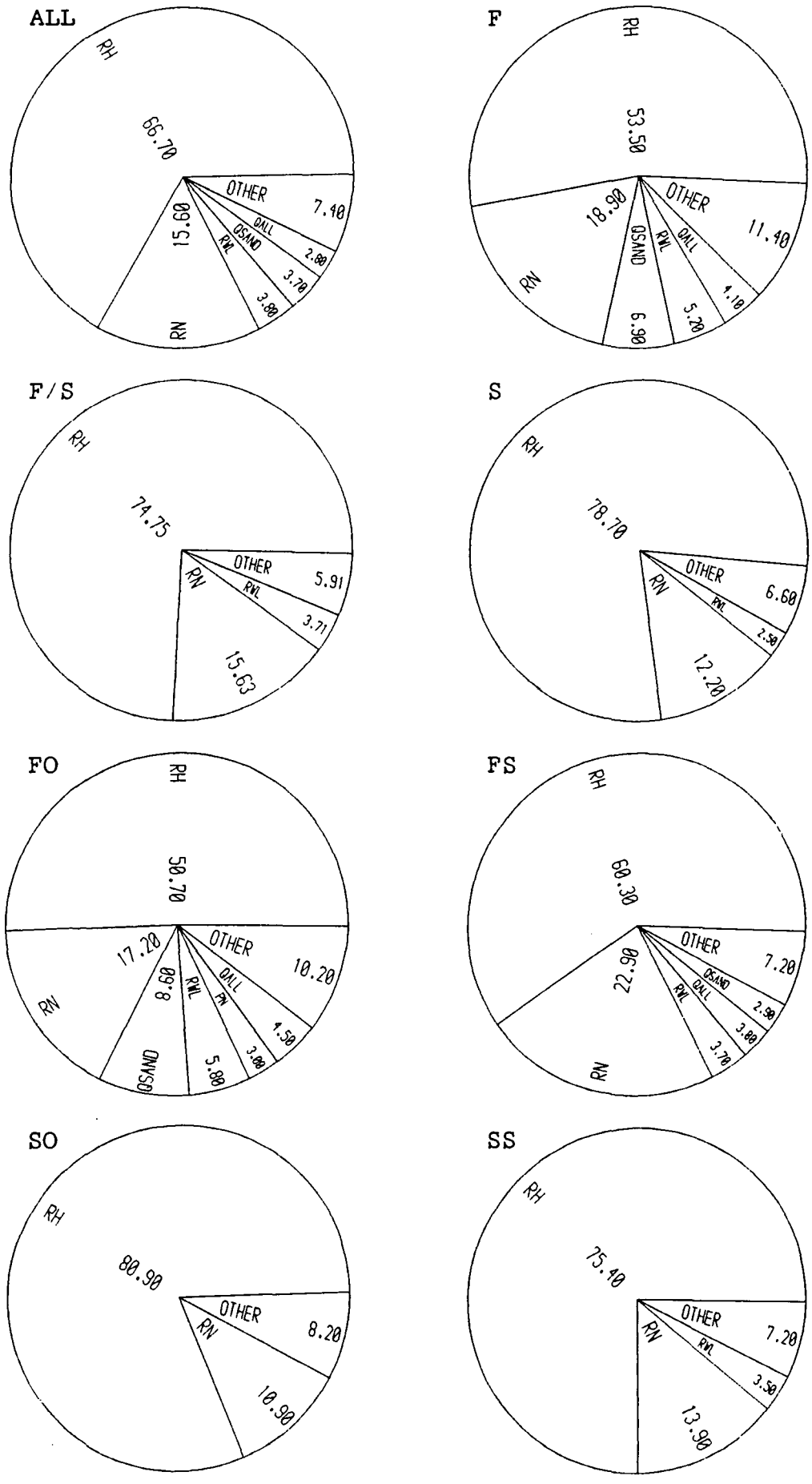


Figure D.1: Aboriginal sites and geological structure - All region.

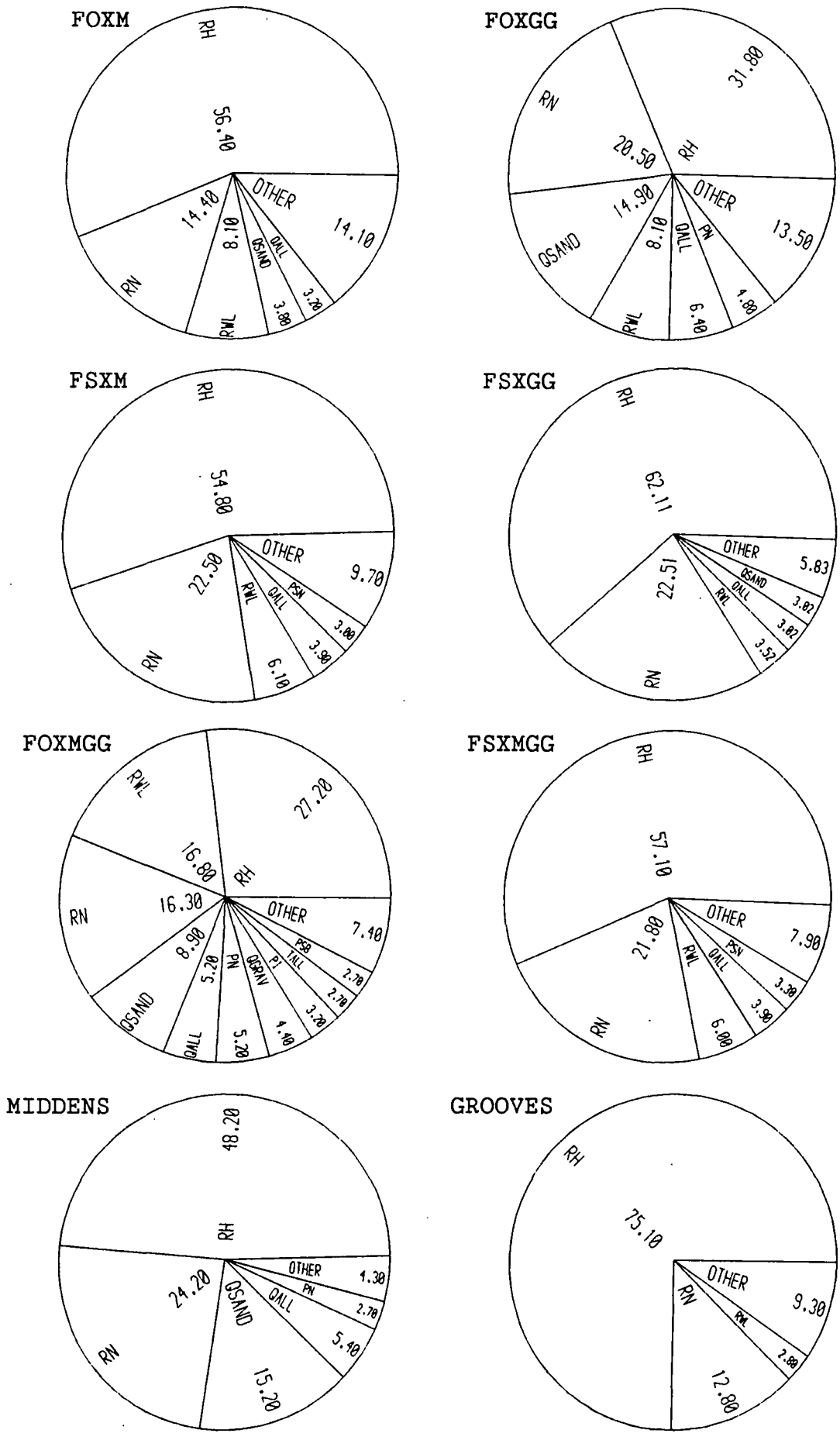


Figure D.1 (cont.): Aboriginal sites and geological structure - All region.

Table D.1

Populations	chi-sq	df	sig?
F vs S	307.872	4	Y
F vs F/S	65.934	4	Y
S vs F/S	10.697	5	N
FO vs SO	253.029	5	Y
FS vs SS	65.976	6	Y
FO vs FS	44.850	6	Y
SO vs SS	23.409	5	Y
FOXM vs FSXM	7.420	7	Y
FOXGG vs FSXGG	199.502	8	Y
FOXMGG vs FSXMGG	111.307	8	Y
FOXM vs SO	140.502	5	Y
FSXM vs SS	463.926	5	Y
FOXGG vs SO	72.798	3	Y
FSXGG vs SS	69.935	3	Y
FOXMGG vs SO	411.276	5	Y
FSXMGG vs SS	62.626	3	Y

Interpretational notes.

There appears to be a general trend exhibited by all site populations towards rocks other than Hawkesbury sandstone (i.e. in comparison to the levels which might be expected from the actual occurrence of the parent materials). This tendency is most clearly pronounced in Function sites - for this population is significantly different from Style sites throughout in possessing a consistent tendency to be more closely associated with rock types other than Hawkesbury sandstone. Of particular interest, is the fact that Function Shelter sites differ from Style shelters in their geological associations, despite the fact that they are likely to be drawn from the same potential population (i.e. naturally occurring weathered excavations).

Those sites which display the characteristics of both Function and Style sites (F/S) confirm their intermediate status, for they are clearly not independent of the characteristics of Style sites and do not display the Function tendency away from Hawkesbury sandstone.

The importance of separating elements from the main body of the Function population is emphasized by the influence of grinding grooves and their close association with Hawkesbury sandstone (as a frictional surface). Middens can also be seen to influence the structure of the Function population. This is most apparent when both middens and grooves

are removed from the Function Open population - when only just over a quarter of the sites are to be found upon Hawkesbury sandstone. Note that Narrabeen sandstone, the parent material which produces the richest soils in terms of nutrients, but is a minor component of the geological structure of the whole region, is a significant characteristic throughout the Function population at levels far in excess of those which would be expected on the basis of its actual occurrence.

SUB-REGIONAL VARIATION

1. Gosford-Wyong.

Approximately 90% of this sub-region possesses a surface geology of Hawkesbury sandstone, approximately 7% is covered by Quaternary sand (to the east of the sub-region) and the remaining 3% is associated with Narrabeen sandstone (Figure D.2). Table D.2 presents the statistical assessment of the relationships between Function and Style sites with regard to this variable, together with an assessment of the significance of the results at the 0.05 level.

Table D.2

Populations	chi-sq	df	sig?
F vs S	84.625	3	Y
F vs F/S	53.349	3	Y
S vs F/S	1.517	2	N
FO vs SO	94.132	3	Y
FS vs SS	30.758	3	Y
FO vs FS	22.982	3	Y
SO vs SS	5.323	2	N
FOXM vs FSXM	13.124	3	Y
FOXGG vs FSXGG	11.101	3	Y
FOXMGG vs FSXMGG	0.007	1	N
FOXM vs SO	3.422	1	N
FSXM vs SS	6.734	1	Y
FOXGG vs SO	162.137	3	Y
FSXGG vs SS	25.504	2	Y
FOXMGG vs SO	10.555	1	Y
FSXMGG vs SS	5.930	1	Y

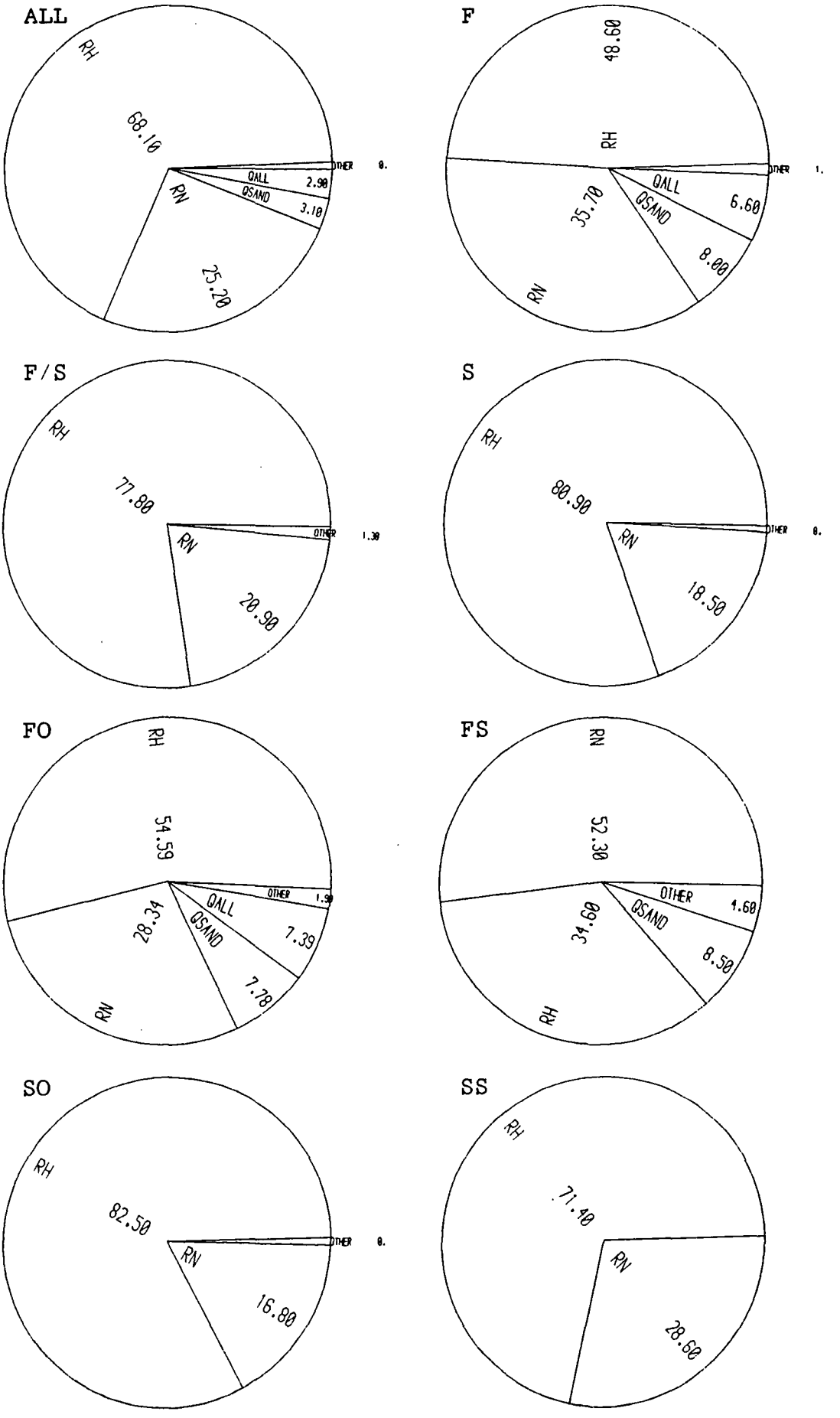


Figure D.2: Aboriginal sites and geological structure - Gosford-Wyong.

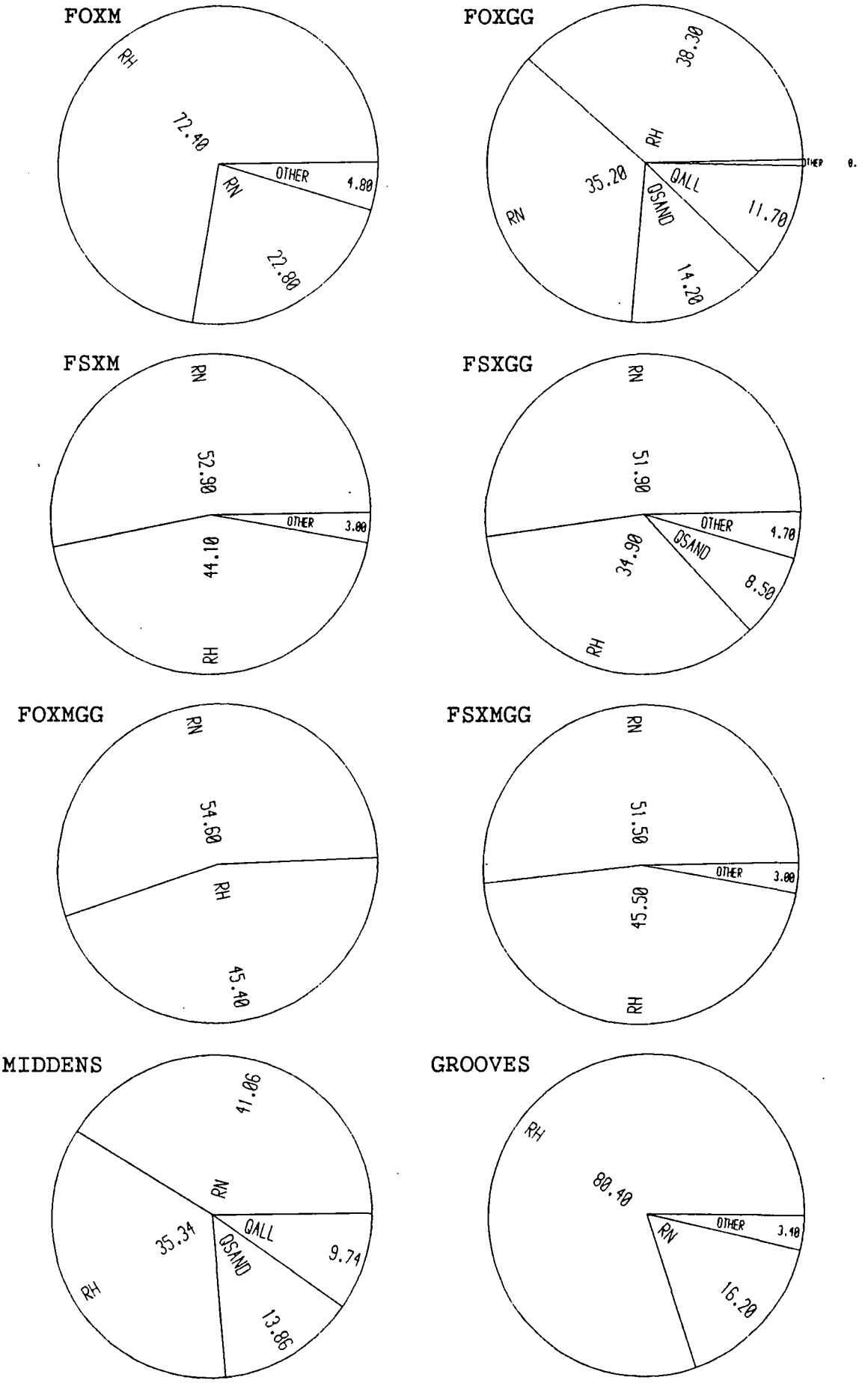


Figure D.2 (cont.): Aboriginal sites and geological structure - Gosford-Wyong.

Interpretational notes

There is a clear tendency away from Hawkesbury sandstone displayed by all site types, and to a larger degree by the Function population than by the Style. Although this difference is most clearly expressed in Function Open sites, it is also clear in Function Shelter sites, particularly when grinding grooves are removed from the analysis.

In addition, it is clear that the influence of grinding grooves raises the level of the representation of Hawkesbury sandstone to an extent that FOXM vs SO displays no significant difference. When grinding grooves and/or middens are removed, the difference between these two populations becomes significant. The presence of middens has a tendency to raise the level of rock types other than Hawkesbury in the Function population but even when these sites are removed the association remains significant. The most influential geological unit is clearly Narrabeen sandstone which produces relatively fertile soils.

2. Upper Mangrove Creek

This sub-region is remarkable in that the geological structure consists essentially of a dichotomy between Hawkesbury sandstone (60% of the geographical area) and Narrabeen sandstone (35%) (the remainder of the sub-region is covered by recent alluvium upon which no Aboriginal activity is visible) (Figure D.3). This area is one of very few where Narrabeen series outcrop to form an extensive element of the surface geology. The results of the statistical analyses of the relationships between Function and Style populations are presented in Table D.3.

Table D.3

Populations	chi-sq	df	Sig?
F vs S	2.129	1	N
F vs F/S	0.551	1	N
S vs F/S	0.127	1	N
FO vs SO	3.661	1	Y
FS vs SS	0.531	1	N
FO vs FS	0.451	1	N
SO vs SS	2.827	1	N
FOXGG vs FSXGG	2.409	1	N
FOXGG vs SO	11.208	1	Y
FSXGG vs SS	0.367	1	N

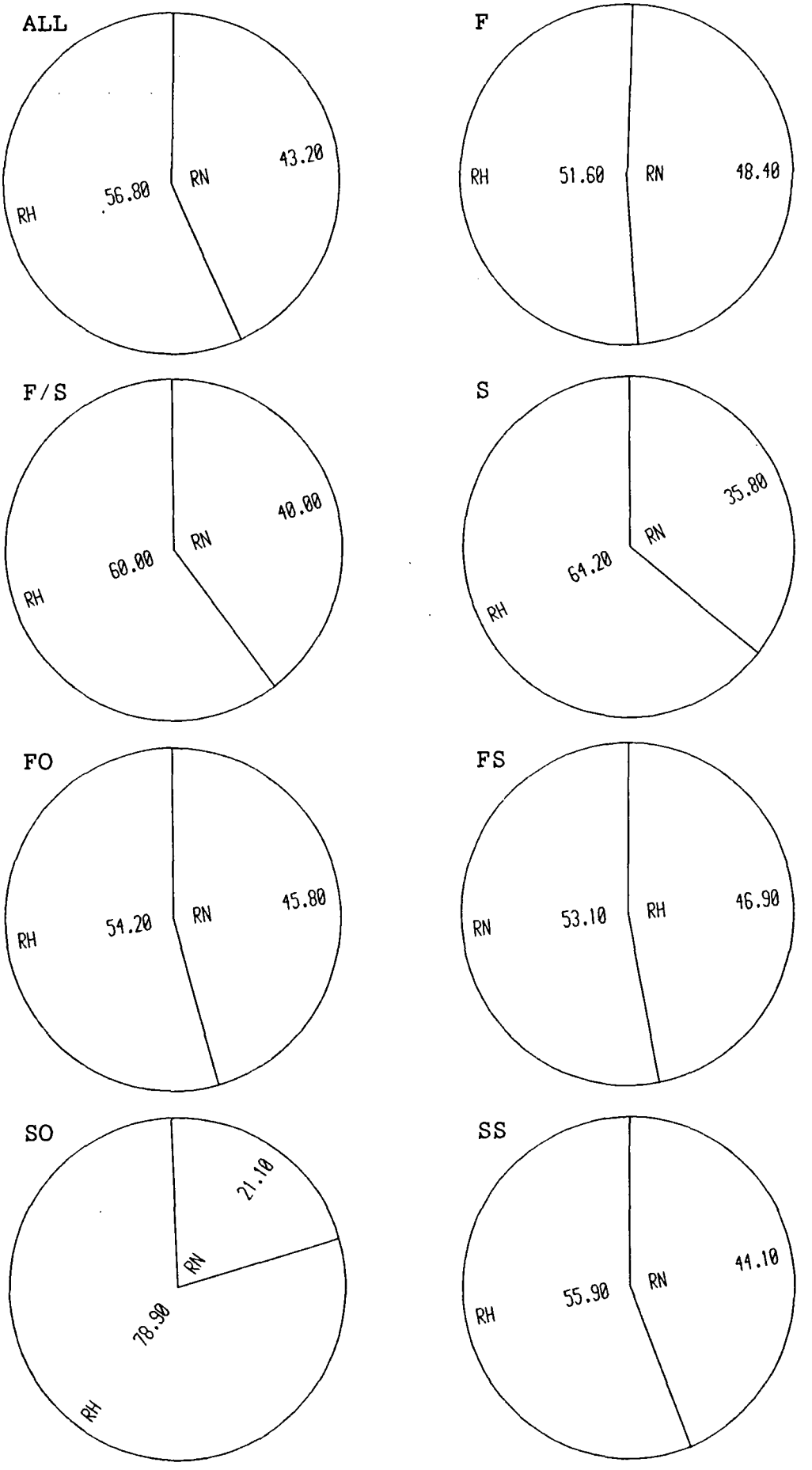
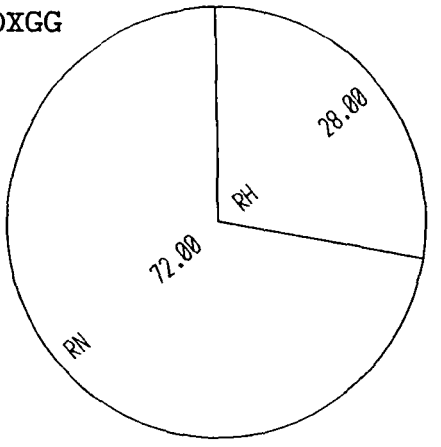


Figure D.3: Aboriginal sites and geological structure - Upper Mangrove Creek.

FOXM

NOT
APPROPRIATE
IN THIS
SUB-REGION

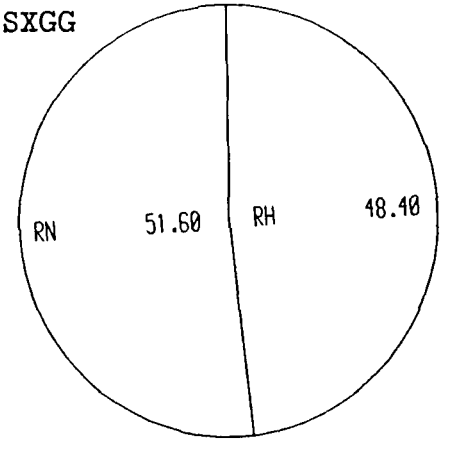
FOXGG



FSXM

NOT
APPROPRIATE
IN THIS
SUB-REGION

FSXGG



FOXMGG

NOT
APPROPRIATE
IN THIS
SUB-REGION

FSXMGG

NOT
APPROPRIATE
IN THIS
SUB-REGION

MIDDENS

NOT
APPROPRIATE
IN THIS
SUB-REGION

GROOVES

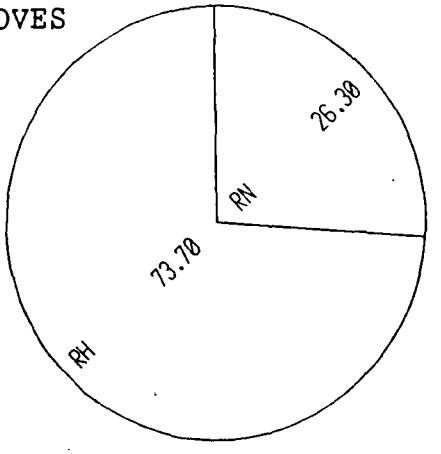


Figure D.3 (cont.): Aboriginal sites and geological structure - Upper Mangrove Creek.

Interpretational notes

There is a slight tendency towards location upon Narrabeen sandstone exhibited by all populations (except Style Open sites). However, there is no significant pattern of difference between Function and Style sites.

When grinding grooves are removed from the analysis, Function Open sites are significantly different from the other groups in being much more closely associated with Narrabeen sandstone, but Function Shelter sites do not appear to display a similar characteristic with regard to Style Shelters.

In summary, there is a clear tendency for the open element of the Function population to be located in close proximity to Narrabeen sandstone, The unusually high representation of this rock type (distributed linearly along the creek floor) accounts for the difference between these sites and their shelter counterparts, and as such provides a justification of the separation of these two elements of the Function population.

3. The Cumberland Plain.

The assessment of site relationships upon the Cumberland Plain is problematic, because while Function Open sites tend to be located upon the Plain itself, Function Shelter and both the Style elements tend to be located on the surrounding slopes. The sub-region is underlain by approximately 85% Wianamatta shale, 10% clay, gravel and alluvial deposits and 5% Hawkesbury sandstone (Figure D.4). Table D.4 presents the statistical assessment of the relationships between Function and Style.

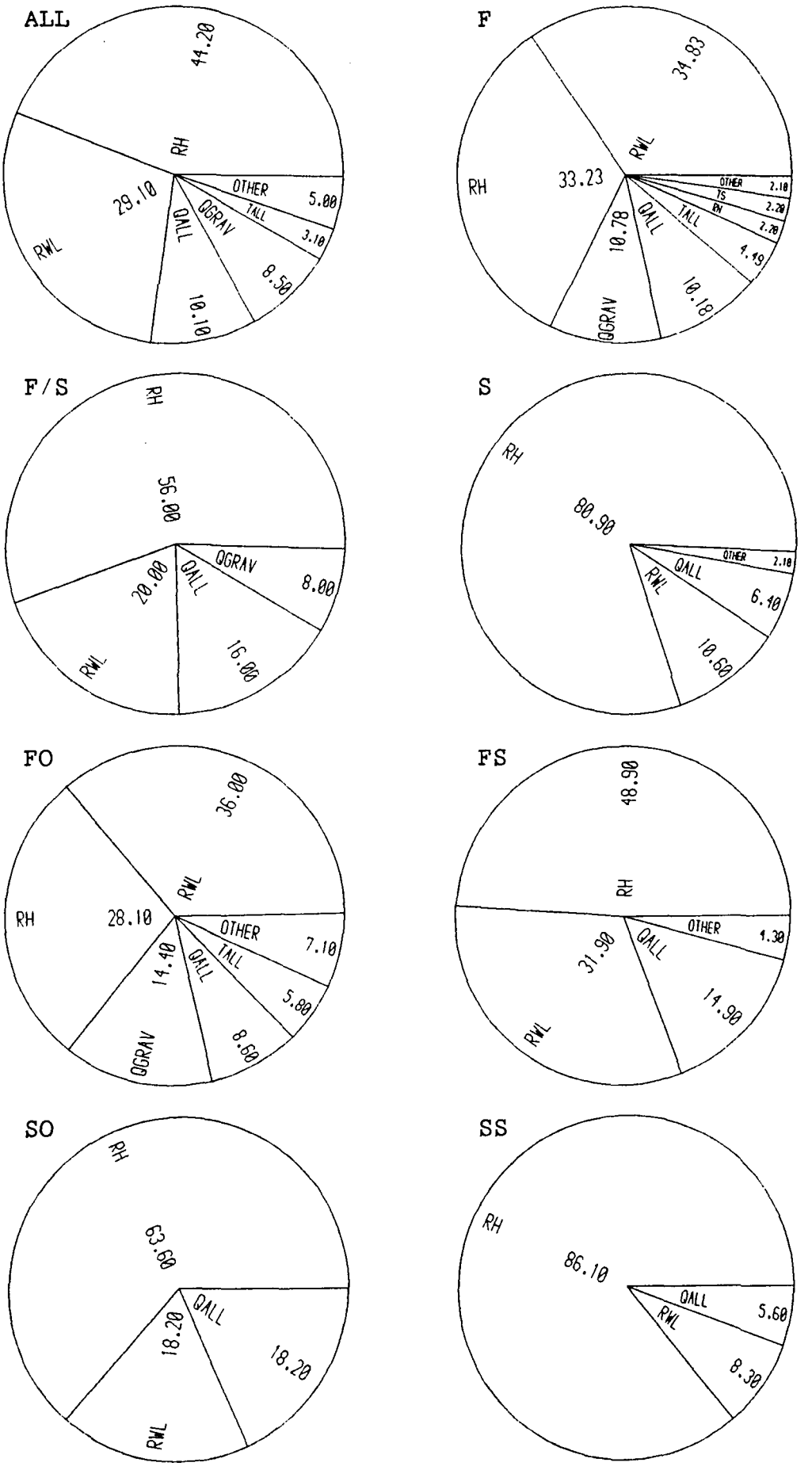
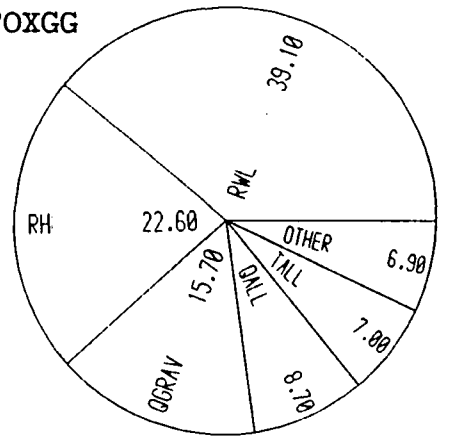


Figure D.4: Aboriginal sites and geological structure - Cumberland Plain.

FOXM

NOT APPROPRIATE IN THIS SUB-REGION

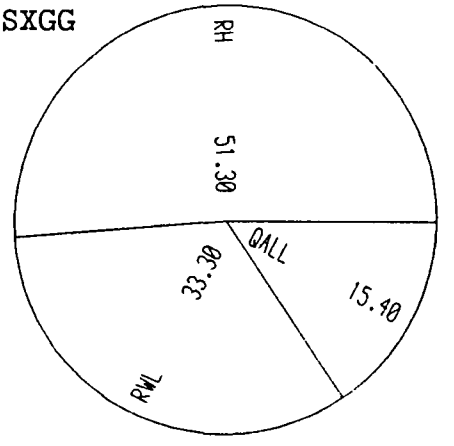
FOXGG



FSXM

NOT APPROPRIATE IN THIS SUB-REGION

FSXGG



FOXMGG

NOT APPROPRIATE IN THIS SUB-REGION

FSXMGG

NOT APPROPRIATE IN THIS SUB-REGION

MIDDENS

NOT APPROPRIATE IN THIS SUB-REGION

GROOVES

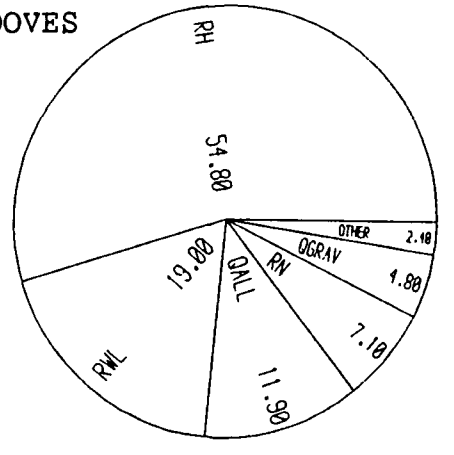


Figure D.4 (cont.): Aboriginal sites and geological structure - Cumberland Plain.

Table D.4

Populations	chi-sq	df	sig?
F vs S	33.056	4	Y
F vs F/S	6.123	4	Y
S vs F/S	2.112	1	N
FO vs SO	1.425	1	N
FS vs SS	9.419	1	Y
FO vs FS	14.686	4	Y
SO vs SS	TOO FEW		
FOXGG vs FSXGG	14.009	3	Y
FOXGG vs SO	5.592	1	Y
FSXGG vs SS	8.611	1	Y

Interpretational notes

Function and Style sites display clearly significant differences throughout; and Function sites show the greater tendency toward rock types other than Hawkesbury sandstone. That Function Open sites should be significantly different from Style Open sites is not surprising (though this relationship is not observable until grinding grooves are removed from the analysis); that Function Shelter sites show the same pattern with regard to Style Shelter is more remarkable because they are potentially from the same population.

The differences observable between the Function elements are principally differences in the degree to which the two elements tend away from Hawkesbury sandstone, and are consistent with the peripheral nature of Function Shelter sites and a justification of the separation of the two Function sub-populations.

4. The Blue Mountains.

In a similar fashion to that remarked upon in the discussion of the Upper Mangrove Creek catchment, the Blue Mountains sub-region is unusual in being represented by a large component of Narrabeen sandstone.

The sub-region is the only portion of the Blue Mountains in which there are a sufficient number of sites to allow statistical testing. Indeed, approximately 80% of the archaeological data for the Blue Mountains comes from the area covered by this sub-region (Stockton &

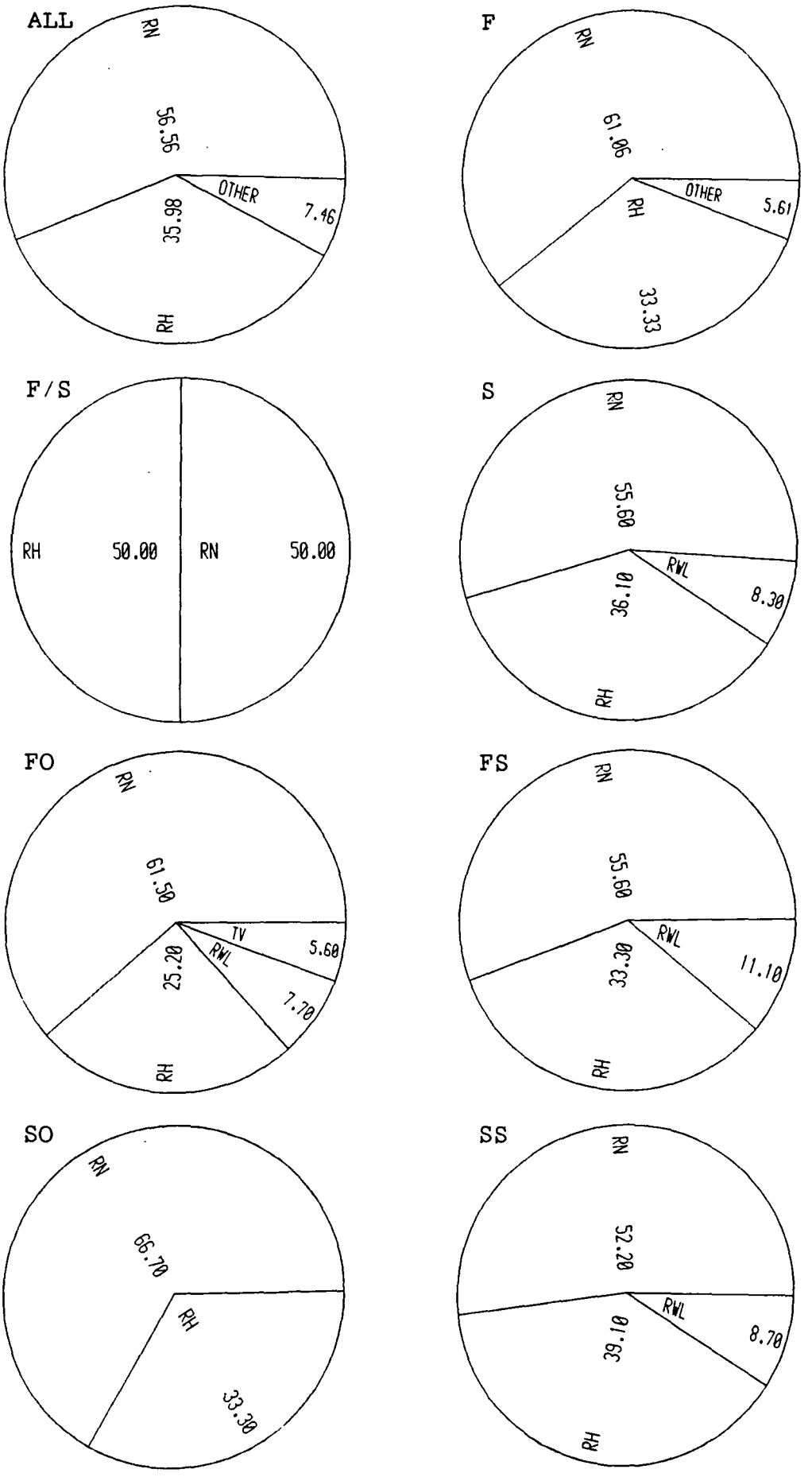
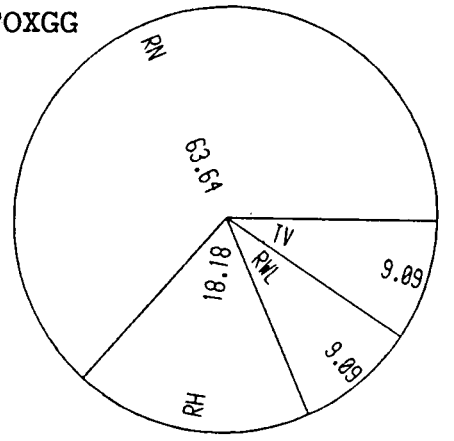


Figure D.5: Aboriginal sites and geological structure - Blue Mountains.

FOXM

NOT
APPROPRIATE
IN THIS
SUB-REGION

FOXGG



FSXM

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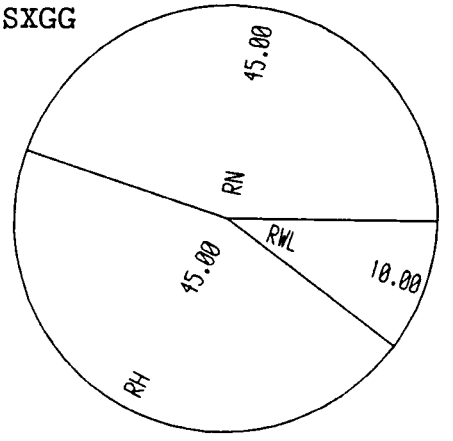
SUB-REGION

FSXGG



FOXMGG

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FSXMGG

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MIDDENS

NOT
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IN THIS
SUB-REGION

GROOVES

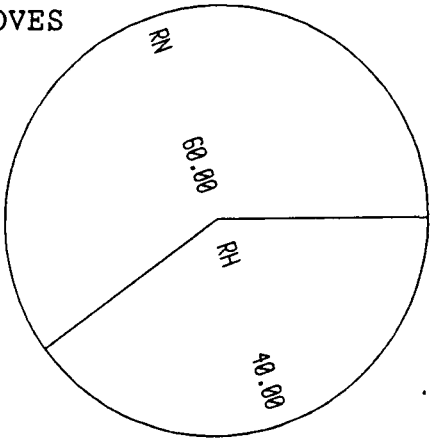


Figure D.5 (cont.): Aboriginal sites and geological structure - Blue Mountains.

Holland 1974). Despite intensive search, researchers have been unable to find sites in close proximity to this area. This alone is suggestive of a fundamental association between site location and geological structure.

The sub-region is underlain by approximately 50% Hawkesbury sandstone, 45% Narrabeen sandstone, 4% Wianamatta shale and 1% Tertiary basalt (Figure D.5). The results of the statistical analysis are presented in Table D.5 (note that in the majority of cases there was either to little data or too little variation in one of the sub-populations to allow a valid test).

Table D.5

Populations	chi-sq	df	sig?
F vs S	4.856	1	N
F vs F/S	TOO FEW		
S vs F/S	TOO FEW		
FO vs SO	TOO FEW		
FS vs SS	TOO FEW		
FO vs FS	0.291	1	N
SO vs SS	TOO FEW		
FOXGG vs FSXGG	0.655	1	N
FOXGG vs SO	TOO FEW		
FSXGG vs SS	TOO FEW		

Interpretational notes

Although, generally, there is insufficient data to allow a valid statistical test, there appears to be a tendency in the Function population away from the Hawkesbury series to a much greater extent than can be said to be true of the Style population. FO sites are unusual in the percentage of sites found upon the small outcrops of basalt (basalt represents a very tiny fraction of the geological structure of the region, but produce the most fertile soils). Indeed, FOXGG (though they are few) show the greatest divergence from Hawkesbury sandstone.

5. Cataract Dam.

Only a small percentage of sites are underlain by anything other than Hawkesbury Sandstone (98% Hawkesbury sandstone & 2% Narrabeen

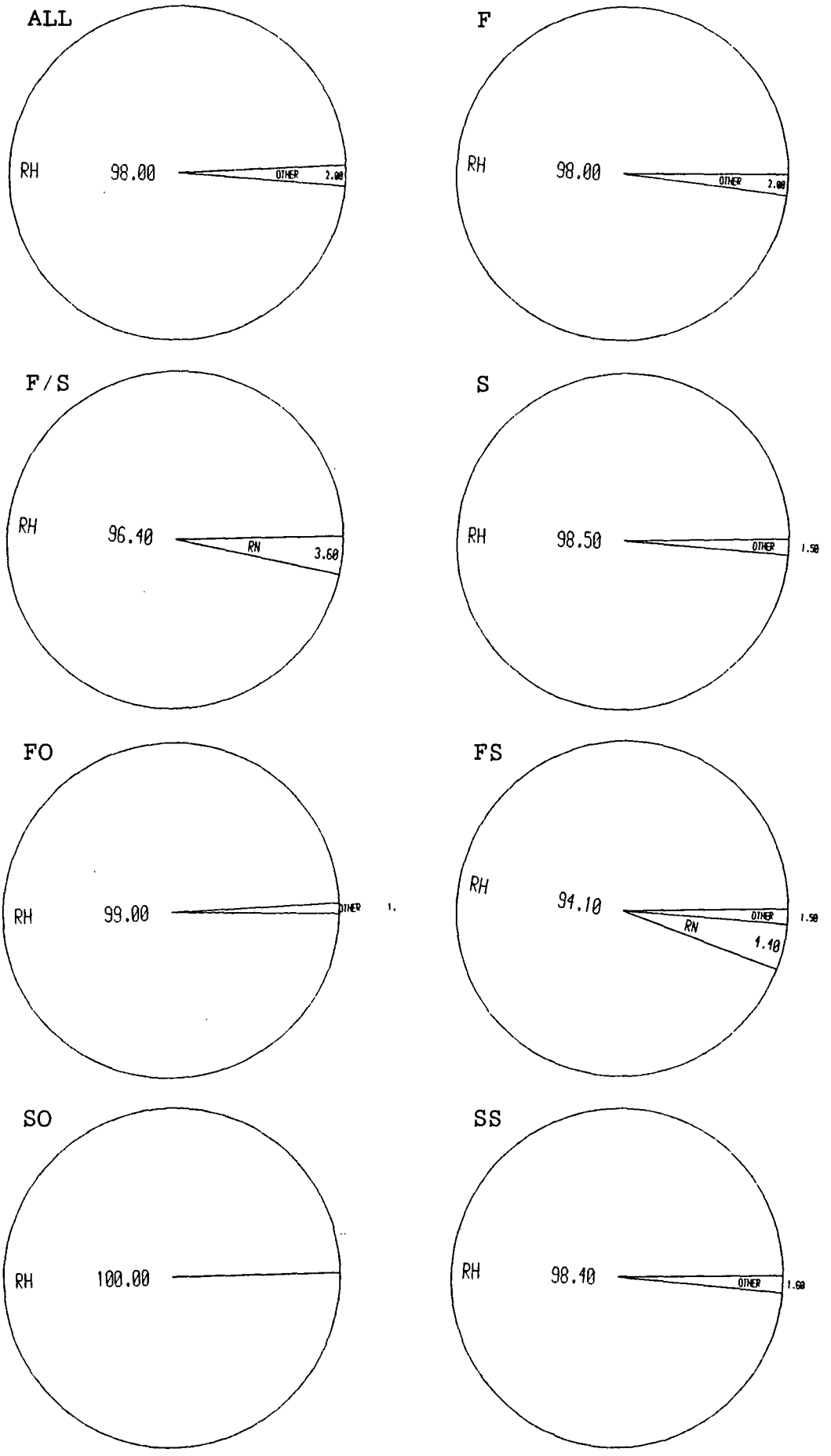


Figure D.6: Aboriginal sites and geological structure - Cataract Dam.

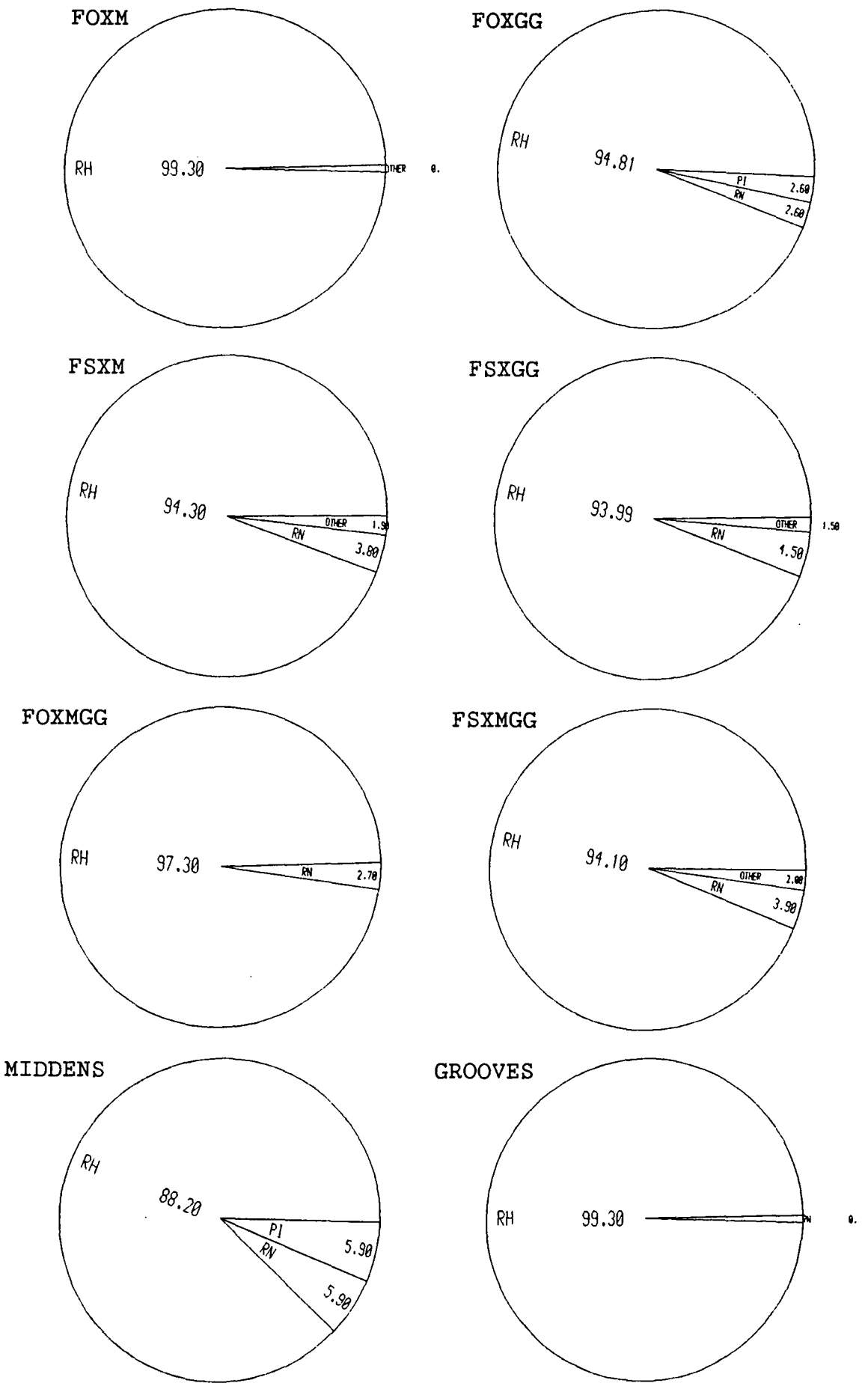


Figure D.6 (cont.): Aboriginal sites and geological structure - Cataract Dam.

sandstone) (Figure D.6). A statistical assessment of the relationship between Function and Style is presented in Table D.6.

Table D.6

Population	chi-sq	df	sig?
F vs S	0.217	1	N

Interpretational notes

For all but the gross level of total Function vs total Style sites there is too little variation to produce a valid statistical assessment.

The Function elements can be seen to diverge but slightly from their Style counterparts in respect to Narrabeen and Permian rocks, a characteristic most highly developed in middens. Overall there is little to suggest a major trend away from Hawkesbury sandstone.

6. Royal National Park.

The Royal National Park is predominantly underlain by Hawkesbury sandstone (98%), while Quaternary sand (1%), Wianamatta shale (0.5%) and Narrabeen sandstone (0.5%) make up only a small percentage of the sub-regional surface geology (Figure D.7). A statistical assessment of the relationships between Function and Style populations is presented in Table D.7.

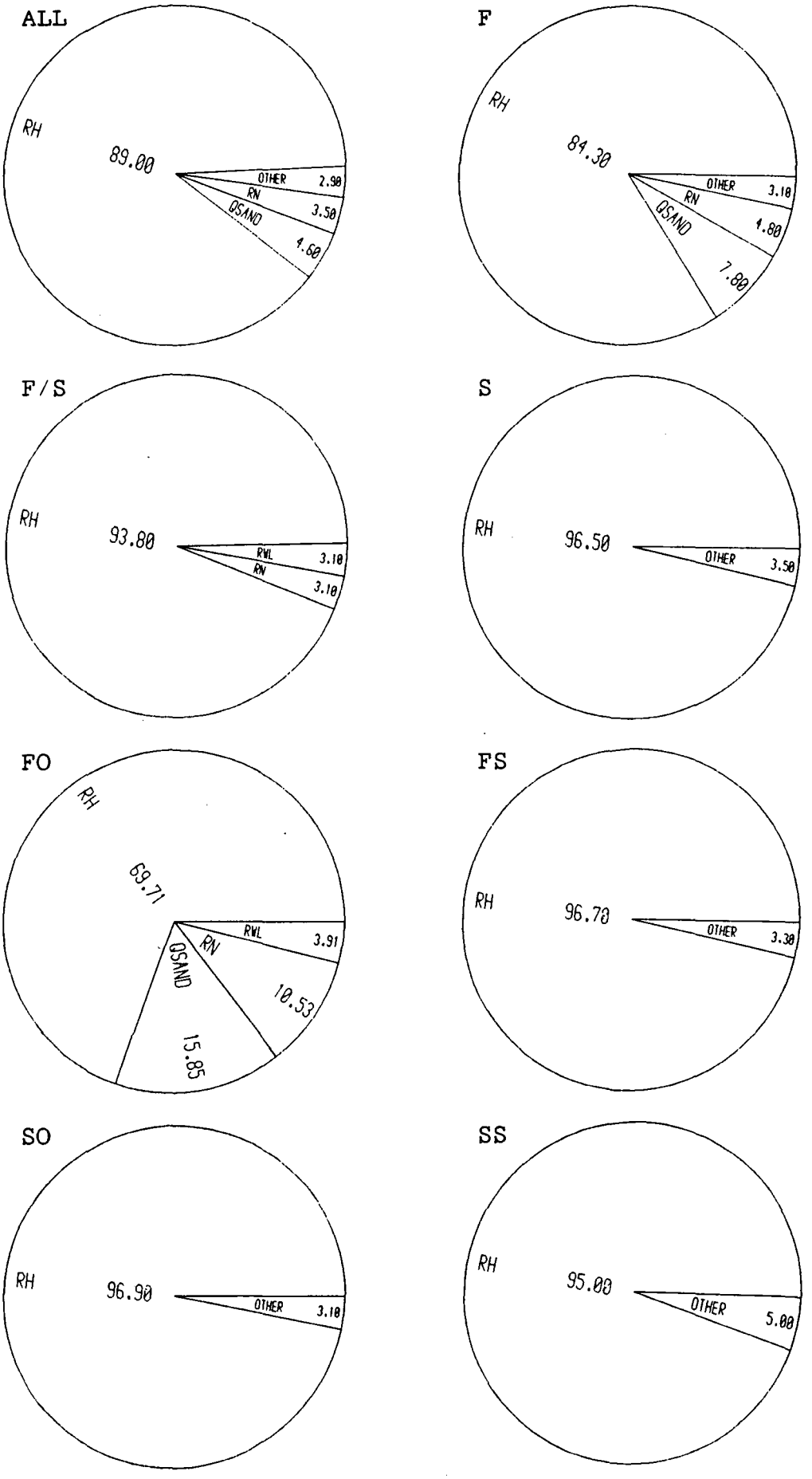
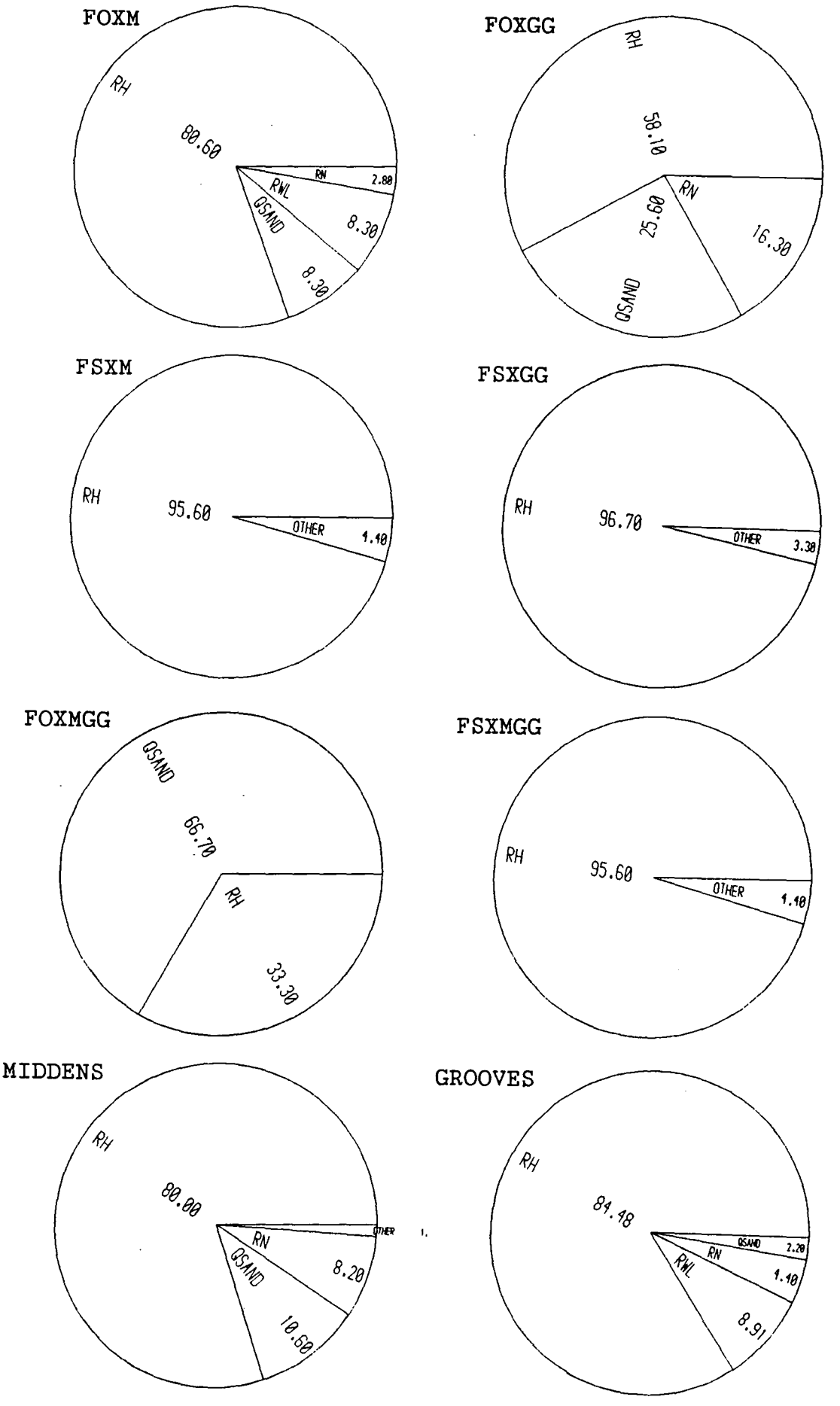


Figure D.7: Aboriginal sites and geological structure - Royal National Park.



gure D.7 (cont.): Aboriginal sites and geological structure - Royal National Park.

Table D.7

Populations	chi-sq	df	sig?
F vs S	8.305	1	Y
F vs F/S	8.078	1	Y
S vs F/S	0.949	1	N
FO vs SO	TOO FEW		
FS vs SS	TOO FEW		
FO vs FS	22.628	1	Y
SO vs SS	TOO FEW		
FOXM vs FSXM	TOO FEW		
FOXGG vs FSXGG	32.479	1	Y
FOXMGG vs FSXMGG	TOO FEW		
FOXM vs SO	TOO FEW		
FSXM vs SS	TOO FEW		
FOXGG vs SO	TOO FEW		
FSXGG vs SS	TOO FEW		
FOXMGG vs SO	TOO FEW		
FSXMGG vs SS	TOO FEW		

Interpretational notes

For the most part there is too little variation or there are too few data to form a pattern of valid statistical tests. However, there appears to be a tendency among Function Open sites towards Quaternary sand and Narrabeen sandstone. However, this tendency is not shared by FS sites. Middens have the clearest association with rocks other than Hawkesbury sandstone.

D-1.2 Topography

The landforms of the region are dominated by features of high relief (the dissected plateaux) and nowhere is coastal plain in evidence. The only substantial low-lying planar area being the gently-undulating hinterland of the Cumberland Plain.

Figures D.8 to D.14 illustrate the variation in landform types within the region as a whole and for the sub-regions, while Table D.8 presents the statistical assessment of the relationships between Function and Style for the region as a whole.

Key to abbreviations - topography	
ALLTERR	Alluvial terrace
BEACH	Beach
BEACHBAC	Beach back dunes
CLIFFTOP	Cliff top
COASTLOW	Coastal lowland
CREEKBED	Creek bed
CREEKSID	Creek-side
CRVALSID	Creek valley side
ESTBAY	Estuary bay
ESTHEAD	Estuary headland
FLOODPL	Floodplain
GULLYFL	Gully floor
HILLSID	Hill side
HILLTOP	Hill top
INPLAIN	Inland plain
ISLAND	Island
LAKESID	Lakeside
PLATEAU	Plateau top
PONDSID	Pondside
RIDGSID	Ridge-side
RIDGTOP	Ridge-top
RIVALFL	River valley floor
RIVALSID	River valley side
RIVHILL	Riverside hill
RIVPLAIN	Riverside plain
RIVSID	Riverside
ROCKHEAD	Rock headland
ROCKPLAT	Rock platform
SPUR	Spur
SWAMP	Swamp
SWAMPHEAD	Swamp headland

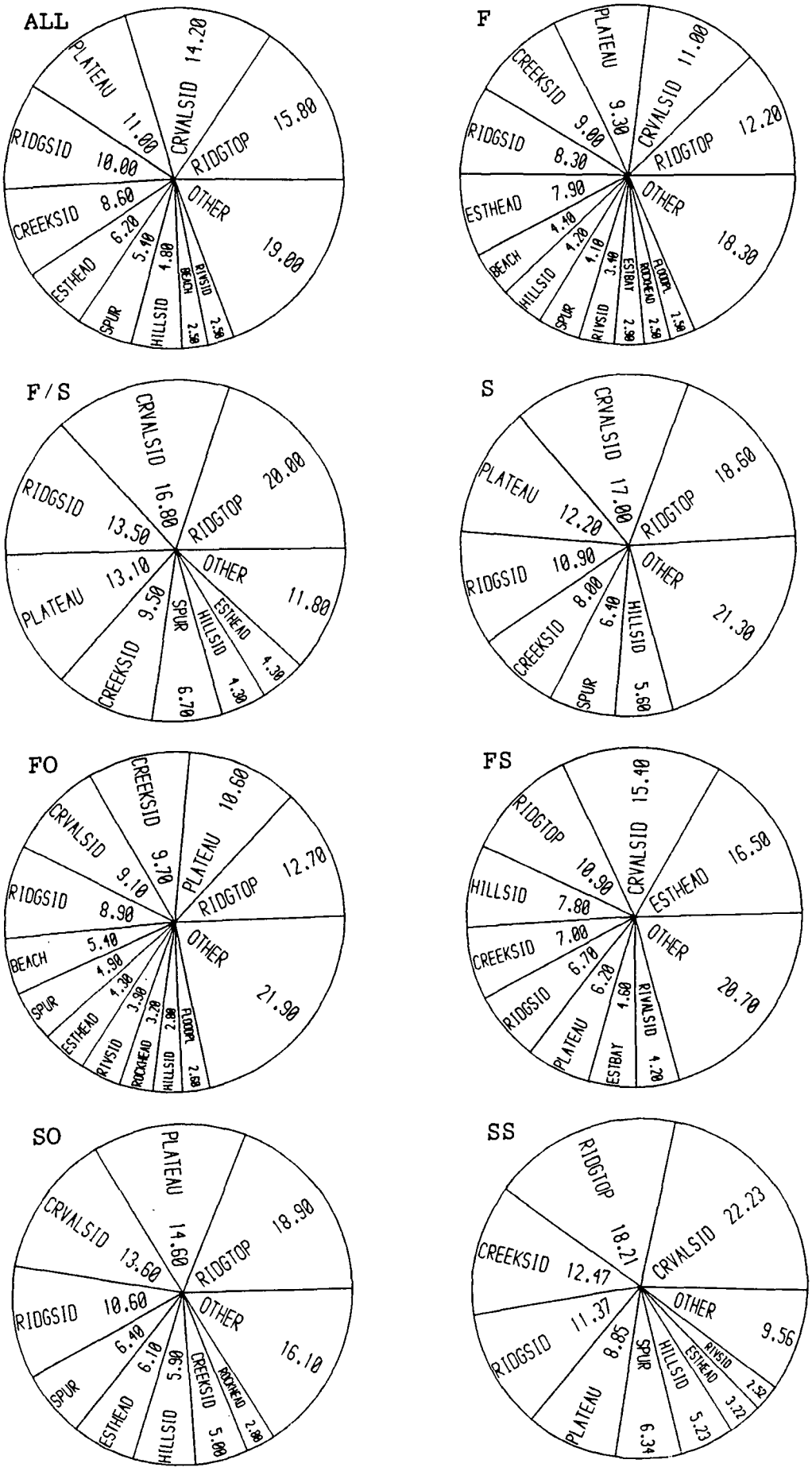


Figure D.8: Aboriginal sites and topography - All region.

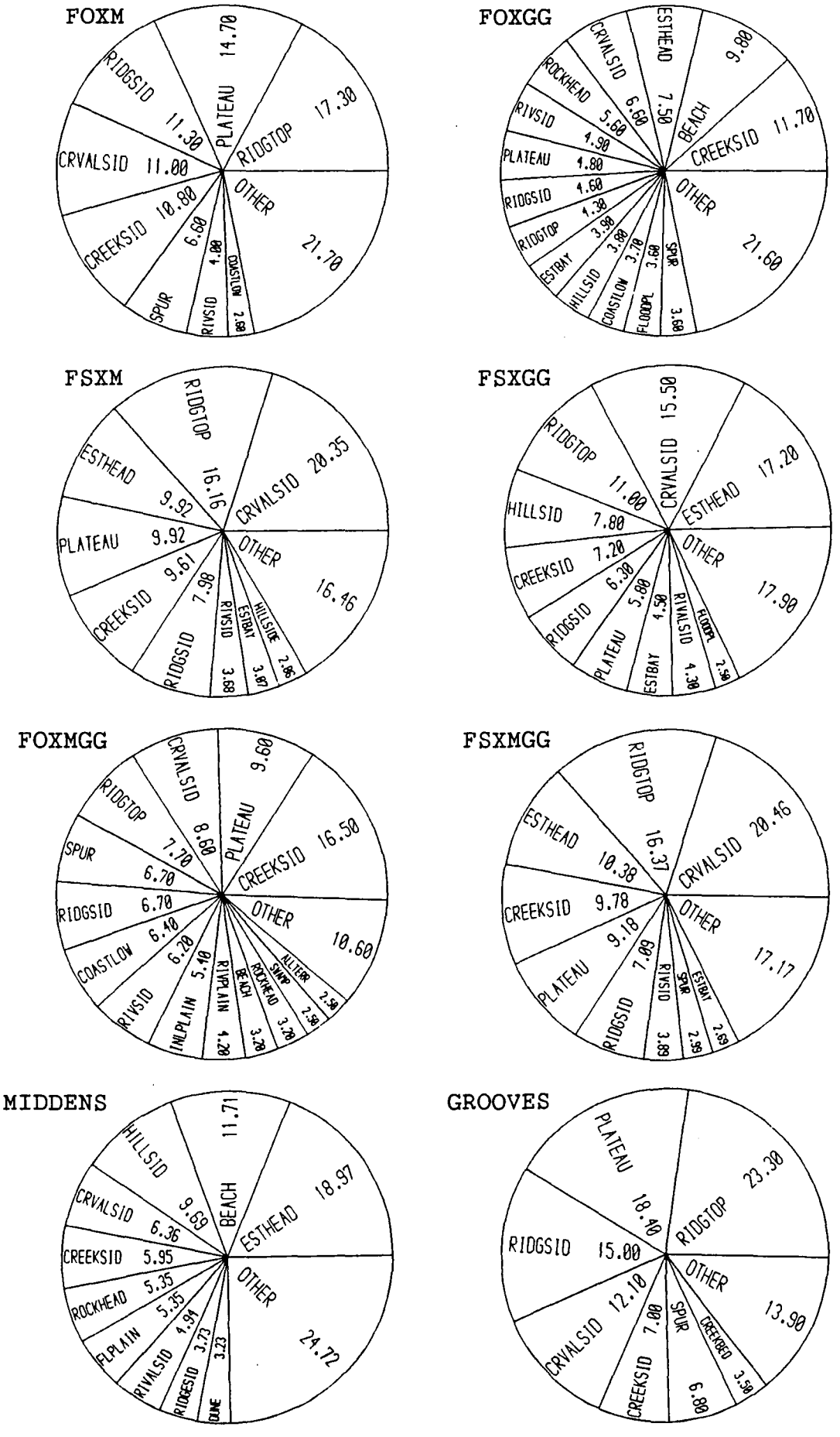


Figure D.8 (cont.): Aboriginal sites and topography - All region.

Table D.8

Populations	chi-sq	df	sig?
F vs S	204.109	15	Y
F vs F/S	94.515	13	Y
S vs F/S	23.114	11	N
FO vs SO	202.287	15	Y
FS vs SS	87.551	10	Y
FO vs FS	241.733	11	Y
SO vs SS	121.438	8	Y
FOXM vs FSXM	166.363	11	Y
FOXGG vs FSXGG	173.710	14	Y
FOXMGG vs FSXMGG	144.834	12	Y
FOXM vs SO	194.018	13	Y
FSXM vs SS	350.870	14	Y
FOXGG vs SO	60.088	10	Y
FSXGG vs SS	170.681	11	Y
FOXMGG vs SO	319.172	14	Y
FSXMGG vs SS	39.981	8	Y

Interpretational notes

The landform characteristics of Function sites are consistently different from those of Style sites. This is illustrated particularly by the tendency of Function Open sites to be located upon landforms of low relief while Style Open sites are located on ridge, plateau and spur tops. More remarkable, is the tendency for Function Shelter and Style Shelter sites to diverge in their landform characteristics. SS sites are to be found more frequently upon ridgetops and plateau tops while FS sites tend to be found upon ridge sides, creek valleys and, particularly, estuarine headlands.

That Function Open sites tend to be located upon landforms of lower relief than Function Shelter sites illustrates the broad geological and topographic conformity of the latter population.

The importance of the influence of middens and grinding grooves is illustrated again by the tendency of middens to act as a major contributor of landform types associated with estuaries and of grinding grooves to contribute high landform types such as plateau and ridge tops. In addition, the intermediate status of F/S sites with regard to structural variables in confirmed by this regional analysis.

SUB-REGIONAL VARIATION

1. Gosford-Wyong.

The Gosford-Wyong sub-region, principally consists of dissected plateau. Where the plateau meets the water, steep scarp slopes usually occur.

In addition, the origin of the Broken Bay estuary as the result of Holocene marine transgression has resulted in the ridges of the plateau (formerly the ridges between creeks) projecting into the estuary with water on three sides - the estuarine headland (Figure D.9). A statistical assessment of the relationships between Function and Style sites for this variable is presented in Table D.9.

Table D.9

Populations	chi-sq	df	sig?
F vs S	193.702	9	Y
F vs F/S	89.255	10	Y
S vs F/S	3.578	6	N
FO vs SO	156.273	9	Y
FS vs SS	18.103	4	Y
FO vs FS	52.320	10	Y
SO vs SS	52.451	9	Y
FOXM vs FSXM	35.182	9	Y
FOXGG vs FSXGG	29.413	7	Y
FOXMGG vs FSXMGG	5.218	1	Y
FOXM vs SO	38.884	6	Y
FSXM vs SS	3.321	3	N
FOXGG vs SO	283.660	8	Y
FSXGG vs SS	18.050	4	Y
FOXMGG vs SO	73.584	5	Y
FSXMGG vs SS	11.329	3	Y

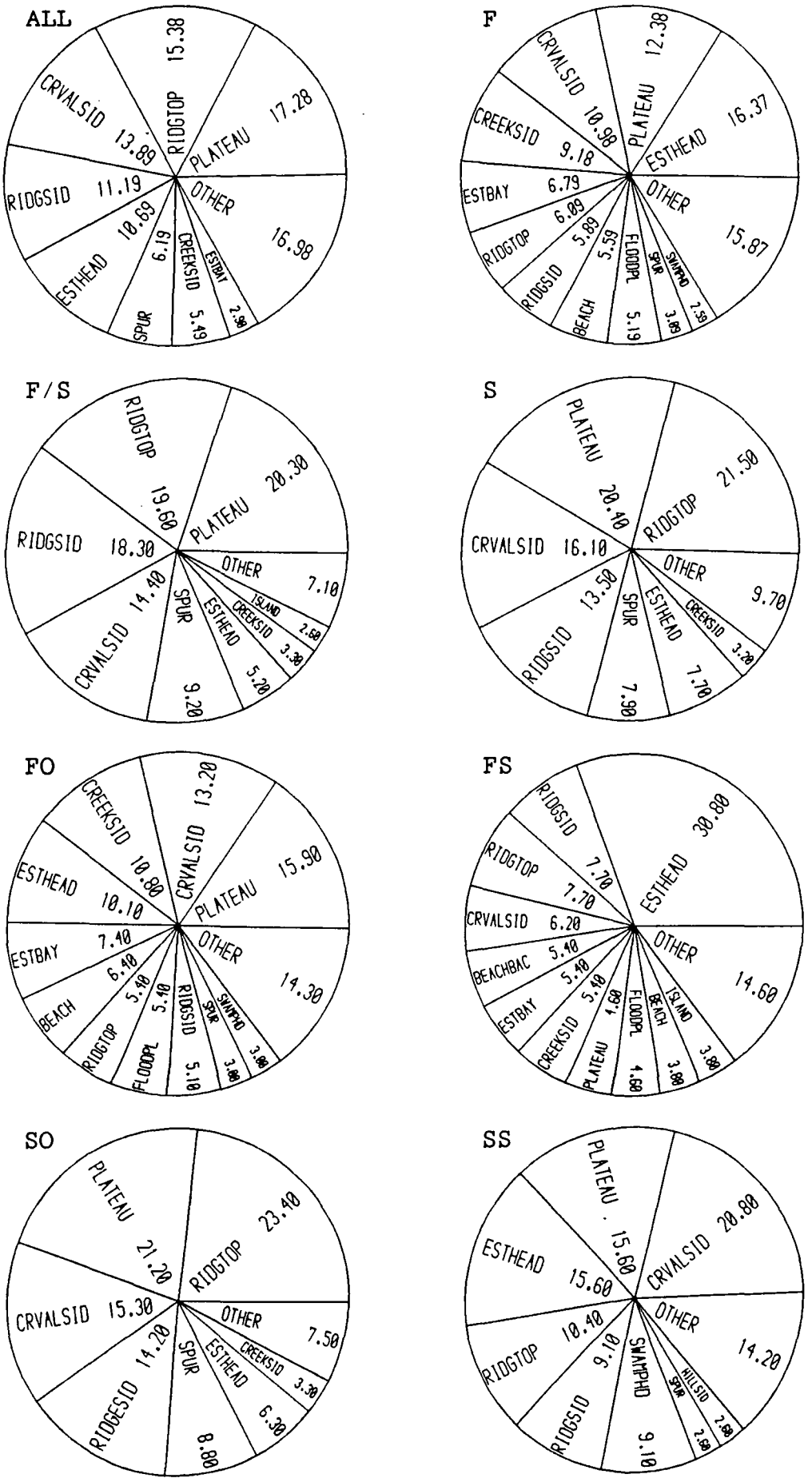


Figure D.9: Aboriginal sites and topography - Gosford-Wyong.

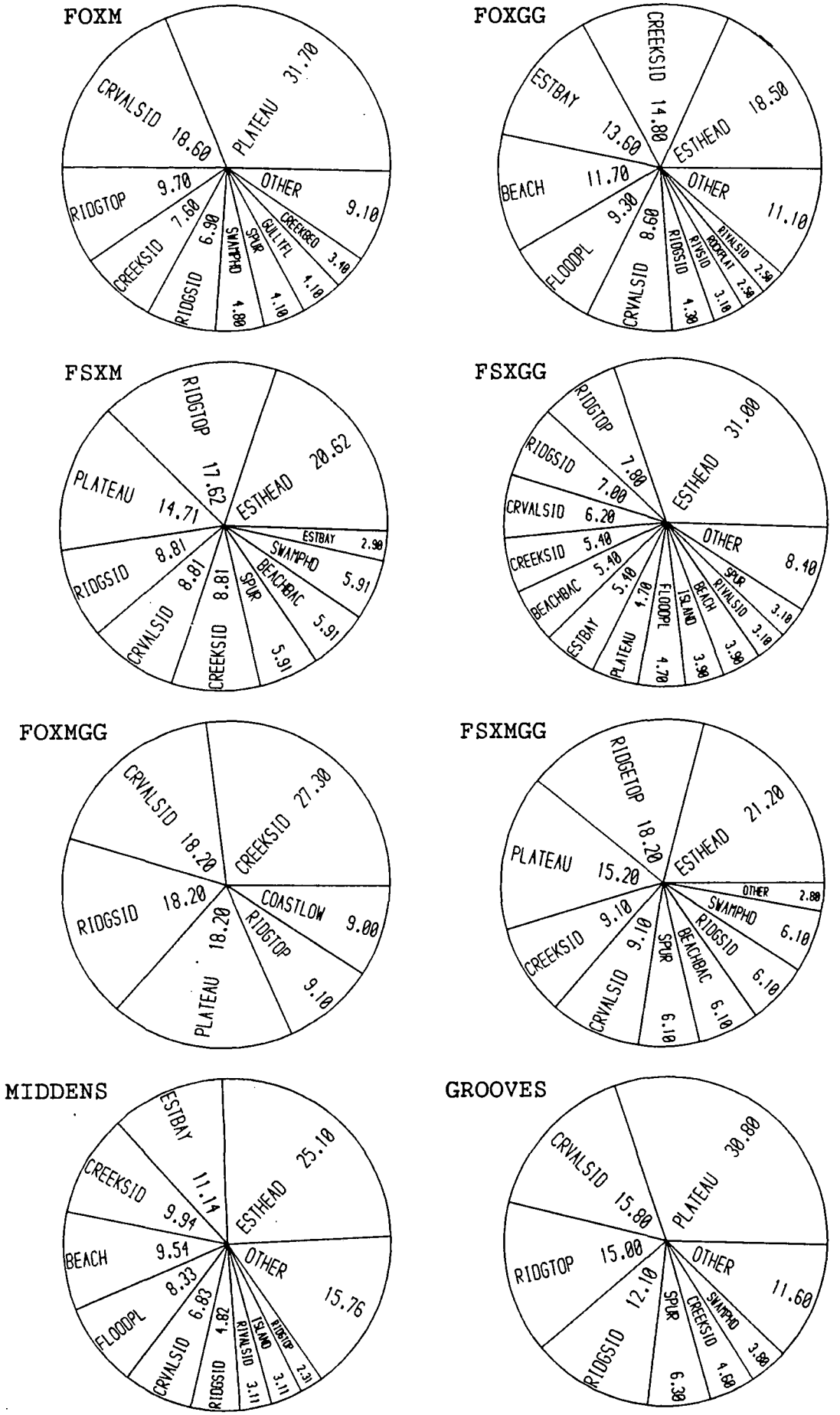


Figure D.9 (cont.): Aboriginal sites and topography - Gosford-Wyong.

Interpretational notes

The pattern of relationship between Function and Style sites noted for the region as a whole is apparently maintained within the Gosford-Wyong sub-region. Of particular importance is the fact that FS sites are significantly different from SS sites, principally because of the association of the former population with estuarine headlands. Note that grinding grooves clearly influence the structure of FO sites, by tending to associate the whole with plateau tops, and bringing FO sites almost into the range of SO sites. When grooves are removed FO sites are more clearly associated with estuarine, bay, and creekside landforms.

2. Upper Mangrove Creek.

In general, the variation in landform characteristics within the inland sub-regions tends to be smaller than that upon the coast. As a consequence, in order to stay within the accepted chi-square rule of not having more than 20% of categories with an expected value lower than five, a dichotomy was formed between landforms of high/flat areas and landforms of slope where appropriate (Figure D.10).

The Upper Mangrove Creek sub-region is an area of dissected plateau through which a major creek and its tributaries flow. A statistical assessment of the relationships between Function and Style sites is presented in Table D.10.

Table D.10

Populations	chi-sq	df	sig?
F vs S	40.395	5	Y
F vs F/S	9.134	2	Y
S vs F/S	3.995	1	N
FO vs SO	20.648	2	Y
FS vs SS	0.138	1	N
FO vs FS	20.648	2	Y
SO vs SS	12.879	1	Y
FOXGG vs FSXGG	15.842	1	Y
FOXGG vs SO	15.394	2	Y
FSXGG vs SS	4.340	1	Y

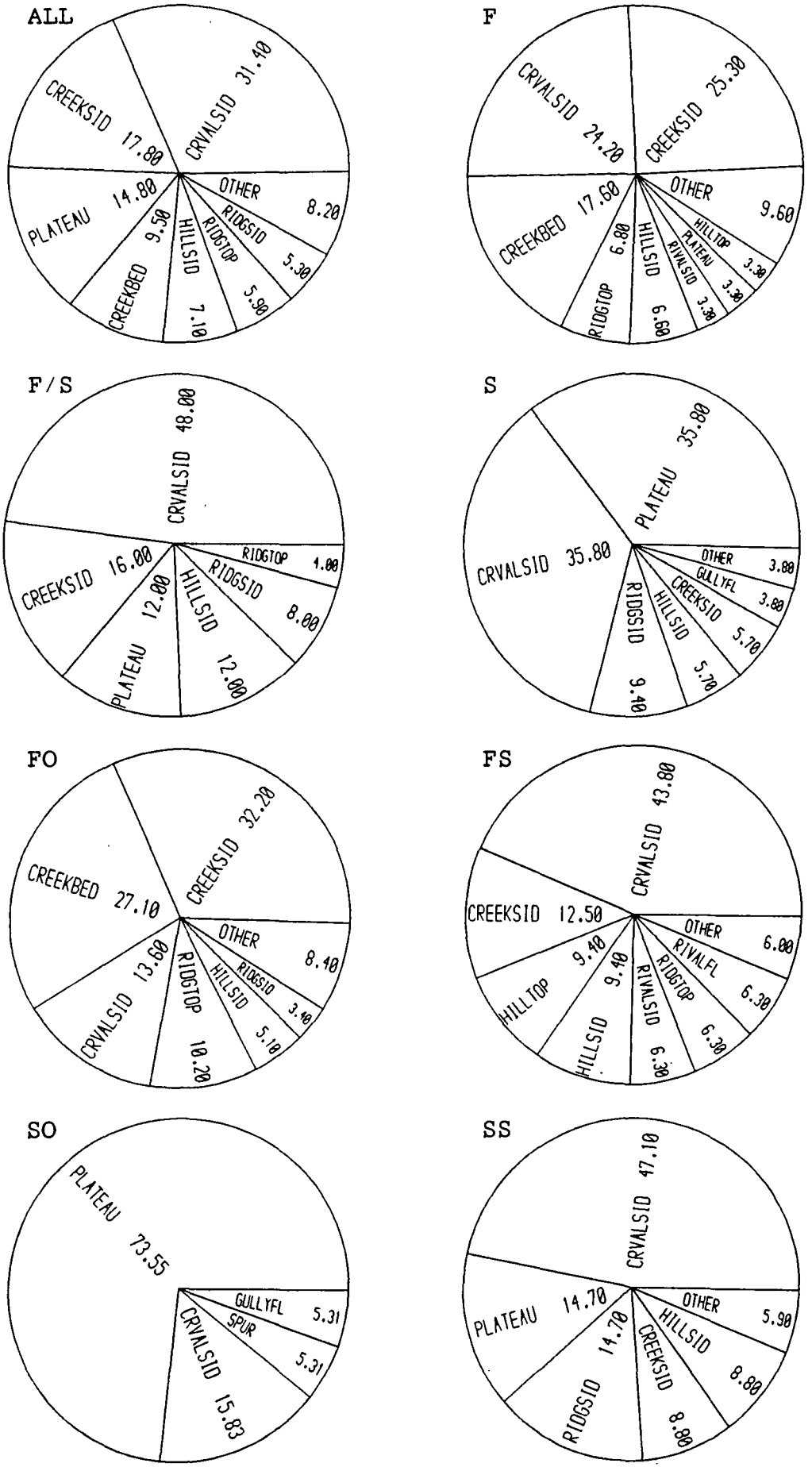
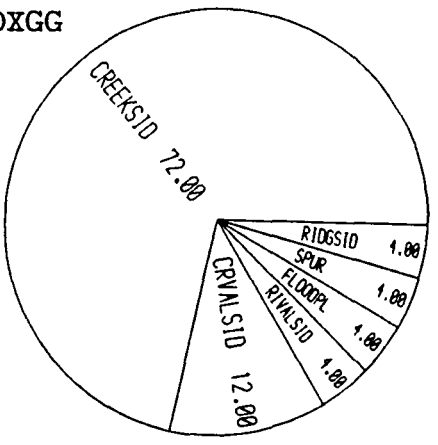


Figure D.10: Aboriginal sites and topography - Upper Mangrove Creek.

FOXM

NOT
APPROPRIATE
IN THIS
SUB-REGION

FOXGG



FSXM

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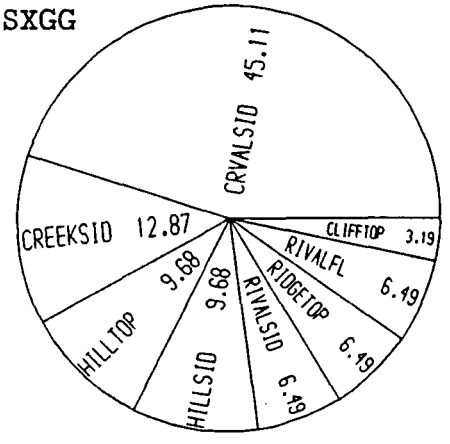
SUB-REGION

FSXGG



FOXMGG

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FSXMGG

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MIDDENS

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SUB-REGION

GROOVES

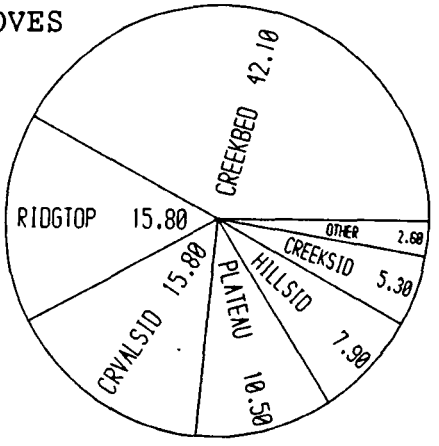

Figure D.10 (cont.): Aboriginal sites and topography - Upper Mangrove Creek.

Interpretational notes

Within this sub-region there is a tendency for Function Open and Shelter sites (without grinding grooves) to be associated with landforms close to creeks, which is not shared by their Style counterparts. Note that in this sub-region, grinding grooves are principally associated with creek beds not with the high features characteristic of the region as a whole - this may be explained by the requirement of water in the frictional process of grinding (see Dickson 1981).

3. The Cumberland Plain

There are few distinguishable landform features upon the Plain itself other than gently undulating plain, and landform elements of the Hawkesbury-Nepean river system which flows through it. Landforms of high relief are peripheral (Figure D.11). Table D.11 presents a statistical assessment of the relationships between Function and Style within this sub-region.

Table D.11

Populations	chi-sq	df	sig?
F vs S	26.500	7	Y
F vs F/S	16.480	3	Y
S vs F/S	5.120	2	N
FO vs SO	12.975	1	Y
FS vs SS	- 1.047	3	N
FO vs FS	10.783	2	Y
SO vs SS	0.546	2	N
FOXGG vs FSXGG	13.296	2	Y
FOXGG vs SO	14.232	1	Y
FSXGG vs SS	3.628	1	Y

Interpretational notes

FO sites are clearly more closely associated than the other three populations with creek and river landforms; which is illustrative of the peripheral nature of the other three groups. It is also clear that Function Shelter sites without grinding grooves are more closely associated with water-related landforms than are Style Shelter sites.

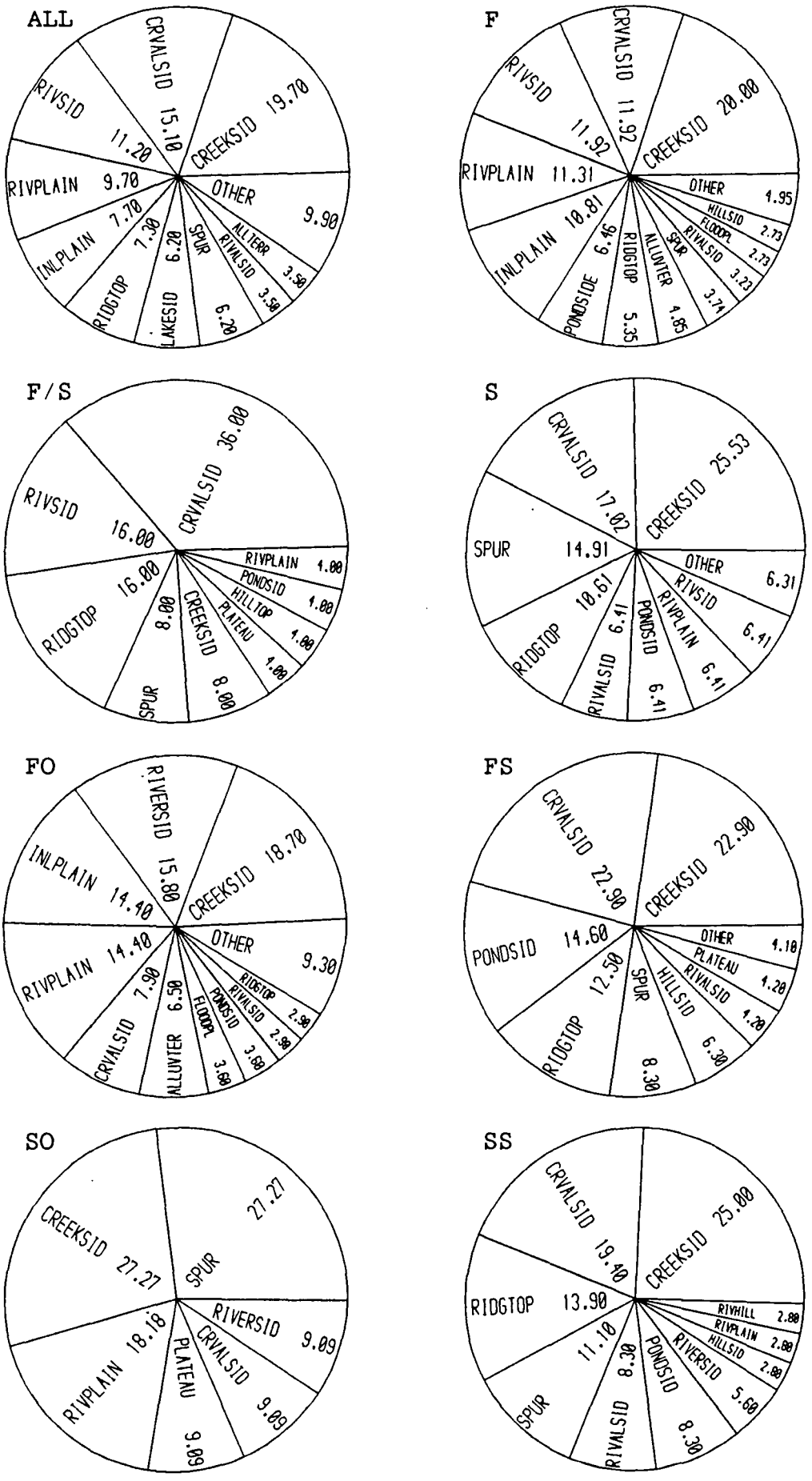

Figure D.11: Aboriginal sites and topography - Cumberland Plain.

FOXM

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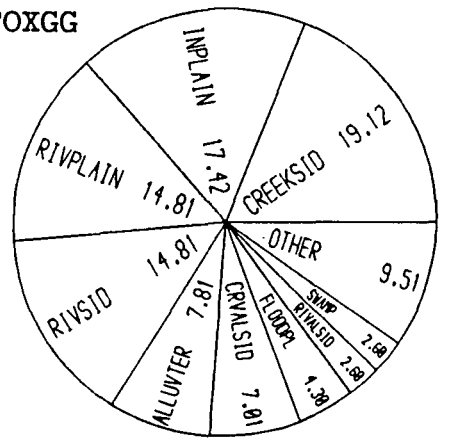
IN THIS
SUB-REGION

FOXGG



FSXM

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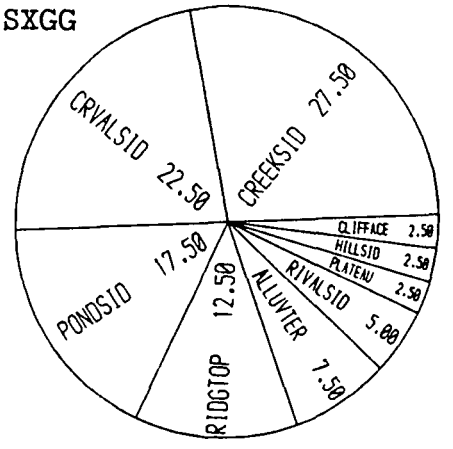
FSXGG



FOXMGG

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SUB-REGION

GROOVES

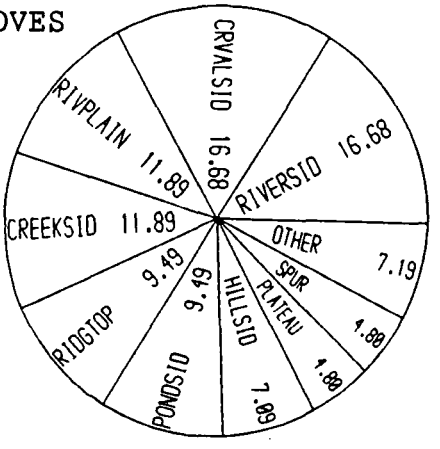

Figure D.11 (cont.): Aboriginal sites and topography - Cumberland Plain.

4. Blue Mountains.

Due to the low degree of differentiation between landform types within this sub-region it was necessary to consider the relationship between high/flat features and features of slope (in order to stay within the requirements of the chi-square test). The sub-region is characterized by plateau-top fringed by steep-sided valleys (Figure D.12). A statistical assessment of the relationships between Function and Style populations for this variable is presented in Table D.12.

Table D.12

Populations	chi-sq	df	sig?
F vs S	No diff.		N
F vs F/S	TOO FEW		
S vs F/S	TOO FEW		
FO vs SO	TOO FEW		
FS vs SS	0.567	1	N
FO vs FS	0.223	1	N
SO vs SS	TOO FEW		
FOXGG vs FSXGG	TOO FEW		
FOXGG vs SO	TOO FEW		
FSXGG vs SS	TOO FEW		

Interpretational notes

There is no evidence of any significant difference between Function and Style populations at any level. All sites tend to be found on ridge-tops, plateau-tops and spurs. Although there is insufficient data to allow a valid statistical test, it is possible that FS sites show a greater tendency toward ridge tops than SS sites.

5. Cataract Dam.

There is little differentiation between landform types within this sub-region. As a consequence, a high/flat and slope landforms division was applied where necessary. The majority of landforms in the sub-region are related to the gently dipping Woronora plateau, though in the south-east corner the land falls away in a steep scarp slope to the sea (Figure D.13). A statistical assessment of the relationships between Function and Style populations is presented in Table D.13.

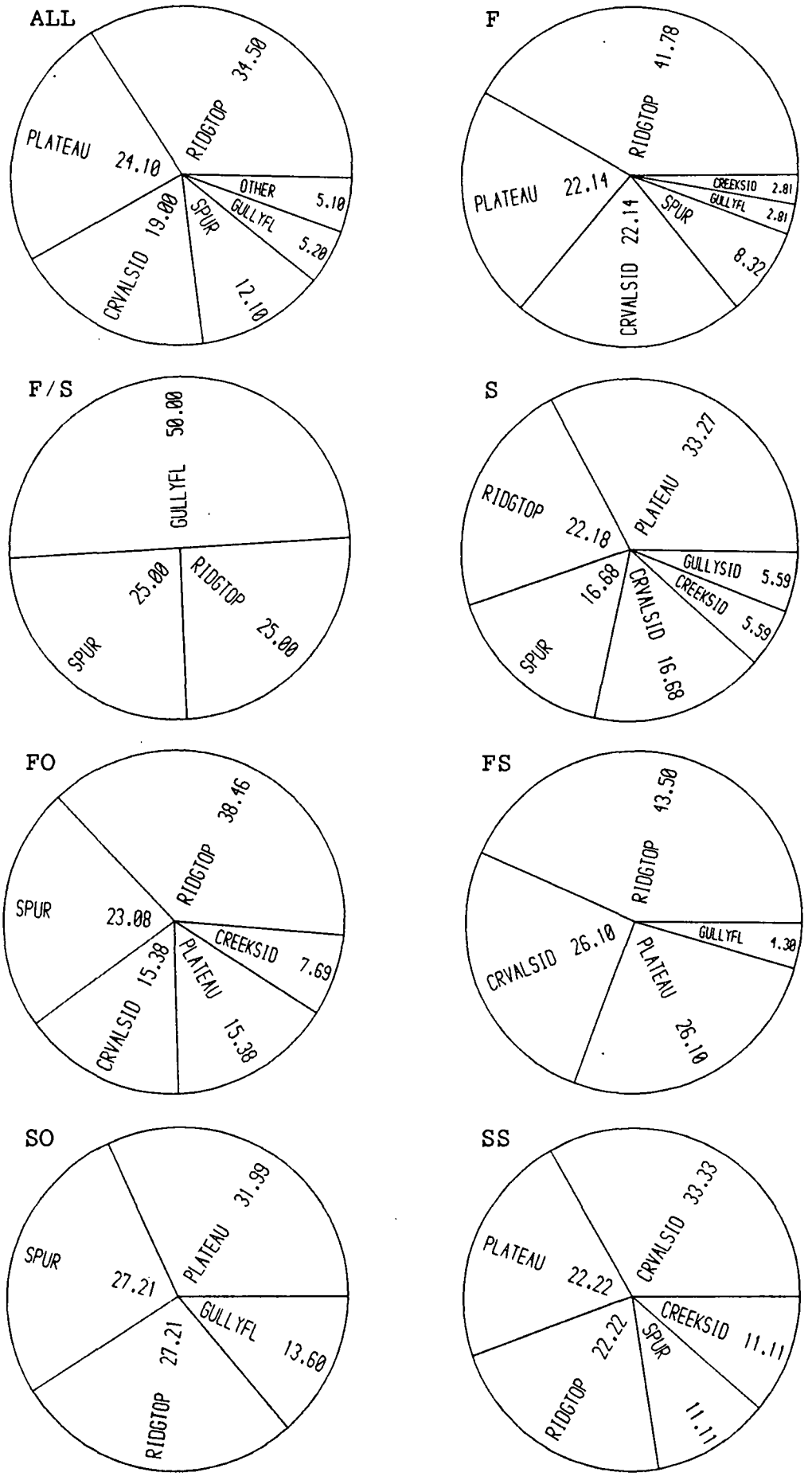

Figure D.12: Aboriginal sites and topography - Blue Mountains.

FOXM

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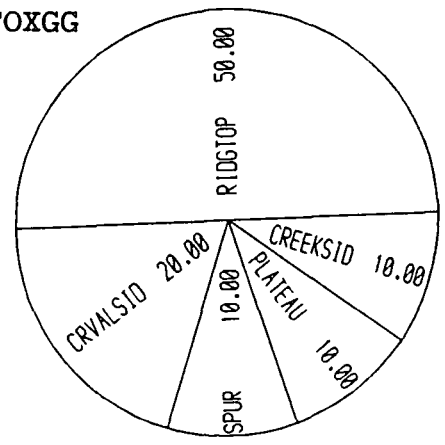
IN THIS
SUB-REGION

FOXGG



FSXM

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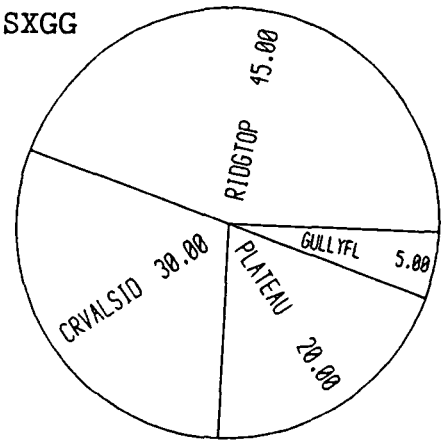
SUB-REGION

FSXGG



FOXMGG

NOT
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SUB-REGION

FSXMGG

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SUB-REGION

GROOVES

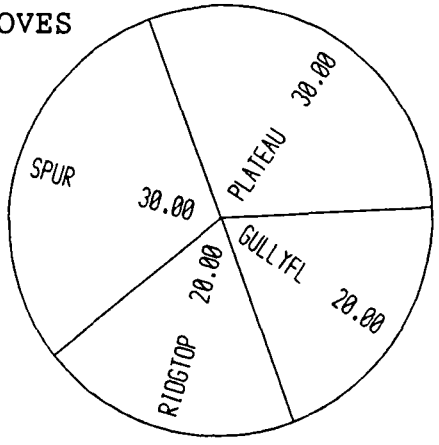


Figure D.12 (cont.): Aboriginal sites and topography - Blue Mountains.

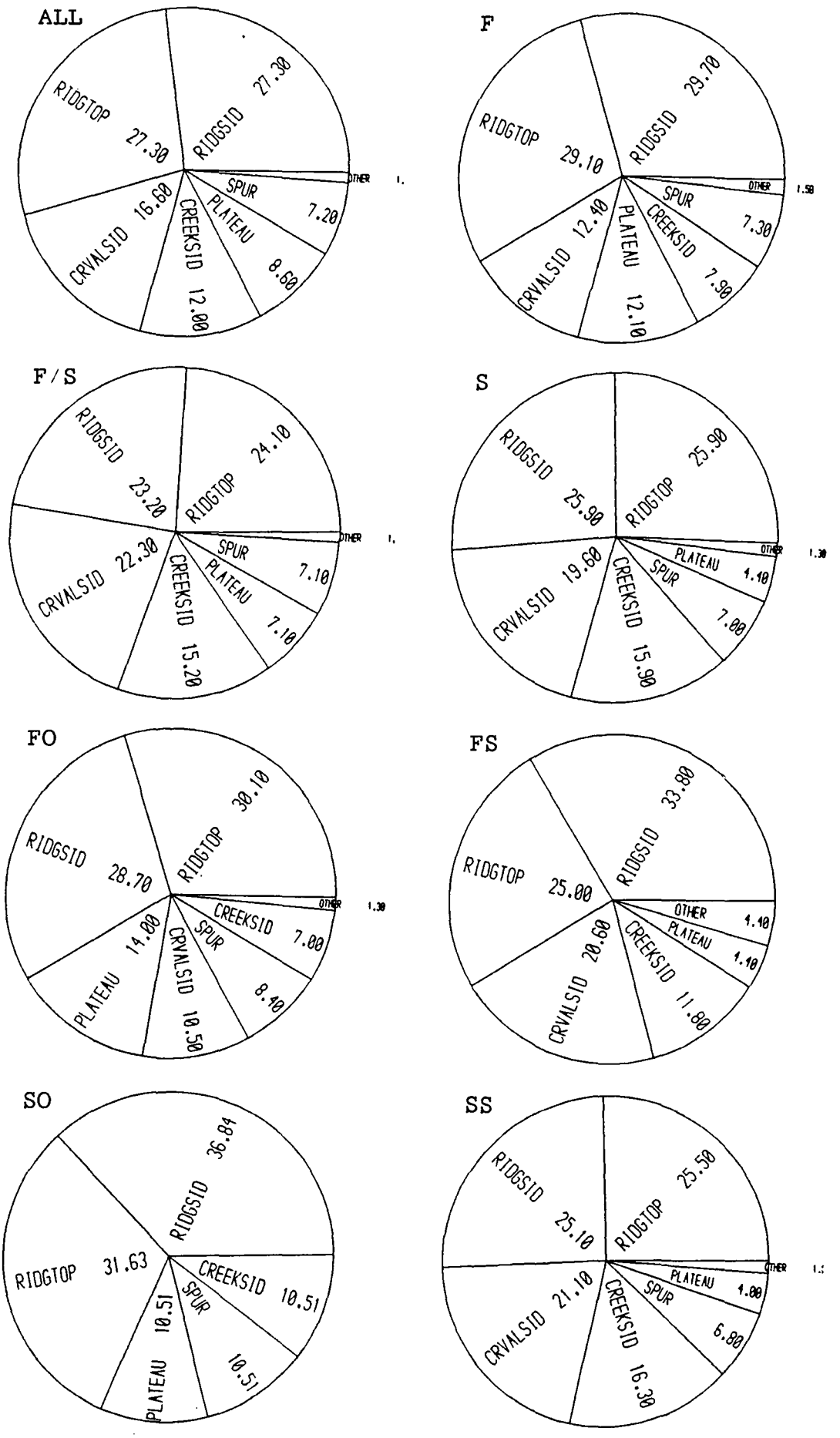


Figure D.13: Aboriginal sites and topography - Cataract Dam.

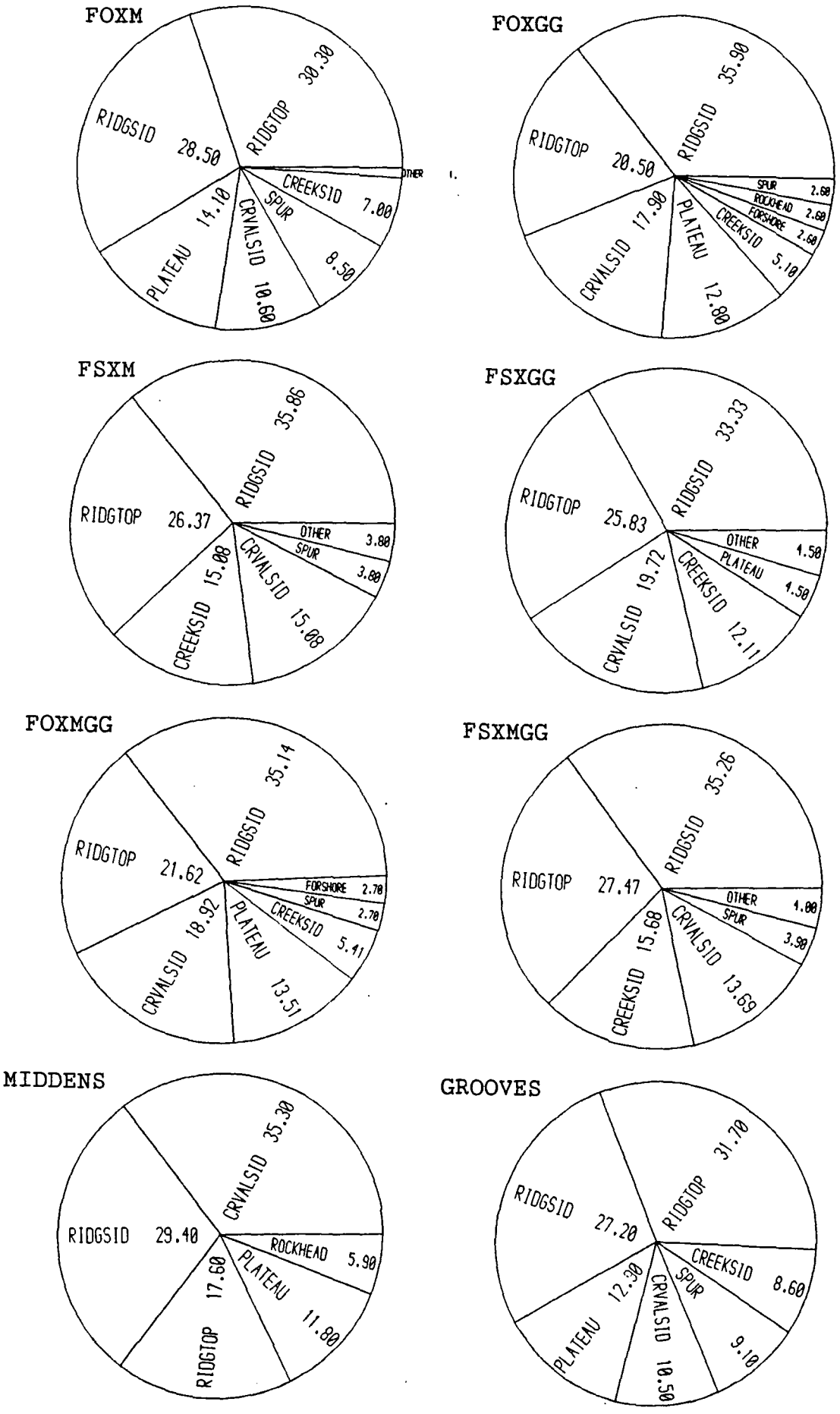


Figure D.13 (cont.): Aboriginal sites and topography - Cataract Dam.

Table D.13

Populations	chi-sq	df	sig?
F vs S	20.035	5	Y
F vs F/S	14.205	5	Y
S vs F/S	5.978	5	N
FO vs SO	1.371	1	N
FS vs SS	3.576	5	N
FO vs FS	12.333	5	Y
SO vs SS	2.019	1	N
FOXM vs FSXM	11.833	5	N
FOXGG vs FSXGG	3.841	4	N
FOXMGG vs FSXMGG	2.416	3	N
FOXM vs SO	0.135	1	N
FSXM vs SS	2.544	3	N
FOXGG vs SO	0.326	1	N
FSXGG vs SS	1.940	3	N
FOXMGG vs SO	2.172	1	N
FSXMGG vs SS	4.159	2	N

Interpretational notes

Within this sub-region there appears to be no statistically significant difference between Function and Style sites. All sites appear to be associated with ridgetops and ridge sides, though there is perhaps a tendency displayed by Function sites toward creek-associated landforms (which is probably contributed principally by middens).

6. Royal National Park.

There is little variation in landform categories within this sub-region. As a consequence a high/flat and slope division was used where appropriate. The sub-region is characterized by plateau - with the Port Hacking estuary to the north; and the ocean to the south-east (Figure D.14). A statistical assessment of the relationships between Function and Style sites with regard to this variable is presented in Table D.14.

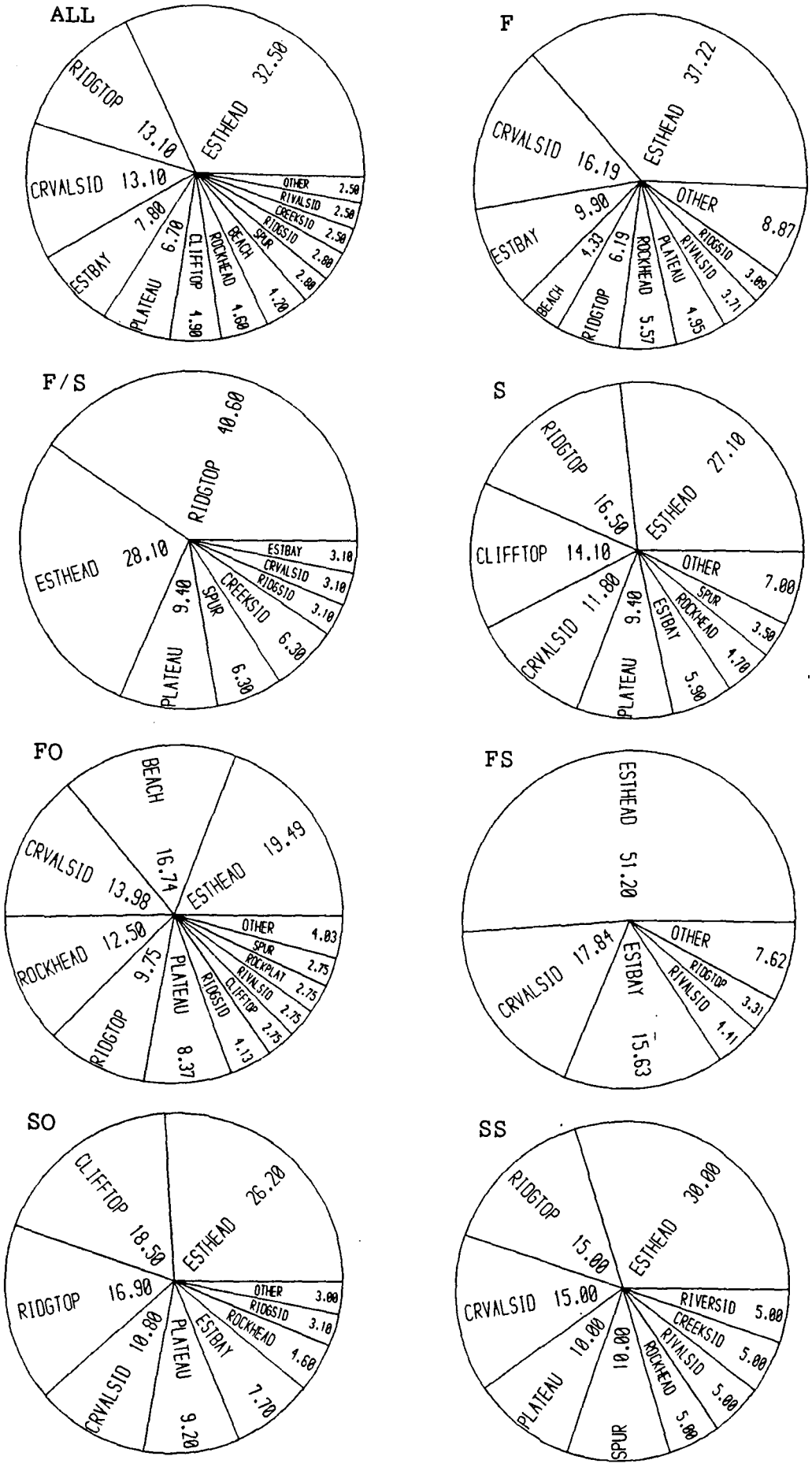


Figure D.14: Aboriginal sites and topography - Royal National Park.

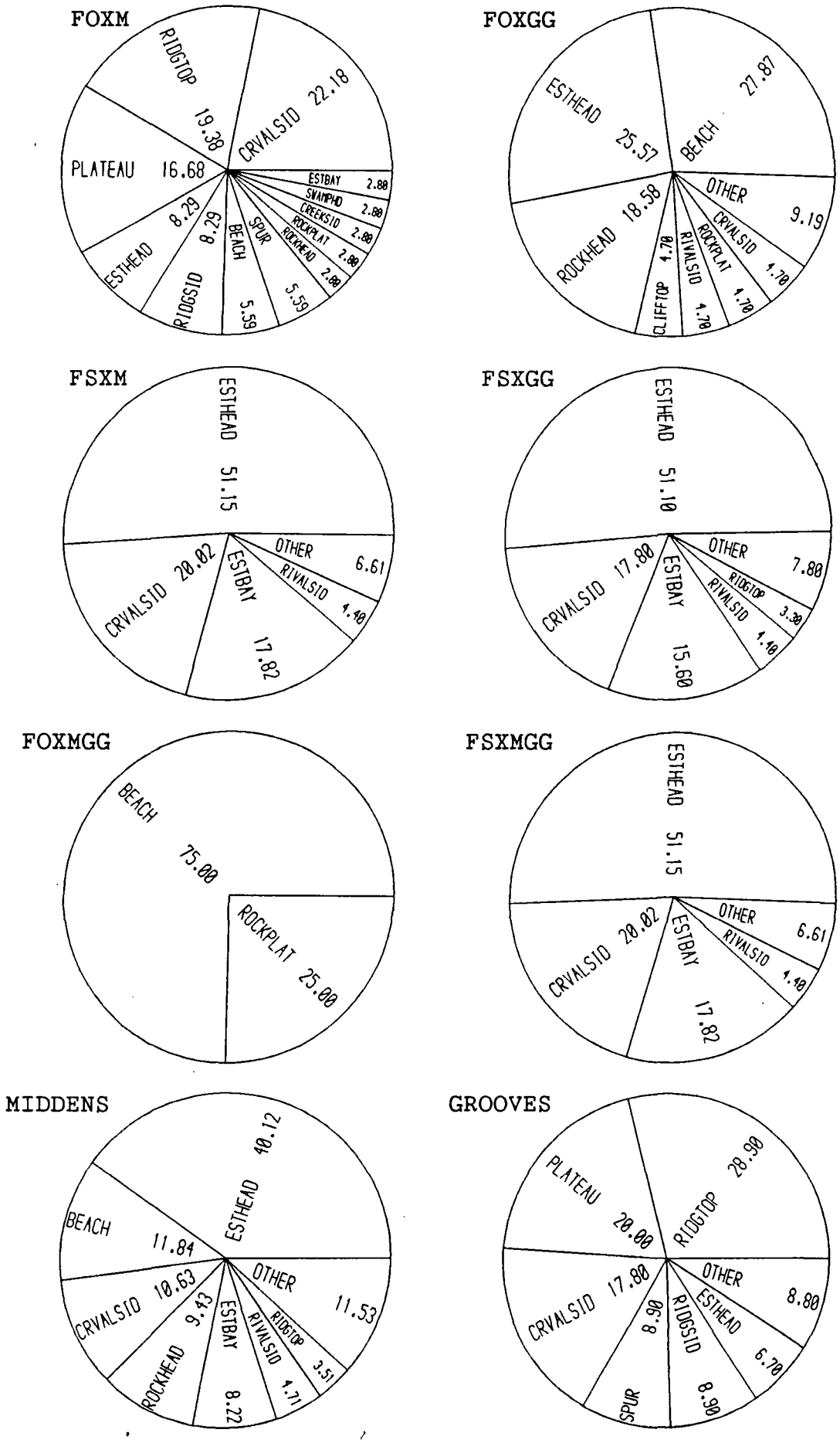


Figure D.14 (cont.): Aboriginal sites and topography - Royal National Park.

Table D.14

Populations	chi-sq	df	sig?
F vs S	33.563	6	Y
F vs F/S	26.347	2	Y
S vs F/S	5.995	2	N
FO vs SO	20.817	5	Y
FS vs SS	1.018	1	N
FO vs FS	44.021	4	Y
SO vs SS	0.394	1	N
FOXM vs FSXM	0.039	1	N
FOXGG vs FSXGG	0.938	1	N
FOXMGG vs FSXMGG	TOO FEW		
FOXM vs SO	5.917	2	Y
FSXM vs SS	TOO FEW		
FOXGG vs SO	5.917	2	Y
FSXGG vs SS	TOO FEW		
FOXMGG vs SO	TOO FEW		
FSXMGG vs SS	TOO FEW		

Interpretational notes

Within this sub-region all the site populations possess a strong marine and estuarine landform component (with the exception of the grinding groove sub-population). FO sites have a clear tendency to be the most closely related to landforms of the coast and estuary, and particularly to beaches and estuarine headlands (SO sites are principally associated with headlands, ridge tops and cliff tops). However, there is no evidence of a comparable pattern in the relationship between FS and SS sites.

D-1.3 Height above sea-level

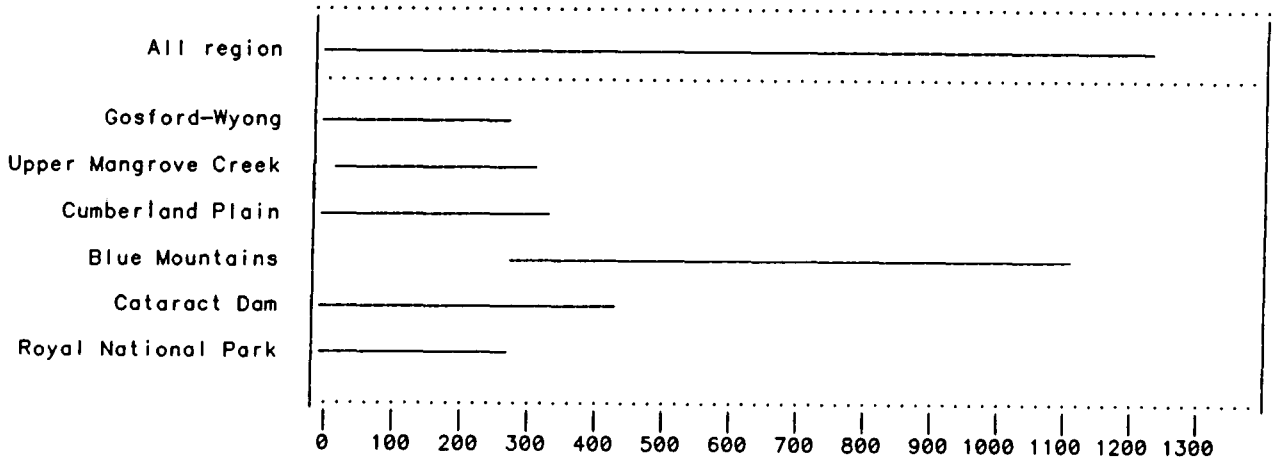
The topographic range within the Sydney region lies between sea-level and 3500m (among the peaks of the Blue Mountains in the south-west corner of the area).

Figure D.15 illustrates the distribution for the region as a whole and for the six sub-regions (note that the inter-quartile range, the median and the 10% and 90% levels are marked), the total range of Aboriginal site data within the region is from sea-level to 1220m, eschewing the high peaks of the Blue Mountains. Table D.15 presents a statistical assessment

Key: The percentage levels marked on graphs of metrical data.

Key	
△	10%
□	25%
✧	50%
○	75%
⧖	90%

a)



b)

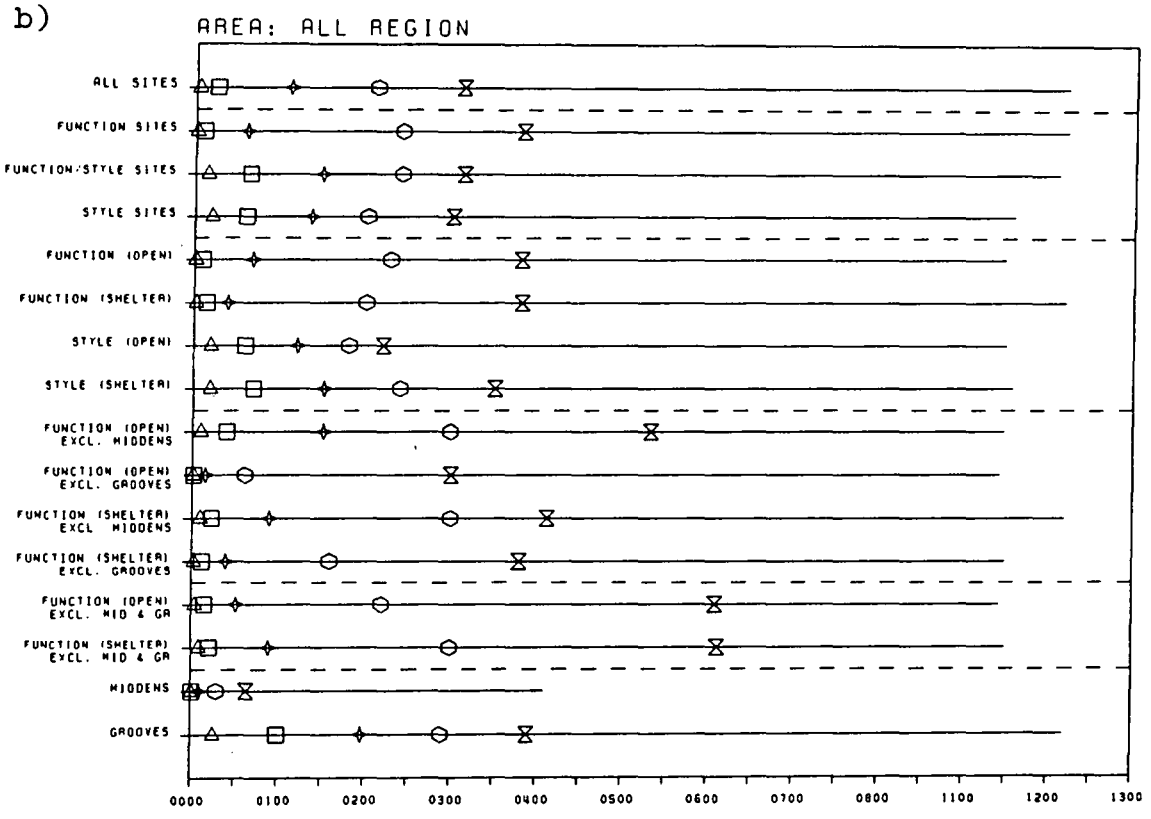


Figure D.15: Aboriginal sites and height above sea level (m).
a) range of data in the region and sub-region
b - h) the distributional characteristics in the region and sub-regions.

of the relationships between Function and Style for the region as a whole.

Table D.15

Populations	Mann-W 'U'	Att sig	sig?
F vs S	1712000.0	.0000	Y
F vs F/S	439820.0	.0000	Y
S vs F/S	499500.0	.0176	N
FO vs SO	798060.0	.0000	Y
FS vs SS	166860.0	.0000	Y
FO vs FS	462080.0	.3049	N
SO vs SS	385020.0	.0000	Y
FOXM vs FSXM	182260.0	.0452	N
FOXGG vs FSXGG	179890.0	.0000	Y
FOXMGG vs FSXMGG	592040.0	.0022	N
FOXM vs SO	534120.0	.0000	Y
FSXM vs SS	133130.0	.0167	N
FOXGG vs SO	243960.0	.0000	Y
FSXGG vs SS	155390.0	.0000	Y
FOXMGG vs SO	203940.0	.0000	Y
FSXMGG vs SS	121650.0	.0054	Y

Interpretational notes

It is clear that all site types tend towards the lower end of the range and no Aboriginal sites are to be found at the highest points in the Blue Mountains. Function sites have a clear and consistent tendency to be located at lower altitudes than their Style counterparts, though FS sites reveal this tendency to a lesser extent than FO sites, presumably as an expression of the fundamental geological and topographic limitations which are characteristic of this group.

The importance of separating grinding grooves and middens from the analysis, in order to establish the fundamental characteristics of the population, is emphasized by the shift caused by the presence of either: middens are low-lying sites and tend to influence the whole Function population in one direction; while grinding grooves are features of high ground and tend to influence the Function population in the other direction. Note, however, that when both are removed from the analysis Function sites are still lower than their Style counterparts. Note also that the intermediate status of F/S sites is confirmed for this variable, there being less difference between Style and F/S than between Function and F/S sites.

SUB-REGIONAL VARIATION

1. Gosford-Wyong

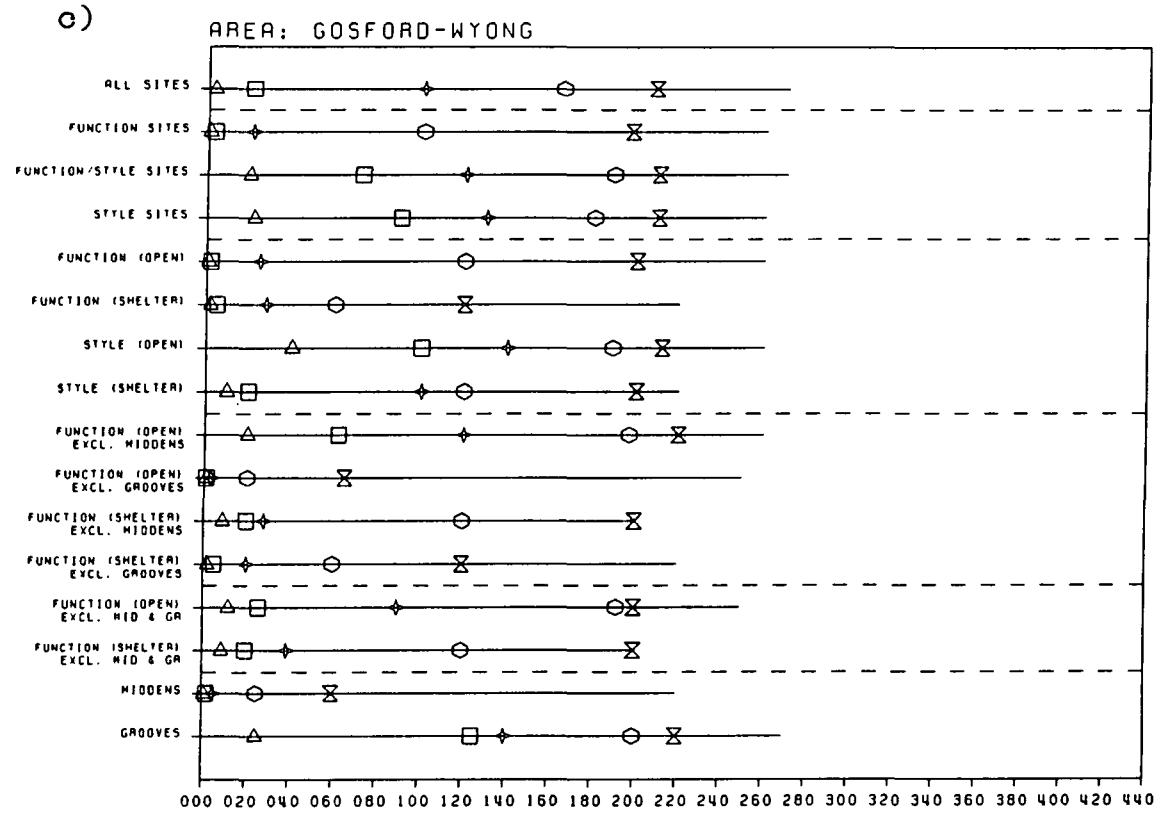
The range in height within this sub-region is approximately from sea-level at the estuarine fringe to 280 metres at the plateau top: Aboriginal sites are found throughout this range. A statistical assessment of the relationships between Function and Style sites with regard to this variable is presented in Table D.16.

Table D.16

Populations	Mann-W 'U'	Att sig	sig?
F vs S	51024.0	.0000	Y
F vs F/S	16310.0	.0000	Y
S vs F/S	38477.0	.2577	N
FO vs SO	32441.0	.0000	Y
FS vs SS	2692.0	.0000	Y
FO vs FS	17983.0	.3058	N
SO vs SS	10724.0	.0000	Y
FOXM vs FSXM	1435.5	.0002	Y
FOXGG vs FSXGG	6127.0	.0000	Y
FOXMGG vs FSXMGG	117.5	.1714	N
FOXM vs SO	29643.0	.0668	N
FSXM vs SS	1056.0	.1047	N
FOXGG vs SO	4499.0	.0000	Y
FSXGG vs SS	2674.0	.0000	Y
FOXMGG vs SO	1701.5	.1637	N
FSXMGG vs SS	1038.0	.1284	N

Interpretational notes

The relationships observed between Function and Style sites within this sub-region are broadly consistent with those observed for the region as a whole. Although all sites tend towards the lower end of the actual range, Function sites are consistently lower than Style sites. Middens clearly contribute a great deal to this significant difference - for when they, and grinding grooves, are removed from the analysis the differences are no longer significant.



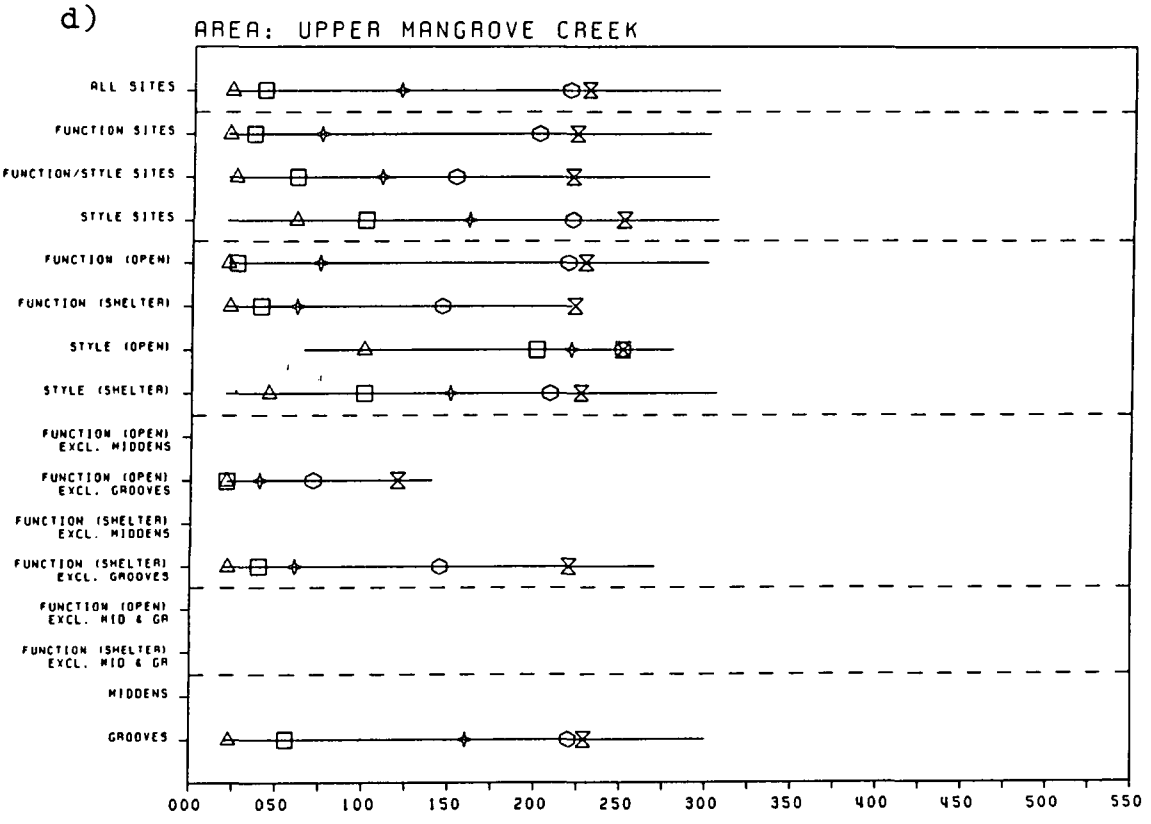


Figure D.15 (cont.) : Aboriginal sites and height above sea-level (m).

2. Upper Mangrove Creek

The range in height within this sub-region is approximately from 25m at the bottom of the valleys to 300m upon the ridge tops: Aboriginal sites are found throughout this range. A statistical assessment of the relationships between Function and Style with regard to this variable is presented in Table D.17.

Table D.17

Populations	Mann-W 'U'	Att sig	sig?
F vs S	1423.0	.0000	Y
F vs F/S	1025.0	.4496	N
S vs F/S	426.0	.0112	Y
FO vs SO	211.0	.0000	Y
FS vs SS	360.0	.0183	Y
FO vs FS	931.0	.9139	N
SO vs SS	163.0	.0029	Y
FOXGG vs FSXGG	254.5	.0281	Y
FOXGG vs SO	17.0	.0000	Y
FSXGG vs SS	330.0	.0096	Y

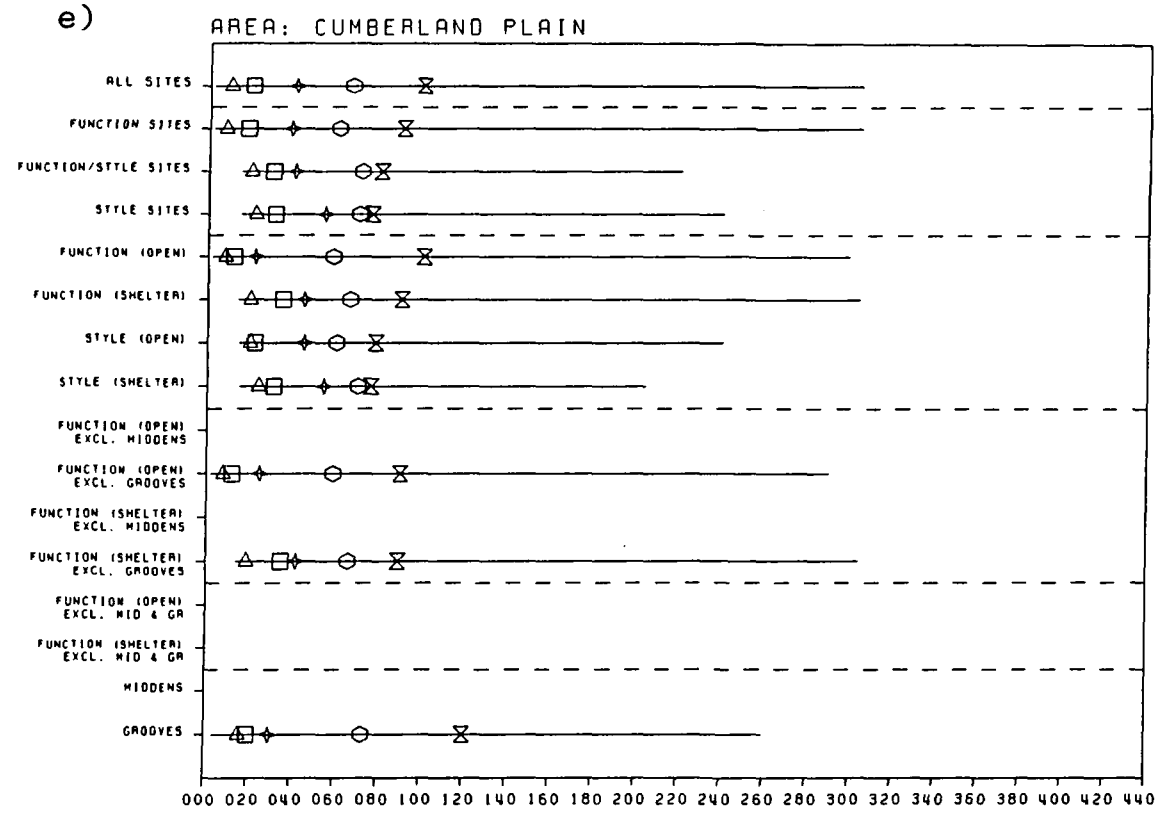
Interpretational notes

The Function components within this region have a tendency to occur at approximately the same altitudes as each other, a characteristic which their Style counterparts do not share. The pattern of relationships between Function and Style is wholly consistent with the pattern observed for the region as a whole - both FO and FS are consistently lower than SO or SS sites.

3. The Cumberland Plain

The range in height within this sub-region (as might be expected) is small - approximately between 0-300 metres.

The gently undulating plain itself, ranges from 0m to 120m - heights greater than this are recorded only from the slopes of the sandstone plateaux at the periphery of the plain. A statistical assessment of the relationships between Function and Style sites is presented in Table D.18.



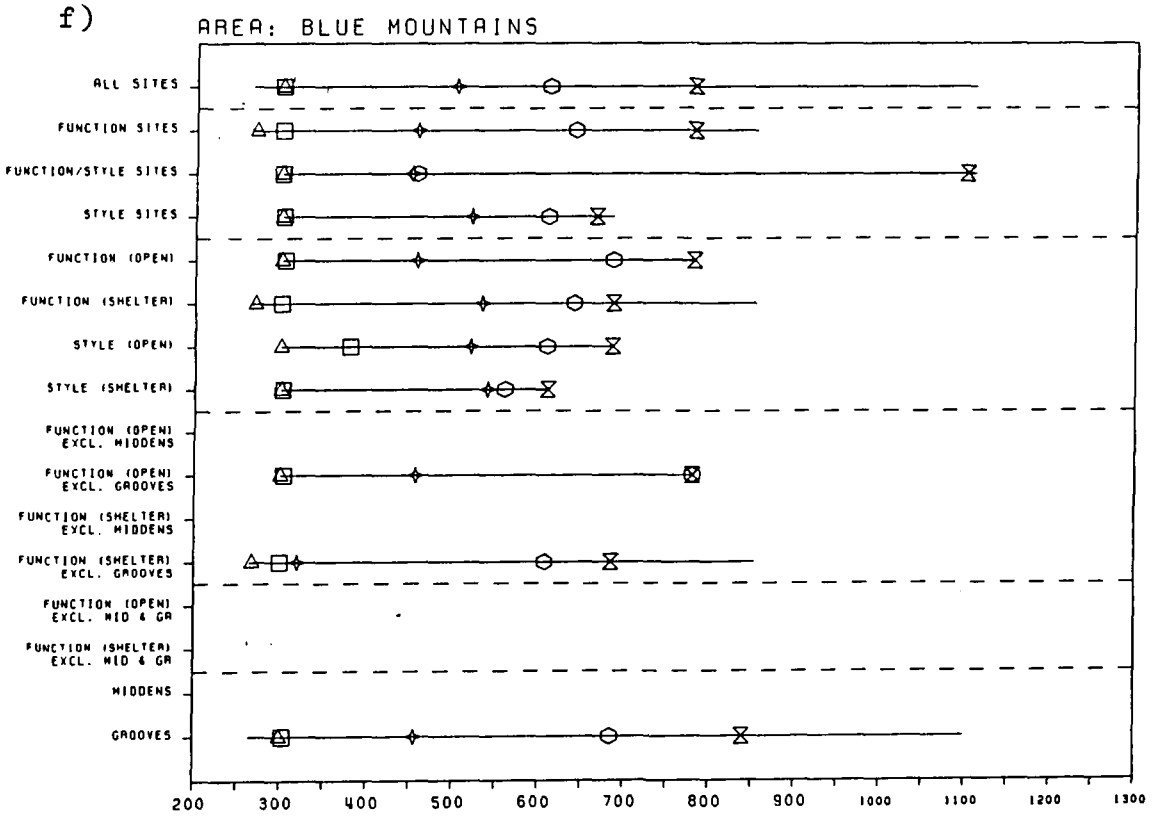


Figure D.15 (cont.) : Aboriginal sites and height above sea-level (m).

Table D.18

Populations	Mann-W 'U'	Att sig	sig?
F vs S	3162.0	.0030	Y
F vs F/S	1763.5	.0462	Y
S vs F/S	582.0	.9481	N
FO vs SO	541.0	.1068	N
FS vs SS	807.5	.6092	N
FO vs FS	2234.5	.0007	Y
SO vs SS	171.5	.5048	N
FOXGG vs FSXGG	1575.0	.0030	Y
FOXGG vs SO	452.5	.1194	N
FSXGG vs SS	675.5	.6431	N

Interpretational notes

Owing to the nature of the Cumberland Plain, a low degree of significant variation with regard to height might reasonably be expected. This is clearly the case, for there appears to be no significant difference between the Function populations and their Style counterparts.

However it remains clear that all sites tend to be at the lower end of the possible range. The statistically significant difference between FO and FS sites represents a vindication of the internal division imposed upon the fundamental dichotomy, for it is a reflection of the spatial differentiation of the two site groups, between (on the one hand) the open sites upon the plain and (on the other) the shelter sites tied to its periphery.

4. Blue Mountains.

Height in the Blue Mountains sub-region ranges from c.300 in the valleys to 1300m on the plateau top. Evidence for Aboriginal activity is confined to altitudes between 300 and 1100m - the highest peaks and plateaux of the area are bereft of sites. A statistical assessment of the relationships between Function and Style sites is presented in Table D.19 below.

Table D.19

Populations	Mann-W 'U'	Att sig	sig?
F vs S	314.0	.0000	Y
F vs F/S	TOO FEW		
S vs F/S	TOO FEW		
FO vs SO	TOO FEW		
FS vs SS	TOO FEW		
FO vs FS	140.0	.7536	N
SO vs SS	TOO FEW		
FOXGG vs FSXGG	78.5	.3428	N
FOXGG vs SO	TOO FEW		
FSXGG vs SS	TOO FEW		

Interpretational notes

Although there are often too few sites to make a valid statistical test between sub-populations, all sites appear to possess a tendency towards the lower end of the range.

Despite the absence of statistical inference, there appears to be a difference between Function and Style sites, within which the Function sites tend to be lower. Note that the presence of grinding grooves appears to have the characteristic of raising the height of the Function population - when they are removed from the analysis FS sites can be seen to be lower than SS sites.

5. Cataract Dam.

The range in height within the Cataract Dam sub-region is from sea level to 425m at the highest point on the Woronora Plateau. However, the range of Aboriginal activity is limited to 100-425m - there being no evidence for sites upon the steep scarp slope from the plateau to the sea. A statistical assessment of the relationship between Function and Style populations is presented in Table D.20.

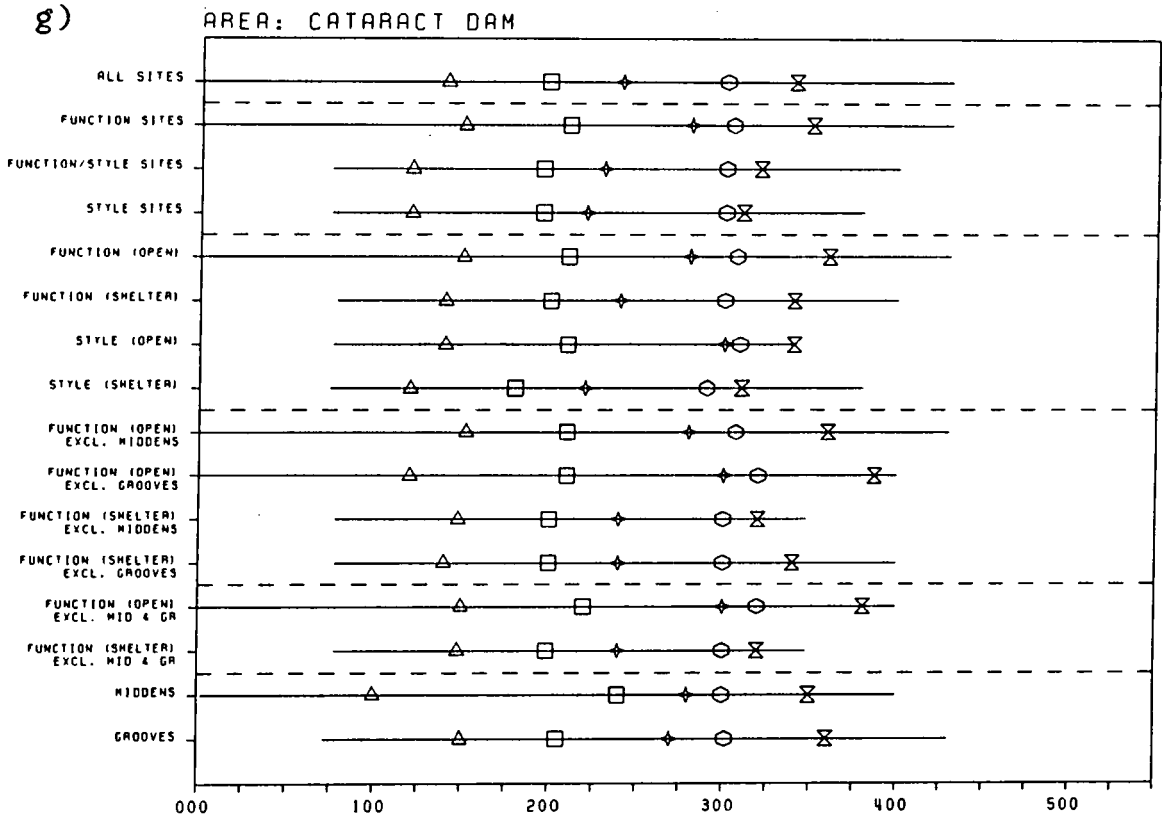
Table D.20

Populations	Mann-W 'U'	Att sig	sig?
F vs S	36666.0	.0000	Y
F vs F/S	16296.0	.0045	Y
S vs F/S	14288.0	.3964	N
FO vs SO	2657.0	.8718	N
FS vs SS	7288.0	.0646	N
FO vs FS	8124.0	.0348	Y
SO vs SS	1653.0	.0257	Y
FOXM vs FSXM	6007.5	.0214	Y
FOXGG vs FSXGG	959.0	.0285	Y
FOXMGG vs FSXMGG	649.5	.0129	Y
FOXM vs SO	2639.0	.8930	N
FSXM vs SS	5902.0	.1971	N
FOXGG vs SO	331.5	.5176	N
FSXGG vs SS	7122.0	.0795	N
FOXMGG vs SO	302.5	.3957	N
FSXMGG vs SS	5736.0	.2421	N

Interpretational notes

The majority of all site types are clearly to be found close to the modal height of the plateau - c.250m. The steep scarp slope (100m - sea-level) which falls straight to the sea is devoid of evidence for Aboriginal activity (this situation is, of course, as likely to be due to taphonomic factors as to actual avoidance, though equally steep slopes elsewhere are known to have been utilized. In addition, it is notable that middens within the sub-region are characteristically found at the top of the scarp slope).

The grouping around the modal height of the plateau top, explains the lack of consistent difference between F and S sites - FS sites are not significantly different from SS sites nor FO sites from SO - though there does appear to be a slight tendency for FS sites to be located at slightly higher altitudes than FO sites, which is consistent with the division of these two site populations on the grounds that FS sites are tied to a smaller range of geological and topographic features.



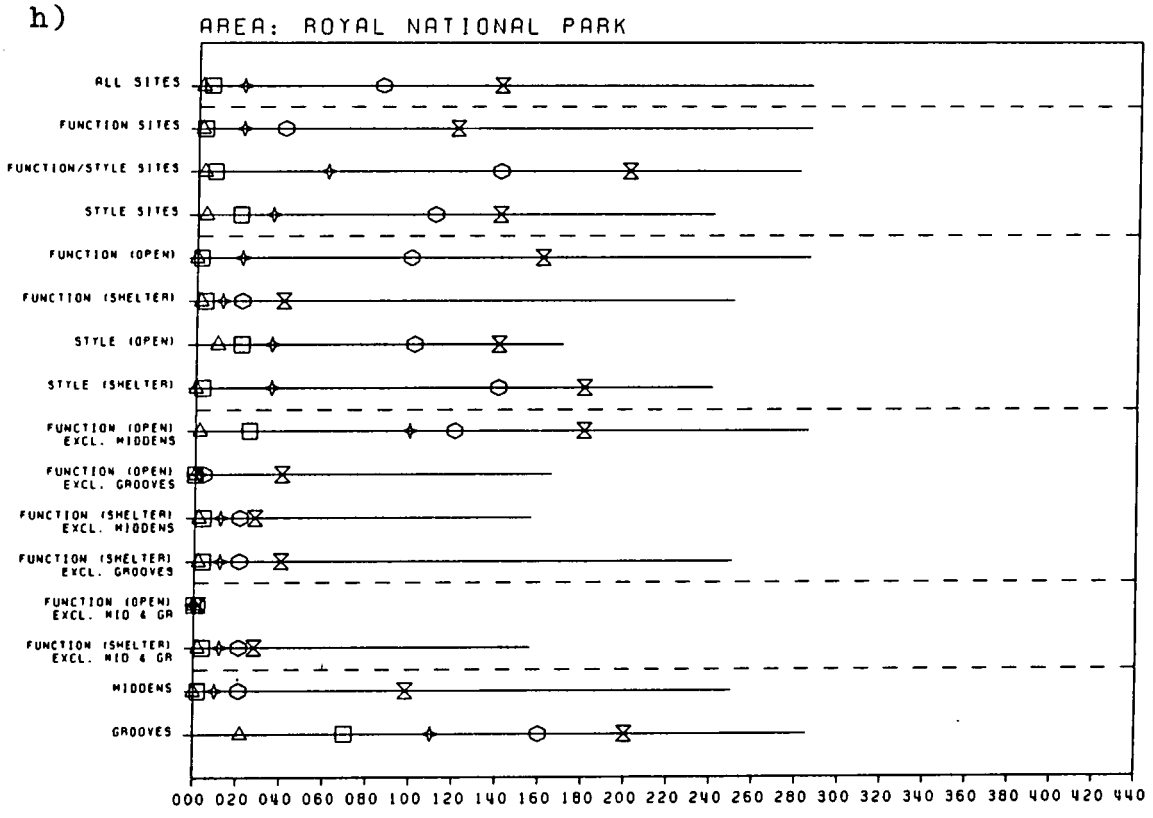


Figure D.15 (cont.) : Aboriginal sites and height above sea-level (m).

6. Royal National Park.

The range in height within this sub-region lies between sea-level upon the coastal beaches (sea-cliffs, the other major component of the coastal morphology, are in some places 60m high) to 280m upon ridge tops: Aboriginal sites are found throughout this range. The relationship between Function and Style with regard to this variable is presented in Table D.21.

Table D.21

Populations	Mann-W 'U'	Att sig	sig?
F vs S	4512.0	.0000	Y
F vs F/S	1762.0	.0026	Y
S vs F/S	1289.0	.6638	N
FO vs SO	1885.5	.0155	Y
FS vs SS	632.0	.0373	Y
FO vs FS	3115.0	.3222	N
SO vs SS	644.5	.9545	N
FOXM vs FSXM	267.5	.0000	Y
FOXGG vs FSXGG	1126.5	.0001	Y
FOXMGG vs FSXMGG	no diff		N
FOXM vs SO	863.0	.0292	Y
FSXM vs SS	289.0	.0218	Y
FOXGG vs SO	410.0	.0000	Y
FSXGG vs SS	632.0	.0373	Y
FOXMGG vs SO	TOO FEW		
FSXMGG vs SS	289.0	.0218	Y

Interpretational notes

Though all sites tend towards the lower end of the range, it is clear that Function sites are consistently lower than Style sites. In general, FO sites also tend to be lower than FS (a reflection of the tying of this latter group to particular geological and topographic associations) to the extent that FO sites without grooves or middens (though admittedly these are few) are at or near sea-level. The influence of both middens (tending to lower the distribution) and grinding grooves (tending to raise it) is again present.

D-2 AQUATIC STRUCTURE

The aquatic structure variables assessed below are: distance to an estuary; distance to the coast; distance to wetland; and distance to freshwater.

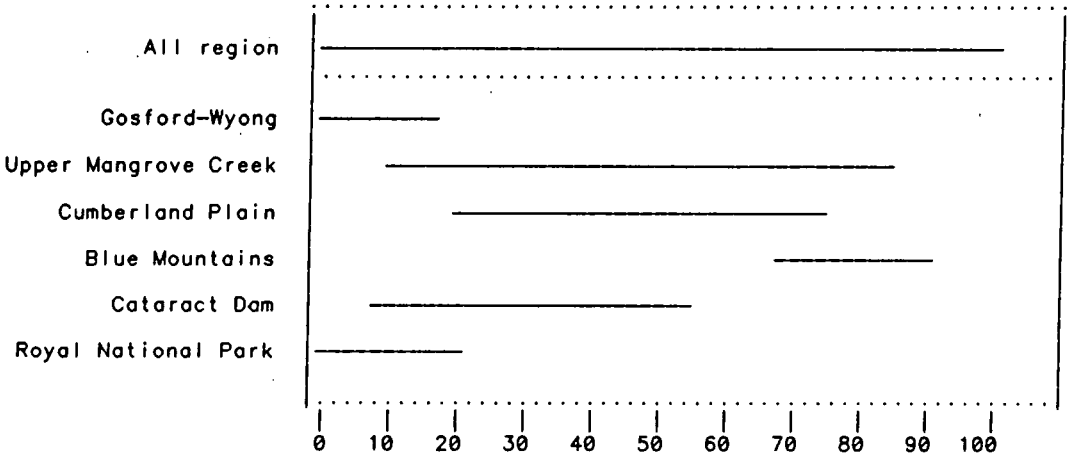
D-2.1 Distance to estuary

The data concerning the distance to estuaries of Function and Style sites in the region as a whole and for the sub-regions are presented in Figure D.16, while the statistical assessment of the relationship between Function and Style for the whole of the region is presented in Table D.22, together with an assessment of the significance of the results at the 0.01 level.

Table D.22

Populations	Mann-W 'U'	Att sig	sig?
F vs S	2071000.0	.0591	N
F vs F/S	545810.0	.0639	N
S vs F/S	479440.0	.0000	Y
FO vs SO	672890.0	.0000	Y
FS vs SS	182720.0	.0000	Y
FO vs FS	415590.0	.0000	Y
SO vs SS	236670.0	.0000	Y
FOXM vs FSXM	191980.0	.5386	N
FOXGG vs FSXGG	248170.0	.5958	N
FOXMGG vs FSXMGG	60934.0	.0117	N
FOXM vs SO	294840.0	.0000	Y
FSXM vs SS	132630.0	.0127	N
FOXGG vs SO	478520.0	.0967	N
FSXGG vs SS	169890.0	.0000	Y
FOXMGG vs SO	100790.0	.0000	Y
FSXMGG vs SS	125310.0	.0386	N

a)



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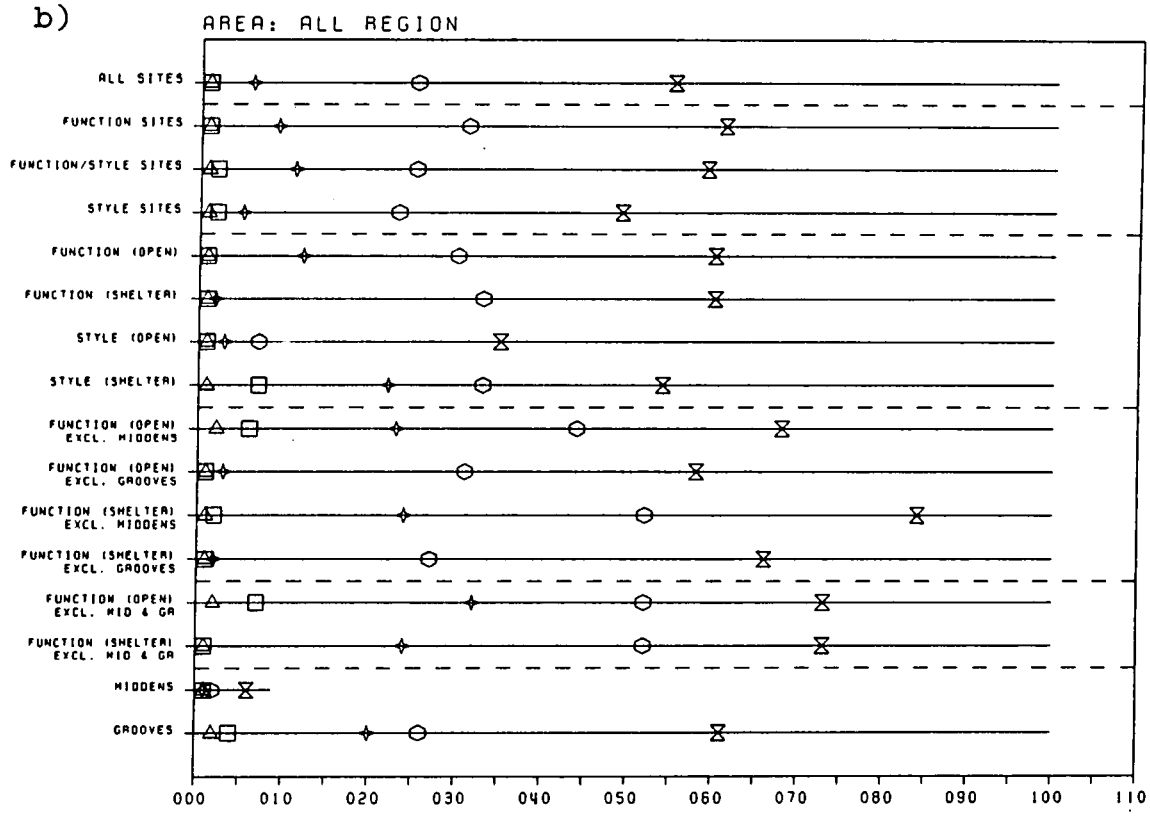


Figure D.16: Aboriginal sites and distance to estuaries (km).
a) range of data in the region and sub-region
b - h) the distributional characteristics in the region and sub-regions.

Interpretational notes

There is a clear tendency for all sites to be close to estuaries. However, there is little tendency for Function sites to be more closely associated than Style sites. FS sites certainly display a tendency to be closer than SS; but SO sites are equally clearly closer than FO sites. When grinding grooves are omitted, however, this latter difference is small. The explanation of this may lie in the general eastward emphasis of Style Open site location in comparison to the wider distribution of Function Open sites, and, particularly, the association of Function Open sites with areas such as the Cumberland Plain whereupon there are few Style Open sites.

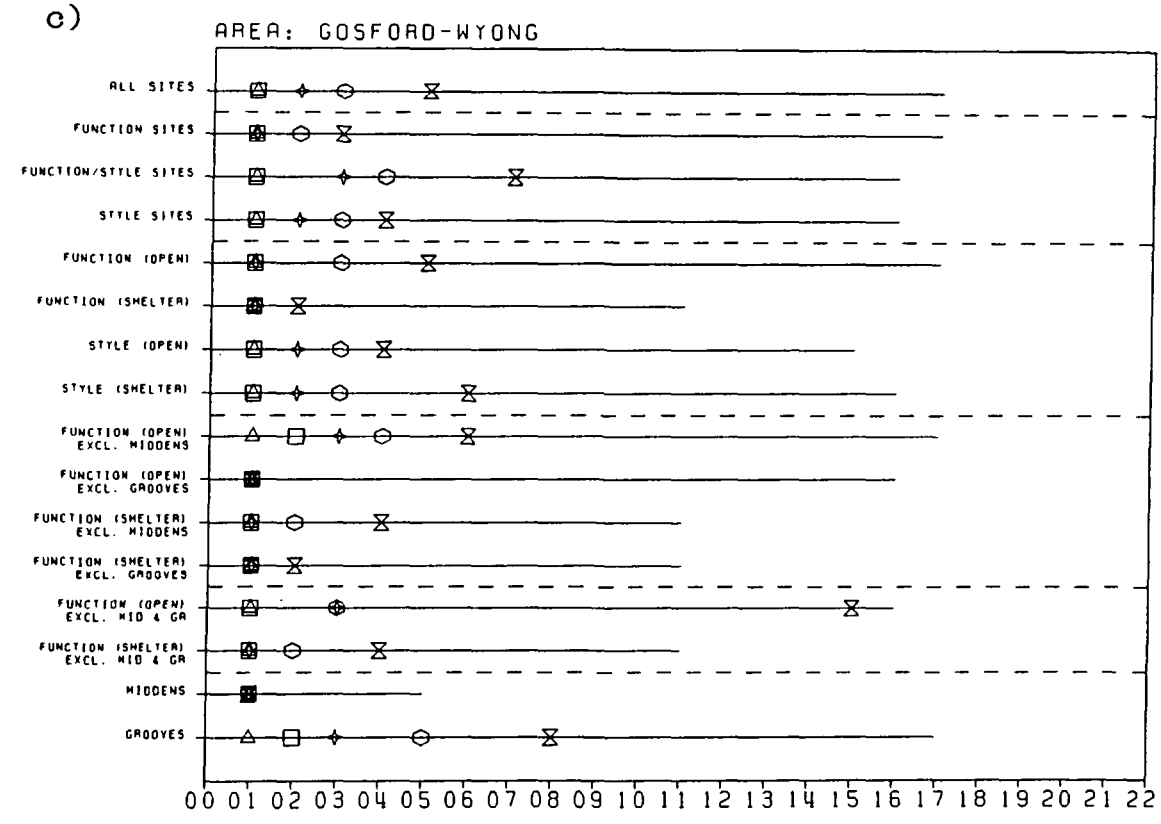
SUB-REGIONAL VARIATION

1. Gosford-Wyong

A statistical assessment of the relationship between Function and Style sites in relation to distance to estuary is presented in Table D.23.

Table D.23

Populations	Mann-W 'U'	Att sig	sig?
F vs S	77229.0	.0000	Y
F vs F/S	19614.0	.0000	Y
S vs F/S	35426.0	.0090	Y
FO vs SO	52015.0	.0000	Y
FS vs SS	2519.0	.0000	Y
FO vs FS	14011.0	.0000	Y
SO vs SS	16977.0	.5895	N
FOXM vs FSXM	1214.0	.0000	Y
FOXGG vs FSXGG	9856.0	.1485	N
FOXMGG vs FSXMGG	113.5	.0384	Y
FOXM vs SO	26521.0	.0002	Y
FSXM vs SS	876.5	.0033	Y
FOXGG vs SO	14887.0	.0000	Y
FSXGG vs SS	2505.0	.0000	Y
FOXMGG vs SO	2276.5	.5734	N
FSXMGG vs SS	862.5	.0047	Y



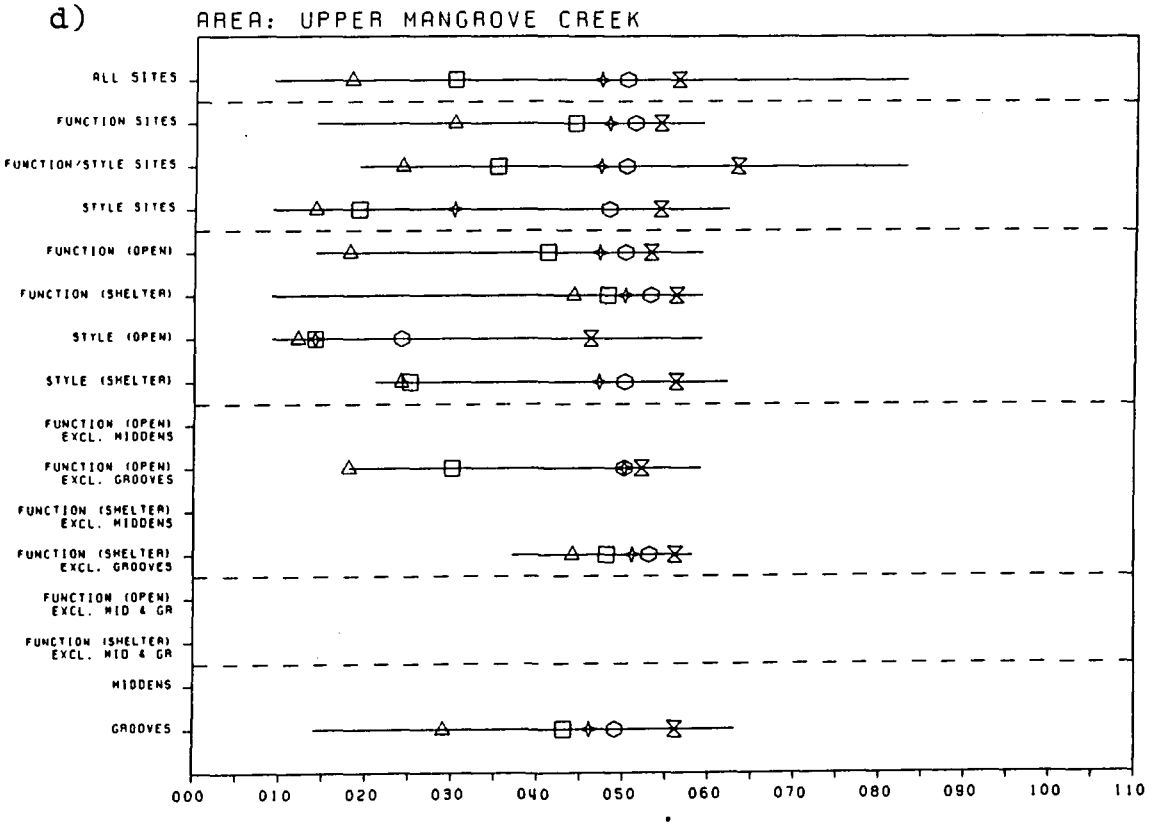


Figure D.16 (cont.) : Aboriginal sites and distance to estuaries (km).

Interpretational notes

All the site populations display a tendency to be located in close proximity to estuarine resources. However, it is clear that both FS and FO sites have a consistent tendency to be closer than their Style counterparts. In the FO population it is clear that middens are the major contributing factor in the relationship, for when both grooves and middens are removed the difference is also removed. Approximately 75% of FS sites and 50% of FO sites are within 1km of the Broken Bay estuary.

2. Upper Mangrove Creek

A statistical assessment of the relationship between Function and Style populations with regard to this variable is presented in Table D.24.

Table D.24

Populations	Mann-W 'U'	Att sig	sig?
F vs S	1465.0	.0001	Y
F vs F/S	1064.0	.6210	N
S vs F/S	430.0	.0126	Y
FO vs SO	120.5	.0000	Y
FS vs SS	321.0	.0041	Y
FO vs FS	533.5	.0006	Y
SO vs SS	64.0	.0000	Y
FOXGG vs FSXGG	239.0	.0139	Y
FOXGG vs SO	58.5	.0000	Y
FSXGG vs SS	313.0	.0049	Y

Interpretational notes

Within this sub-region there is a clear and consistent tendency for Style sites to be located closer to the estuary of the Hawkesbury-Nepean than is true of Function sites. This reversal can be interpreted as indicative of the lack of influence exerted by estuarine resources upon Function sites in this inland sub-region, despite the fact that at its southern border, the sub-region lies only a few kilometres from Broken Bay.

3. Cumberland Plain

A statistical assessment of the relationships between Function and Style populations with regard to this variable is presented in Table D.25.

Table D.25

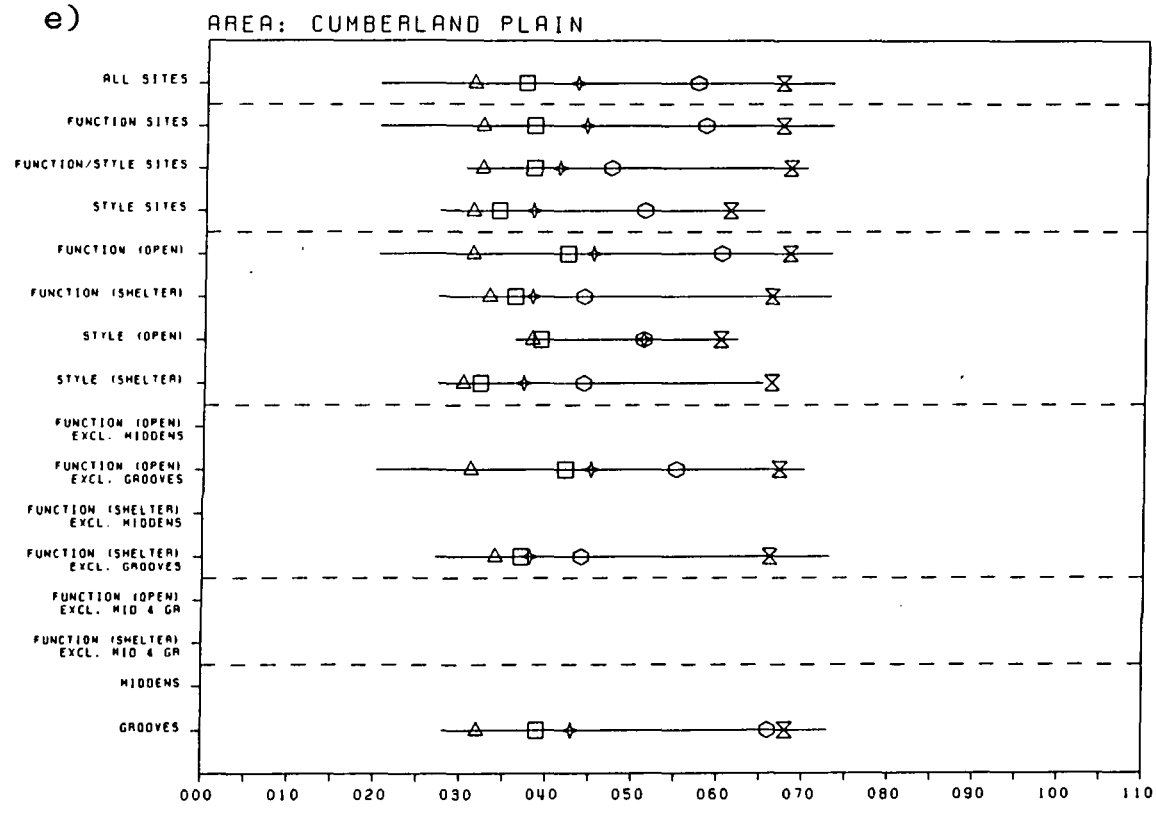
Populations	Mann-W 'U'	Att sig	sig?
F vs S	5228.5	.0049	Y
F vs F/S	2099.5	.4083	N
S vs F/S	460.0	.1311	Y
FO vs SO	716.5	.7290	N
FS vs SS	686.0	.1068	N
FO vs FS	2118.0	.0002	Y
SO vs SS	109.5	.0259	Y
FOXGG vs FSXGG	1569.0	.0028	Y
FOXGG vs SO	626.5	.9586	N
FSXGG vs SS	546.5	.0704	N

Interpretational notes

Within this sub-region there is no clear tendency for either population to display a tendency towards estuarine resources. This suggests that this variable has little influence upon the locational characteristics of the Function population. Such an interpretation is consistent with the inland nature of the sub-region, despite the fact that upon its northern and eastern borders estuarine resources are only a few kilometres away.

4. Blue Mountains

A statistical assessment of the relationships between Function and Style populations with regard to distance to estuarine resources is presented in Table D.26.



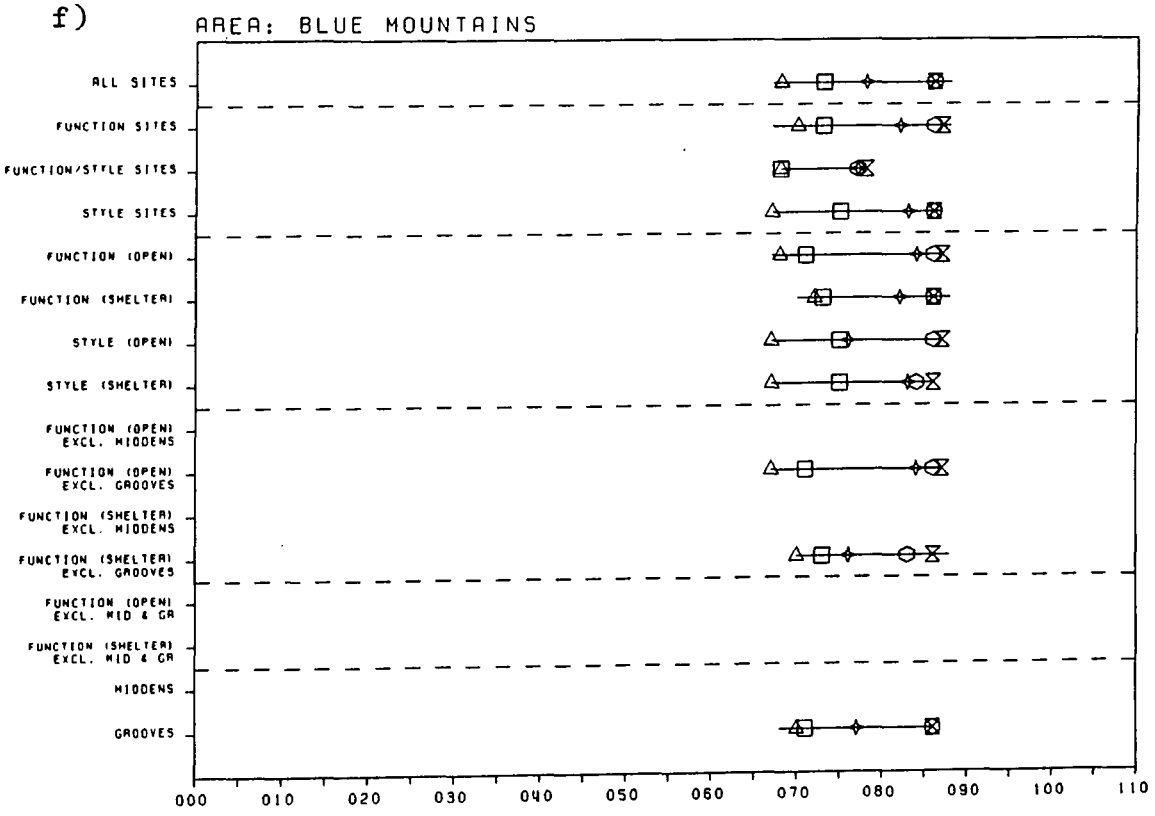


Figure D.16 (cont.) : Aboriginal sites and distance to estuaries (km).

Table D.26

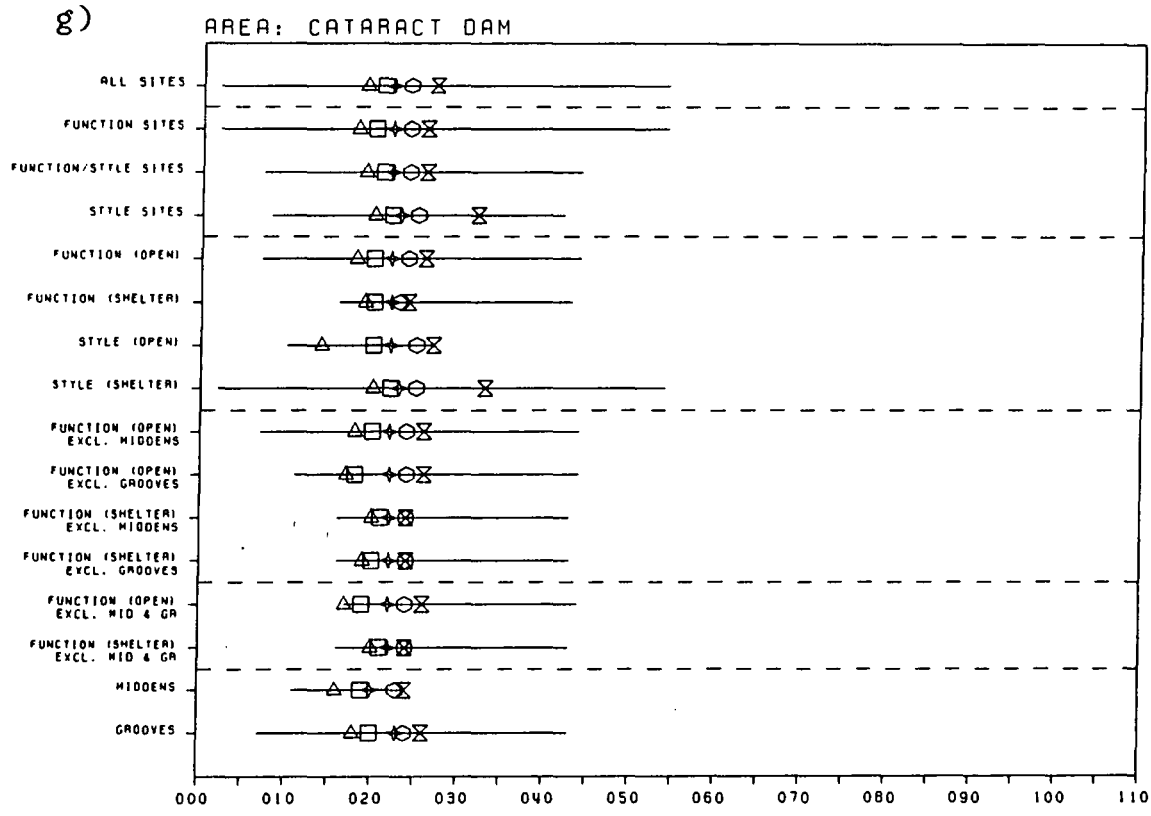
Populations	Mann-W 'U'	Att sig	sig?
F vs S	320.5	.9484	N
F vs F/S	TOO FEW		
S vs F/S	TOO FEW		
FO vs SO	TOO FEW		
FS vs SS	TOO FEW		
FO vs FS	145.5	.8813	N
SO vs SS	TOO FEW		
FOXGG vs FSXGG	86.5	.5507	N
FOXGG vs SO	TOO FEW		
FSXGG vs SS	75.5	.2499	N

Interpretational notes

There is no evidence to suggest that there is any significant difference between F and S sites. This is wholly consistent with the nature of the sub-region, the most easterly boundary of which occurs some 65km from the nearest extensive estuarine resources.

5. Cataract Dam

A statistical assessment of the relationships between Function and Style and this variable is presented in Table D.27.



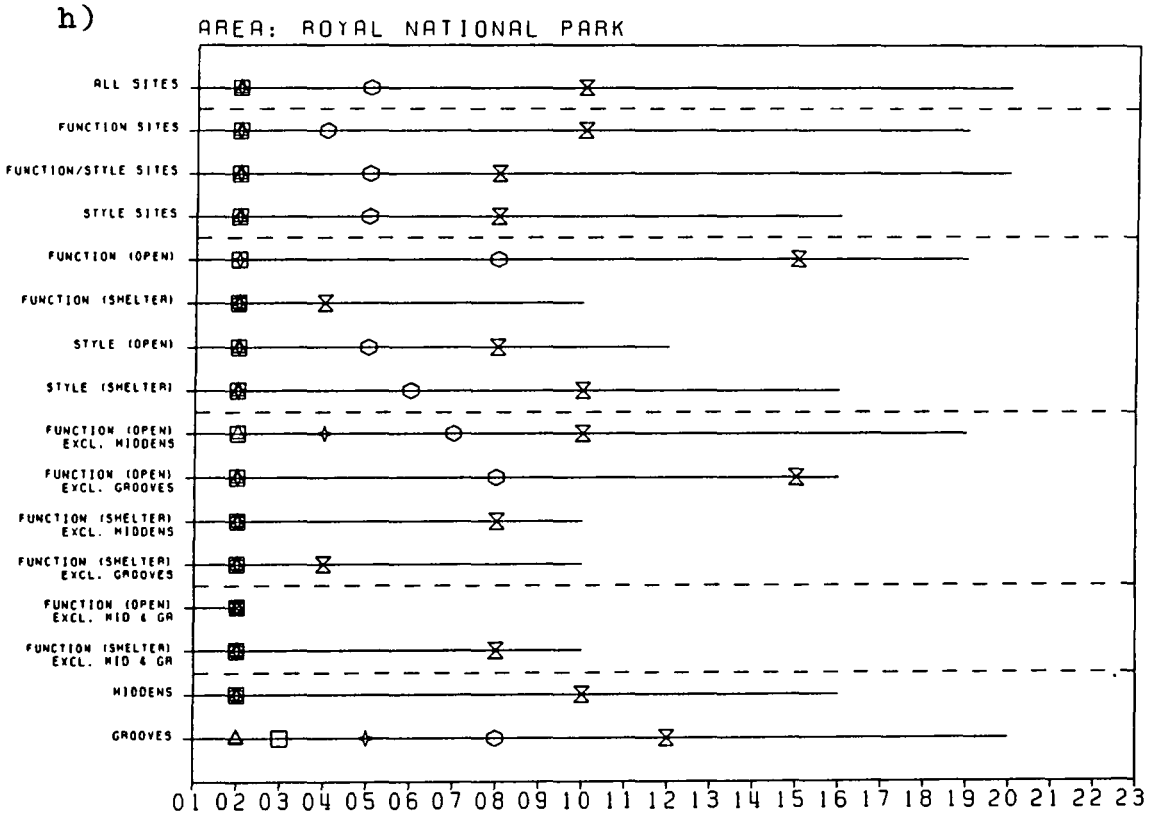


Figure D.16 (cont.) : Aboriginal sites and distance to estuaries (km).

Table D.27

Populations	Mann-W 'U'	Att sig	sig?
F vs S	39422.0	.0002	Y
F vs F/S	19415.0	.7399	N
S vs F/S	12688.0	.0125	Y
FO vs SO	2517.0	.5887	N
FS vs SS	6126.0	.0003	Y
FO vs FS	8776.5	.2082	N
SO vs SS	1773.5	.0602	N
FOXM vs FSXM	7291.5	.7467	N
FOXGG vs FSXGG	1202.0	.5694	N
FOXMGG vs FSXMGG	818.0	.2837	N
FOXM vs SO	2478.5	.5663	N
FSXM vs SS	5229.5	.0135	Y
FOXGG vs SO	352.0	.7581	N
FSXGG vs SS	6000.5	.0005	Y
FOXMGG vs SO	337.5	.8077	N
FSXMGG vs SS	5104.0	.0212	Y

Interpretational notes

There is no particularly marked tendency for sites to be located in close proximity to estuarine resources - the median value tends to be associated with the centre of the range. However, there is a slight but consistent tendency for FS sites to be closer to estuaries than SS. There is no corresponding tendency observable in the FO population.

6. Royal National Park

A statistical assessment of the relationships between Function and Style populations and this variable is presented in Table D.28.

Table D.28

Populations	Mann-W 'U'	Att sig	sig?
F vs S	6036.0	.0258	Y
F vs F/S	2239.0	.0823	N
S vs F/S	1300.5	.6900	N
FO vs SO	2326.0	.5160	N
FS vs SS	653.5	.0037	Y
FO vs FS	2293.5	.0000	Y
SO vs SS	643.5	.9412	N
FOXM vs FSXM	447.0	.0001	Y
FOXGG vs FSXGG	1591.5	.0121	Y
FOXMGG vs FSXMGG	No diff.		N
FOXM vs SO	960.0	.1137	N
FSXM vs SS	338.0	.0310	Y
FOXGG vs SO	1285.0	.4238	N
FSXGG vs SS	653.5	.0037	Y
FOXMGG vs SO	No diff.		N
FSXMGG vs SS	338.0	.0310	Y

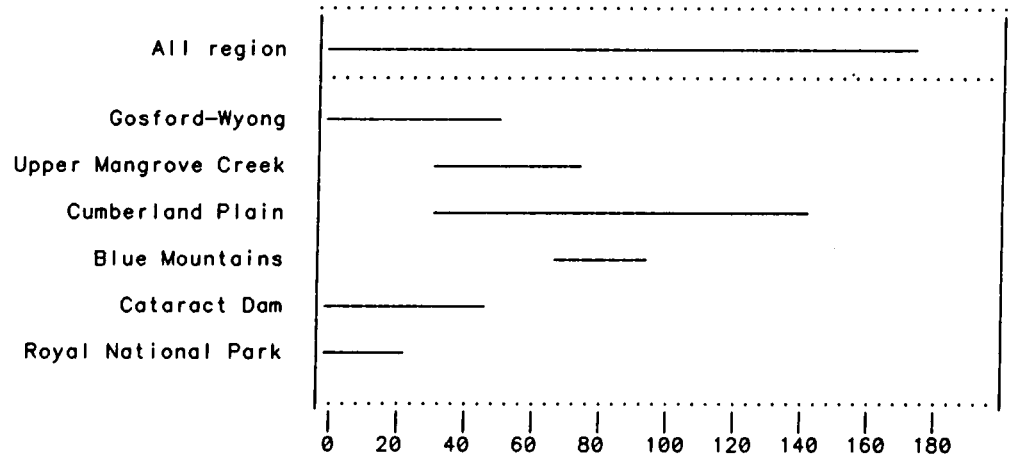
Interpretational notes

Clearly all site populations tend to proximity with regard to estuarine resources. However, it is apparent that FS sites are more closely associated with these than any of the other three sub-populations. Note also that middens, in particular, have a tendency to contribute to this characteristic of Function populations, while grinding grooves tend to influence this population in the opposite direction.

D-2.2 Distance to coastal resources

The data concerning the distances between the various site populations and coastal resources for the region as a whole and for each of the sub-regions are illustrated in Figure D.17; and a statistical assessment of the relationships between Function and Style and coastal resources at a regional level is presented in Table D.29.

a)



b)

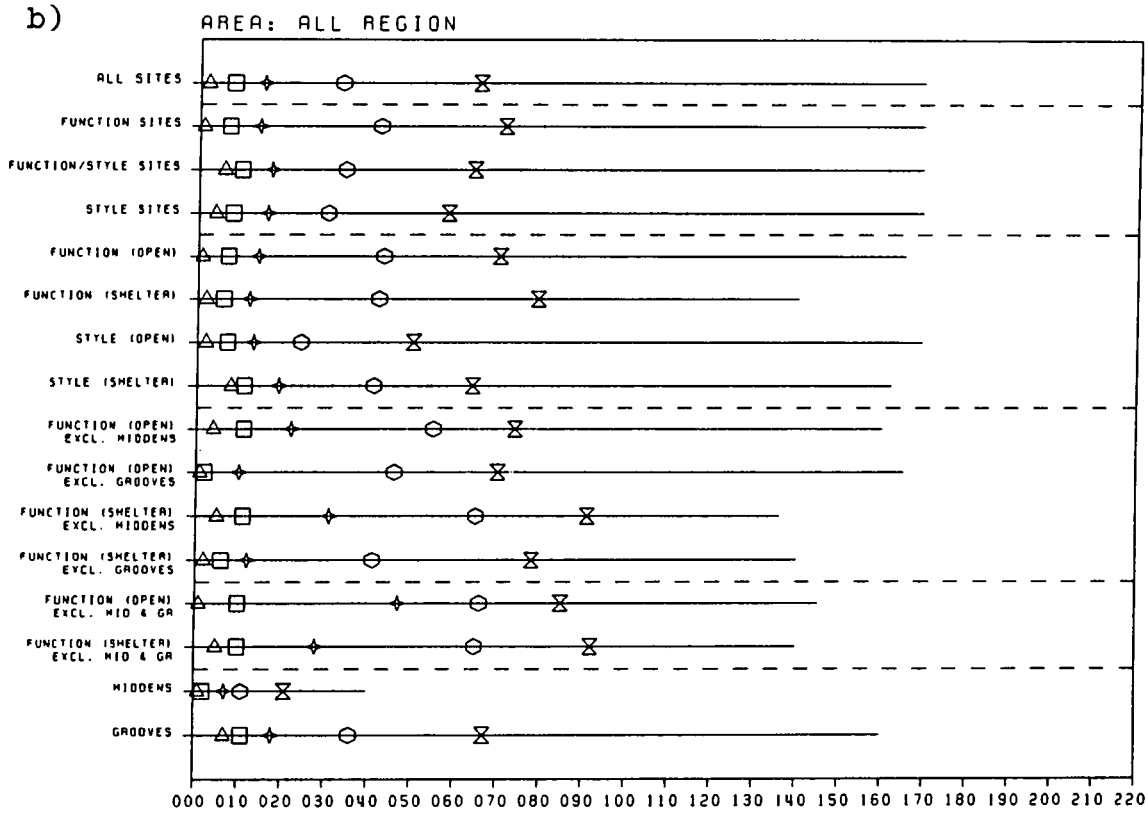


Figure D.17: Aboriginal sites and distance to the coast (km).
a) range of data in the region and sub-region
b - h) the distributional characteristics in the region and sub-regions.

Table D.29

Populations	Mann-W 'U'	Att sig	sig?
F vs S	2082200.0	.1343	N
F vs F/S	512120.0	.0001	Y
S vs F/S	484500.0	.0010	Y
FO vs SO	836360.0	.0000	Y
FS vs SS	205060.0	.0000	Y
FO vs FS	471620.0	.7873	N
SO vs SS	347240.0	.0000	Y
FOXM vs FSXM	178260.0	.0104	Y
FOXGG vs FSXGG	226120.0	.0040	Y
FOXMGG vs FSXMGG	65296.0	.3381	N
FOXM vs SO	461990.0	.0000	Y
FSXM vs SS	124140.0	.0001	Y
FOXGG vs SO	471240.0	.0322	N
FSXGG vs SS	191450.0	.0000	Y
FOXMGG vs SO	153440.0	.0000	Y
FSXMGG vs SS	117620.0	.0004	Y

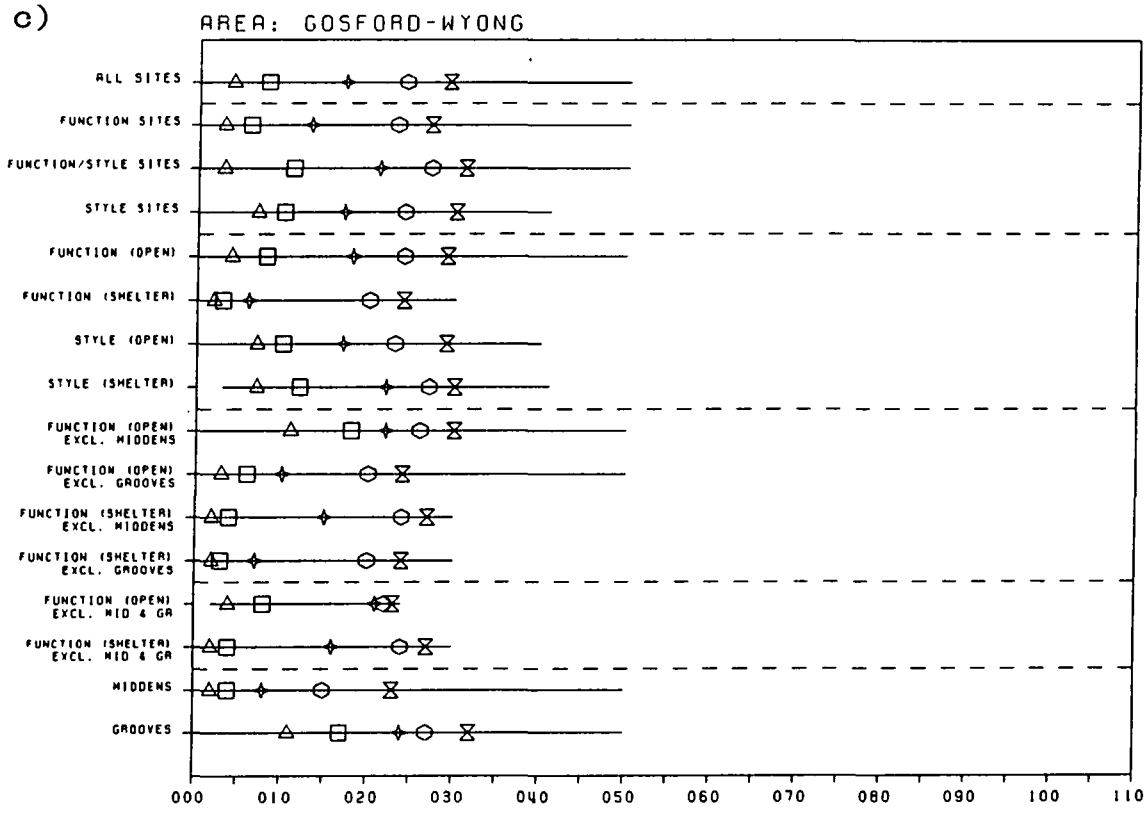
Interpretational notes

There is an obvious tendency for all populations to be located in proximity to the coast. Function Shelter sites have a consistent tendency to be located in closer proximity to coastal resources than Style Shelter sites; but this tendency is apparently reversed in the relationship between FO and SO sites. In the latter case this may be explicable in terms of the occurrence of the former upon inland plains areas where SO sites do not occur in abundance.

SUB-REGIONAL VARIATION

1. Gosford-Wyong

A statistical assessment of the relationship between Function and Style populations and distance to coastal resources is presented in Table D.30.



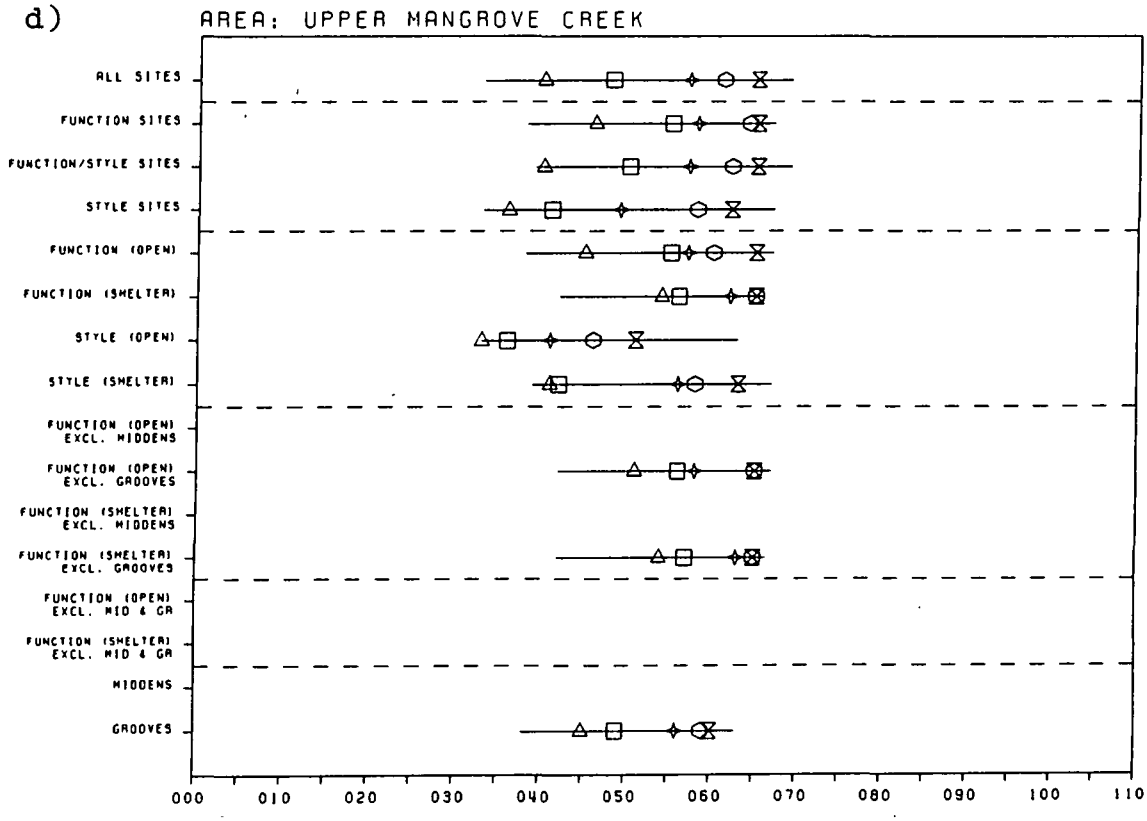


Figure D.17 (cont.) : Aboriginal sites and distance to the coast (km).

Table D.30

Populations	Mann-W 'U'	Att sig	sig?
F vs S	96228.0	.0000	Y
F vs F/S	24607.0	.0000	Y
S vs F/S	35839.0	.0188	Y
FO vs SO	67461.0	.9119	N
FS vs SS	2099.0	.0000	Y
FO vs FS	11707.0	.0000	Y
SO vs SS	132506.0	.0000	Y
FOXM vs FSXM	1586.0	.0012	Y
FOXGG vs FSXGG	8645.5	.0013	Y
FOXMGG vs FSXMGG	177.5	.9135	N
FOXM vs SO	20819.0	.0000	Y
FSXM vs SS	908.5	.0103	Y
FOXGG vs SO	25072.0	.0000	Y
FSXGG vs SS	2096.5	.0000	Y
FOXMGG vs SO	2482.0	.9336	N
FSXMGG vs SS	906.0	.0173	Y

Interpretational notes

Within this sub-region there is a clear tendency for Function sites to be located in closer proximity to coastal resources than is evident among Style sites, although this tendency only becomes apparent in FO sites when grinding grooves are removed from the analysis, and is lost again when middens are also removed. Note that, in general, grinding grooves have an apparent tendency to raise the distance of the Function population, while the very close proximity of middens tends to influence the whole population in the other direction.

2. Upper Mangrove Creek

A statistical assessment of the relationship between Function and Style sites and this variable is presented in Table D.31.

Table D.31

Populations	Mann-W 'U'	Att sig	sig?
F vs S	1217.0	.0000	Y
F vs F/S	952.0	.2109	N
S vs F/S	443.0	.0184	Y
FO vs SO	105.0	.0000	Y
FS vs SS	262.0	.0003	Y
FO vs FS	617.0	.0064	Y
SO vs SS	111.5	.0001	Y
FOXGG vs FSXGG	365.5	.7125	N
FOXGG vs SO	21.0	.0000	Y
FSXGG vs SS	243.0	.0002	Y

Interpretational notes

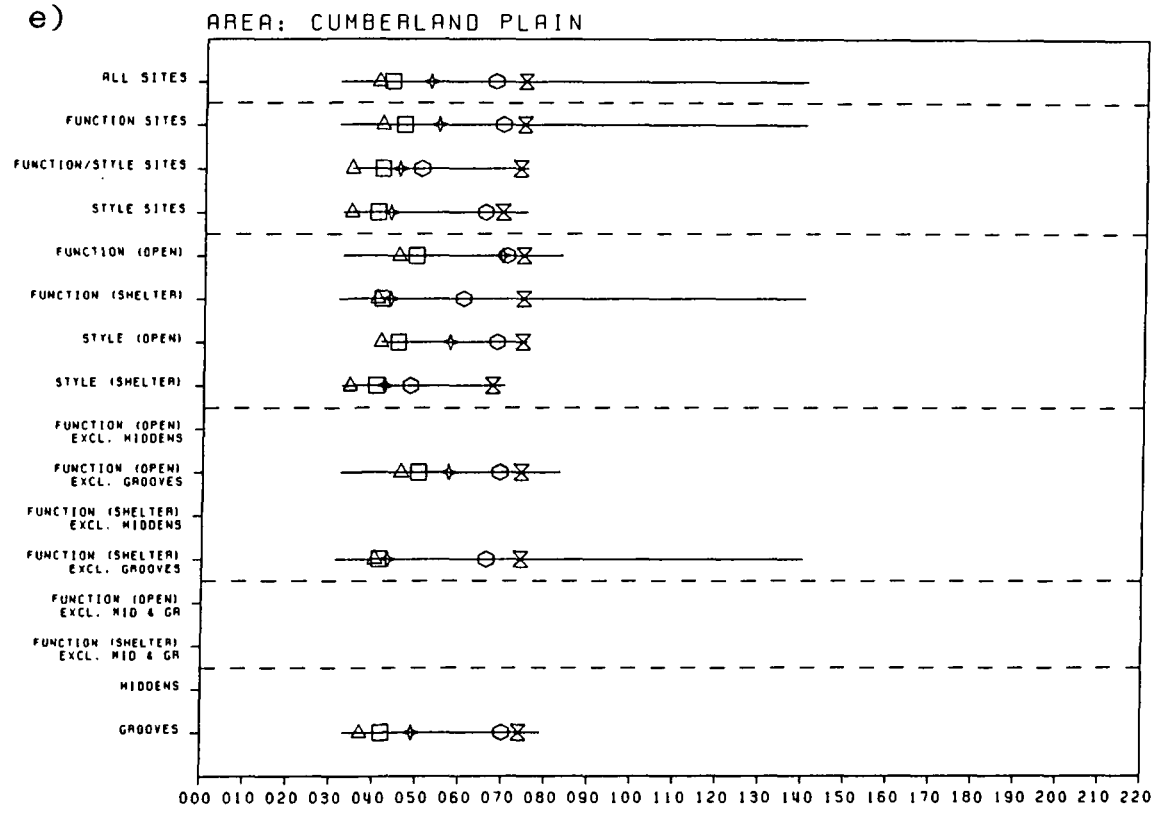
In this sub-region there is a consistently significant pattern between the two main populations, wherein Style sites are closer to the coast than Function sites. This reversal of the expected relationship is probably indicative of the lack of influence exerted upon the location of Function sites by this variable.

3. Cumberland Plain

A statistical assessment of the relationship between Function and Style and distance to coastal resources is presented in Table D.32.

Table D.32

Populations	Mann-W 'U'	Att sig	sig?
F vs S	2795.0	.0001	Y
F vs F/S	1579.0	.0084	Y
S vs F/S	535.5	.5377	N
FO vs SO	660.5	.4530	N
FS vs SS	717.0	.1826	N
FO vs FS	1809.5	.0000	Y
SO vs SS	103.5	.0173	Y
FOXGG vs FSXGG	1302.5	.0000	Y
FOXGG vs SO	546.0	.4543	N
FSXGG vs SS	568.0	.1126	N



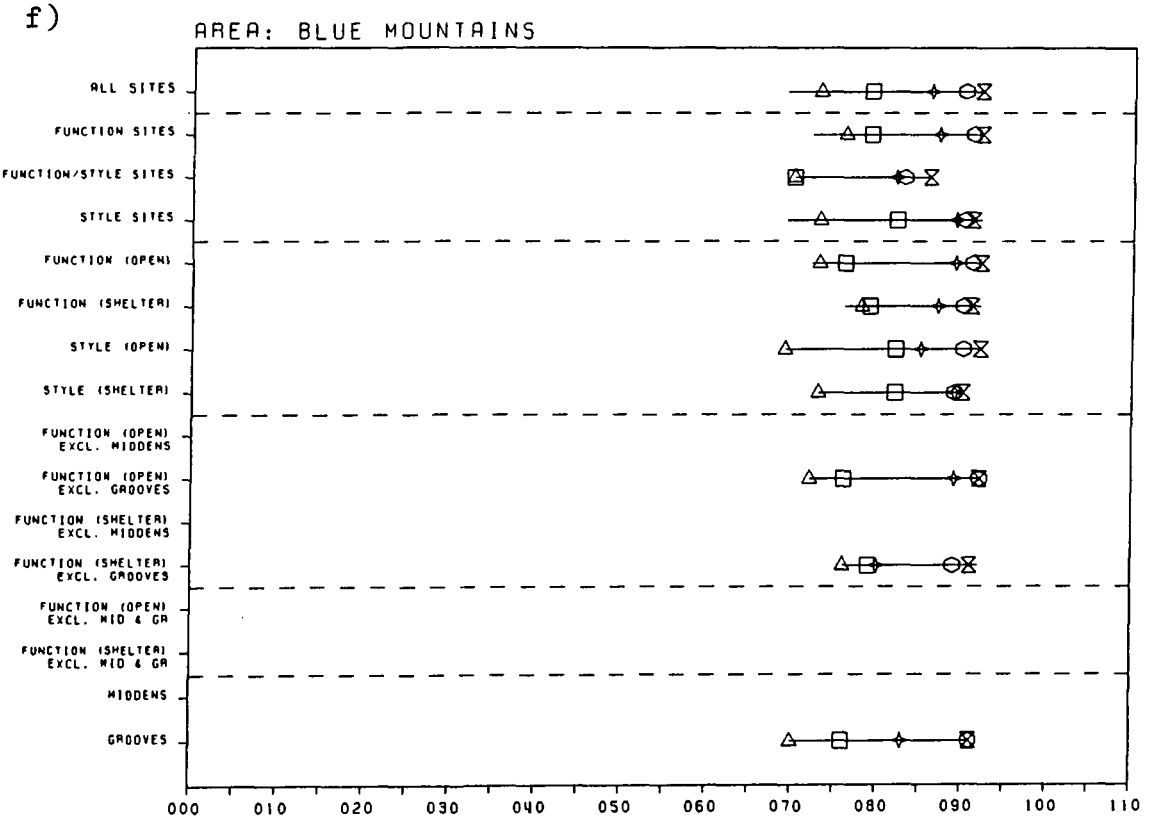


Figure D.17 (cont.) : Aboriginal sites and distance to the coast (km).

Interpretational notes

There is no clear tendency for either population to be located in such a way as to suggest an influential role for this variable. FS sites have a tendency, however, to be located nearer to the coast than FO sites, which clearly reflects the distribution of the latter upon the plain proper, and the peripheral status (and eastward distribution) of the former.

4. Blue Mountains

A statistical assessment of the relationships between Function and Style with regard to this variable is presented in Table D.33.

Table D.33

Populations	Mann-W 'U'	Att sig	sig?
F vs S	318.0	.9118	N
F vs F/S	TOO FEW		
S vs F/S	TOO FEW		
FO vs SO	TOO FEW		
FS vs SS	TOO FEW		
FO vs FS	147.5	.9471	N
SO vs SS	TOO FEW		
FOXGG vs FSXGG	86.0	.5351	N
FOXGG vs SO	TOO FEW		
FSXGG vs SS	76.0	.2499	N

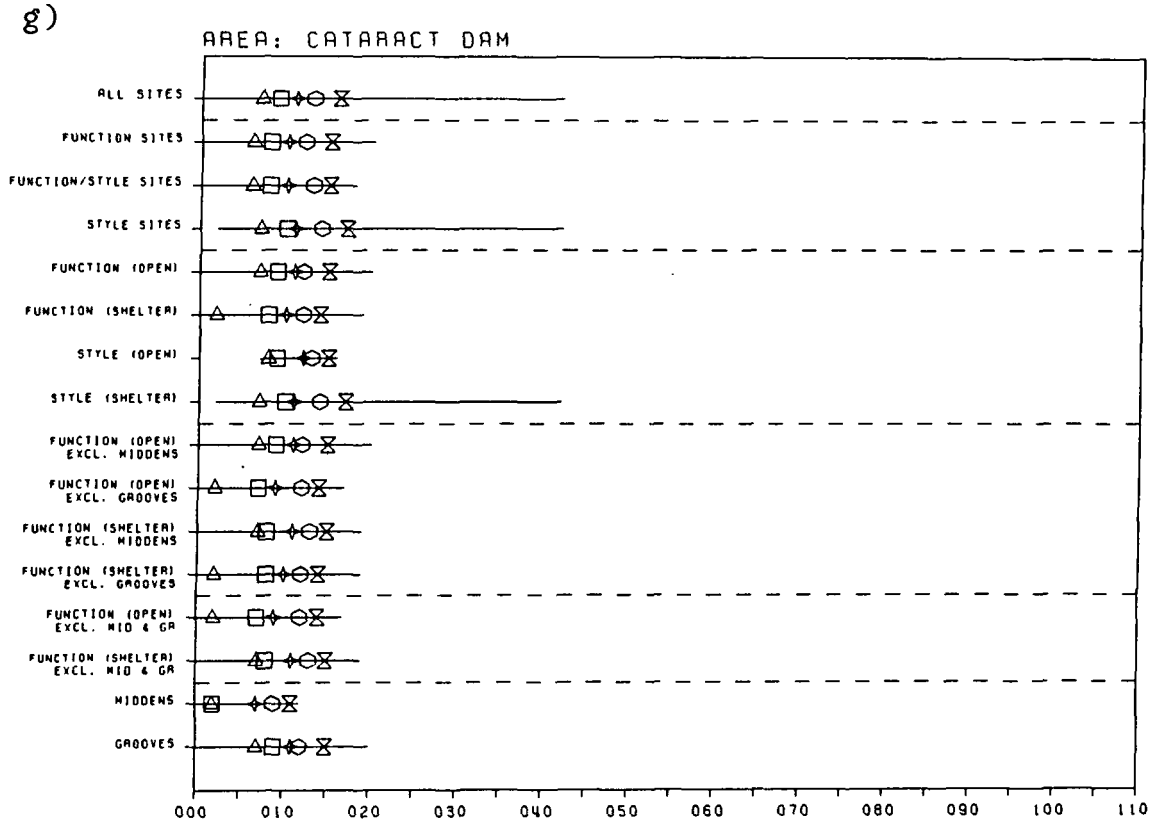
Interpretational notes

There is no apparent significant difference between Function and Style sites with regard to this variable. In the absence of statistical evidence, it can be suggested that Style sites tend to be more closely related to coastal resources than Function sites, which is indicative of the lack of influence of this variable upon location.

5. Cataract Dam

A statistical assessment of the relationships between Function and Style and distance to coastal resources is presented in Table D.34.

g)



h)

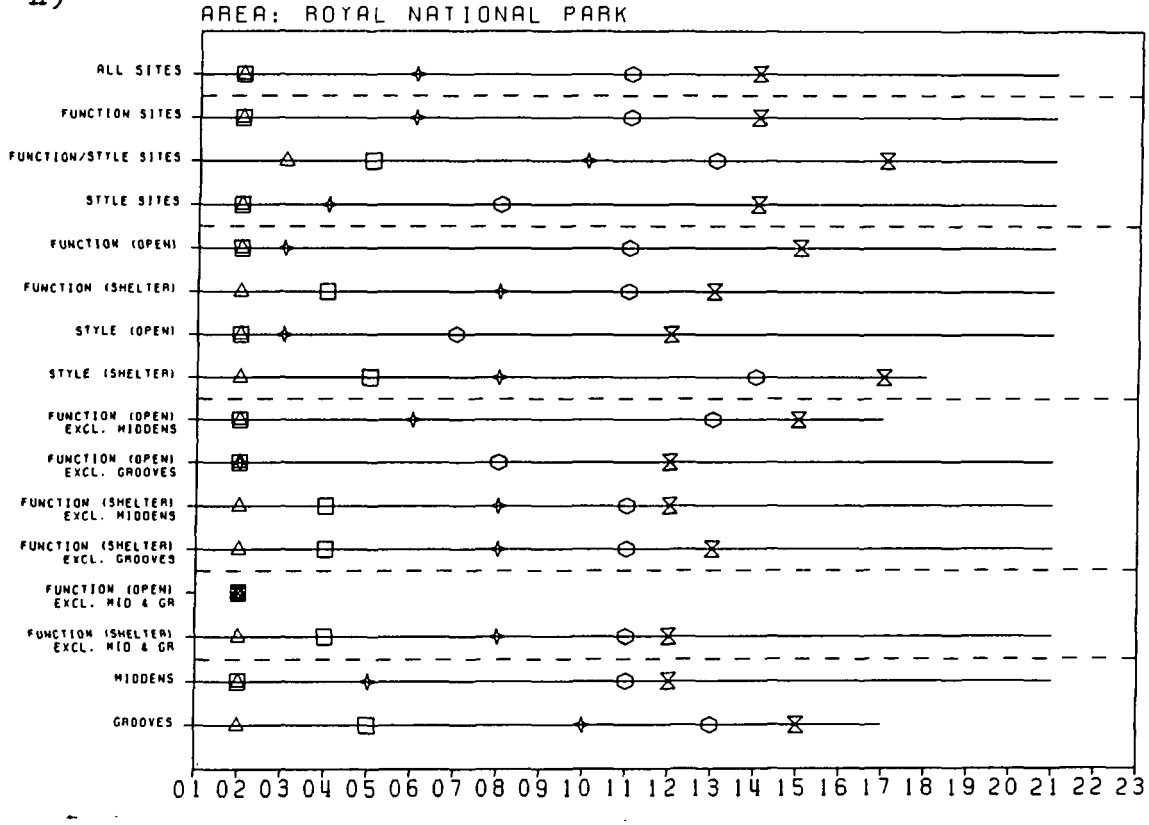


Figure D.17 (cont.) : Aboriginal sites and distance to the coast (km).

Table D.34

Populations	Mann-W 'U'	Att sig	sig?
F vs S	38531.0	.0001	Y
F vs F/S	19093.0	.6149	N
S vs F/S	11934.0	.0013	Y
FO vs SO	2288.0	.2648	N
FS vs SS	6121.0	.0004	Y
FO vs FS	8414.5	.0978	N
SO vs SS	2299.5	.8165	N
FOXM vs FSXM	7432.5	.9826	N
FOXGG vs FSXGG	1109.5	.3274	N
FOXMGG vs FSXMGG	724.5	.0940	N
FOXM vs SO	2285.5	.2912	N
FSXM vs SS	5604.0	.0766	N
FOXGG vs SO	228.5	.0241	Y
FSXGG vs SS	6000.0	.0006	Y
FOXMGG vs SO	228.0	.0424	Y
FSXMGG vs SS	5483.0	.1136	N

interpretation

All the site populations display a general tendency towards the coast, but only in the case of middens can this tendency be seen to be particularly strong. It is however clear that, particularly when grinding grooves are removed from the analysis, all Function sites tend to be closer to the coast than their Style counterparts (except in the case of FS sites when both middens and grooves are removed from the analysis).

6. Royal National Park

A statistical assessment of the relationships between Function and Style and this variable is presented in Table D.35.

Table D.35

Populations	Mann-W 'U'	Att sig	sig?
F vs S	6123.5	.0851	N
F vs F/S	1909.0	.0110	Y
S vs F/S	799.0	.0005	Y
FO vs SO	2239.5	.3208	N
FS vs SS	740.0	.2120	N
FO vs FS	2731.0	.0235	Y
SO vs SS	307.0	.0003	Y
FOXM vs FSXM	767.5	.6837	N
FOXGG vs FSXGG	1128.0	.0001	Y
FOXMGG vs FSXMGG	No diff.		N
FOXM vs SO	810.5	.0089	Y
FSXM vs SS	355.0	.1743	N
FOXGG vs SO	1211.5	.2127	N
FSXGG vs SS	740.0	.2120	N
FOXMGG vs SO	TOO FEW		
FSXMGG vs SS	355.0	.1743	N

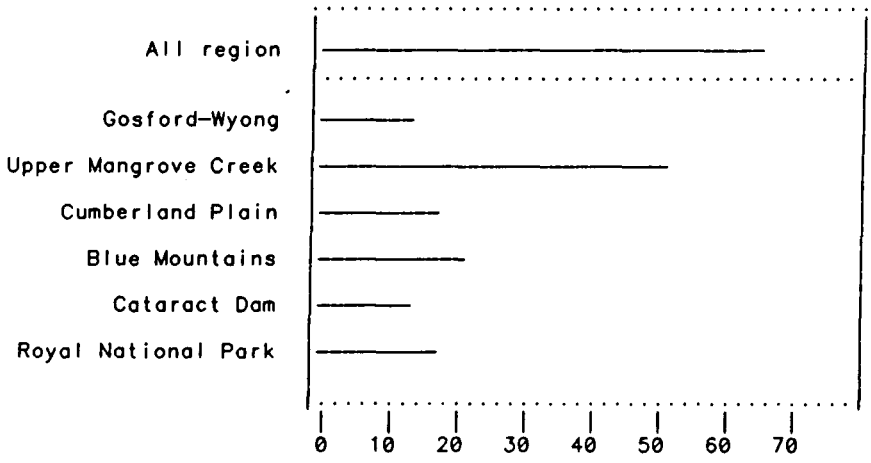
Interpretational notes

Although all site populations display a tendency towards the coast, there is little evidence to suggest that Function sites are more closely linked with coastal resources than Style sites. Indeed, middens (which might reasonably be expected to show this tendency to a greater extent than any other group) display no evidence of a particularly strong influence.

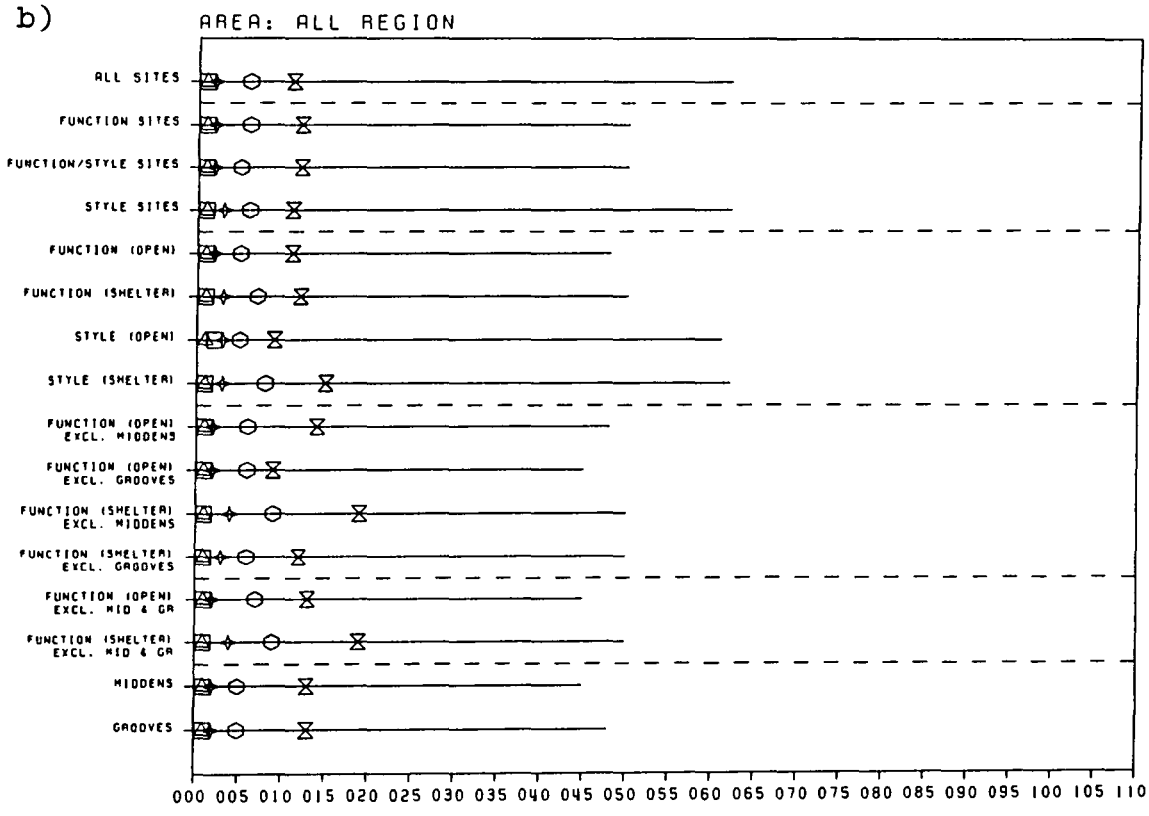
D-2.3 Distance to wetland

The data concerning the relationships between Function and Style sites and the distance to major wetlands for the region as a whole, and for the sub-regions is illustrated in Figure D.18; while a statistical assessment of the relationships between Function and Style and this variable is presented for the whole region in Table D.36.

a)



b)



igure D.18: Aboriginal sites and distance to major wetlands (km).
a) range of data in the region and sub-region
b - h) the distributional characteristics in the region and sub-regions.

Table D.36

Populations	Mann-W 'U'	Att sig	sig?
F vs S	2018000.0	.0019	Y
F vs F/S	548060.0	.0926	N
S vs F/S	477660.0	.0001	Y
FO vs SO	807240.0	.0000	Y
FS vs SS	244990.0	.3357	N
FO vs FS	409900.0	.0000	Y
SO vs SS	472040.0	.5435	N
FOXM vs FSXM	158230.0	.0000	Y
FOXGG vs FSXGG	229090.0	.0040	Y
FOXMGG vs FSXMGG	604540.0	.0074	Y
FOXM vs SO	569610.0	.0000	Y
FSXM vs SS	132090.0	.0079	Y
FOXGG vs SO	477050.0	.1091	N
FSXGG vs SS	236560.0	.0000	Y
FOXMGG vs SO	239060.0	.8665	N
FSXMGG vs SS	123660.0	.0142	N

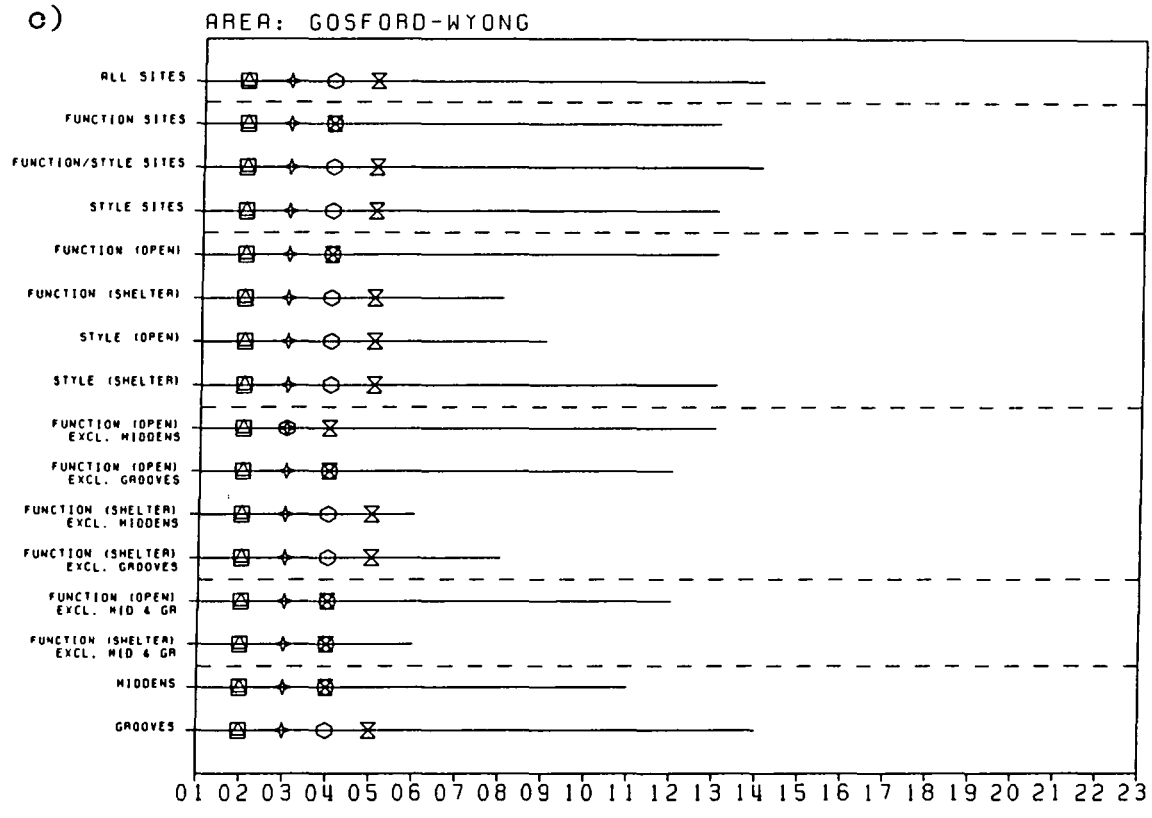
Interpretational notes

There is an obvious tendency for all sites to be located in close proximity to wetlands. FS sites tend to be closer to these landscape elements than SS sites, a characteristic apparently not shared in the relationship between FO and SO sites. However, these latter groups display a very close association with wetlands (in both cases 50% of the sites occur within 2km of these areas) and it may be that the measurement scale is too coarse to reveal any consistent pattern of significance.

SUB-REGIONAL VARIATION

1. Gosford-Wyong

A statistical assessment of the relationship between Function and Style populations and distance to wetland within this sub-region is presented in Table D.37.



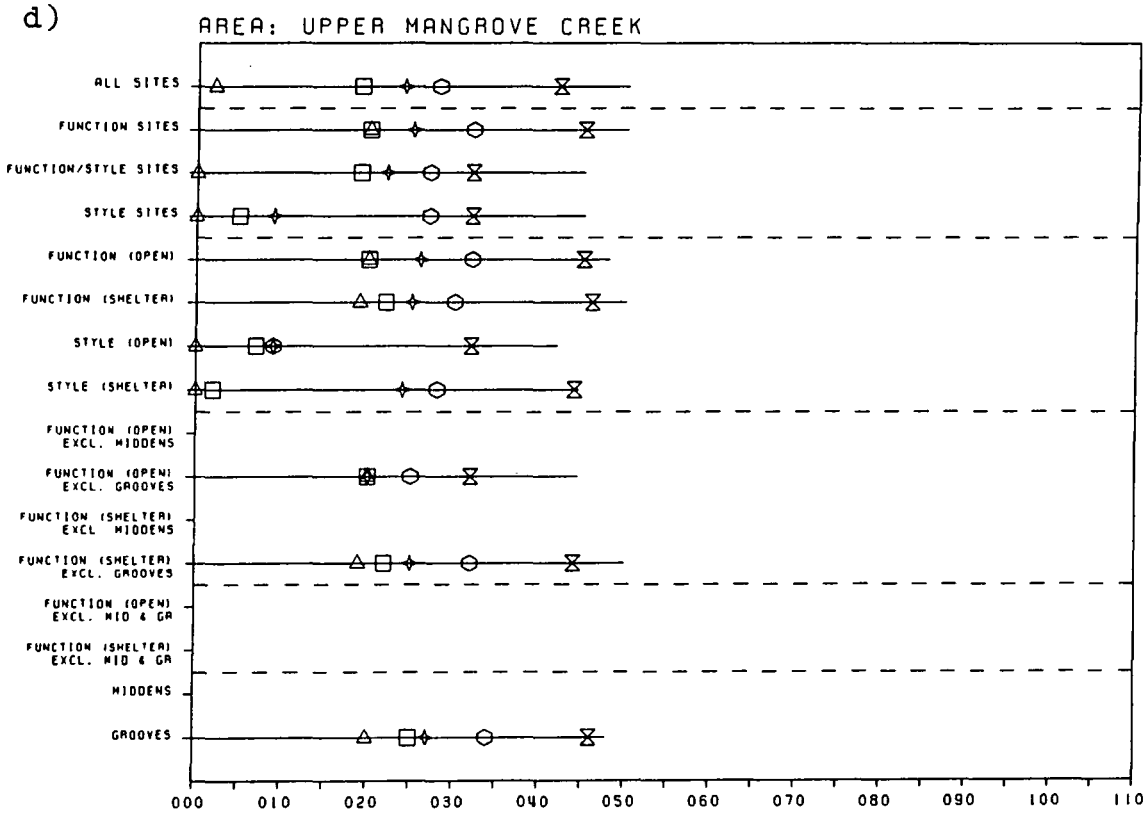


Figure D.18 (cont.) : Aboriginal sites and distance to major wetlands (km).

Table D.37

Populations	Mann-W 'U'	Att sig	sig?
F vs S	95394.0	.0000	Y
F vs F/S	30361.0	.1862	N
S vs F/S	37316.0	.0841	N
FO vs SO	56861.0	.0001	Y
FS vs SS	4465.0	.1706	N
FO vs FS	18077.0	.2935	N
SO vs SS	15763.0	.1224	N
FOXM vs FSXM	2246.5	.3910	N
FOXGG vs FSXGG	9171.0	.0593	N
FOXMGG vs FSXMGG	167.5	.6899	N
FOXM vs SO	25089.0	.0000	Y
FSXM vs SS	1249.0	.6877	N
FOXGG vs SO	33678.0	.0777	N
FSXGG vs SS	4450.0	.1879	N
FOXMGG vs SO	1995.5	.2228	N
FSXMGG vs SS	1234.5	.8059	N

Interpretational notes

All site populations have a clear tendency toward proximity to wetlands. However, there is little evidence that Function sites tend to be closer than Style sites, though FO sites may have a slight tendency to be closer than the other site groups.

2. Upper Mangrove Creek

A statistical assessment of the relationships between Function and Style populations and wetland distance is presented in Table D.38.

Table D.38

Populations	Mann-W 'U'	Att sig	sig?
F vs S	1350.0	.0000	Y
F vs F/S	853.5	.0554	N
S vs F/S	567.5	.3076	N
FO vs SO	128.5	.0000	Y
FS vs SS	408.0	.0803	N
FO vs FS	938.5	.9633	N
SO vs SS	229.0	.0802	N
FOXGG vs FSXGG	262.5	.0360	Y
FOXGG vs SO	60.0	.0000	Y
FSXGG vs SS	593.0	.1803	N

Interpretational notes

Within this sub-region, there is no evidence to suggest that any site population is particularly close to wetlands - though SO sites are, in general, closer to this landscape element than the other site populations. Overall, this would suggest that wetlands do not exert much influence upon the location of Function sites within this sub-region.

3. Cumberland Plain

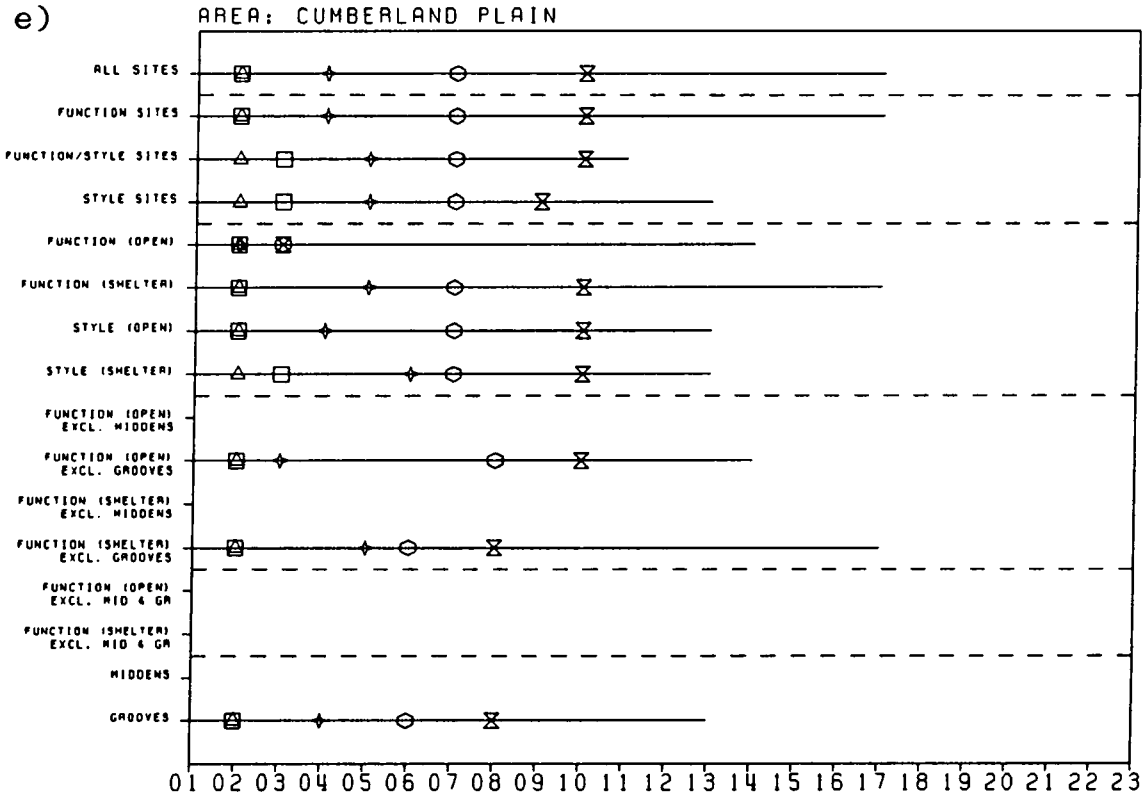
The statistical assessment of the relationship between Function and Style and distance to wetlands is presented in Table D.39.

Table D.39

Populations	Mann-W 'U'	Att sig	sig?
F vs S	4254.0	.7310	N
F vs F/S	2256.0	.7739	N
S vs F/S	585.5	.9808	N
FO vs SO	421.0	.0115	Y
FS vs SS	744.5	.2747	N
FO vs FS	435.2	.0348	Y
SO vs SS	61.5	.0005	Y
FOXGG vs FSXGG	427.5	.0251	Y
FOXGG vs SO	342.5	.0104	Y
FSXGG vs SS	593.0	.1808	N

Interpretational notes

Upon the Cumberland Plain, all sites tend toward proximity to wetlands. However, there is no consistent difference in the relationship between FS and SS sites with regard to this variable. FO sites, on the other hand, are consistently closer than the other site groups, to a degree wherein 50% of FOXGG sites lie within three kilometres of wetland areas. The significant difference between FO and FS sites is consistent with the peripheral status of the latter site population.



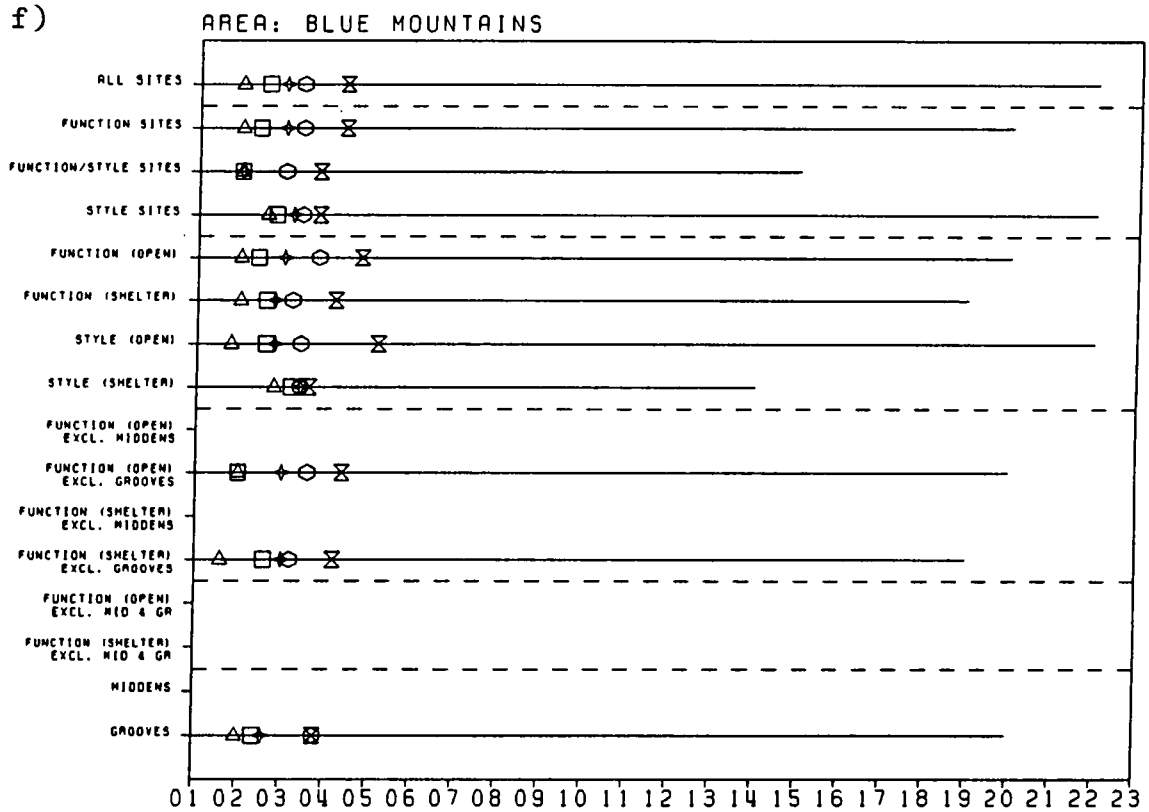


Figure D.18 (cont.) : Aboriginal sites and distance to major wetlands (km).

4. Blue Mountains

A statistical assessment of the relationship between Function and Style populations and distance to wetland is presented in Table D.40.

Table D.40

Populations	Mann-W 'U'	Att sig	sig?
F vs S	275.5	.3704	N
F vs F/S	TOO FEW		
S vs F/S	TOO FEW		
FO vs SO	TOO FEW		
FS vs SS	TOO FEW		
FO vs FS	125.0	.4164	N
SO vs SS	TOO FEW		
FOXGG vs FSXGG	TOO FEW		
FOXGG vs SO	TOO FEW		
FSXGG vs SS	53.0	.0847	N

interpretation

Despite the absence of statistical inference, it is apparent that all sites tend towards proximity to wetlands, 90% of all data fall within 6km of these areas. There is no evidence to suggest, however, that Function sites are closer to these landscape elements than their Style counterparts.

5. Cataract Dam

A statistical assessment of the relationship between Function and Style populations with regard to this variable is presented in Table D.41.

Table D.41

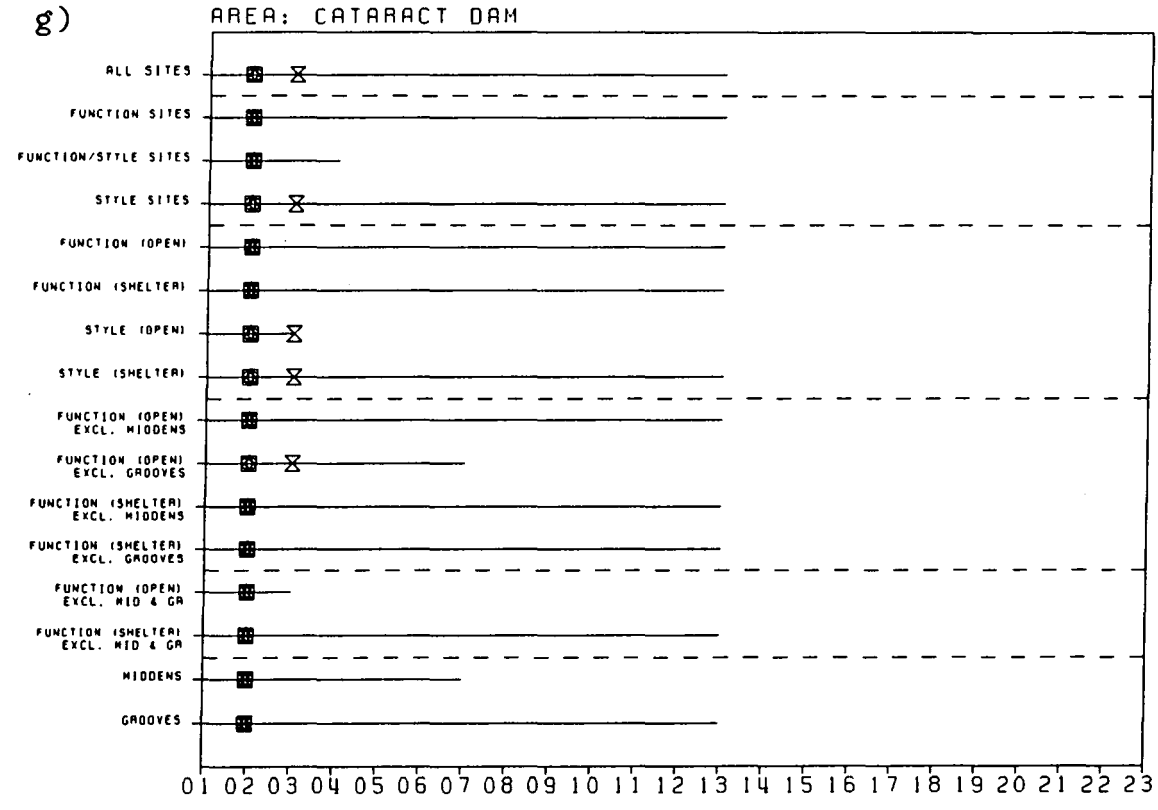
Populations	Mann-W 'U'	Att sig	sig?
F vs S	45002.0	.0217	Y
F vs F/S	19518.0	.6031	N
S vs F/S	13978.0	.0415	Y
FO vs SO	1861.5	.0139	Y
FS vs SS	6115.0	.0001	Y
FO vs FS	9583.5	.7013	N
SO vs SS	2255.0	.5184	N
FOXM vs FSXM	7432.5	.8295	N
FOXGG vs FSXGG	1254.0	.6521	N
FOXMGG vs FSXMGG	943.0	.9928	N
FOXM vs SO	1854.0	.0155	Y
FSXM vs SS	6115.0	.0001	Y
FOXGG vs SO	332.5	.2925	N
FSXGG vs SS	7752.5	.1650	N
FOXMGG vs SO	200.5	.0051	Y
FSXMGG vs SS	4794.0	.0020	Y

Interpretational notes

There is an obvious tendency for all sites to lie in very close proximity to wetlands. In addition, there is a consistent and significant tendency for Function sites to be closer than their Style counterparts to these landscape elements.

6. Royal National Park

A statistical assessment of the relationship between Function and Style and distance to wetland is presented in Table D.42.



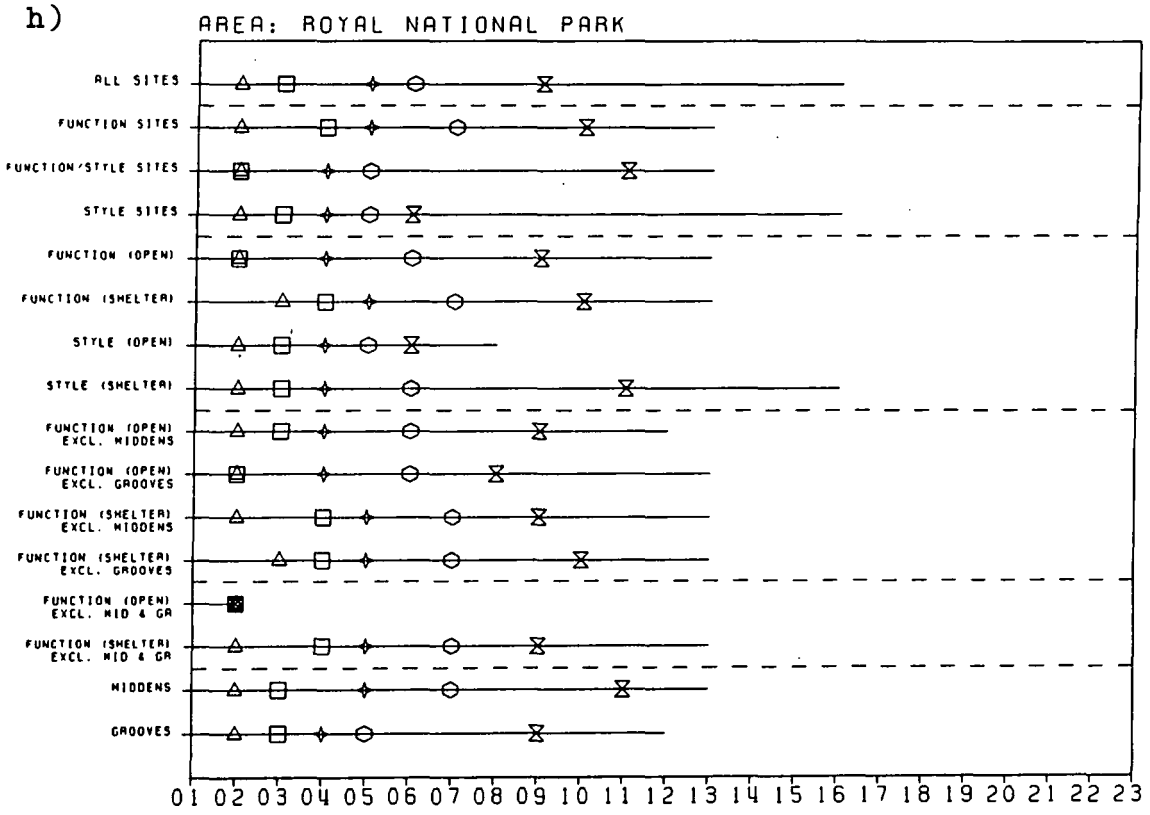


Figure D.18 (cont.) : Aboriginal sites and distance to major wetlands (km).

Table D.42

Populations	Mann-W 'U'	Att sig	sig?
F vs S	4820.5	.0001	Y
F vs F/S	2200.5	.1318	N
S vs F/S	1269.0	.6367	N
FO vs SO	2051.0	.1338	N
FS vs SS	614.0	.0250	Y
FO vs FS	2452.0	.0020	Y
SO vs SS	607.5	.7259	N
FOXM vs FSXM	621.0	.0676	N
FOXGG vs FSXGG	1288.5	.0029	Y
FOXMGG vs FSXMGG	No diff.		N
FOXM vs SO	963.5	.1671	N
FSXM vs SS	319.5	.0599	N
FOXGG vs SO	1269.0	.6216	N
FSXGG vs SS	614.0	.0250	Y
FOXMGG vs SO	TOO FEW		
FSXMGG vs SS	319.5	.0599	N

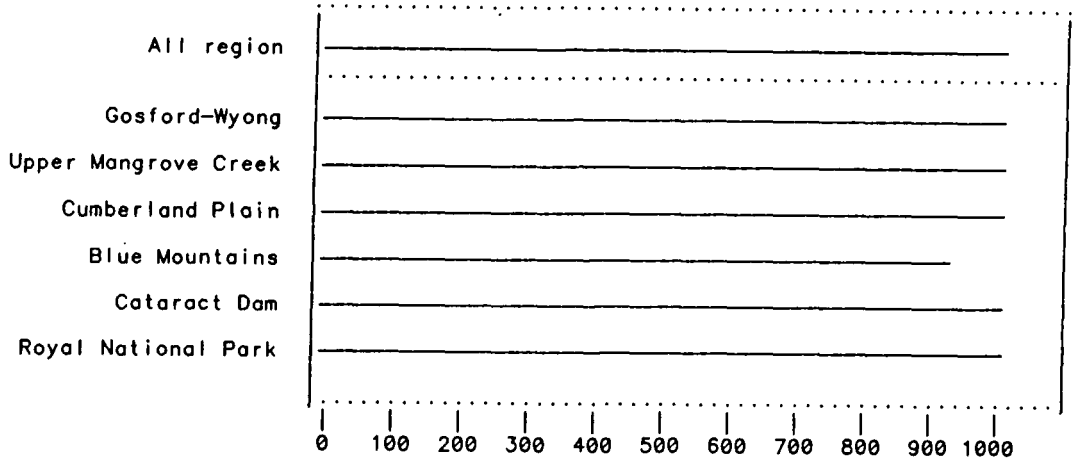
Interpretational notes

There is a general tendency for all sites to be located in close proximity to wetlands. However, there is no clear evidence to suggest that Function sites are closer than Style sites. Indeed, when grinding grooves are removed from the analysis SS sites are closer than FS sites, though the balance is restored when middens are also removed. In the absence of sufficient data to test statistically, there is a suggestion that when both grooves and middens are removed from the analysis, FO sites tend toward very close proximity to wetlands.

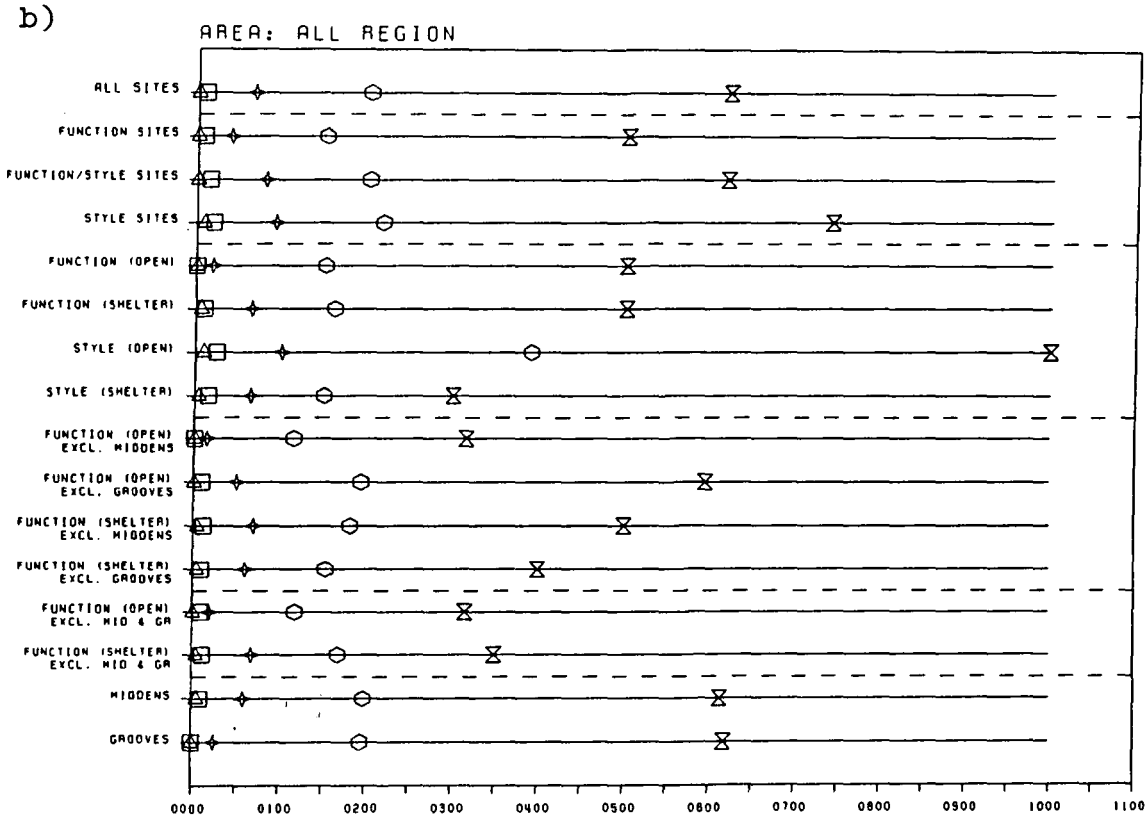
D-2.4 Freshwater distance

The data concerning the distance to freshwater for the region as a whole and for the sub-regions are illustrated in Figure D.19 below, and a statistical assessment of the relationship between Function and Style populations with regard to distance to freshwater is presented in Table D.43 for the region as a whole.

a)



b)



gure D.19: Aboriginal sites and distance to freshwater (m).
a) range of data in the region and sub-region
b - h) the distributional characteristics in the region and sub-regions.

Table D.43

Populations	Mann-W 'U'	Att sig	sig?
F vs S	1549800.0	.0000	Y
F vs F/S	466420.0	.0000	Y
S vs F/S	470160.0	.0133	N
FO vs SO	570620.0	.0000	Y
FS vs SS	228590.0	.5594	N
FO vs FS	371320.0	.0000	Y
SO vs SS	352960.0	.0000	Y
FOXM vs FSXM	146420.0	.0000	Y
FOXGG vs FSXGG	218880.0	.0976	N
FOXMGG vs FSXMGG	57343.0	.0000	Y
FOXM vs SO	534120.0	.0000	Y
FSXM vs SS	139570.0	.7176	N
FOXGG vs SO	346320.0	.0000	Y
FSXGG vs SS	217300.0	.4207	N
FOXMGG vs SO	155970.0	.0000	Y
FSXMGG vs SS	131160.0	.9293	N

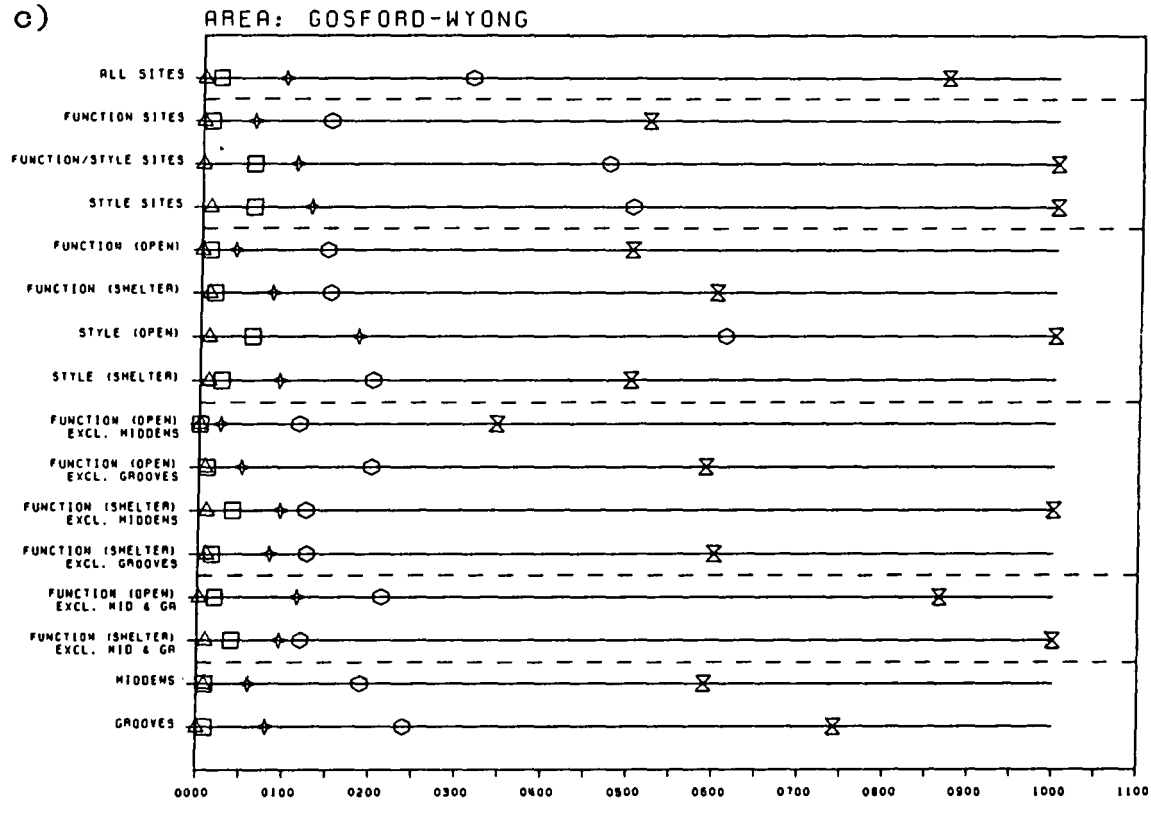
Interpretational notes

The data clearly suggest that all sites display a tendency toward close proximity to freshwater. However, there is no apparent difference between FS and SS sites with regard to freshwater distance, presumably as a function of their being tied broadly to the same structural characteristics. FO sites by contrast are significantly and consistently closer to freshwater than any of the other site groups. Note, in addition, that both middens and grinding grooves can be seen to be very closely associated with water, but even when both these characteristics are removed the close relationship between FO sites and freshwater remains.

SUB-REGIONAL VARIATION

1. Gosford-Wyong

A statistical assessment of the relationship between Function and Style populations and freshwater distance is presented in Table D.44.



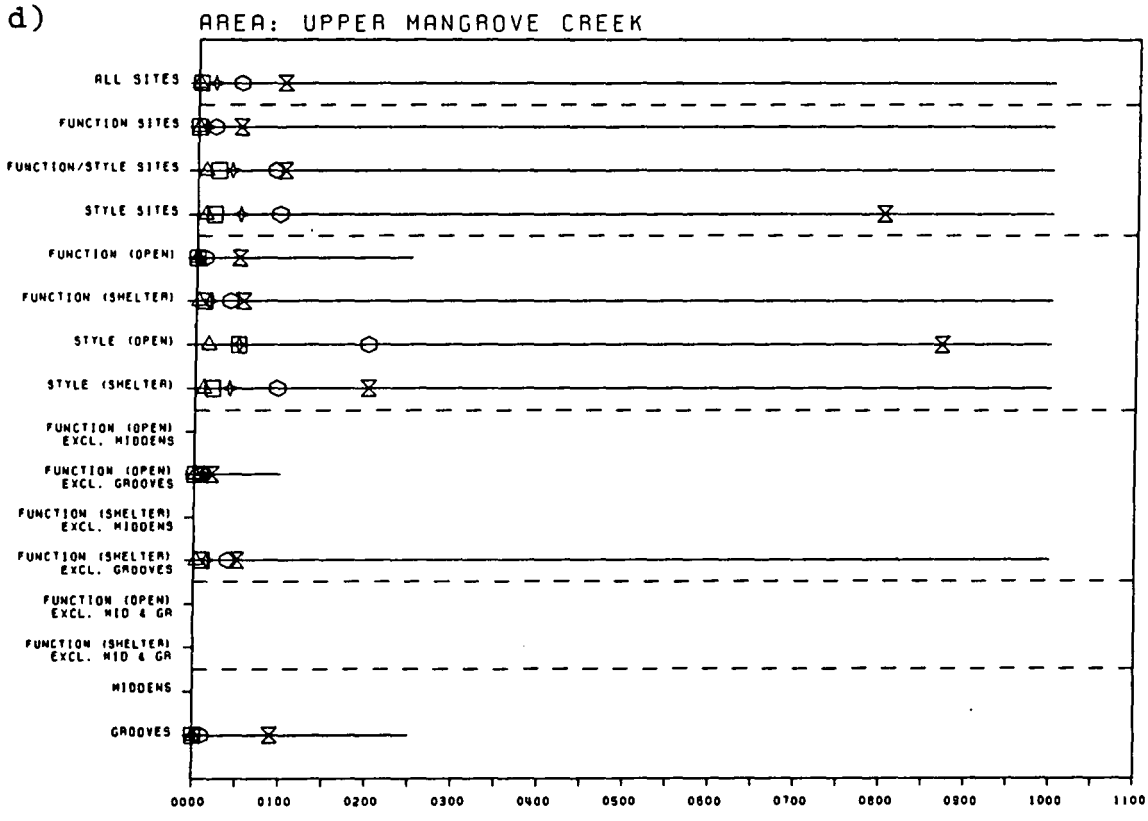


Figure D.19 (cont.) : Aboriginal sites and distance to freshwater (m).

Table D.44

Populations	Mann-W 'U'	Att sig	sig?
F vs S	75582.0	.0000	Y
F vs F/S	23429.0	.0000	Y
S vs F/S	38477.0	.3882	N
FO vs SO	40843.0	.0000	Y
FS vs SS	4599.0	.3290	N
FO vs FS	16107.0	.0073	Y
SO vs SS	13417.0	.0008	Y
FOXM vs FSXM	1648.0	.0025	Y
FOXGG vs FSXGG	9669.5	.2731	N
FOXMGG vs FSXMGG	170.5	.7652	N
FOXM vs SO	18076.0	.0000	Y
FSXM vs SS	1260.0	.7537	N
FOXGG vs SO	24880.0	.0000	Y
FSXGG vs SS	4532.0	.2931	N
FOXMGG vs SO	2112.5	.3595	N
FSXMGG vs SS	1250.0	.8935	N

Interpretational notes

It is readily apparent that, all sites are closely associated with freshwater. However, there is no apparent difference between FS and SS sites in this respect, which presumably reflects the broadly similar structural bases shared by the two populations. FO sites, by contrast, are clearly the most closely associated population.

This latter difference is particularly evident when grinding grooves are removed from the analysis, thus emphasizing the value of removing this Function characteristic (which is likely to be least closely associated with subsistence behaviour). However, it is clear that it is principally middens which contribute this characteristic to open sites.

2. Upper Mangrove Creek

A statistical assessment of the relationship between Function and Style populations and this landscape variable is presented in Table D.45.

Table D.45

Populations	Mann-W 'U'	Att sig	sig?
F vs S	763.0	.0000	Y
F vs F/S	448.0	.0000	Y
S vs F/S	560.5	.3291	N
FO vs SO	98.5	.0000	Y
FS vs SS	303.0	.0030	Y
FO vs FS	449.0	.0000	Y
SO vs SS	226.0	.0954	N
FOXGG vs FSXGG	250.0	.0191	Y
FOXGG vs SO	36.0	.0000	Y
FSXGG vs SS	282.0	.0019	Y

Interpretational notes

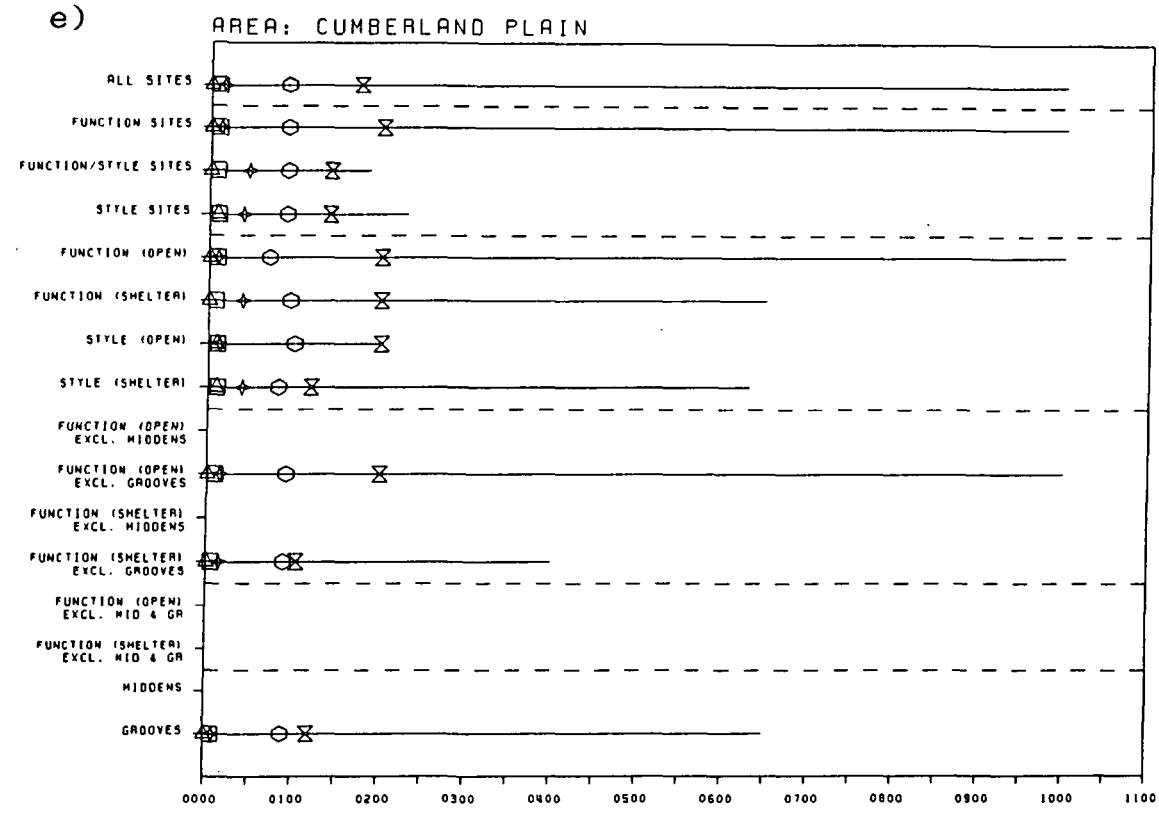
All sites within this sub-region display a clear tendency toward close proximity to water. Both FS and FO sites show a significant and consistent tendency toward closer proximity to water than do their Style counterparts.

3. Cumberland Plain

A statistical analysis of the relationship between Function and Style with regard to freshwater distance is presented in Table D.46.

Table D.46

Populations	Mann-W 'U'	Att sig	sig?
F vs S	3649.0	.0703	N
F vs F/S	2194.0	.6156	N
S vs F/S	554.5	.6959	N
FO vs SO	648.0	.3949	N
FS vs SS	801.5	.5713	N
FO vs FS	3049.0	.3700	N
SO vs SS	180.5	.6596	N
FOXGG vs FSXGG	2245.0	.8204	N
FOXGG vs SO	564.5	.5521	N
FSXGG vs SS	613.5	.2668	N



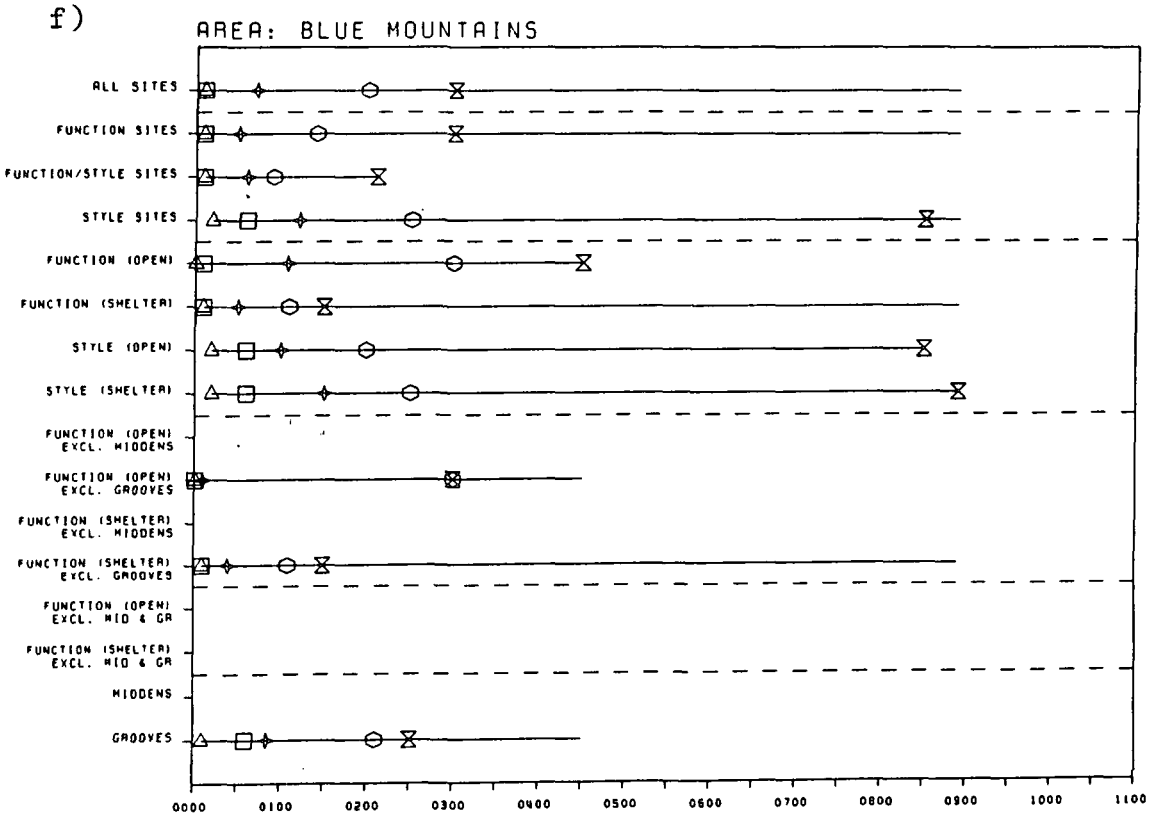


Figure D.19 (cont.) : Aboriginal sites and distance to freshwater (m).

Interpretational notes

It is immediately apparent that all sites upon the Cumberland Plain are very closely associated with water. However, there is no apparent difference in the measure of this proximity between Function and Style sites. This may because of the ubiquitous nature and regular spacing of water upon the Plain.

4. Blue Mountains

A statistical assessment of the relationship between Function and Style sites and freshwater distance is presented in Table D.47.

Table D.47

Populations	Mann-W 'U'	Att sig	sig?
F vs S	195.5	.0178	Y
F vs F/S	TOO FEW		
S vs F/S	TOO FEW		
FO vs SO	TOO FEW		
FS vs SS	TOO FEW		
FO vs FS	140.5	.7635	N
SO vs SS	TOO FEW		
FOXGG vs FSXGG	84.0	.4729	N
FOXGG vs SO	TOO FEW		
FSXGG vs SS	TOO FEW		

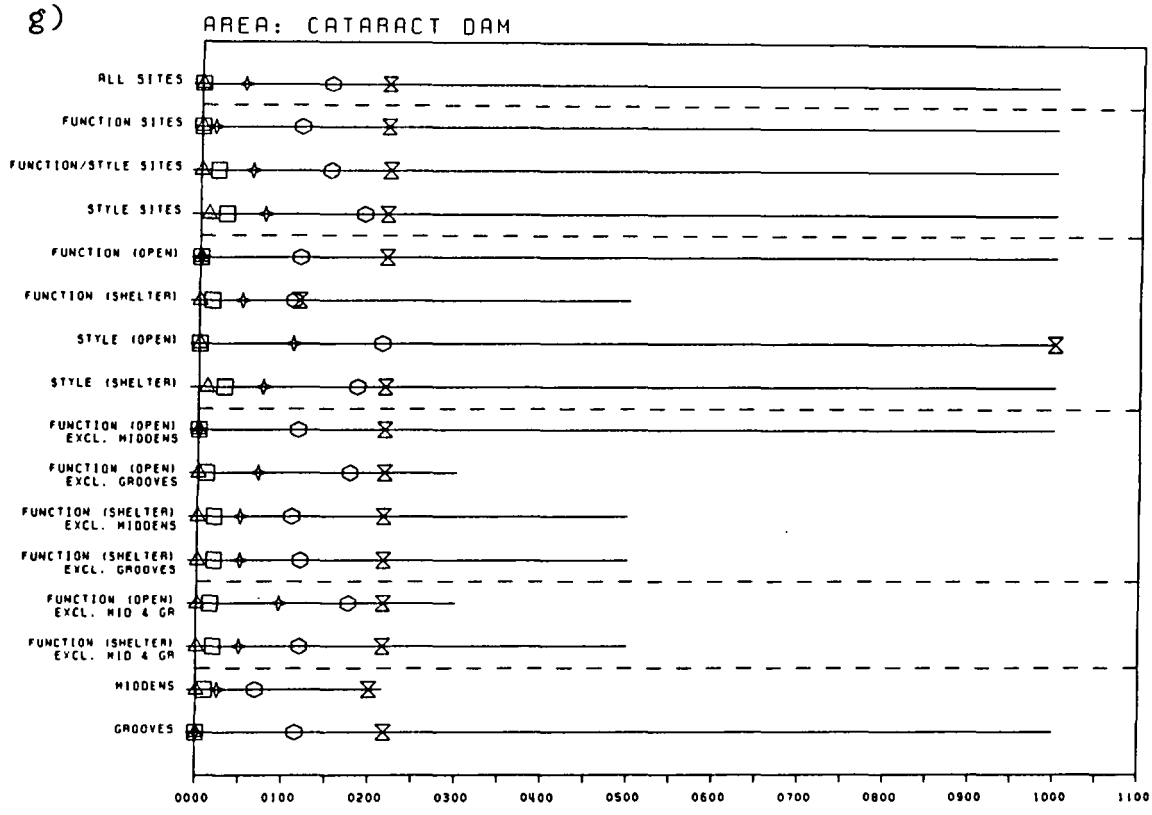
Interpretational notes

Within this sub-region there is an obvious tendency for all sites to be situated close to water and, perhaps, a slight tendency for Function sites to be closer to water than their Style counterparts, though there is insufficient data upon which to test this relationship statistically.

5. Cataract Dam

A statistical assessment of the relationship between Function and Style populations and freshwater distance is presented in Table D.48

g)



h)

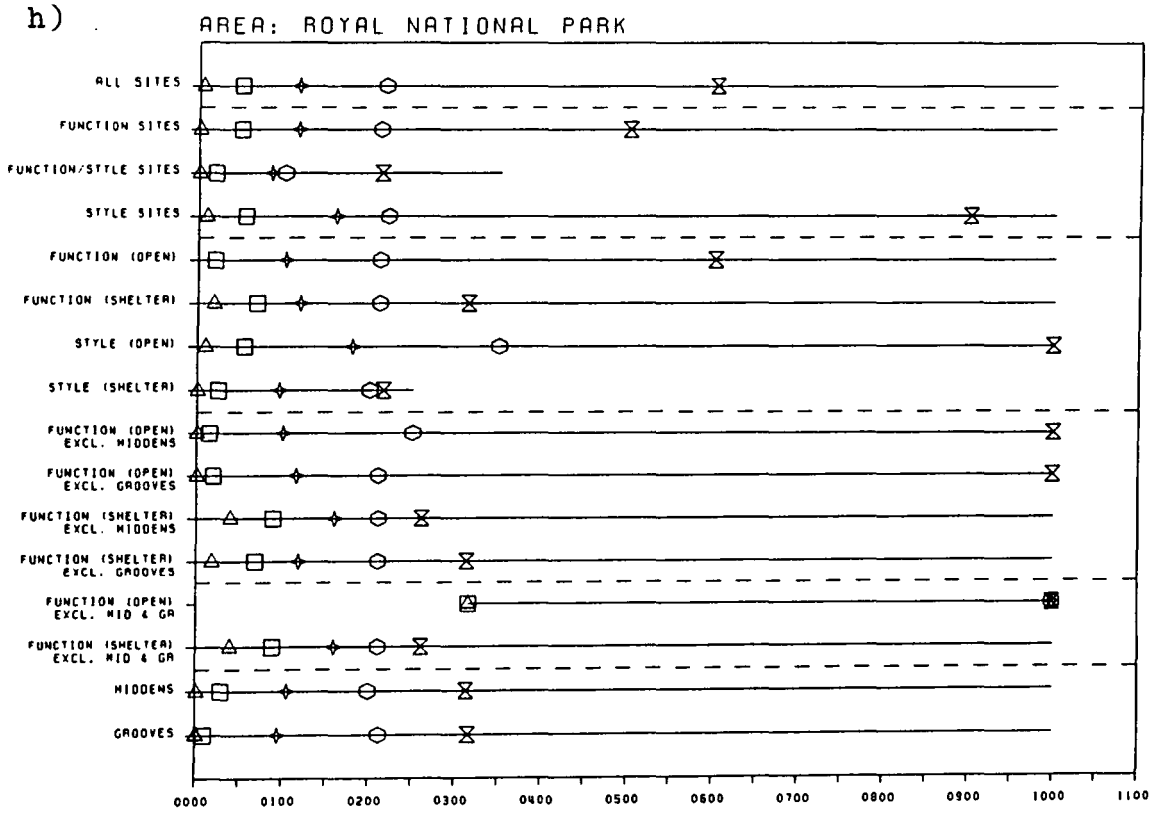


Figure D.19 (cont.) : Aboriginal sites and distance to freshwater (m).

Table D.48

Populations	Mann-W 'U'	Att sig	sig?
F vs S	32177.0	.0000	Y
F vs F/S	14324.0	.0000	Y
S vs F/S	13965.0	.2390	N
FO vs SO	1977.5	.0362	Y
FS vs SS	6752.0	.0082	Y
FO vs FS	7317.5	.0011	Y
SO vs SS	2300.5	.7977	N
FOXM vs FSXM	5550.5	.0019	Y
FOXGG vs FSXGG	1149.0	.3589	N
FOXMGG vs FSXMGG	850.5	.4308	N
FOXM vs SO	1961.0	.0373	Y
FSXM vs SS	5476.5	.0430	Y
FOXGG vs SO	544.0	.6593	N
FSXGG vs SS	6642.0	.0131	Y
FOXMGG vs SO	333.5	.7546	N
FSXMGG vs SS	5366.0	.0648	N

Interpretational notes

There is a clear tendency for all site populations to be located in close proximity to water. Yet there is no apparent, consistent difference between the Function and Style populations. However, when grinding grooves are removed from the FS population it can be shown that this site group tends to be closer to freshwater than their Style counterparts though no comparable tendency can be demonstrated for the FO population.

6. Royal National Park

A statistical assessment of the relationship between Function and Style populations and distance to freshwater is presented in Table D.49.

Table D.49

Populations	Mann-W 'U'	Att sig	sig?
F vs S	5908.5	.1615	N
F vs F/S	1942.0	.0161	Y
S vs F/S	815.0	.0028	Y
FO vs SO	1756.0	.0216	Y
FS vs SS	736.0	.2049	N
FO vs FS	3068.0	.2532	N
SO vs SS	407.0	.0318	Y
FOXM vs FSXM	729.5	.4438	N
FOXGG vs FSXGG	1795.5	.5019	N
FOXMGG vs FSXMGG	No diff.		N
FOXM vs SO	886.0	.1415	N
FSXM vs SS	336.5	.1063	N
FOXGG vs SO	1027.5	.0788	N
FSXGG vs SS	736.5	.2049	N
FOXMGG vs SO	TOO FEW		
FSXMGG vs SS	336.5	.1063	N

Interpretational notes

The Aboriginal site populations within this sub-region do not exhibit the extremely close association with water which is to be observed in the region as a whole and within the other sub-regions. An explanation of this may lie in the fact that there are relatively few natural water sources. There is no evidence to suggest that Function sites are closer to freshwater than are Style sites.

D-3 CLIMATIC STRUCTURE

A number of climatic factors are presented below: average annual rainfall; average rainfall in summer; average rainfall in winter; average annual maximum and minimum temperature; average maximum and minimum temperature in summer; and average maximum and minimum temperatures in winter.

D-3.1 Average annual rainfall

The annual rainfall within the region ranges from 700-1800m and evidence for Aboriginal activity is found throughout that range. Rainfall is orographic in its influence - high at the coast and in the Blue Mountains but conspicuously lower in the intervening Cumberland Plain.

The data concerning the relationship between the distribution of site populations and rainfall are illustrated in Figure D.20 for the region as a whole and for each sub-region; and a statistical assessment of the relationship between Function and Style populations with regard to this variable is presented in Table D.50 below, for the whole region.

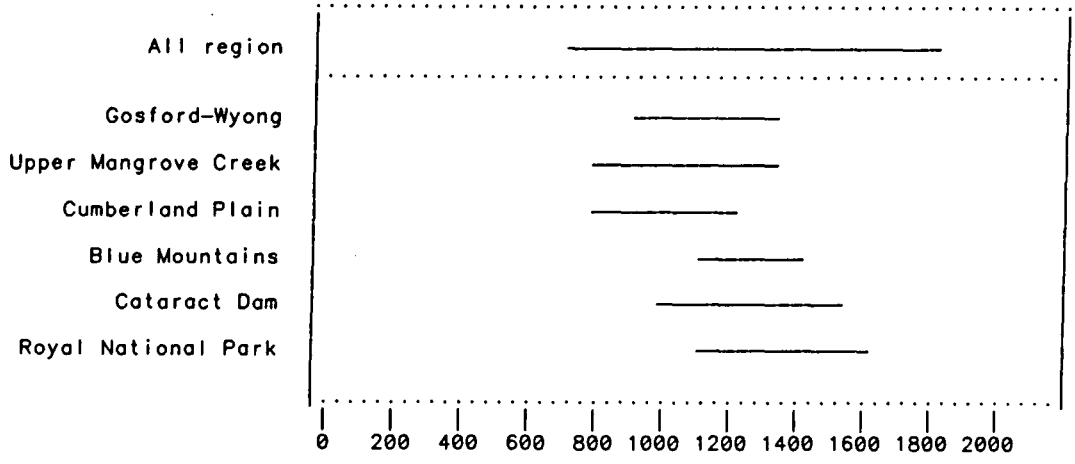
Table D.50

Populations	Mann-W 'U'	Att sig	sig?
F vs S	2023100.0	.0017	Y
F vs F/S	554020.0	.2046	N
S vs F/S	526670.0	.6133	N
FO vs SO	774830.0	.0000	Y
FS vs SS	229740.0	.0034	Y
FO vs FS	474270.0	.9078	N
SO vs SS	383820.0	.0000	Y
FOXM vs FSXM	191080.0	.4521	N
FOXGG vs FSXGG	245130.0	.3579	N
FOXMGG vs FSXMGG	55377.0	.0000	Y
FOXM vs SO	499800.0	.0000	Y
FSXM vs SS	140710.0	.3274	N
FOXGG vs SO	408280.0	.0000	Y
FSXGG vs SS	217700.0	.0011	Y
FOXMGG vs SO	134580.0	.0000	Y
FSXMGG vs SS	132600.0	.5251	N

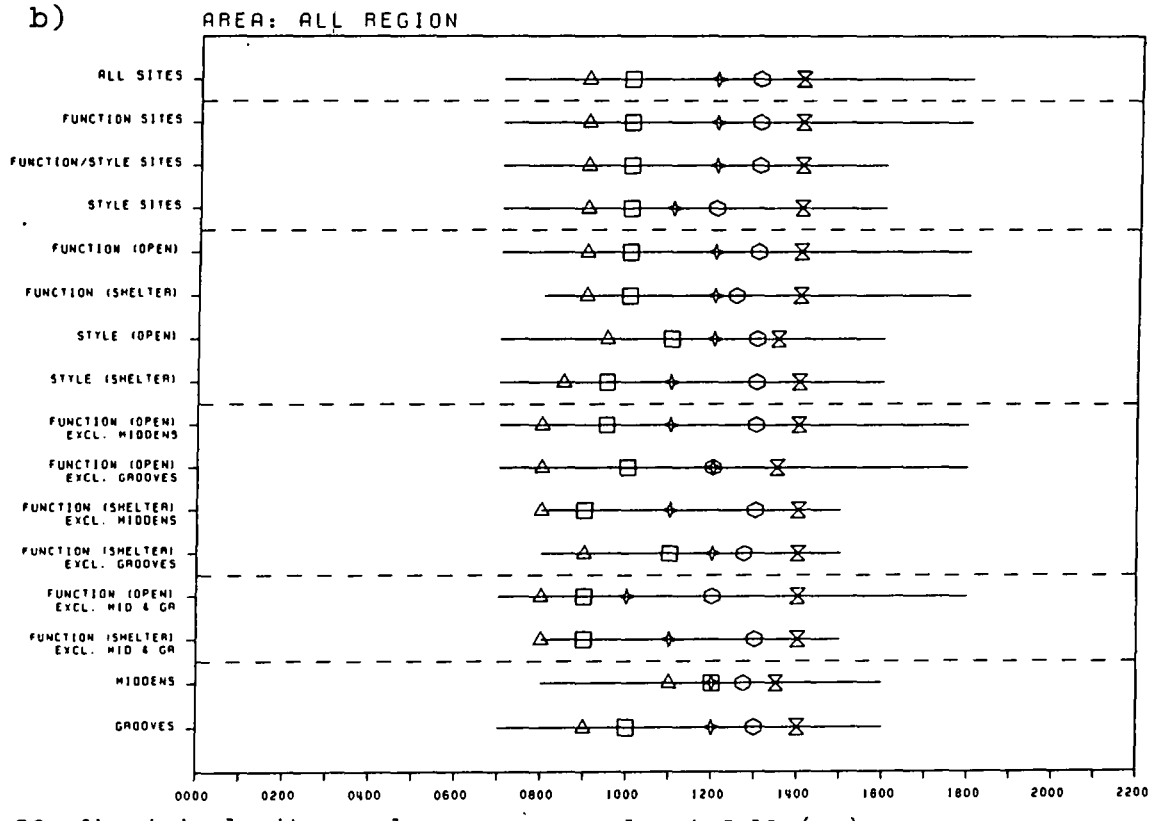
Interpretational notes

Overall, there appears to be little tendency for Aboriginal sites as a whole to be distributed other than about the mid-point of the rainfall range. Both FS and FO sites display a slight but consistent tendency towards the higher end of the range above that displayed by their Style counterparts. That FS sites should differ significantly from SS sites is the more important result, because it illustrates that even taking into account the necessarily coarse scale of the data, these two groups can be shown to be independent with regard to this variable.

a)



b)



igure D.20: Aboriginal sites and average annual rainfall (mm).
a) range of data in the region and sub-region
b - h) the distributional characteristics in the region and sub-regions.

Middens, clearly and unsurprisingly, have the closest association with high rainfall areas (i.e. on the coast) which influences the characteristics of the Function population as a whole. When this sub-population is removed from the analysis the difference between FS and SS sites is removed: that between FO and SO, however, is maintained.

SUB-REGIONAL VARIATION.

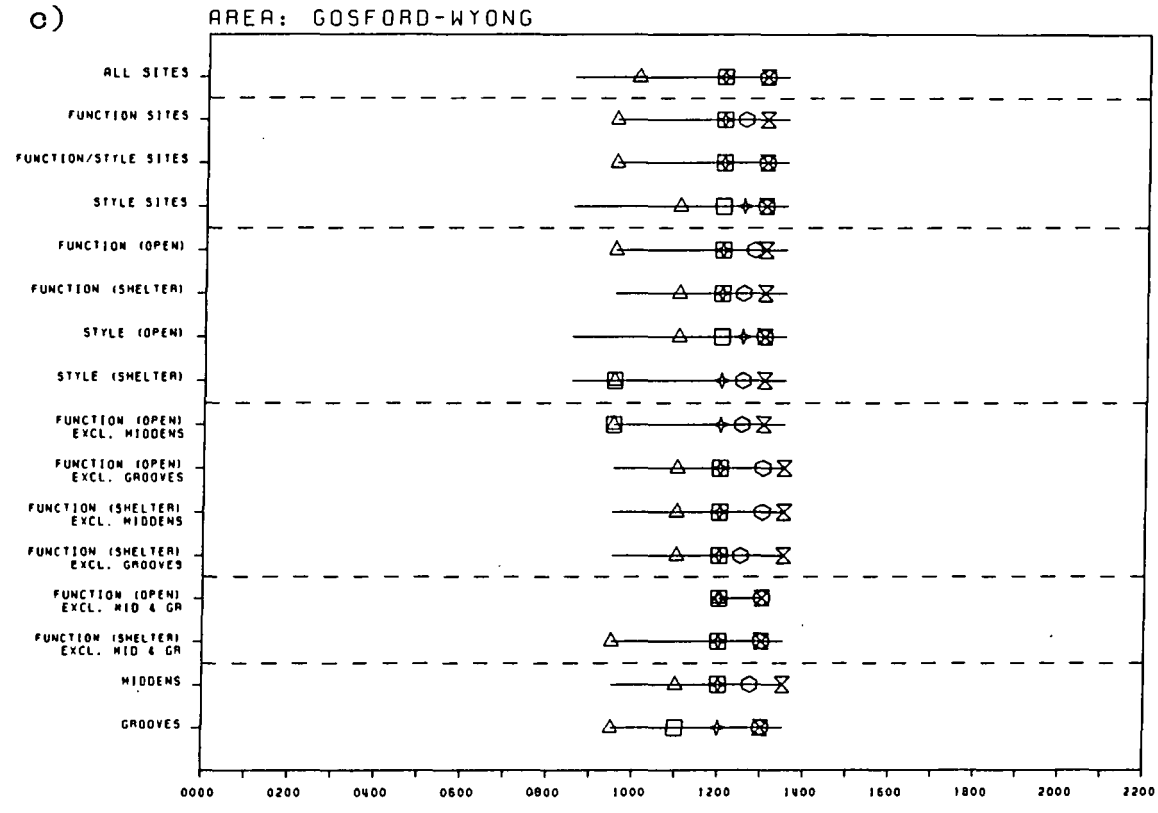
Within the sub-regions, scale factors are likely to have a much more important influence than in the region as a whole - sub-regional variation tends to be far smaller. In addition, large areas of plateau or plain tend to have very widely spaced contours. As a consequence of these factors there is a minimum of variation from which to draw inference.

1. Gosford-Wyong.

The rainfall range within this area is from c.900-1350mm (modal value 1200mm). The area is coastal and for the most part high and flat. A Statistical assessment of the relationships between Function and Style populations with regard to average annual rainfall is presented in Table D.51.

Table D.51

Populations	Mann-W 'U'	Att sig	sig?
F vs S	97271.0	.0001	Y
F vs F/S	29440.0	.0663	N
S vs F/S	39328.0	.4498	N
FO vs SO	55728.0	.0000	Y
FS vs SS	4579.0	.2881	N
FO vs FS	19111.0	.9087	N
SO vs SS	13312.0	.0004	Y
FOXM vs FSXM	1884.0	.0268	Y
FOXGG vs FSXGG	8833.5	.0173	Y
FOXMGG vs FSXMGG	178.0	.9204	N
FOXM vs SO	22603.0	.0000	Y
FSXM vs SS	1082.5	.1379	N
FOXGG vs SO	35544.0	.4176	N
FSXGG vs SS	4537.5	.2820	N
FOXMGG vs SO	2419.0	.8174	N
FSXMGG vs SS	1041.0	.1254	N



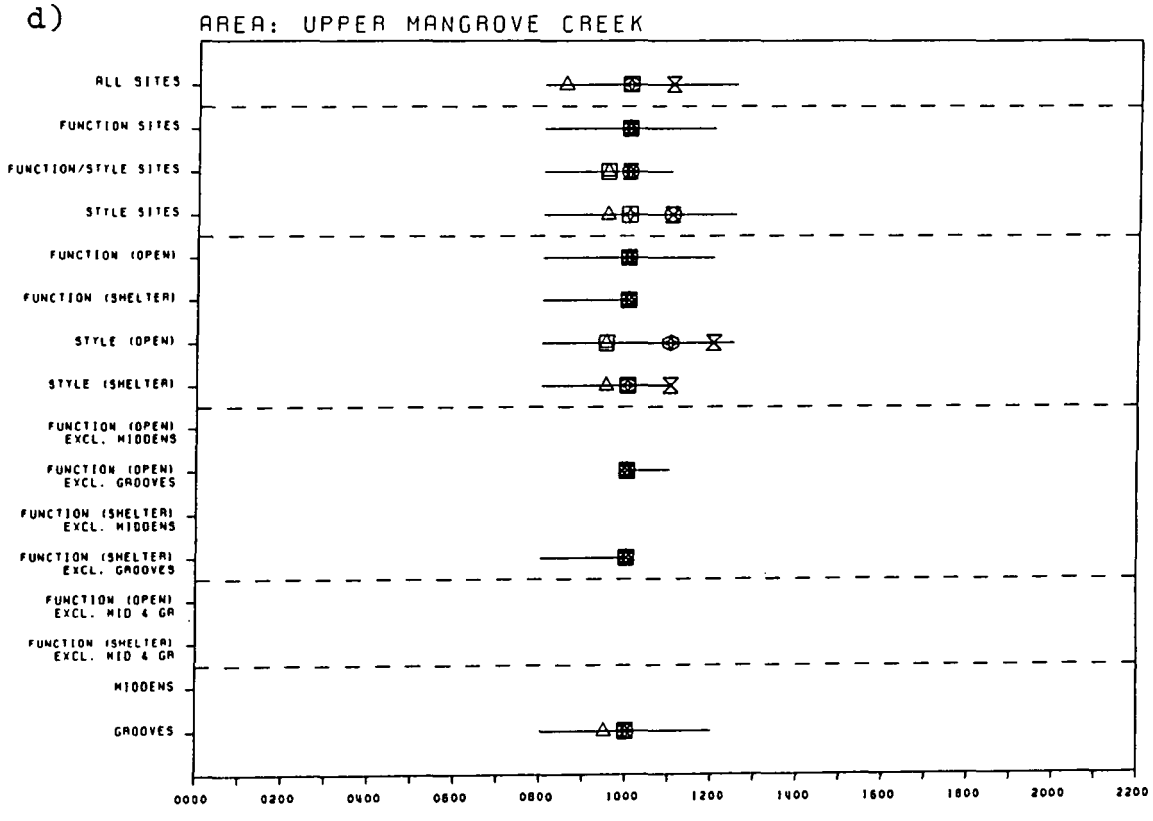


Figure D.20 (cont.) : Aboriginal sites and average annual rainfall (mm).

Interpretational notes

There is perhaps a slight tendency toward the wetter end of the range exhibited by all sites. However, there is no clear pattern of difference between Function and Style, save that SO sites tend to diverge from the other groups in being in areas of greater rainfall. This is suggestive of a link between their differentiation on the basis of height and the orographic differences in rainfall distribution.

2. Upper Mangrove Creek.

The rainfall range within this sub-region lies between 800-1200mm (modal value 1000mm) and Aboriginal sites are found throughout that range. A statistical assessment of the relationship between Function and Style populations and average annual rainfall is presented in Table D.52.

Table D.52

Populations	Mann-W 'U'	Att sig	sig?
F vs S	2111.0	.1109	N
F vs F/S	920.0	.0490	Y
S vs F/S	488.0	.0792	N
FO vs SO	375.5	.0100	Y
FS vs SS	527.5	.7602	N
FO vs FS	899.5	.4514	N
SO vs SS	216.0	.0359	Y
FOXGG vs FSXGG	360.0	.1586	N
FOXGG vs SO	155.0	.0310	Y
FSXGG vs SS	510.5	.7561	N

Interpretational notes

There is little tendency for any site population distribution to fall away from the modal value for this sub-region (1000mm). However, SO sites can clearly be seen to display a tendency toward areas of greater rainfall, presumably as a function of their greater height and the orographic influence of rainfall.

3. The Cumberland Plain

The Cumberland Plain region possesses a range of rainfall between 800-1200mm (modal value 800mm) and on average receives less rainfall than higher areas in all directions surrounding it. A statistical assessment of the relationship between Function and Style and average annual rainfall is presented in Table D.53.

Table D.53

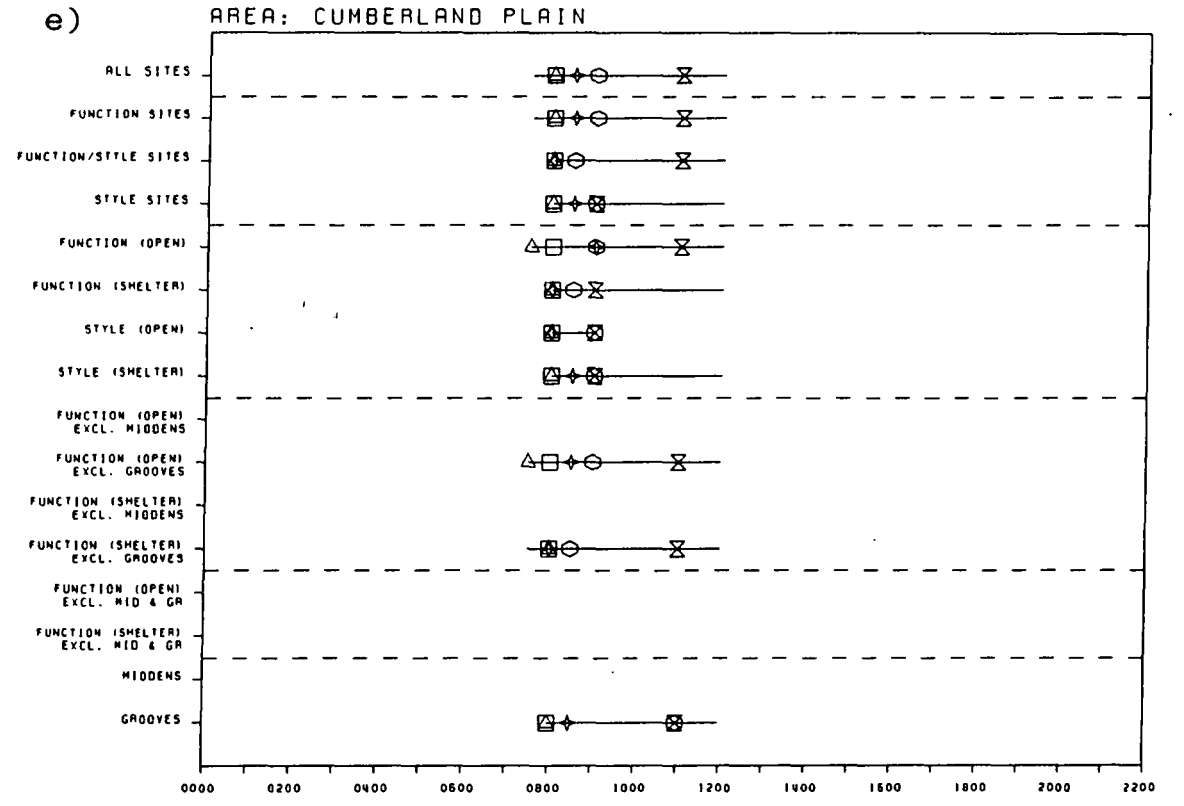
Populations	Mann-W 'U'	Att sig	sig?
F vs S	4274.0	.7611	N
F vs F/S	2211.0	.6449	N
S vs F/S	549.0	.6266	N
FO vs SO	636.5	.3331	N
FS vs SS	748.0	.2607	N
FO vs FS	3023.0	.3113	N
SO vs SS	748.0	.3855	N
FOXGG vs FSXGG	2194.0	.6499	N
FOXGG vs SO	306.5	.0491	Y
FSXGG vs SS	642.0	.3863	N

Interpretational notes

There is a clear tendency for site population distributions (except FS) to fall above the level which is modal for the sub-region. FO sites, in particular show a slight deviation from the general pattern by being in slightly wetter areas. However, there is no other statistically significant difference evident between the other site groups.

4. Blue Mountains.

In this sub-region there is a range in annual rainfall between 1100-1450mm (modal value 1100mm) and the Aboriginal site range lies between 1100-1350mm. A statistical assessment of the relationship between Function and Style and average annual rainfall is presented in Table D.54.



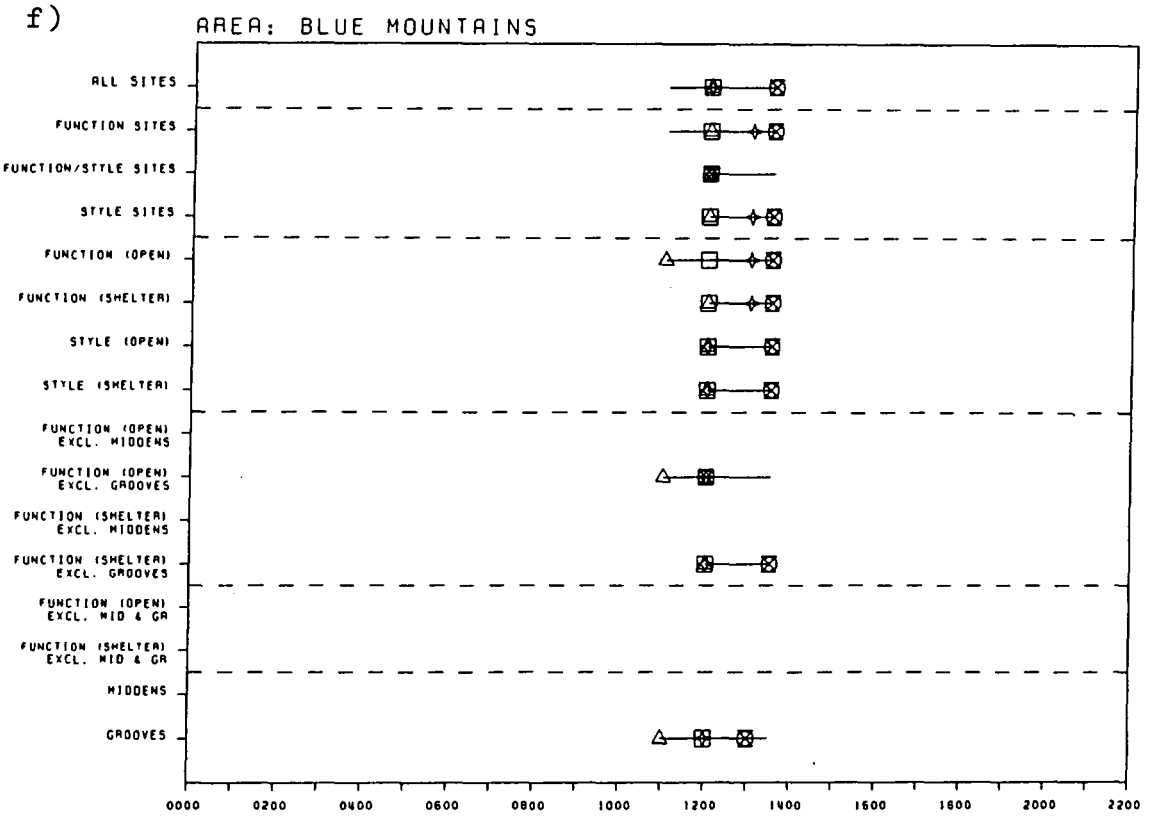


Figure D.20 (cont.) : Aboriginal sites and average annual rainfall (mm).

Table D.54

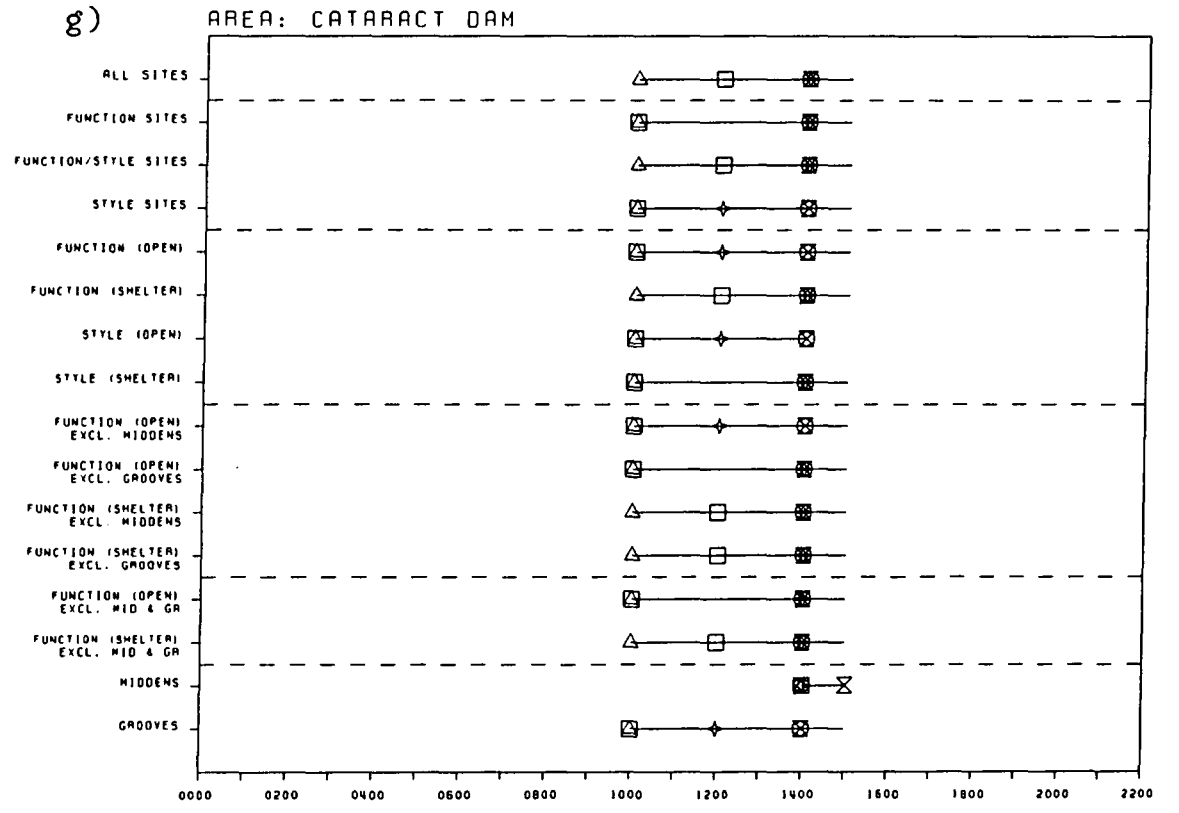
Populations	Mann-W 'U'	Att sig	sig?
F vs S	271.50	.3025	N
F vs F/S	TOO FEW		
S vs F/S	TOO FEW		
FO vs SO	TOO FEW		
FS vs SS	TOO FEW		
FO vs FS	115.5	.2355	N
SO vs SS	TOO FEW		
FOXGG vs FSXGG	90.0	.6361	N
FOXGG vs SO	TOO FEW		
FSXGG vs SS	67.5	.2499	N

Interpretational notes

There is an apparent tendency for all sites to avoid the wetter (and higher) parts of the sub-region. However, there is no apparent difference between Function and Style sites with regard to this variable.

5. Cataract Dam.

The annual rainfall range within this sub-region is 1000-1450mm (modal value 1200mm) and Aboriginal sites occur throughout this range. A statistical assessment of the relationship between Function and Style populations for this variable is presented in Table D.55.



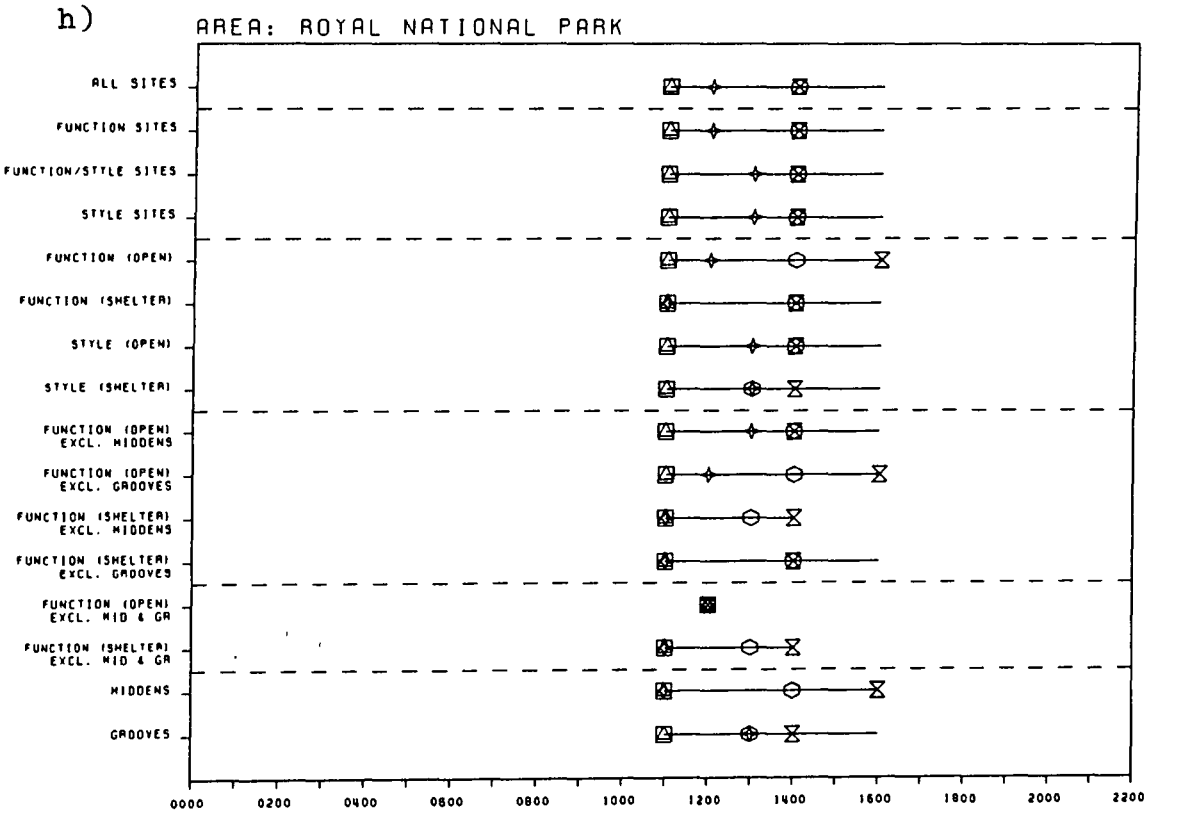


Figure D.20 (cont.) : Aboriginal sites and average annual rainfall (mm).

Table D.55

Populations	Mann-W 'U'	Att sig	sig?
F vs S	44076.0	.0694	N
F vs F/S	18505.0	.2463	N
S vs F/S	12991.0	.0172	Y
FO vs SO	2324.0	.2566	N
FS vs SS	6238.0	.0002	Y
FO vs FS	7138.0	.0002	Y
SO vs SS	2117.0	.3700	N
FOXM vs FSXM	6167.5	.0262	Y
FOXGG vs FSXGG	1073.0	.1083	N
FOXMGG vs FSXMGG	840.5	.3320	N
FOXM vs SO	2319.0	.2812	N
FSXM vs SS	5468.0	.0241	Y
FOXGG vs SO	294.0	.1757	N
FSXGG vs SS	6110.0	.0003	Y
FOXMGG vs SO	291.5	.2664	N
FSXMGG vs SS	5340.5	.0389	Y

Interpretational notes

There is a slight tendency toward the wetter end of the range exhibited by all site populations. Middens make a strong contribution to this tendency in the Function population. Yet, even when this is taken into account, FS sites display a clear and consistent tendency to be located in higher rainfall areas than the other three site groups. It is particularly significant that FS should differ throughout from SS sites, as both groups are derived from the same potential population.

6. Royal National Park.

Rainfall ranges between 1100-1600mm (modal value 1400mm) and Aboriginal sites are found throughout this range. A statistical assessment of the relationship between Function and Style sites and average annual rainfall is presented in Table D.56.

Table D.56

Populations	Mann-W 'U'	Att sig	sig?
F vs S	5806.0	.0132	Y
F vs F/S	2394.0	.3336	N
S vs F/S	1227.0	.3911	N
FO vs SO	2334.0	.5569	N
FS vs SS	688.0	.0524	N
FO vs FS	2451.5	.0005	Y
SO vs SS	566.5	.3584	N
FOXM vs FSXM	572.0	.0133	Y
FOXGG vs FSXGG	1394.5	.0029	Y
FOXMGG vs FSXMGG	No diff.		N
FOXM vs SO	1082.0	.5119	N
FSXM vs SS	345.5	.0902	N
FOXGG vs SO	1322.5	.6229	N
FSXGG vs SS	688.0	.0522	N
FOXMGG vs SO	No diff.		N
FSXMGG vs SS	345.5	.0902	N

Interpretational notes

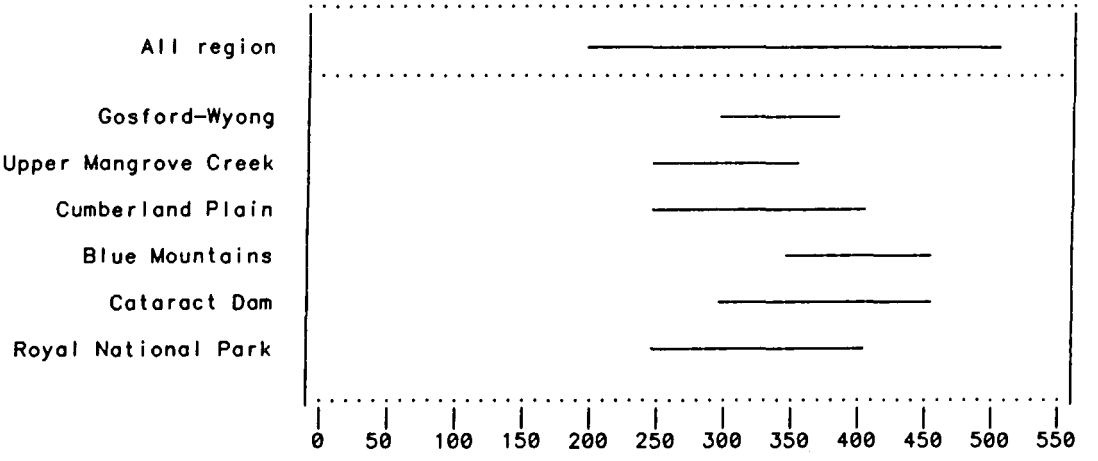
There is a tendency for all site populations to be distributed toward lower rainfall than the modal value for the sub-region. FS sites have a tendency to be in the lowest rainfall areas of all the groups, but, overall there is no clear pattern of difference between Function and Style.

D-3.2 Average summer rainfall

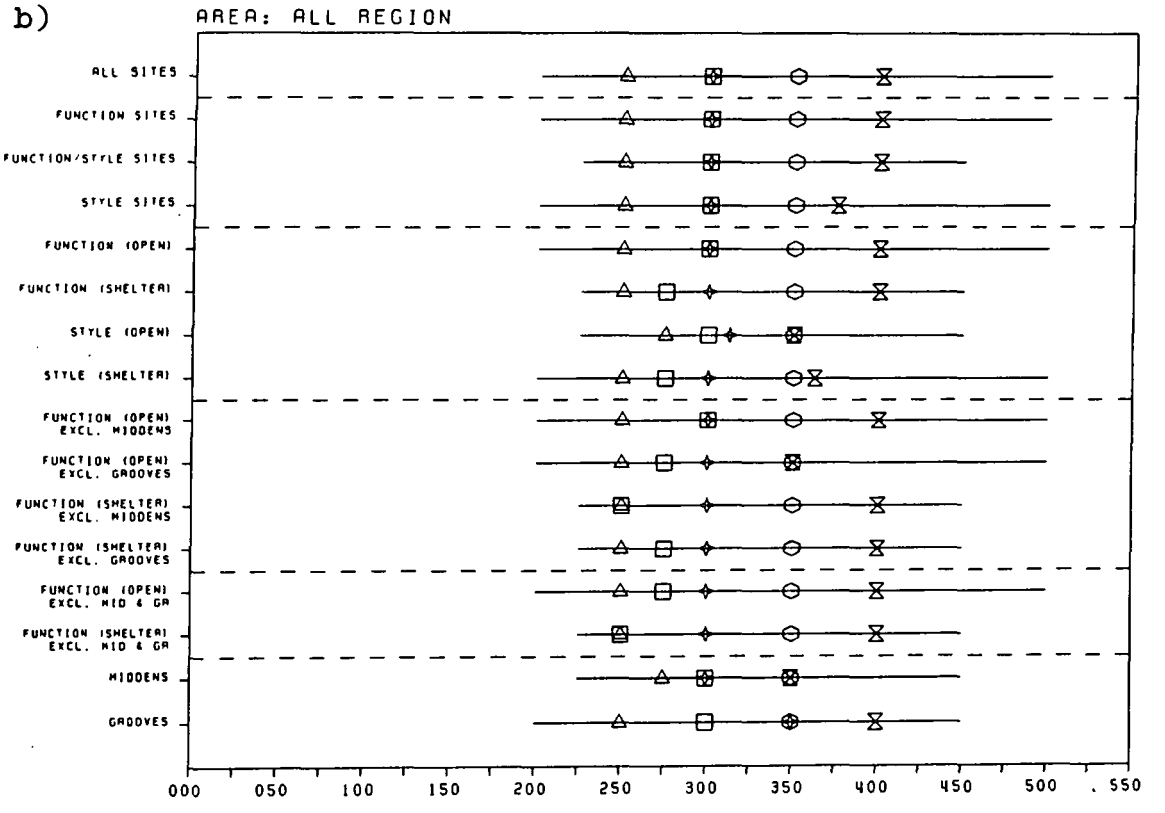
Summer is the period of greatest rainfall within the region and also the period of greatest evaporation. The range in summer rainfall lies between 200-550mm and is orographically distributed, so that the Cumberland Plain receives less than the coast (to the east) and the mountains (to the west).

The data concerning average summer rainfall for the region as a whole and for each of the sub-regions is illustrated in Figure D.21, and a statistical assessment of the relationship between Function and Style and this variable is presented in Table D.57.

a)



b)



igure D.21: Aboriginal sites and average summer rainfall (mm).
a) range of data in the region and sub-region
b - h) the distributional characteristics in the region and sub-regions.

Table D.57

Populations	Mann-W 'U'	Att sig	sig?
F vs S	2047300.0	.0140	N
F vs F/S	535690.0	.0136	N
S vs F/S	516740.0	.2364	N
FO vs SO	861160.0	.0265	N
FS vs SS	239980.0	.1027	N
FO vs FS	427820.0	.0001	Y
SO vs SS	383820.0	.0000	Y
FOXM vs FSXM	176100.0	.0027	Y
FOXGG vs FSXGG	250770.0	.8574	N
FOXMGG vs FSXMGG	624120.0	.0386	N
FOXM vs SO	620960.0	.1113	N
FSXM vs SS	137000.0	.0872	N
FOXGG vs SO	413070.0	.0000	Y
FSXGG vs SS	231250.0	.1346	N
FOXMGG vs SO	175230.0	.0000	Y
FSXMGG vs SS	128270.0	.1285	N

Interpretational notes

There is an overall tendency for sites to be found at levels around the centre of the range: no sites are found at the highest levels within the region. While there is no statistically significant difference between FS and SS sites, there is a clear and consistent difference between FO and the SO population, wherein the latter group is associated with areas which are wetter - presumably reflecting the coastal bias is the SO population. For the same reasons, it is clear that middens contribute a wetter element to the observed distribution of Function sites.

SUB-REGIONAL VARIATION

1. Gosford-Wyong.

The range of rainfall within this sub-region lies between 300-400mm (modal value 350); and the Aboriginal site range lies between 300-375mm. A statistical assessment of the relationship between Function and Style populations with regard to this variable is

presented in Table D.58.

Table D.58

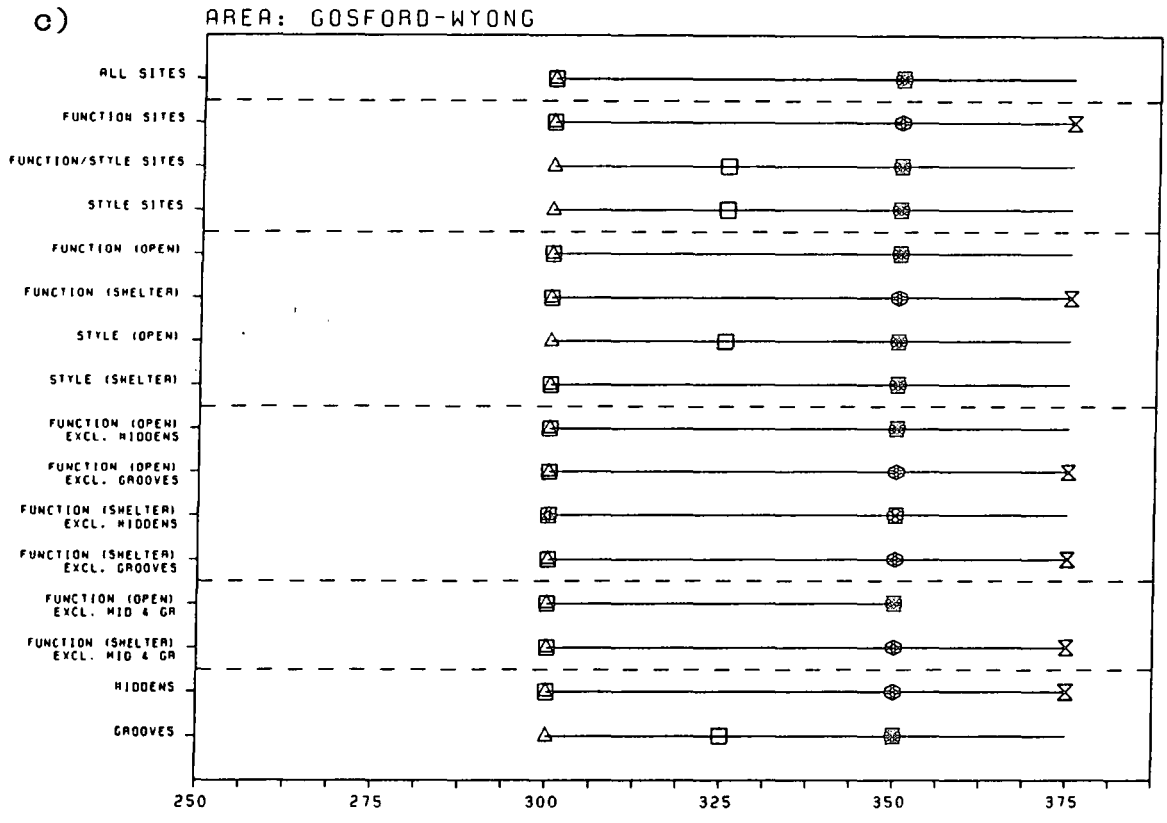
Populations	Mann-W 'U'	Att sig	sig?
F vs S	10473.0	.0152	Y
F vs F/S	28517.0	.0122	Y
S vs F/S	38739.0	.2318	N
FO vs SO	61435.0	.0121	Y
FS vs SS	4819.0	.6252	N
FO vs FS	18088.0	.2859	N
SO vs SS	14285.0	.0014	Y
FOXM vs FSXM	1884.0	.0268	Y
FOXGG vs FSXGG	9795.0	.3273	N
FOXMGG vs FSXMGG	171.0	.7412	N
FOXM vs SO	30274.0	.0541	N
FSXM vs SS	1091.5	.1160	N
FOXGG vs SO	33613.0	.0401	Y
FSXGG vs SS	4759.0	.5836	N
FOXMGG vs SO	2451.0	.8529	N
FSXMGG vs SS	1031.5	.0779	N

Interpretational notes

Within this sub-region there appears to be a slight tendency for all site populations to be located toward the higher end of the range, but no Aboriginal activity has been detected between the 375-400mm range. There is a tendency for FO sites to be located in slightly wetter areas than SO sites, which at least in part is due to the presence of middens.

2. Upper Mangrove Creek.

The range in rainfall lies between 250-350mm (modal value 300): Aboriginal sites sites are distributed throughout this range. A statistical assessment of the relationship between Function and Style with regard to average summer rainfall is presented in Table D.59.



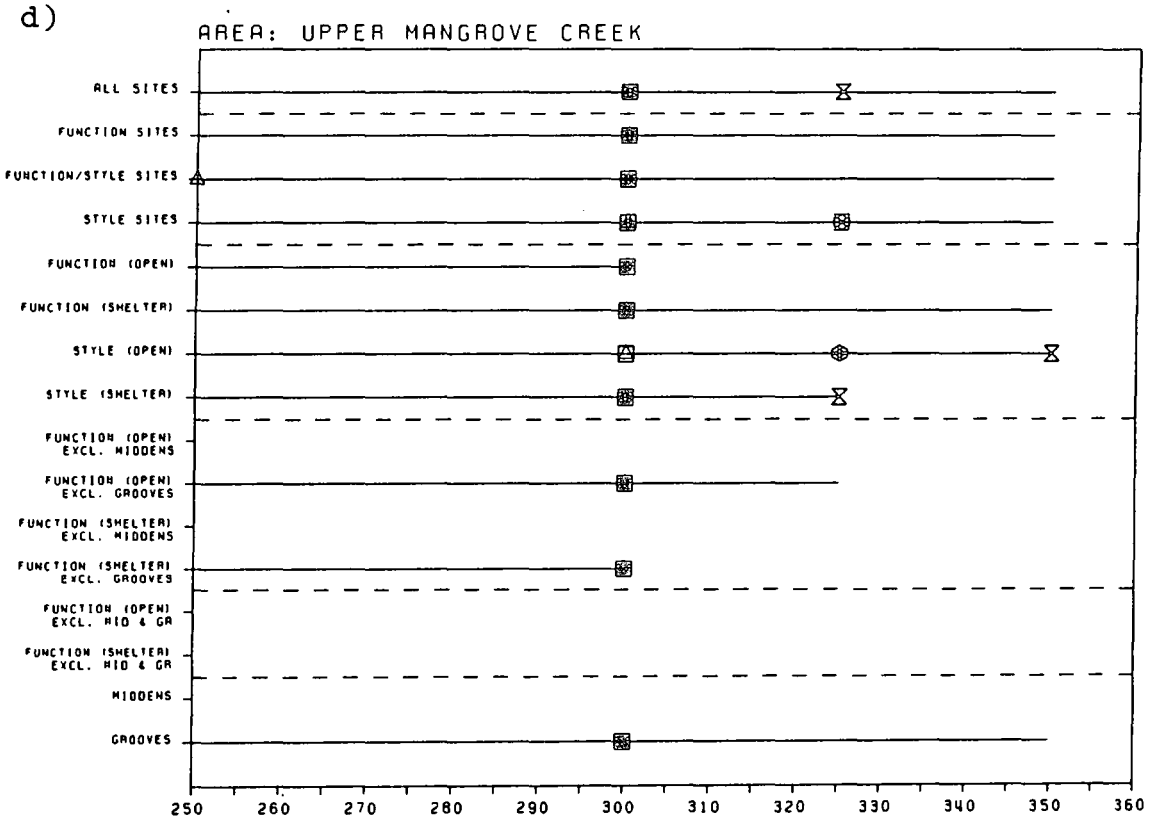


Figure D.21 (cont.) : Aboriginal sites and average summer rainfall (mm).

Table D.59

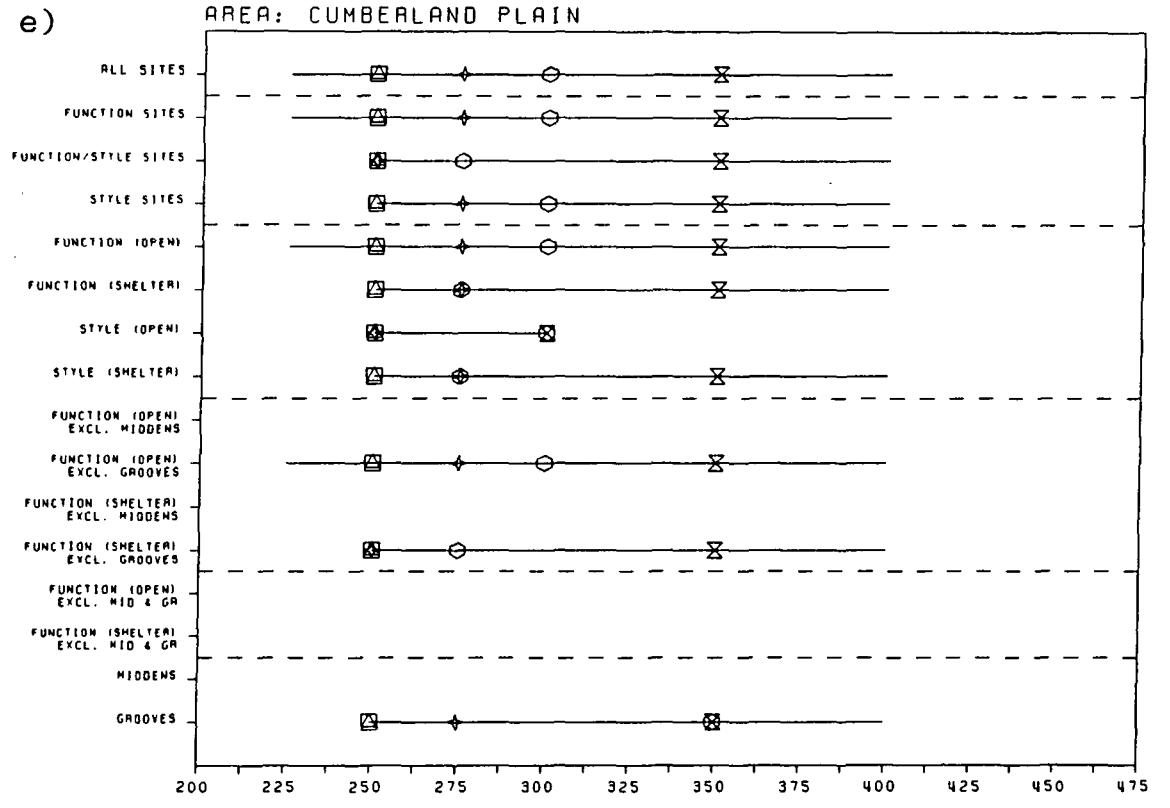
Populations	Mann-W 'U'	Att sig	sig?
F vs S	1738.0	.0001	Y
F vs F/S	1093.0	.5852	N
S vs F/S	468.0	.0134	Y
FO vs SO	253.0	.0000	Y
FS vs SS	438.0	.0394	Y
FO vs FS	813.5	.0272	Y
SO vs SS	158.0	.0005	Y
FOXGG vs FSXGG	336.0	.0572	N
FOXGG vs SO	95.0	.0001	Y
FSXGG vs SS	423.0	.0363	Y

Interpretational notes

There is little evident tendency for site population distributions to tend away from the 300mm level which is modal for the sub-region. However, there is a consistently significant pattern of difference between Function and Style in that both Style components are in significantly higher rainfall areas than their Function counterparts - presumably as a result of their relatively greater height and the orographic nature of rainfall distribution.

3. Cumberland Plain.

The range in average summer rainfall within this sub-region lies between 250-400mm (modal value 250mm). A statistical assessment of the relationship between Function and Style populations and this variable is presented in Table D.60.



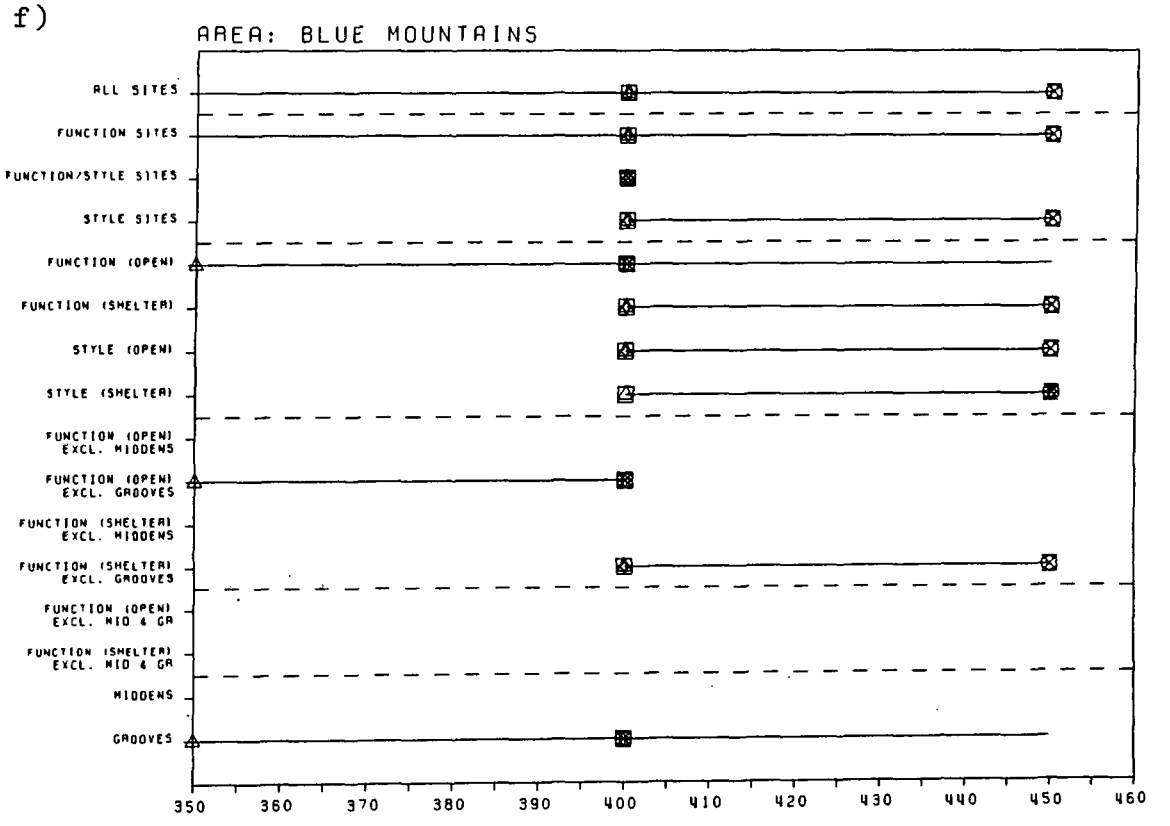


Figure D.21 (cont.) : Aboriginal sites and average summer rainfall (mm).

Table D.60

Populations	Mann-W 'U'	Att sig	sig?
F vs S	4226.5	.6668	N
F vs F/S	2161.5	.5137	N
S vs F/S	548.5	.6223	N
FO vs SO	591.5	.1817	N
FS vs SS	740.0	.2293	N
FO vs FS	2854.5	.1116	N
SO vs SS	161.5	.3305	N
FOXGG vs FSXGG	2058.5	.2904	N
FOXGG vs SO	506.5	.2404	N
FSXGG vs SS	635.0	.3452	N

Interpretational notes

There is a consistent tendency for all site populations to be located in situations where rainfall is above the modal value, but there is no evidence of a significant difference between Function and Style.

4. The Blue Mountains.

The range in average summer rainfall within this sub-region is 350-450mm (modal value 400mm). A statistical assessment of the relationship between Function and Style with regard to this variable is presented in Table D.61.

Table D.61

Populations	Mann-W 'U'	Att sig	sig?
F vs S	243.0	.0816	N
F vs F/S	TOO FEW		
S vs F/S	TOO FEW		
FO vs SO	TOO FEW		
FS vs SS	TOO FEW		
FO vs FS	88.5	.0150	Y
SO vs SS	TOO FEW		
FOXGG vs FSXGG	64.0	.0543	N
FOXGG vs SO	TOO FEW		
FSXGG vs SS	TOO FEW		

Interpretational notes

It is evident that all site population distributions tend to fall around the value which is modal for the sub-region. There is no evident difference between Function and Style in this regard. Though in the absence of sufficient data for statistical assessment it can be suggested that Function Open sites display more of a tendency toward low rainfall areas than can be said to be true of any of the other site groups.

5. Cataract Dam.

The range of average summer rainfall lies between 300-450mm (modal value 350mm). A statistical assessment of the relationship between Function and Style sites and this variable is presented in Table D.62.

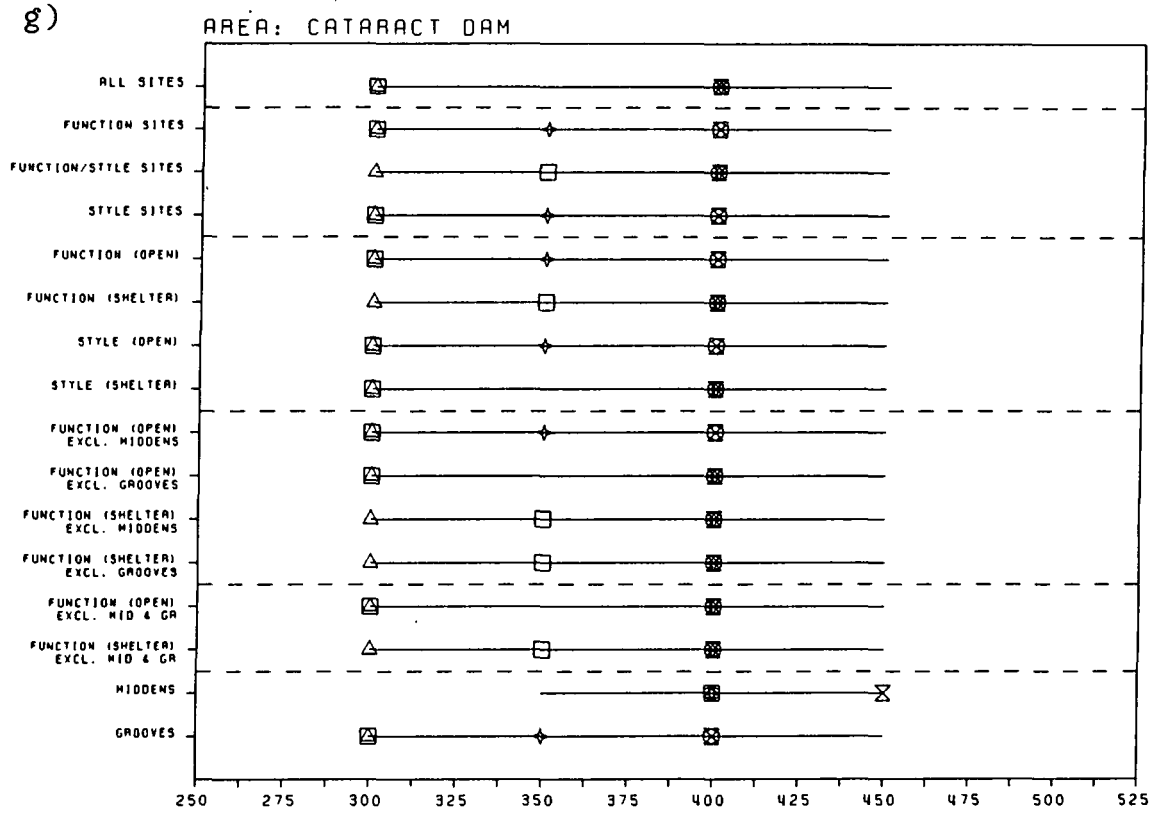
Table D.62

Populations	Mann-W 'U'	Att sig	sig?
F vs S	44729.0	.1365	N
F vs F/S	18089.0	.2341	N
S vs F/S	13065.0	.0311	Y
FO vs SO	2302.0	.2352	N
FS vs SS	6238.0	.0002	Y
FO vs FS	6895.0	.0001	Y
SO vs SS	2055.0	.2690	N
FOXM vs FSXM	5999.5	.0129	Y
FOXGG vs FSXGG	1047.0	.0734	N
FOXMGG vs FSXMGG	840.0	.3320	N
FOXM vs SO	2292.0	.2503	N
FSXM vs SS	5468.5	.0241	Y
FOXGG vs SO	291.5	.1628	N
FSXGG vs SS	6110.0	.0003	Y
FOXMGG vs SO	283.0	.2043	N
FSXMGG vs SS	5340.5	.0389	Y

Interpretational notes

There is a consistent tendency for all sites to be located at the higher end of the range. This tendency is particularly emphasized in the Function population through the influence of middens. However FS sites possess a tendency to be located in wetter areas than the other

g)



h)

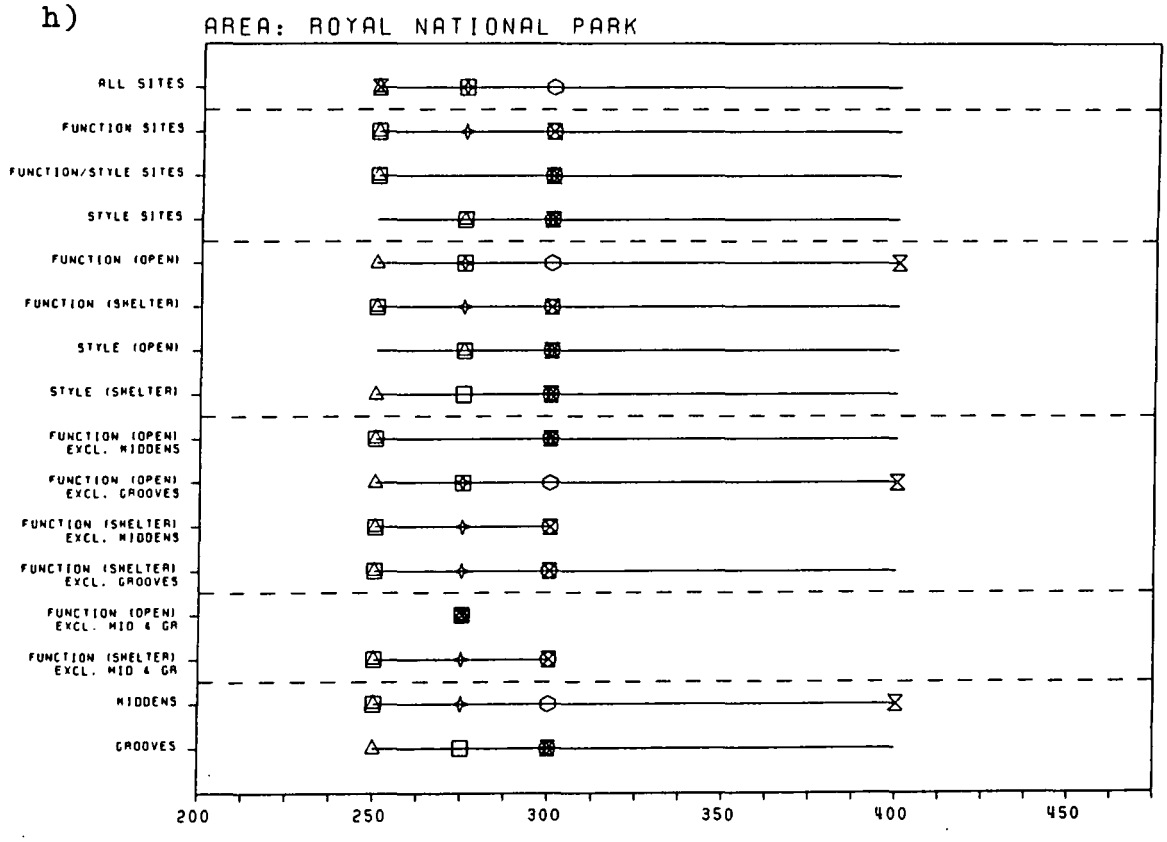


Figure D.21 (cont.) : Aboriginal sites and average summer rainfall (mm).

three site populations even when both middens and grooves are removed from the analysis.

6. Royal National Park

The range within this sub-region is 250-400mm (modal value 300mm). An assessment of the relationships between Function and Style with regard to this variable are presented in Table D.63.

Table D.63

Populations	Mann-W 'U'	Att sig	sig?
F vs S	5001.0	.0001	Y
F vs F/S	2365.0	.3042	N
S vs F/S	1187.0	.2344	N
FO vs SO	2178.0	.1956	N
FS vs SS	533.0	.0026	Y
FO vs FS	2442.0	.0009	Y
SO vs SS	632.5	.8344	N
FOXM vs FSXM	588.0	.0254	Y
FOXGG vs FSXGG	1429.5	.0105	Y
FOXMGG vs FSXMGG	No diff.		
FOXM vs SO	1080.0	.4727	N
FSXM vs SS	280.0	.0104	Y
FOXGG vs SO	1138.5	.0804	N
FSXGG vs SS	533.0	.0026	Y
FOXMGG vs SO	No diff.		N
FSXMGG vs SS	280.0	.0104	Y

Interpretational notes

Within this sub-region there is little evidence to suggest that any of the site population distributions tend away from the modal value for this variable. However, FS sites display a consistent tendency toward drier places than the other site populations.

D-3.3 Average winter rainfall

For the whole region, the range in average winter rainfall (which is lower than that of the summer months) lies between 150-500mm and is

distributed orographically in the manner described for other rainfall variables. The data for this variable are illustrated for the region and for each of the sub-regions in Figure D.22, and a statistical assessment of the relationships between Function and Style populations with regard to average winter rainfall is presented for the region as a whole in Table D.64.

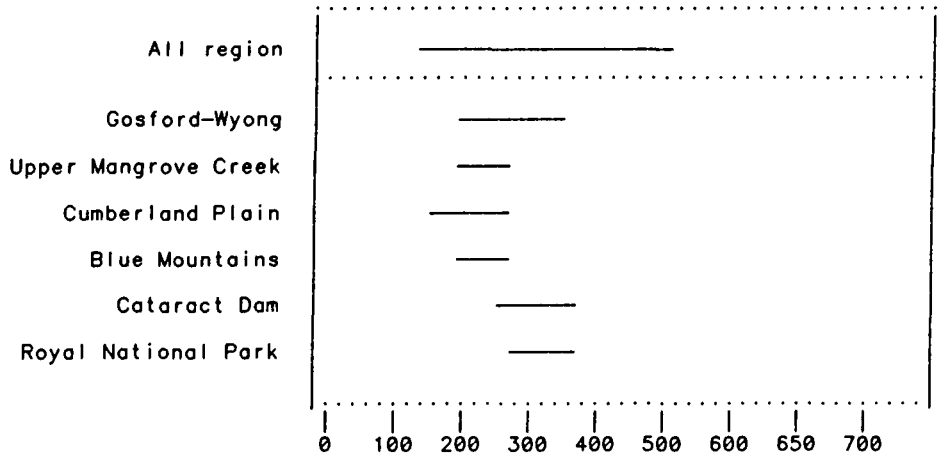
Table D.64

Populations	Mann-W 'U'	Att sig	sig?
F vs S	2117200.0	.5089	N
F vs F/S	552460.0	.1488	N
S vs F/S	508060.0	.0639	N
FO vs SO	803360.0	.0000	Y
FS vs SS	209880.0	.0000	Y
FO vs FS	421500.0	.0001	Y
SO vs SS	398520.0	.0000	Y
FOXM vs FSXM	190300.0	.3813	N
FOXGG vs FSXGG	221170.0	.0001	Y
FOXMGG vs FSXMGG	494560.0	.0000	Y
FOXM vs SO	486460.0	.0000	Y
FSXM vs SS	446530.0	.0000	Y
FOXGG vs SO	138440.0	.1524	N
FSXGG vs SS	197870.0	.0000	Y
FOXMGG vs SO	131840.0	.0000	Y
FSXMGG vs SS	130300.0	.2670	N

Interpretational notes

There is an apparent tendency for all site populations to be distributed around the lower end of the range. The pattern in the relationships between Function and Style is unclear - FS sites display a tendency to be located in wetter areas than SS sites, while FO are consistently in drier areas than SO sites. These differences appear to be largely related to midden distribution within the Function sub-categories, though the difference is maintained in the FO population even when both middens and grooves are removed from the analysis. The distribution of FO sites upon low-lying plains areas may account for some of this degree of variance with regard to the other three populations.

a)



b)

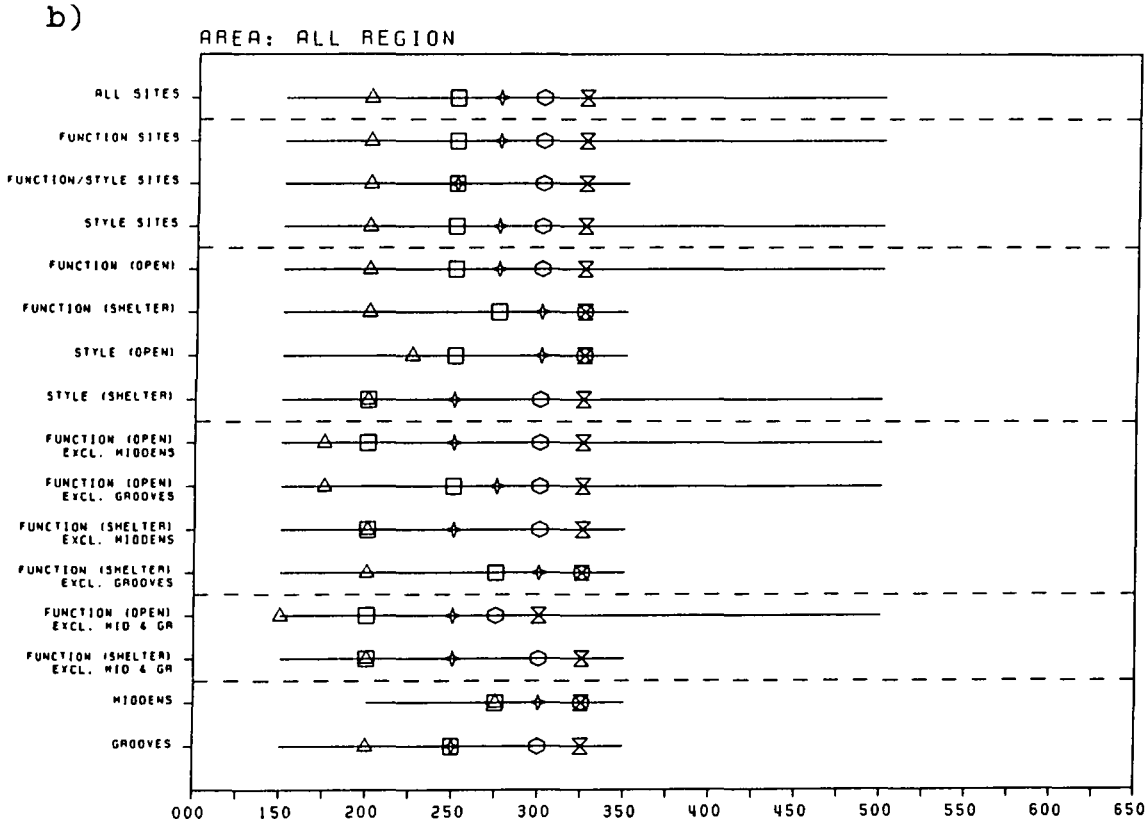


Figure D.22: Aboriginal sites and average winter rainfall (mm).
a) range of data in the region and sub-region
b - h) the distributional characteristics in the region and sub-regions.

SUB-REGIONAL VARIATION.

1. Gosford-Wyong.

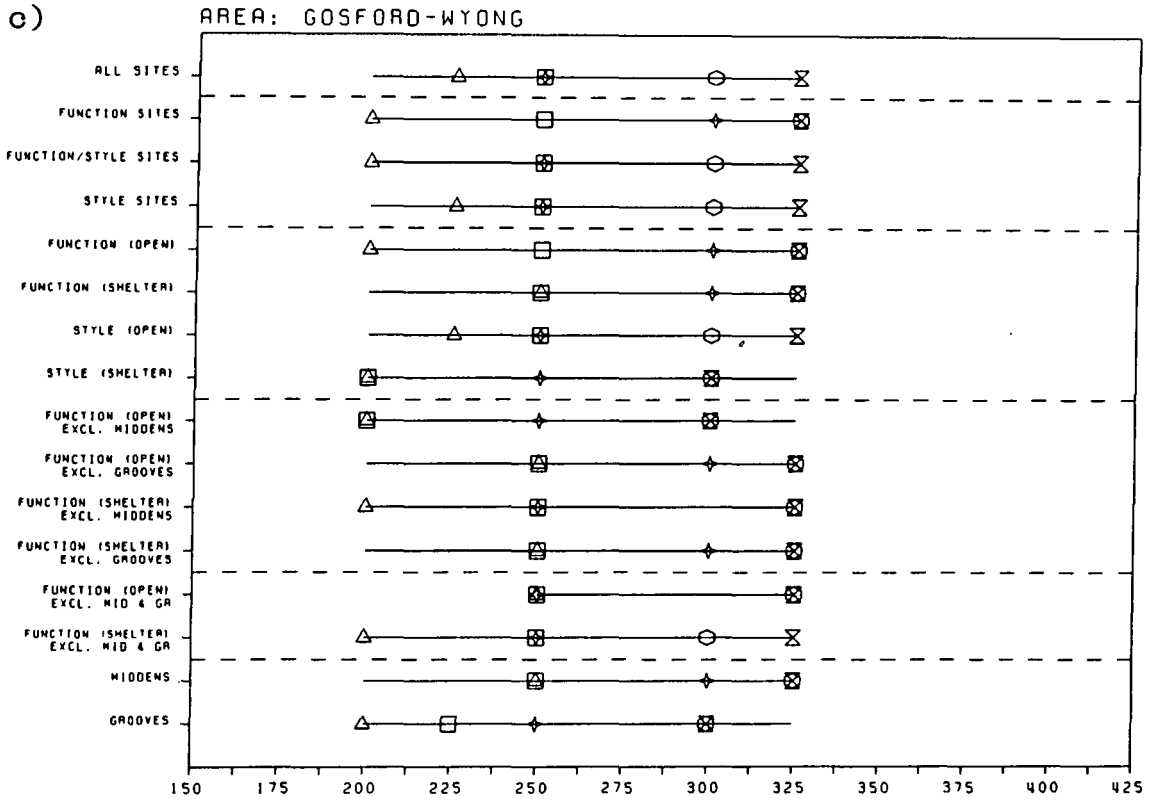
The range in average winter rainfall lies between 200-325mm (modal value 250mm). A statistical assessment of the relationship between Function and Style and average winter rainfall is presented in Table D.65.

Table D.65

Populations	Mann-W 'U'	Att sig	sig?
F vs S	97650.0	.0001	Y
F vs F/S	26281.0	.0002	Y
S vs F/S	38478.0	.2350	N
FO vs SO	66396.0	.6200	N
FS vs SS	2432.5	.0000	Y
FO vs FS	14283.0	.0000	Y
SO vs SS	12781.0	.0000	Y
FOXM vs FSXM	1674.0	.0023	Y
FOXGG vs FSXGG	1018.7	.6961	N
FOXMGG vs FSXMGG	168.0	.7002	N
FOXM vs SO	22604.0	.0000	Y
FSXM vs SS	942.0	.0439	Y
FOXGG vs SO	24837.0	.0000	Y
FSXGG vs SS	2429.5	.0000	Y
FOXMGG vs SO	2247.00	.5178	N
FSXMGG vs SS	939.00	.0246	Y

Interpretational notes

There is some evidence that all site populations tend to be mainly distributed above the modal value for the sub-region; and Function sites show a consistent tendency to be found in areas of higher rainfall than their Style counterparts. This is particularly illustrated by the consistent divergence of FS and SS sites which are potentially from the same population.



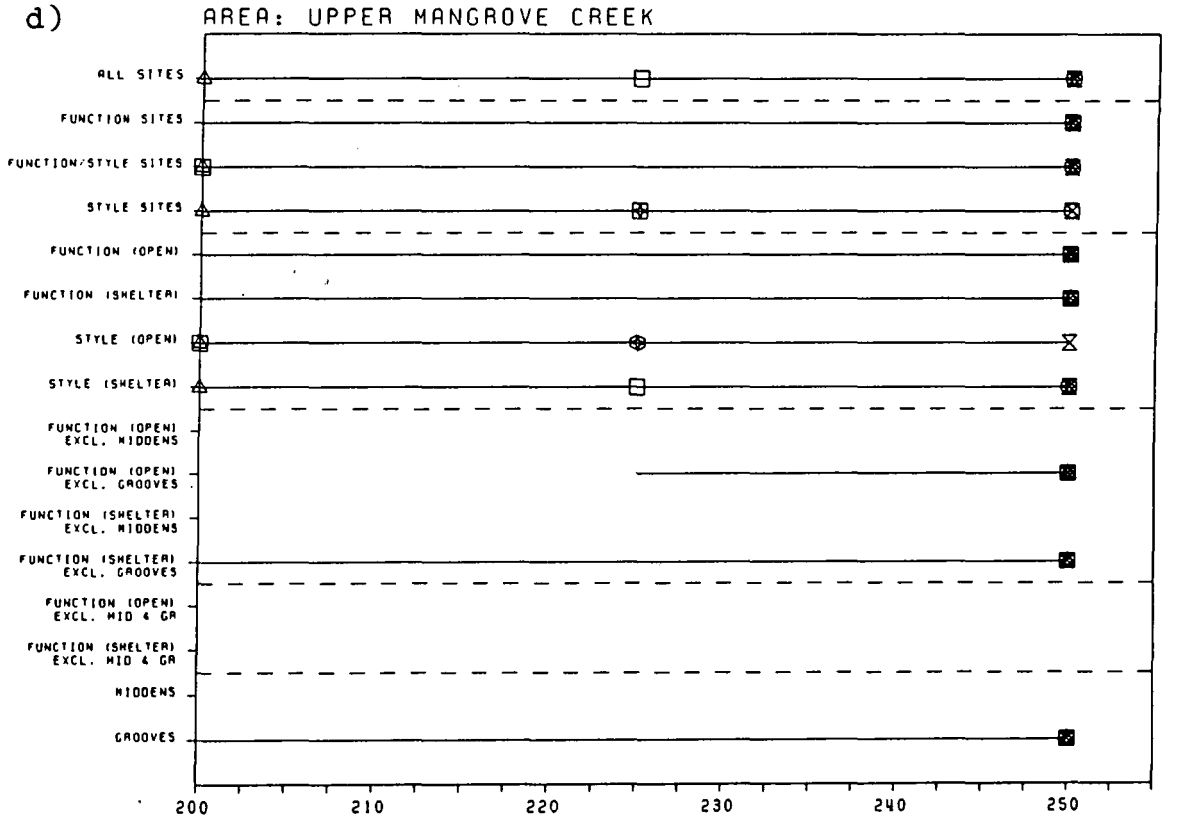


Figure D.22 (cont.) : Aboriginal sites and average winter rainfall (mm).

2. Upper Mangrove Creek

The range of rainfall in winter is small, from 200-250mm (modal value 200mm). A statistical assessment of the relationships between Function and Style and average winter rainfall is presented in Table D.66.

Table D.66

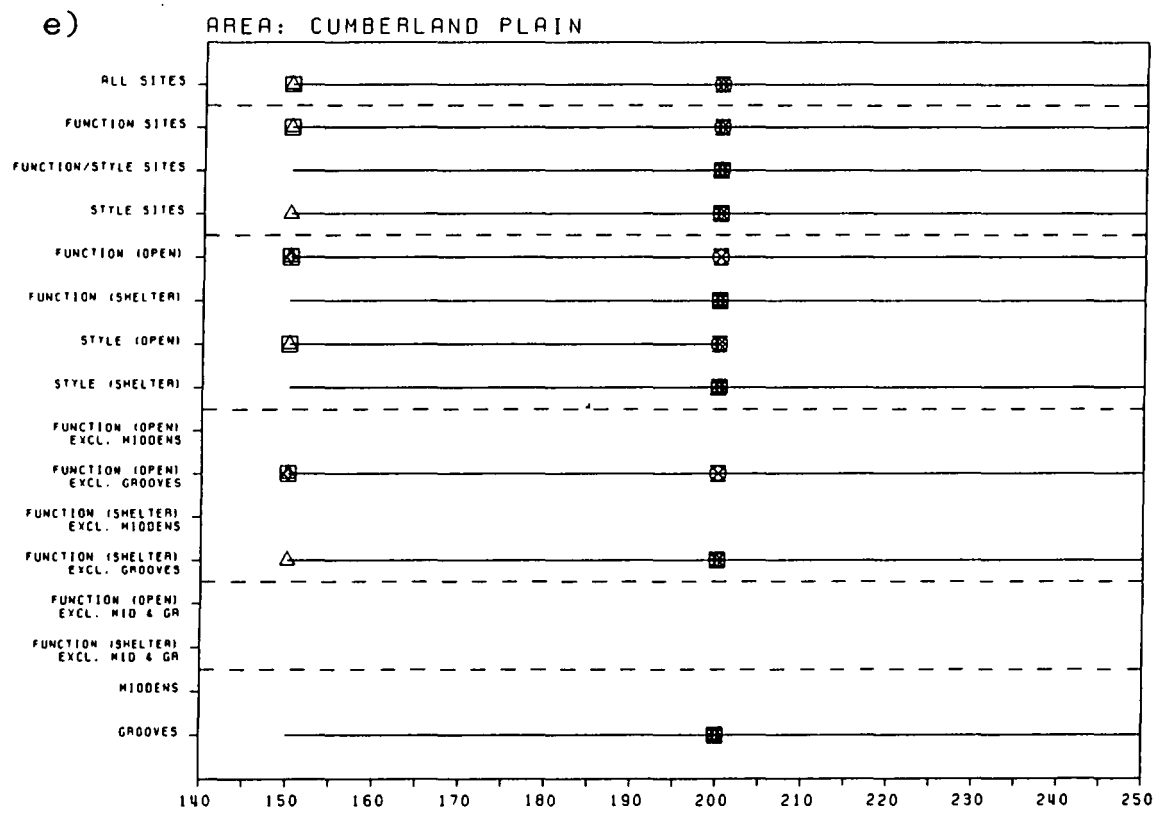
Populations	Mann-W 'U'	Att sig	sig?
F vs S	1319.0	.0000	Y
F vs F/S	814.5	.0003	Y
S vs F/S	596.0	.4360	N
FO vs SO	138.5	.0000	Y
FS vs SS	396.0	.0112	Y
FO vs FS	918.0	.6398	N
SO vs SS	191.5	.0087	Y
FOXGG vs FSXGG	364.0	.3856	N
FOXGG vs SO	44.0	.0000	Y
FSXGG vs SS	385.5	.0136	Y

Interpretational notes

There is an apparent tendency for all site populations to be distributed around the higher end of the range. In addition, Function sites are consistently located in higher rainfall areas than their Style counterparts.

3. The Cumberland Plain

The range in winter rainfall within this sub-region is small from 150-200mm (modal value 200mm). A statistical assessment of the relationship between Function and Style and average winter rainfall is presented in Table D.67.



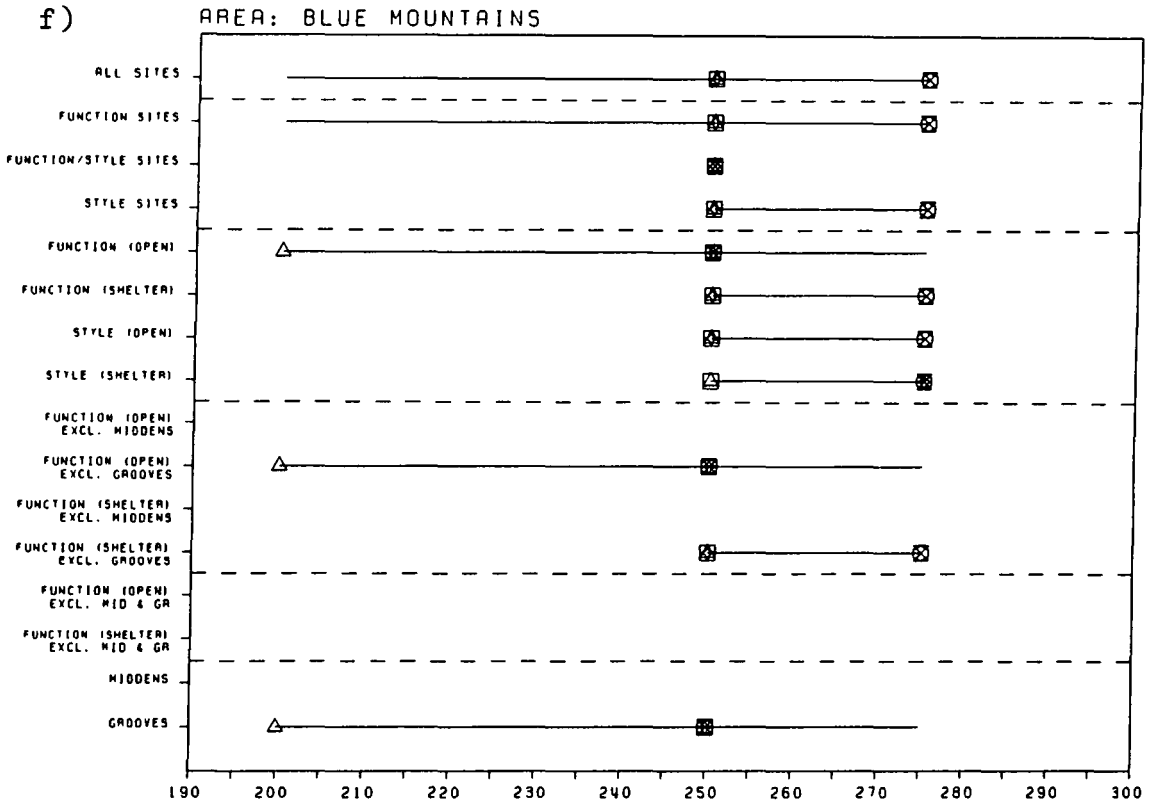


Figure D.22 (cont.) : Aboriginal sites and average winter rainfall (mm).

Table D.67

Populations	Mann-W 'U'	Att sig	sig?
F vs S	3044.0	.0002	Y
F vs F/S	1451.0	.0004	Y
S vs F/S	551.5	.4958	N
FO vs SO	637.0	.2979	N
FS vs SS	825.0	.5620	N
FO vs FS	1766.5	.0000	Y
SO vs SS	126.5	.0087	Y
FOXGG vs FSXGG	1048.0	.0000	Y
FOXGG vs SO	470.0	.1027	N
FSXGG vs SS	685.0	.5657	N

Interpretational notes

There is little evidence that any of the site population distributions tend away from the modal value for the sub-region. FO and SO sites tend to occur in drier areas than their shelter counterparts, which is suggestive of the peripheral status and difference in height which are characteristic of shelter sites and the orographic nature of rainfall distribution.

4. Blue Mountains

The range in rainfall in this area lies between 200-275mm (modal value 250mm). A statistical assessment of the relationship between Function and Style is presented in Table D.68.

Table D.68

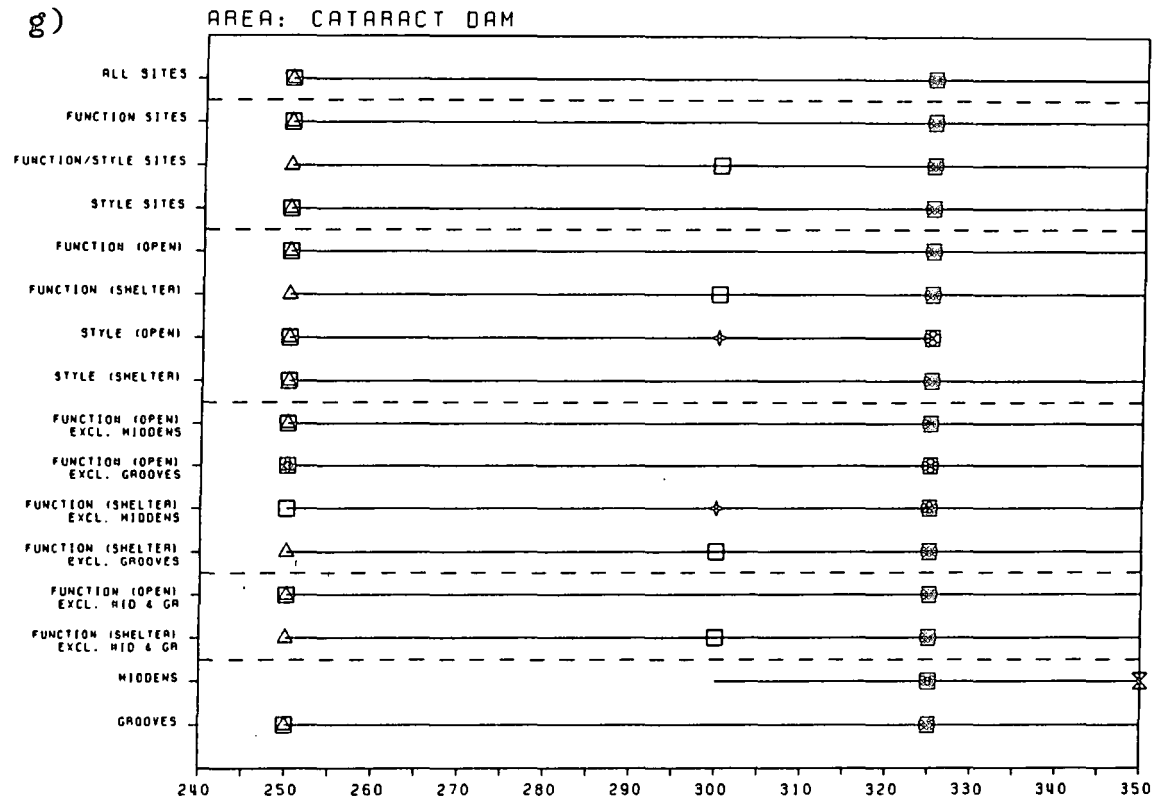
Populations	Mann-W 'U'	Att sig	sig?
F vs S	243.0	.0816	N
F vs F/S	TOO FEW		
S vs F/S	TOO FEW		
FO vs SO	TOO FEW		
FS vs SS	TOO FEW		
FO vs FS	88.5	.0150	Y
SO vs SS	TOO FEW		
FOXGG vs FSXGG	64.0	.0543	N
FOXGG vs SO	TOO FEW		
FSXGG vs SS	No diff.		N

Interpretational notes

There is little evidence to suggest that any site population tends away from the modal value for the sub-region; and there is no evident statistical difference between Function and Style sites. However there is an apparent divergence between FO and FS sites - the latter group being in areas of greater rainfall.

5. Cataract Dam

The range in winter rainfall lies between 250-350mm (modal value 300mm). A statistical assessment of the relationship between Function and Style and average winter rainfall is presented in Table D.69.



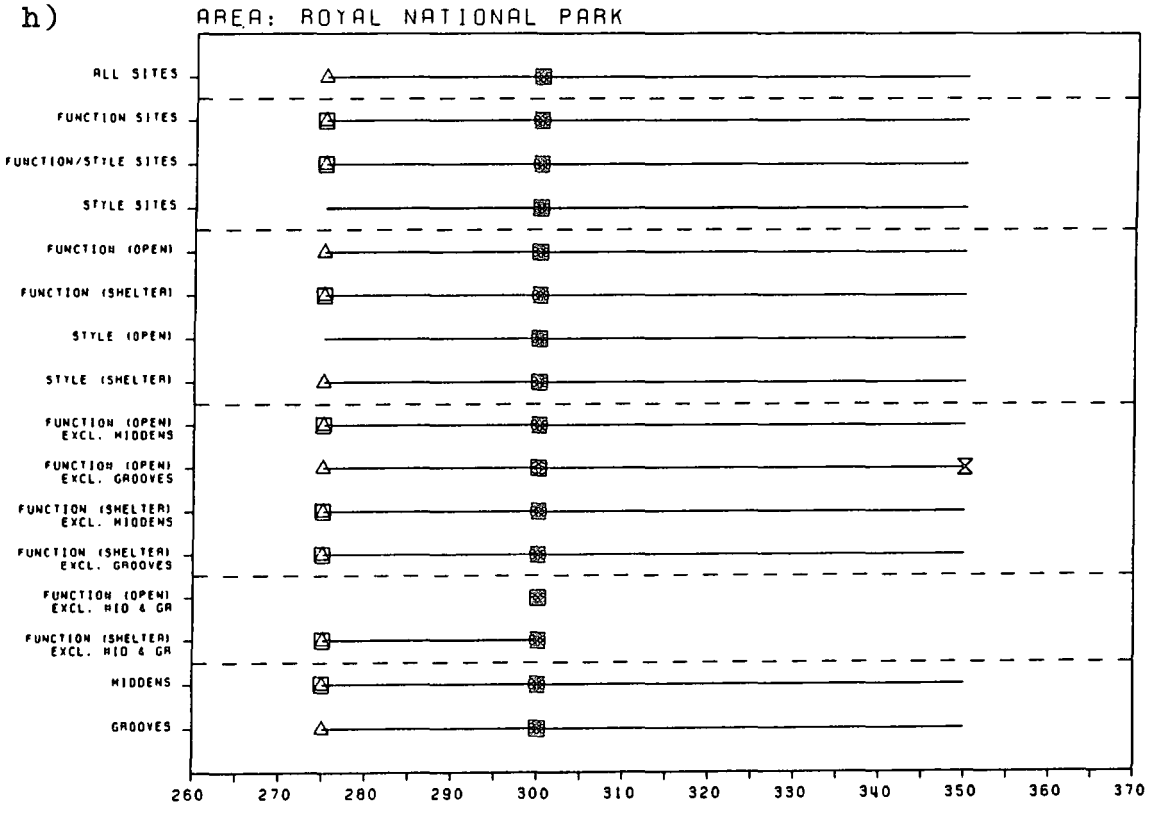


Figure D.22 (cont.) : Aboriginal sites and average winter rainfall (mm).

Table D.69

Populations	Mann-W 'U'	Att sig	sig?
F vs S	43828.3	.0506	N
F vs F/S	48589.0	.2732	N
S vs F/S	12967.0	.0152	Y
FO vs SO	2486.0	.4992	N
FS vs SS	6265.0	.0002	Y
FO vs FS	7354.0	.0006	Y
SO vs SS	2277.0	.7167	N
FOXM vs FSXM	6356.0	.0539	N
FOXGG vs FSXGG	1099.0	.1558	N
FOXMGG vs FSXMGG	880.5	.5478	N
FOXM vs SO	2472.0	.5225	N
FSXM vs SS	5489.5	.0264	Y
FOXGG vs SO	315.5	.5179	N
FSXGG vs SS	6136.0	.0003	Y
FOXMGG vs SO	305.5	.3778	N
FSXMGG vs SS	5360.0	.0424	N

Interpretational notes

There is evidence that all site populations tend to be located in wetter areas than those which are associated with the modal value. Middens contribute greatly toward this tendency within the Function population. However, FS sites appear to possess a tendency to diverge from the rest of the site groups in being located in drier areas.

6. Royal National Park

The range in winter rainfall lies between 275-350mm (modal value 300mm). A statistical assessment of the relationships between Function and Style populations and average winter rainfall is presented in Table D.70.

Table D.70

Populations	Mann-W 'U'	Att sig	sig?
F vs S	5666.0	.0013	Y
F vs F/S	2629.0	.9158	N
S vs F/S	1073.0	.0061	Y
FO vs SO	2406.0	.7174	N
FS vs SS	612.0	.0097	Y
FO vs FS	2478.0	.0004	Y
SO vs SS	637.0	.7775	N
FOXM vs FSXM	681.0	.1401	N
FOXGG vs FSXGG	1251.0	.0001	Y
FOXMGG vs FSXMGG	No diff.		N
FOXM vs SO	1011.0	.0755	N
FSXM vs SS	320.5	.0198	Y
FOXGG vs SO	1299.5	.3632	N
FSXGG vs SS	612.0	.0077	Y
FOXMGG vs SO	TOO FEW		
FSXMGG vs SS	320.5	.0198	Y

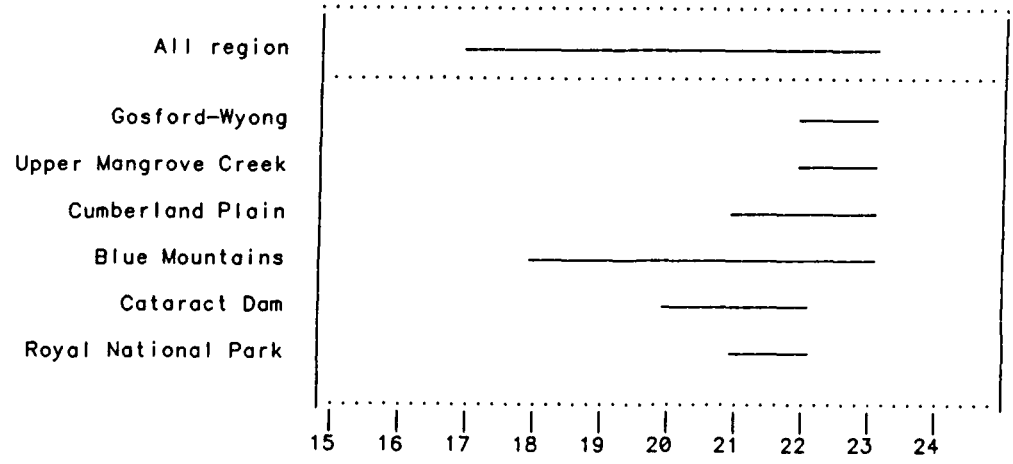
Interpretational notes

There appears to be little divergence from the modal characteristics of the sub-region displayed by any of the site populations. However, FS sites appear to occur in wetter areas than any of the other three site groups.

D-3.4 Average annual maximum temperature

The range in average annual maximum temperature within the whole region lies between 17-22C, and decreases, more or less steadily, from the coast and with increasing height. The data concerning this variable are illustrated in Figure D.23 for the region as a whole and for each sub-region, and a statistical assessment of the relationships between Function and Style and average annual maximum temperature is presented in Table D.71 for the whole region.

a)



b)

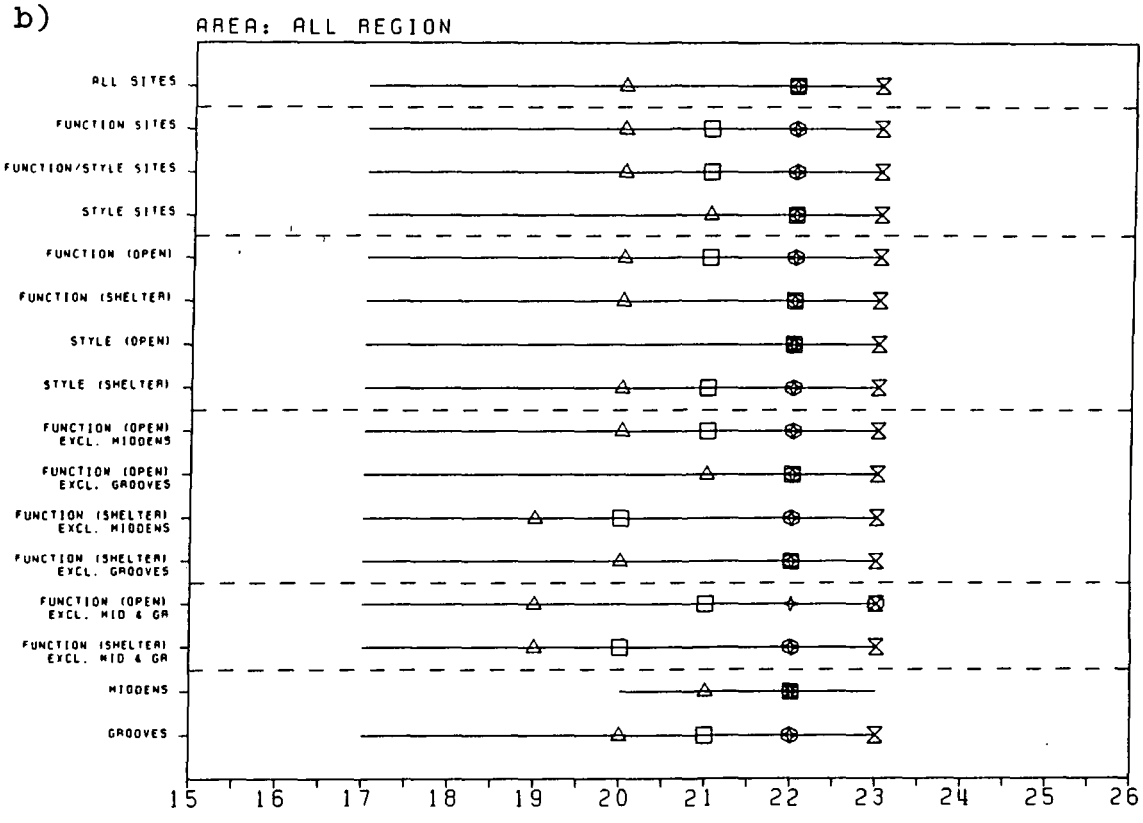


Figure D.23: Aboriginal sites and average annual maximum temperature (C).
a) range of data in the region and sub-region
b - h) the distributional characteristics in the region and sub-regions.

Table D.71

Populations	Mann-W 'U'	Att sig	sig?
F vs S	1916900.0	.0000	Y
F vs F/S	573050.0	.8986	N
S vs F/S	487100.0	.0003	Y
FO vs SO	724390.0	.0001	Y
FS vs SS	243820.0	.2302	N
FO vs FS	454970.0	.0767	N
SO vs SS	391780.0	.0000	Y
FOXM vs FSXM	192750.0	.5958	N
FOXGG vs FSXGG	257070.0	.0280	N
FOXMGG vs FSXMGG	569050.0	.0000	Y
FOXM vs SO	508700.0	.0000	Y
FSXM vs SS	139140.0	.1757	N
FOXGG vs SO	450850.0	.0005	Y
FSXGG vs SS	236640.0	.4150	N
FOXMGG vs SO	235190.0	.3691	N
FSXMGG vs SS	126170.0	.0420	N

Interpretational notes

There is a general tendency for all site populations to be distributed around the warmer end of the range. While FS sites display no statistically significant difference from SS sites with regard to this variable, FO sites can be shown to be in consistently cooler positions than SO sites. Indeed, SO sites can be seen to diverge from all other site populations in being in significantly warmer areas, presumably as a function of their principal distribution along the coast.

SUB-REGIONAL VARIATION.

Accurate statistical assessment is made increasingly difficult because of the low degree of variation present within the sub-regions. Although the statistical techniques are maintained a greater degree of emphasis is laid, of necessity, upon the evident distributional patterns illustrated for each sub-region.

1. Gosford-Wyong

The range in average annual maximum temperature within this sub-region lies only between 22-23C (modal value 22C). A statistical

assessment of the relationship between Function and Style and this variable is presented in Table D.72.

Table D.72

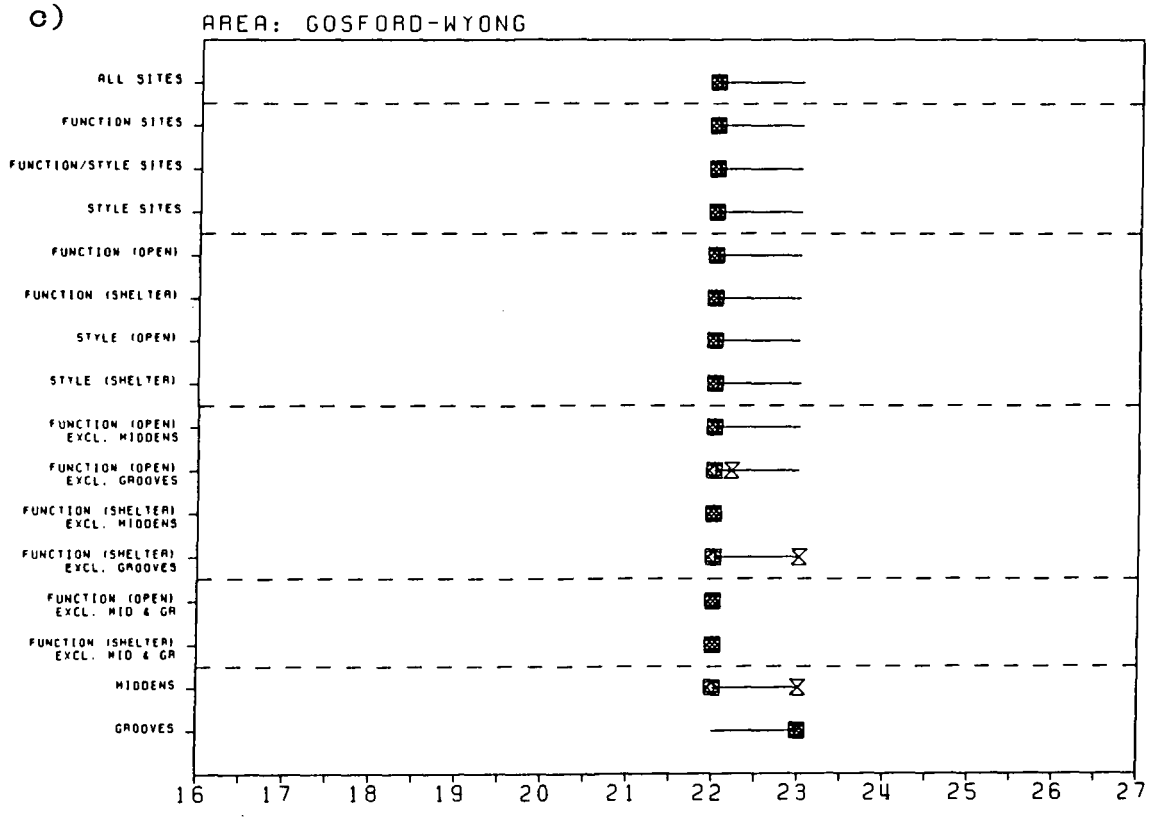
Populations	Mann-W 'U'	Att sig	sig?
F vs S	112160.0	.3051	N
F vs F/S	31223.0	.0552	N
S vs F/S	39856.0	.1752	N
FO vs SO	67672.0	.9213	N
FS vs SS	4764.5	.2247	N
FO vs FS	18356.0	.0833	N
SO vs SS	17625.0	.9868	N
FOXM vs FSXM	2431.0	.4922	N
FOXGG vs FSXGG	10299.0	.6755	N
FOXMGG vs FSXMGG	No diff.		N
FOXM vs SO	31923.0	.0463	Y
FSXM vs SS	1241.0	.1778	N
FOXGG vs SO	35836.0	.1211	N
FSXGG vs SS	4724.0	.2190	N
FOXMGG vs SO	2387.0	.4362	N
FSXMGG vs SS	1204.5	.1843	N

Interpretational notes

There is little evidence to suggest that site population distributions display a tendency away from the modal value for the sub-region. Middens, perhaps, display an element of deviation from the patterns exhibited by other groups which may tend to influence the FOXGG and FSXGG sub-populations.

2. Upper Mangrove Creek.

The range of annual average maximum temperature only lies between 22-23C (modal value 22C). A statistical assessment of the relationship between Function and Style and this variable is presented in Table D.73.



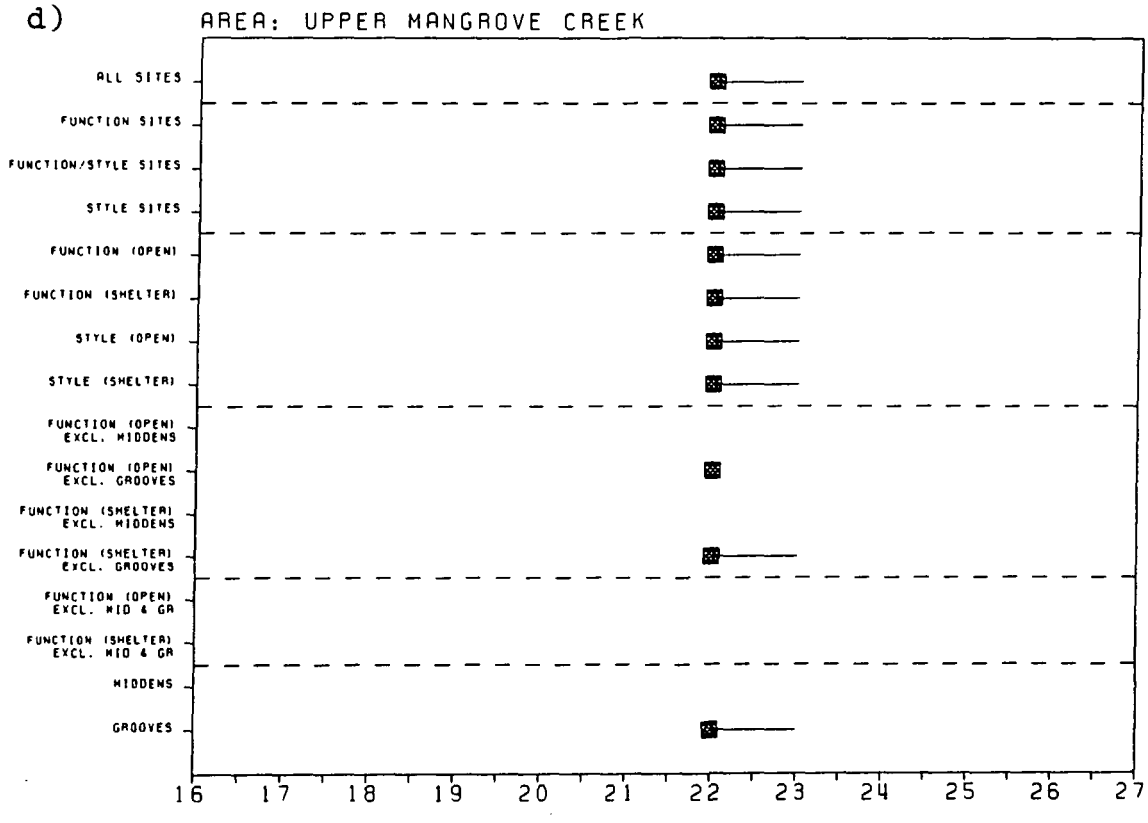


Figure D.23 (cont.) : Aboriginal sites and average annual maximum temperature (C).

Table D.73

Populations	Mann-W 'U'	Att sig	sig?
F vs S	2373.5	.5803	N
F vs F/S	1117.0	.6166	N
S vs F/S	571.5	.7127	N
FO vs SO	540.5	.3951	N
FS vs SS	543.0	.9655	N
FO vs FS	930.5	.6586	N
SO vs SS	815.5	.6735	N
FOXGG vs FSXGG	875.0	.3692	N
FOXGG vs SO	225.0	.2513	N
FSXGG vs SS	525.5	.9475	N

Interpretational notes

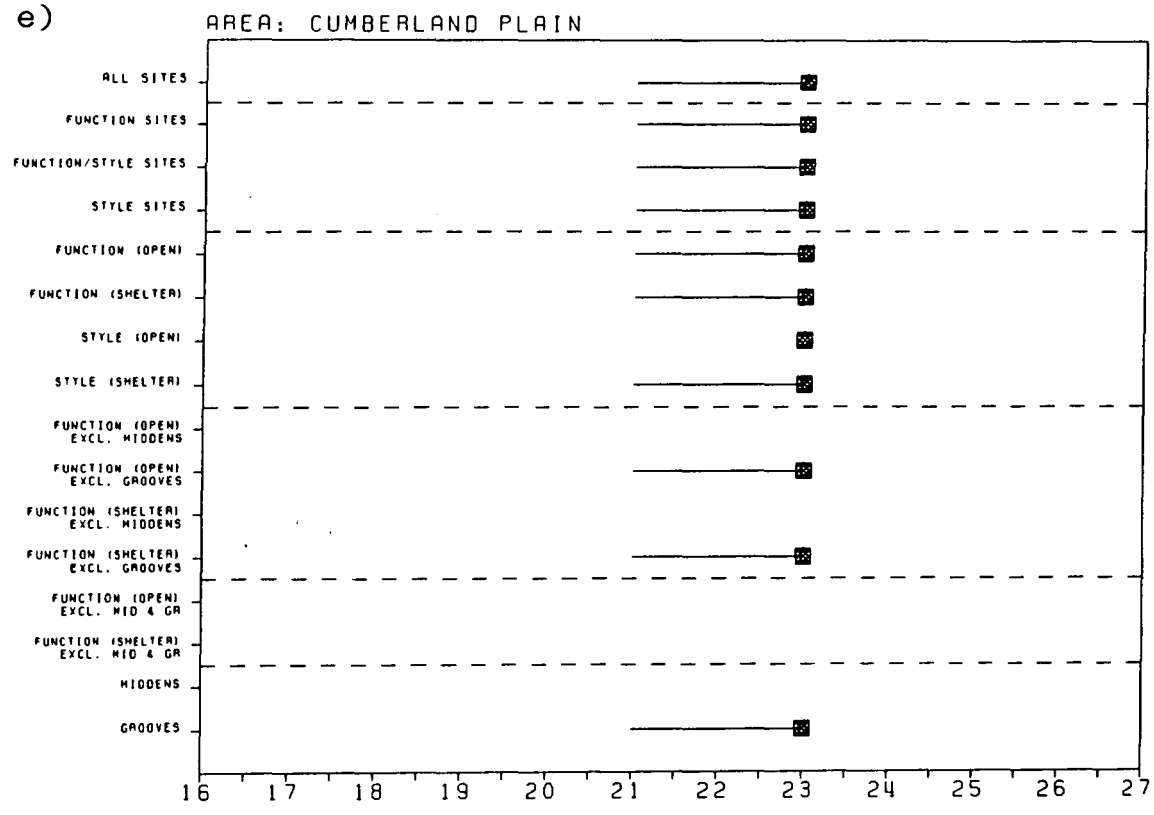
There is little evidence of a tendency away from the modal value for the sub-region and no apparently significant difference between Function and Style populations at any level.

3. The Cumberland Plain.

The range in average annual maximum temperature lies between 21-24C (modal value 23C). All site groups tend to display a tendency toward the lower end of the range. However there is virtually no variation within this general characteristic, and there is consequently no basis for statistical analysis.

4. Blue Mountains

The actual range for this variable within the Blue Mountains sub-region lies between 17-23C (modal value 21C), while the Aboriginal site range lies between 18-23C. A statistical assessment of the relationships between Function and Style with regard to this variable is presented in Table D.74.



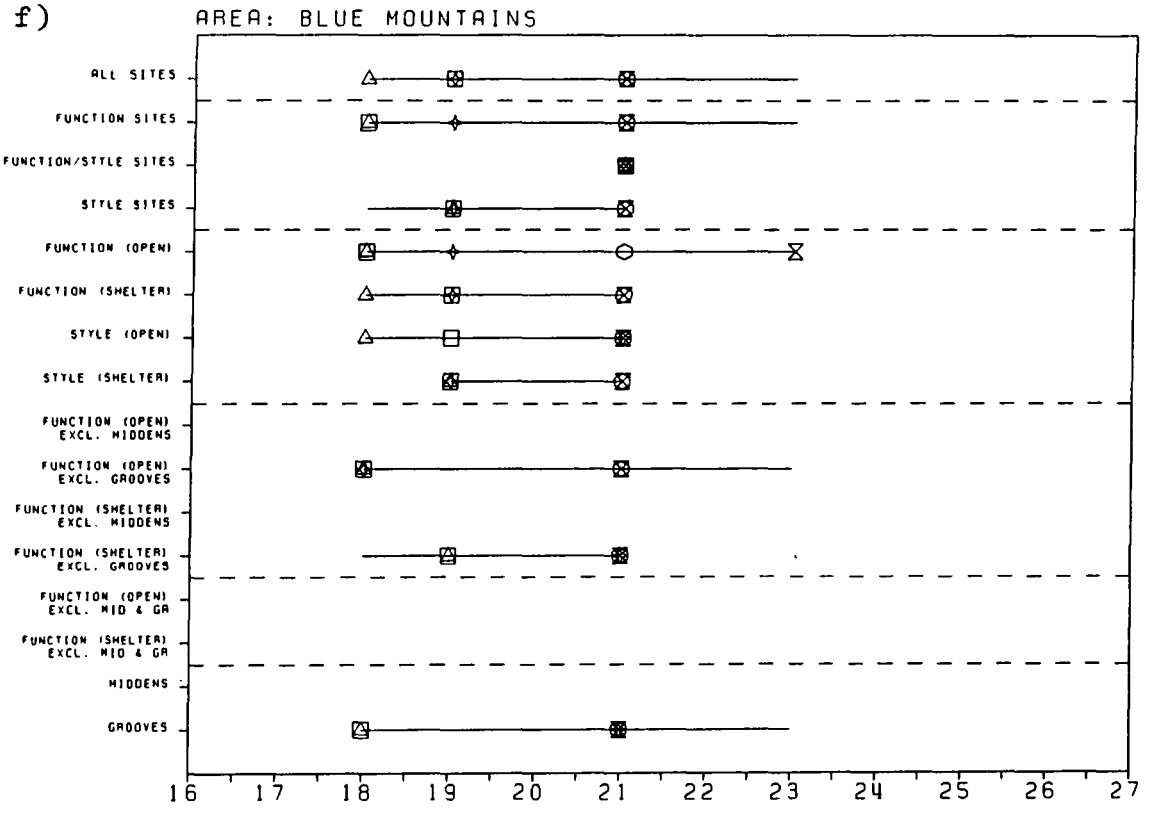


Figure D.23 (cont.) : Aboriginal sites and average annual maximum temperature (C).

Table D.74

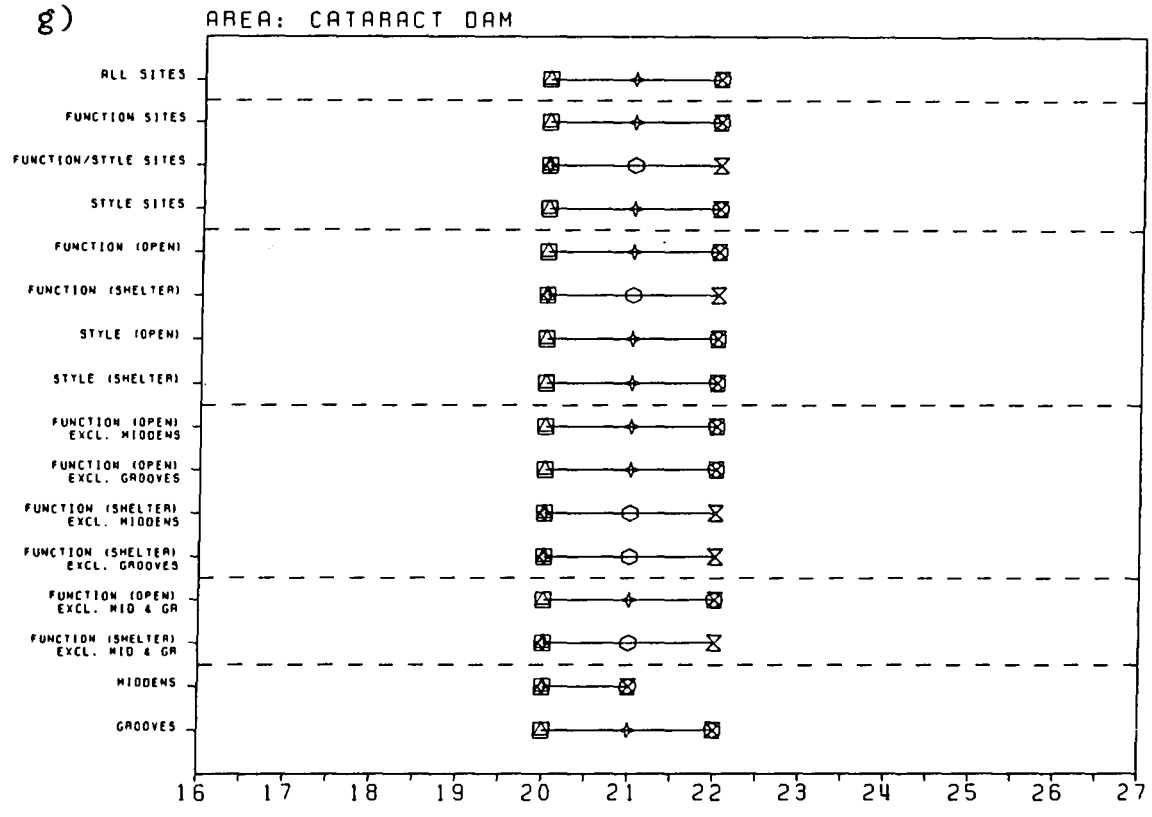
Populations	Mann-W 'U'	Att sig	sig?
F vs S	305.5	.7164	N
F vs F/S	TOO FEW		
S vs F/S	TOO FEW		
FO vs SO	TOO FEW		
FS vs SS	TOO FEW		
FO vs FS	132.5	.5531	N
SO vs SS	TOO FEW		
FOXGG vs FSXGG	71.0	.1700	N
FOXGG vs SO	TOO FEW		
FSXGG vs SS	TOO FEW		

Interpretational notes

Despite the apparent avoidance of the area with the lowest average maximum temperature, there is little evidence that any of the site populations display a tendency away from the modal characteristic for the region. In addition, there is no observable statistical difference between Function and Style sites with regard to this variable.

5. Cataract Dam.

The range in average annual maximum temperature lies between 20-22C (modal 21C). A statistical assessment of the relationships between Function and Style and this variable is presented in Table D.75 below.



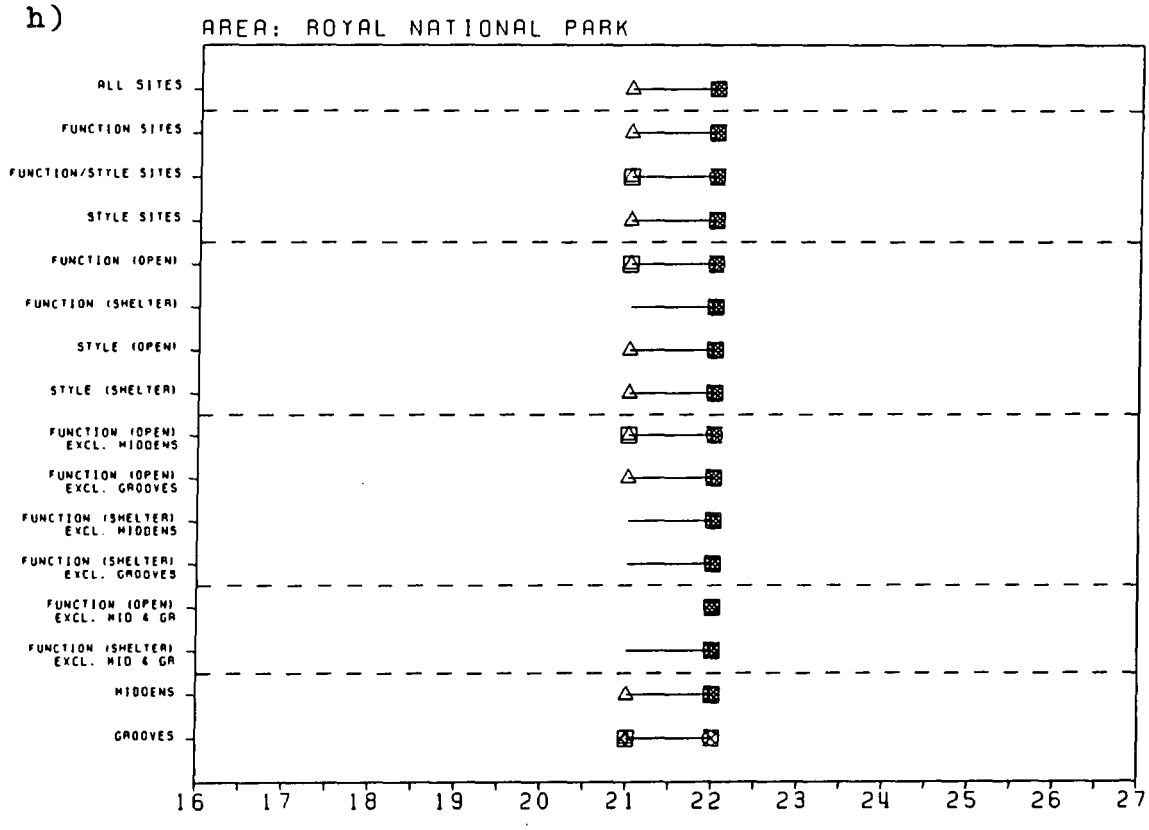


Figure D.23 (cont.) : Aboriginal sites and average annual maximum temperature (C).

Table D.75

Populations	Mann-W 'U'	Att sig	sig?
F vs S	46198.0	.4408	N
F vs F/S	18385.0	.2103	N
S vs F/S	13601.0	.0921	N
FO vs SO	2361.0	.3077	N
FS vs SS	6713.0	.0029	Y
FO vs FS	7209.0	.0004	Y
SO vs SS	2038.5	.2510	N
FOXM vs FSXM	5957.5	.0107	Y
FOXGG vs FSXGG	1011.0	.0399	Y
FOXMGG vs FSXMGG	806.0	.1973	N
FOXM vs SO	2341.5	.3151	N
FSXM vs SS	5558.0	.0389	Y
FOXGG vs SO	314.5	.3225	N
FSXGG vs SS	6591.0	.0049	Y
FOXMGG vs SO	297.5	.3172	N
FSXMGG vs SS	5436.0	.0627	N

Interpretational notes

There is little evidence that any site population tends to be distributed away from the modal value for the sub-region. However, it is apparent that FS sites tend to be located in consistently cooler areas than the other site sub-populations.

6. Royal National Park.

The range in average annual maximum temperature within the Royal National Park lies between 21-23C (modal value 21C). A statistical assessment of the relationship between Function and Style and this variable is presented in Table D.76.

Table D.76

Populations	Mann-W 'U'	Att sig	sig?
F vs S	6459.5	.1083	N
F vs F/S	2175.0	.0175	Y
S vs F/S	1228.0	.2977	N
FO vs SO	2216.5	.1651	N
FS vs SS	580.0	.0000	Y
FO vs FS	2537.0	.0000	Y
SO vs SS	520.0	.0714	Y
FOXM vs FSXM	549.0	.0004	Y
FOXGG vs FSXGG	1616.0	.0029	Y
FOXMGG vs FSXMGG	No diff.		
FOXM vs SO	949.0	.0409	Y
FSXM vs SS	300.0	.0010	Y
FOXGG vs SO	1384.0	.9069	N
FSXGG vs SS	580.0	.0000	Y
FOXMGG vs SO	TOO FEW		
FSXMGG vs SS	300.0	.0010	Y

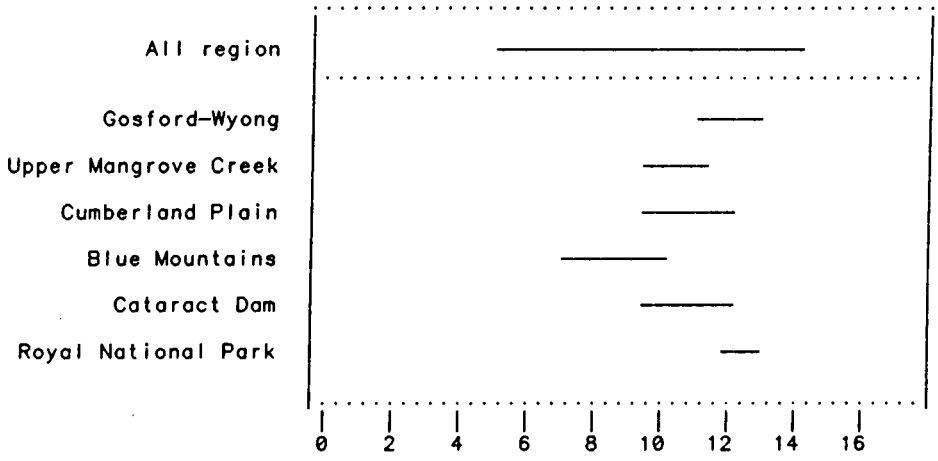
Interpretational notes

There is some evidence that all site populations tend to be distributed within the warmer end of the range and above the modal value for the sub-region. FS sites tend to display a divergence from the other site sub-populations in being located in warmer areas: a divergence which continues to be significant even when both middens and grinding grooves are removed from the analysis.

D-3.5 Average annual minimum temperature

The range in average annual minimum temperature lies between 5-13C. The minimum temperature declines more or less steadily from the coast and as height increases. The data concerning this variable are presented in Figure D.24 for the region as a whole and for each sub-region; and a statistical assessment of the relationship between Function and Style populations with regard to this variable is presented in Table D.77.

a)



b)

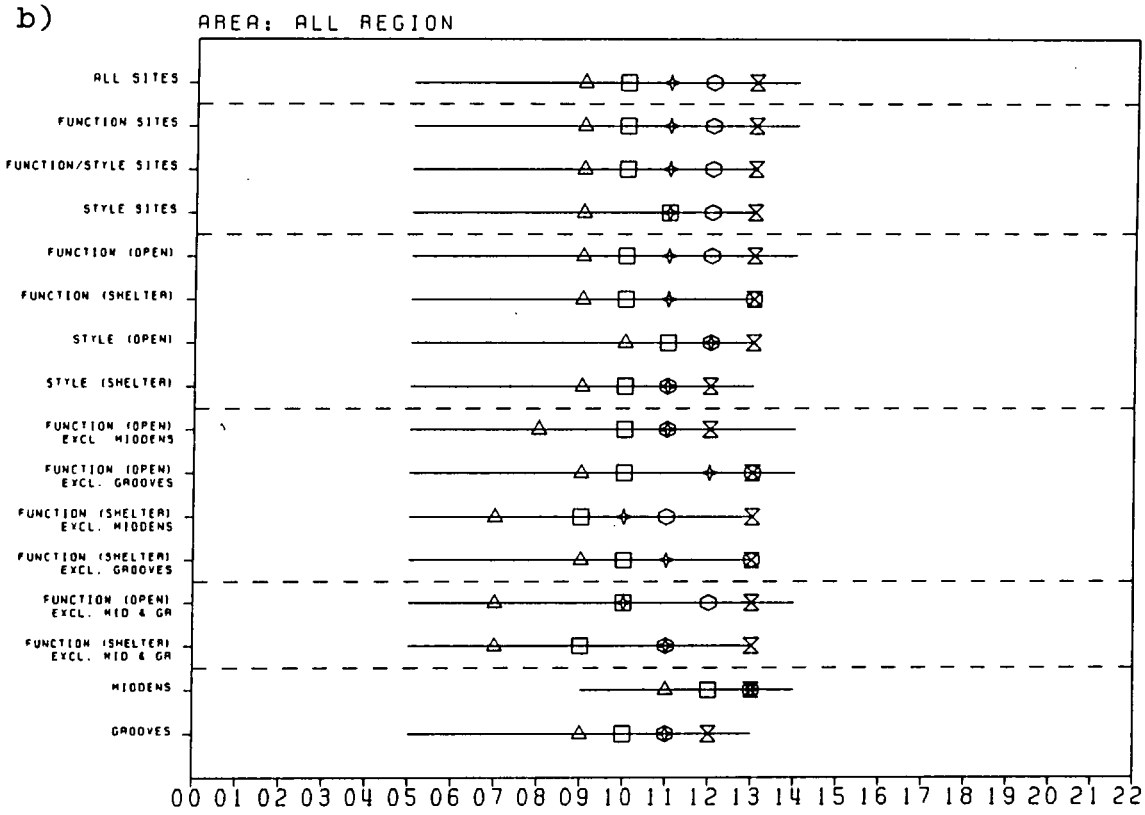


Figure D.24: Aboriginal sites and average annual minimum temperature (C).
a) range of data in the region and sub-region
b - h) the distributional characteristics in the region and sub-regions.

Table D.77

Populations	Mann-W 'U'	Att sig	sig?
F vs S	2122900.0	.6083	N
F vs F/S	533760.0	.0084	Y
S vs F/S	487100.0	.0010	Y
FO vs SO	723080.0	.0000	Y
FS vs SS	182280.0	.0000	Y
FO vs FS	436460.0	.0021	Y
SO vs SS	255030.0	.0000	Y
FOXM vs FSXM	188250.0	.2359	N
FOXGG vs FSXGG	236560.0	.0398	N
FOXMGG vs FSXMGG	67298.0	.7141	N
FOXM vs SO	354520.0	.0000	Y
FSXM vs SS	492760.0	.5857	N
FOXGG vs SO	136120.0	.0586	N
FSXGG vs SS	168440.0	.0000	Y
FOXMGG vs SO	138270.0	.0000	Y
FSXMGG vs SS	129810.0	.2228	N

Interpretational notes

There is evidence to suggest that all site population distributions tend toward the higher end of the range. In addition, there is a clear differentiation between FS and SS sites in which the former are usually to be found in areas of a higher annual minimum temperature than the latter. In contrast, FO sites display a consistently significant tendency to be in areas of lower minimum temperature than SO sites - presumably a reflection of the principally coastal distribution of the latter group. For the same reason, middens clearly contribute to the Function population tendency toward warmer areas.

SUB-REGIONAL VARIATION.

1. Gosford-Wyong.

The range in annual minimum temperature within the Gosford-Wyong sub-region lies between 11-13C (modal value 11C). A statistical assessment of the relationships between Function and Style and average

annual minimum temperature is presented in Table D.78.

Table D.78

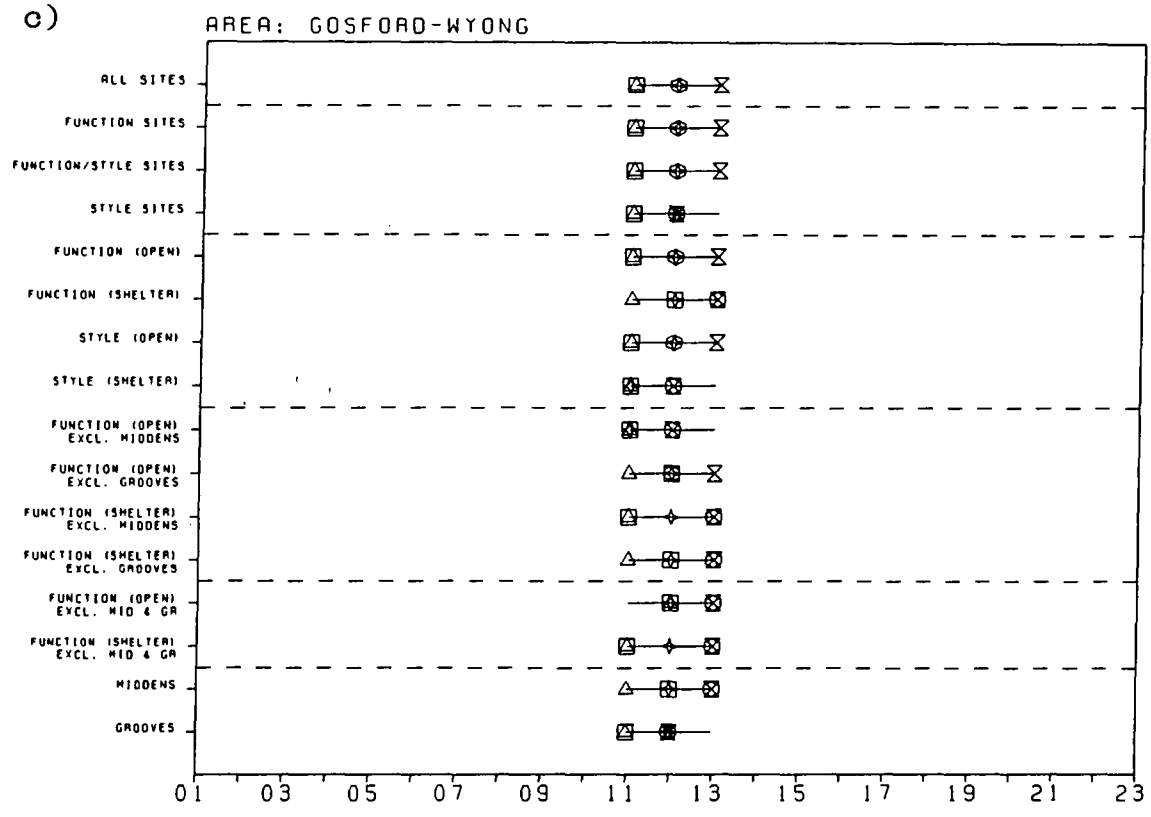
Populations	Mann-W 'U'	Att sig	sig?
F vs S	95995.0	.0000	Y
F vs F/S	30804.0	.2768	N
S vs F/S	36578.0	.0266	Y
FO vs SO	64405.0	.2002	N
FS vs SS	2778.5	.0000	Y
FO vs FS	13240.0	.0000	Y
SO vs SS	15491.0	.0584	N
FOXM vs FSXM	1889.0	.0181	Y
FOXGG vs FSXGG	8804.0	.0125	Y
FOXMGG vs FSXMGG	137.5	.2044	N
FOXM vs SO	28551.0	.0047	Y
FSXM vs SS	1023.0	.0439	Y
FOXGG vs SO	28077.0	.0000	Y
FSXGG vs SS	2776.5	.0000	Y
FOXMGG vs SO	1532.0	.0140	Y
FSXMGG vs SS	1021.0	.0724	N

Interpretational notes

All sites tend to be found in areas of higher minimum temperature than the value which is modal for the sub-region. In addition, although the range is small, FS and FO sites can be seen to be consistently located in areas of higher average annual minimum temperature than their Style counterparts, particularly when grinding grooves are removed from the analysis. It is clear, however, that middens make a major contribution to this difference.

2. Upper Mangrove Creek.

The range in average annual minimum temperature within this sub-region lies between 9-12C (modal value 10C). A statistical assessment of the relationship between Function and Style and this variable is presented in Table D.79.



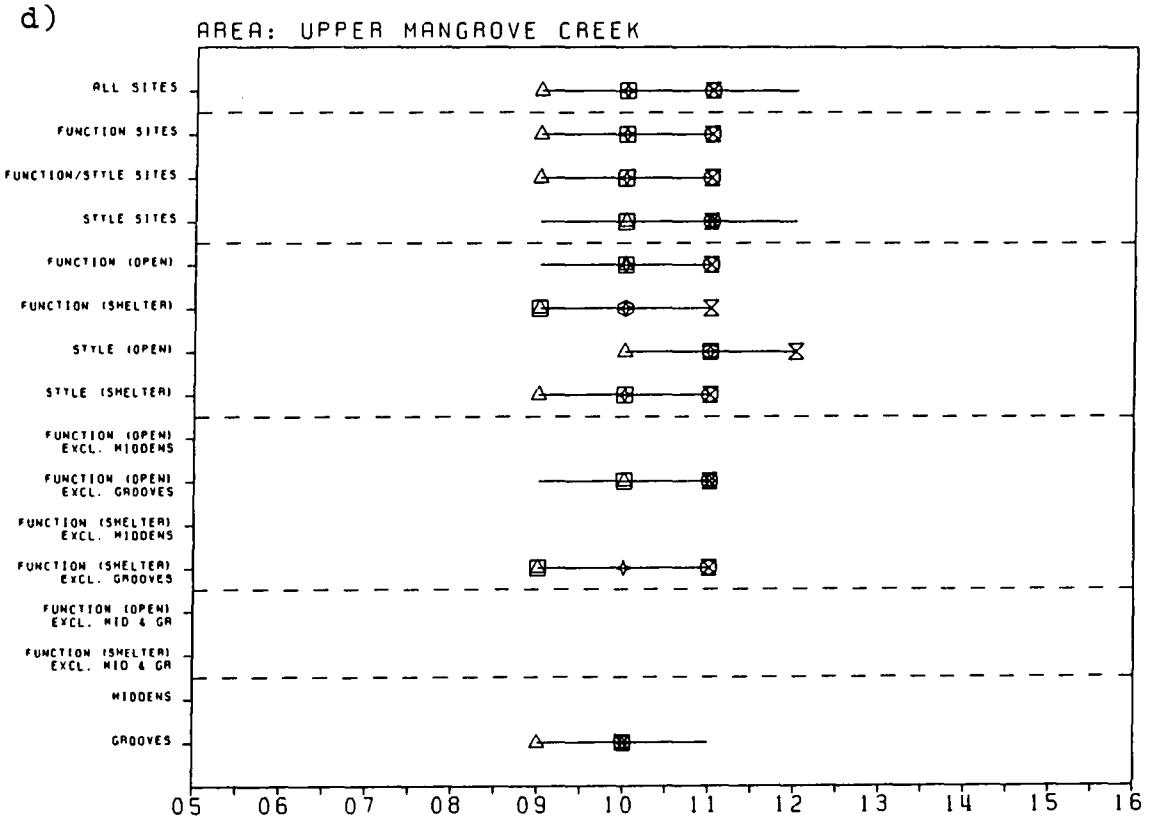


Figure D.24 (cont.) : Aboriginal sites and average annual minimum temperature (C).

Table D.79

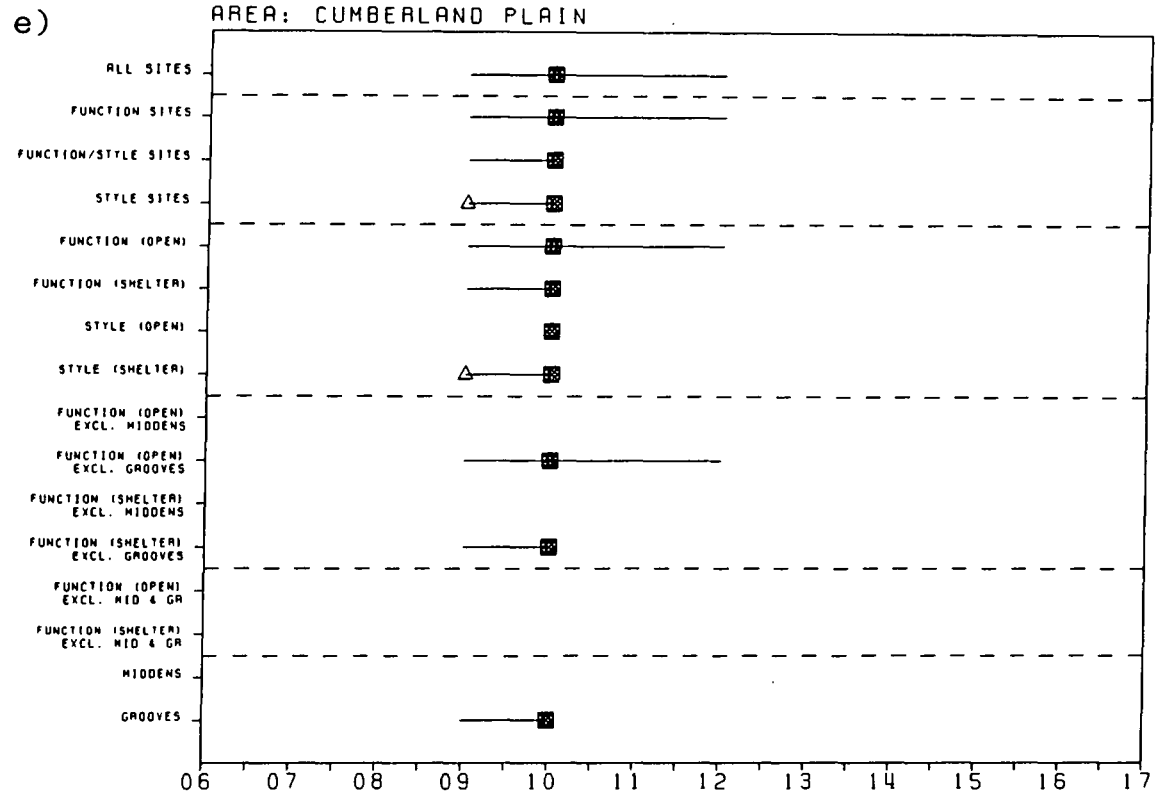
Populations	Mann-W 'U'	Att sig	sig?
F vs S	1734.0	.0023	Y
F vs F/S	1007.0	.3358	N
S vs F/S	545.0	.1682	N
FO vs SO	224.0	.0000	Y
FS vs SS	416.5	.0793	N
FO vs FS	705.5	.0293	Y
SO vs SS	139.5	.0002	Y
FOXGG vs FSXGG	181.5	.0002	Y
FOXGG vs SO	177.0	.0581	N
FSXGG vs SS	403.5	.0823	N

Interpretational notes

There is little evidence to suggest that any of the site population distributions display a tendency away from the modal value for the sub-region. In addition, there is no clearly significant difference between Function and Style, though SO sites display a slight tendency towards higher temperatures than FO sites.

3. The Cumberland Plain.

The range in the average annual minimum temperature lies between 9-12C (modal value 10C). A statistical assessment of the relationship between Function and Style with regard to this variable is presented in Table D.80.



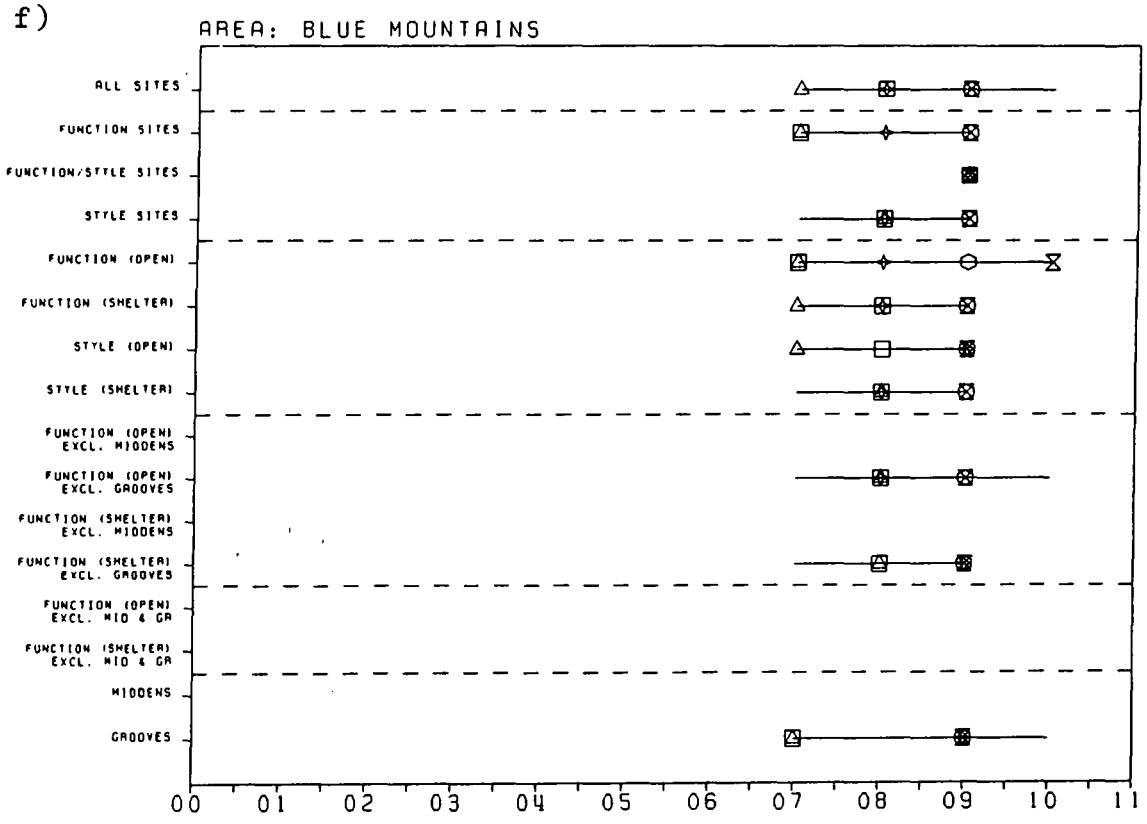


Figure D.24 (cont.) : Aboriginal sites and average annual minimum temperature (C).

Table D.80

Populations	Mann-W 'U'	Att sig	sig?
F vs S	3162.0	.0030	Y
F vs F/S	2194.0	.2900	N
S vs F/S	572.0	.7209	N
FO vs SO	No diff.		N
FS vs SS	798.0	.2407	N
FO vs FS	3136.5	.1901	N
SO vs SS	170.5	.1958	N
FOXGG vs FSXGG	2116.5	.1311	N
FOXGG vs SO	427.0	.9226	N
FSXGG vs SS	170.50	.1958	N

Interpretational notes

There is little evidence of a tendency away from the modal value for the sub-region displayed by any of the site populations; and no evident statistically significant difference between Function and Style for this variable.

4. The Blue Mountains.

The range of average annual minimum temperature lies between 7-10C (modal value 9C). A statistical assessment of the relationship between Function and Style populations with regard to this variable is presented in Table D.81.

Table D.81

Populations	Mann-W 'U'	Att sig	sig?
F vs S	305.5	.7164	N
F vs F/S	TOO FEW		
S vs F/S	TOO FEW		
FO vs SO	TOO FEW		
FS vs SS	TOO FEW		
FO vs FS	132.5	.5531	N
SO vs SS	TOO FEW		
FOXGG vs FSXGG	71.0	.1700	N
FOXGG vs SO	TOO FEW		
FSXGG vs SS	73.50	.6897	N

Interpretational notes

All site populations display a tendency to be distributed below the modal value for the sub-region. However, there is no evident statistical basis for suggesting that there is a difference between the Function and Style populations.

5. Cataract Dam.

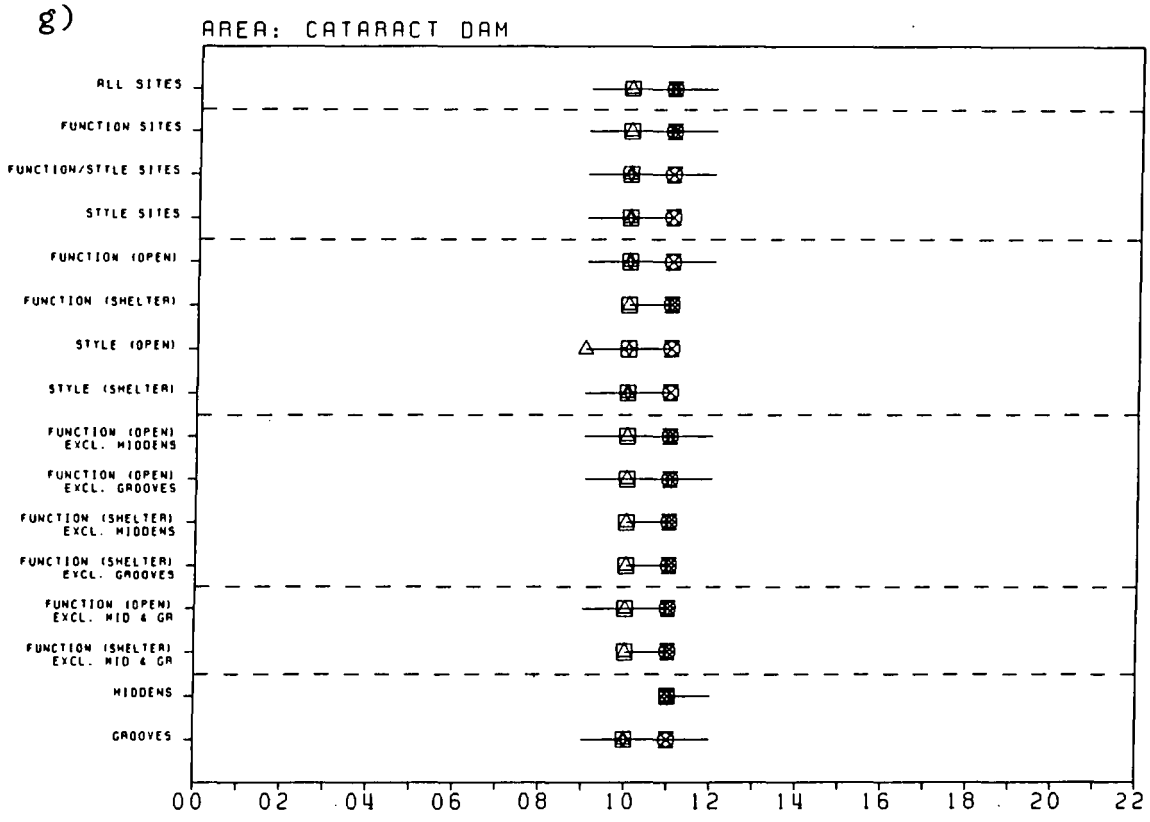
The range in average annual minimum temperature for this sub-region lies between 9-12C (modal value 10C). A statistical assessment of the relationship between Function and Style and this variable is presented in Table D.82.

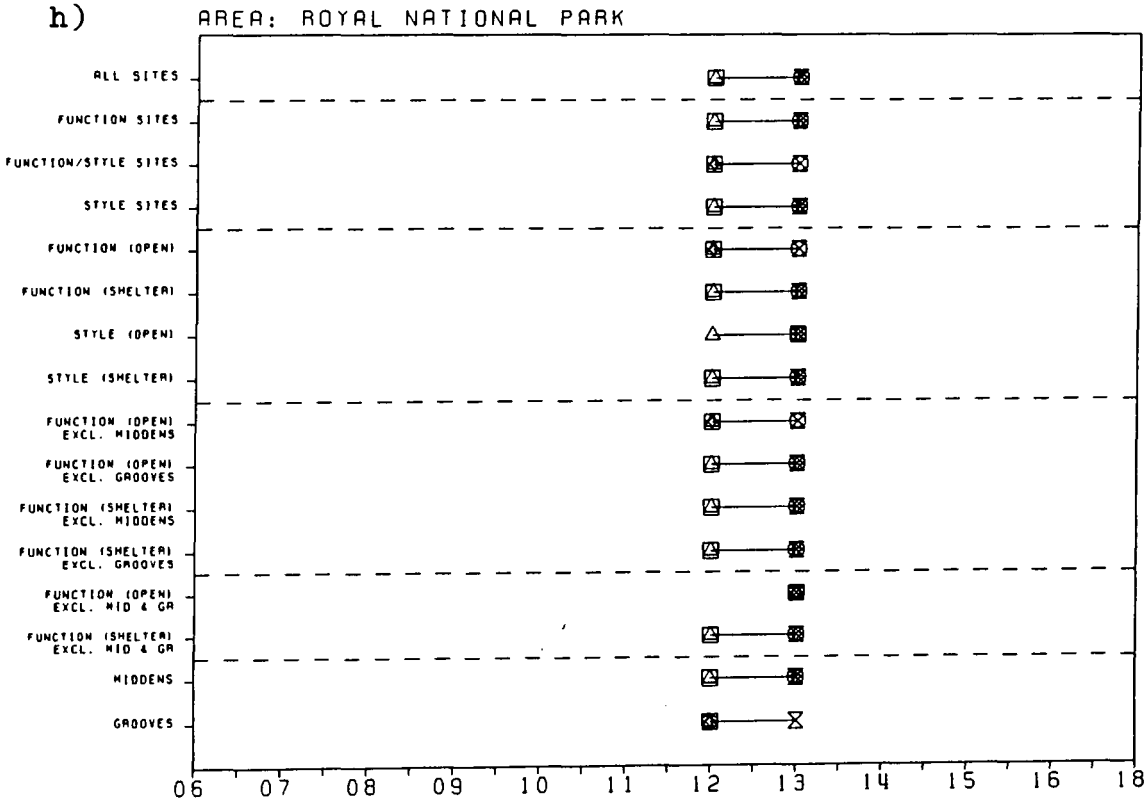
Table D.82

Populations	Mann-W 'U'	Att sig	sig?
F vs S	46429.0	.4910	N
F vs F/S	18624.0	.2785	N
S vs F/S	13708.0	.1012	N
FO vs SO	2043.0	.0446	Y
FS vs SS	6682.0	.0015	Y
FO vs FS	7394.0	.0006	Y
SO vs SS	1658.5	.0112	Y
FOXM vs FSXM	6210.5	.0265	Y
FOXGG vs FSXGG	253.0	.0314	Y
FOXMGG vs FSXMGG	834.5	.2868	N
FOXM vs SO	2039.0	.0499	Y
FSXM vs SS	5759.0	.0769	N
FOXGG vs SO	253.0	.0314	Y
FSXGG vs SS	6559.0	.0026	Y
FOXMGG vs SO	154.5	.0132	Y
FSXMGG vs SS	4347.5	.0287	Y

Interpretational notes

There appears to be a slight tendency toward the higher end of the range exhibited by all site populations. When grinding grooves are removed from the analysis there is a consistent tendency for FO and FS sites to be found in areas of higher average minimum temperature than their Style counterparts.





igure D.24 (cont.) : Aboriginal sites and average annual minimum temperature (C).

6. Royal National Park

The range in average minimum temperature in this sub-region only lies between 12-13C (modal value 13C). A statistical assessment of the relationship between Function and Style with regard to this variable is presented in Table D.83.

Table D.83

Populations	Mann-W 'U'	Att sig	sig?
F vs S	5855.5	.0099	Y
F vs F/S	2177.0	.0624	N
S vs F/S	883.5	.0006	Y
FO vs SO	1810.5	.0012	Y
FS vs SS	850.0	.6532	N
FO vs FS	3185.0	.3786	N
SO vs SS	485.0	.0322	Y
FOXM vs FSXM	634.5	.0539	N
FOXGG vs FSXGG	1795.0	.4310	N
FOXMGG vs FSXMGG	No diff.		N
FOXM vs SO	710.5	.0001	Y
FSXM vs SS	415.0	.5635	N
FOXGG vs SO	1221.0	.1625	N
FSXGG vs SS	850.5	.6532	N
FOXMGG vs SO	No diff.		N
FSXMGG vs SS	415.0	.5635	N

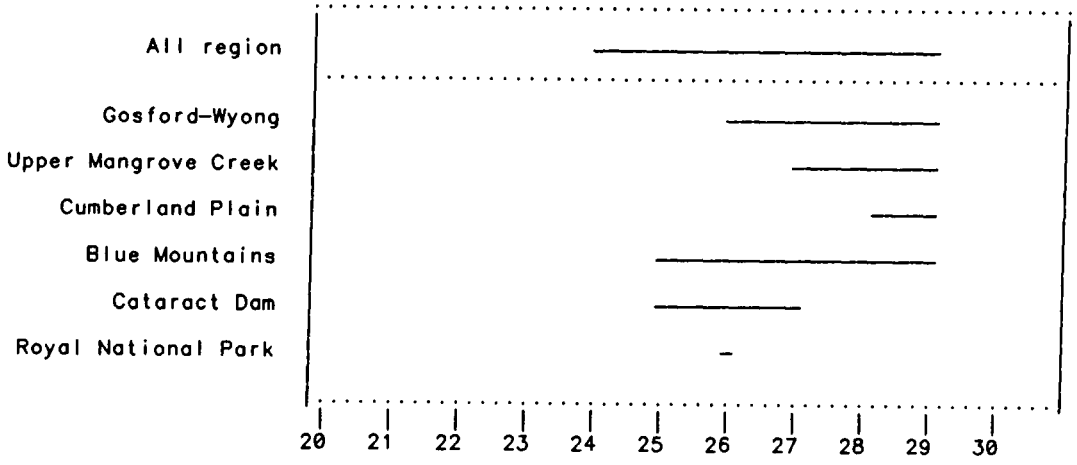
Interpretational notes

There is little evidence of divergence from the modal value for the sub-region displayed by any site population; nor is there evidence of a consistent pattern of significant variation between Function and Style.

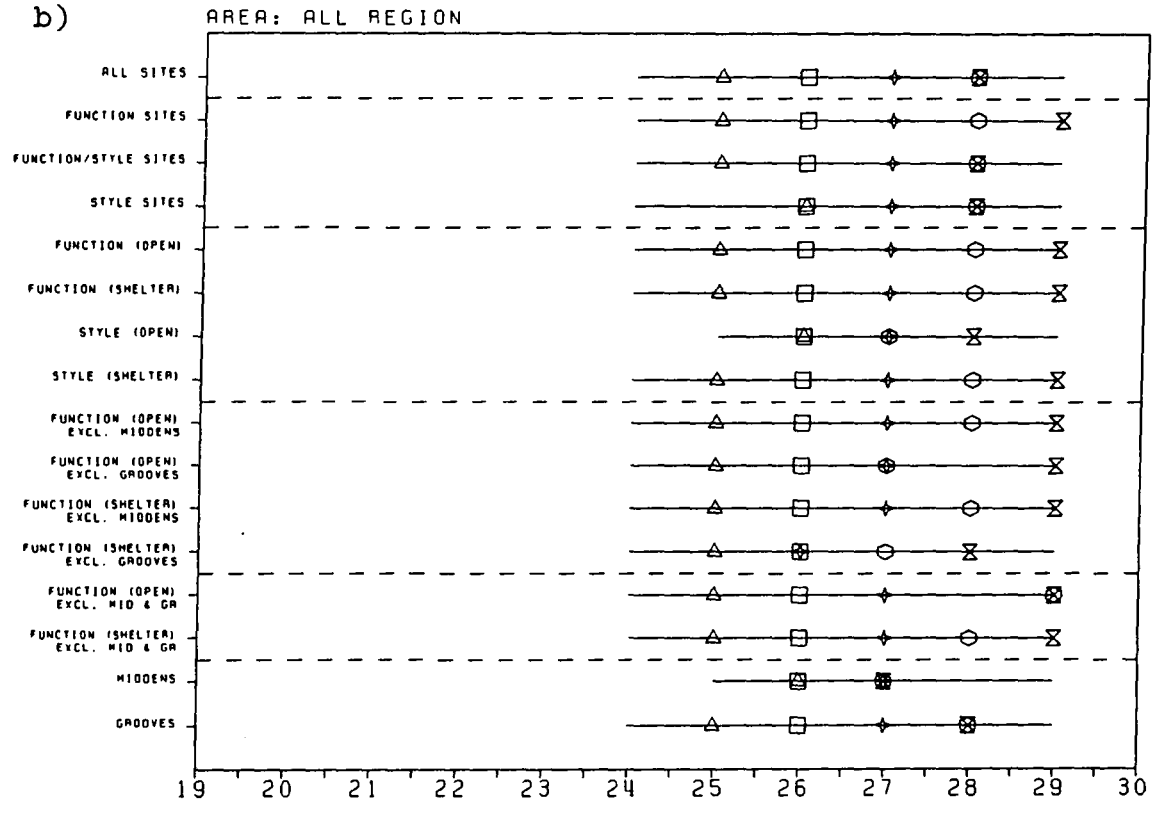
D-3.6 Average maximum temperature - summer

The range in maximum summer temperature lies between 24-29C. The temperature rises with distance from the coast and over the Cumberland Plain, until the Blue Mountains are reached. Then the temperature begins to drop as height increases. The data concerning this variable are illustrated in Figure D.25 for the region as a whole and for each

a)



b)



ure D.25: Aboriginal sites and average summer maximum temperature (C).
a) range of data in the region and sub-region
b - h) the distributional characteristics in the region and sub-regions.

sub-region; and a statistical assessment of the relationship between Function and Style and this variable is presented in Table D.84.

Table D.84

Populations	Mann-W 'U'	Att sig	sig?
F vs S	1975200.0	.0000	Y
F vs F/S	560540.0	.3565	N
S vs F/S	510040.0	.0779	N
FO vs SO	856990.0	.0120	N
FS vs SS	145610.0	.9031	N
FO vs FS	445320.0	.8965	N
SO vs SS	468670.0	.3437	N
FOXM vs FSXM	190370.0	.4304	N
FOXGG vs FSXGG	228570.0	.0021	Y
FOXMGG vs FSXMGG	59791.0	.0037	Y
FOXM vs SO	621850.0	.1128	N
FSXM vs SS	138830.0	.2004	N
FOXGG vs SO	472580.0	.0260	N
FSXGG vs SS	211410.0	.3841	Y
FOXMGG vs SO	197550.0	.0000	Y
FSXMGG vs SS	131350.0	.4132	N

Interpretational notes

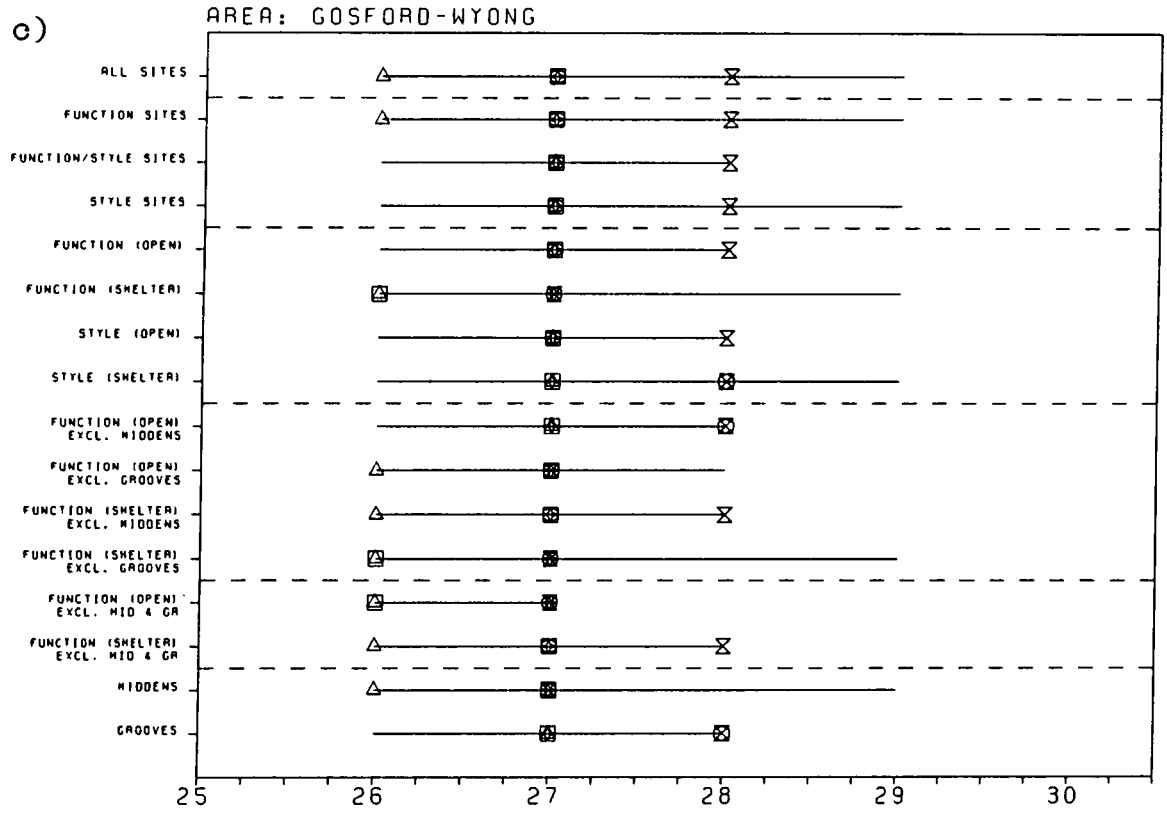
There is no clear pattern of differentiation between Function and Style sites. However, the presence of middens tends to bring FS sites into the cooler end of the range, while FO sites without grinding grooves and middens tend also to be found in cooler areas.

SUB-REGIONAL VARIATION

1. Gosford-Wyong.

The range in average maximum summer temperature lies between 26-29C (modal value 28C) within this sub-region. A statistical assessment of the relationships between Function and Style and this variable is presented in Table D.85.

c)



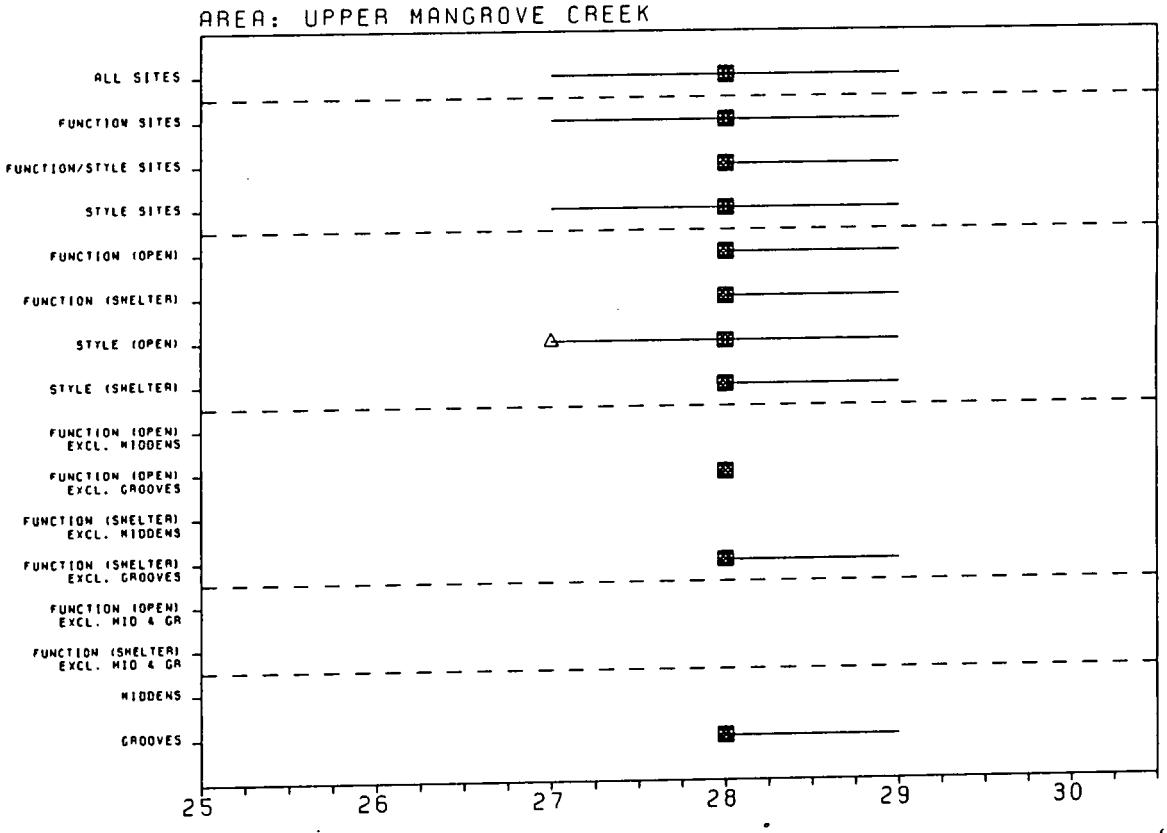


Figure D.25 (cont.) : Aboriginal sites and average summer maximum temperature (C).

Table D.85

Populations	Mann-W 'U'	Att sig	sig?
F vs S	107420.0	.0562	N
F vs F/S	30839.0	.2257	N
S vs F/S	40767.0	.9237	N
FO vs SO	62499.0	.0200	Y
FS vs SS	2755.5	.0000	Y
FO vs FS	12982.0	.0000	Y
SO vs SS	13592.0	.0000	Y
FOXM vs FSXM	1638.5	.0004	Y
FOXGG vs FSXGG	8952.0	.0069	Y
FOXMGG vs FSXMGG	139.5	.1558	N
FOXM vs SO	23877.0	.0000	Y
FSXM vs SS	934.0	.0055	Y
FOXGG vs SO	32323.0	.0010	Y
FSXGG vs SS	2753.5	.0000	Y
FOXMGG vs SO	1787.0	.0280	Y
FSXMGG vs SS	932.0	.0102	Y

Interpretational notes

There is a clear tendency for sites to be found below the levels of summer maximum temperature which are modal for the sub-region. In addition, both FS and FO sites display a consistent tendency to be located in areas with a lower maximum summer temperature than their Style counterparts.

2. Upper Mangrove Creek

The range in this variable lies between 27-29C (modal value 28C) within this sub-region. A statistical assessment of the relationships between Function and Style and average maximum summer temperature is presented in Table D.86.

Table D.86

Populations	Mann-W 'U'	Att sig	sig?
F vs S	2360.5	.5417	N
F vs F/S	1117.0	.6166	N
S vs F/S	637.0	.5201	N
FO vs SO	522.5	.2471	N
FS vs SS	543.0	.9655	N
FO vs FS	830.5	.6586	N
SO vs SS	297.5	.3017	N
FOXGG vs FSXGG	375.0	.3692	N
FOXGG vs SO	225.0	.4979	N
FSXGG vs SS	525.5	.9475	N

Interpretational notes

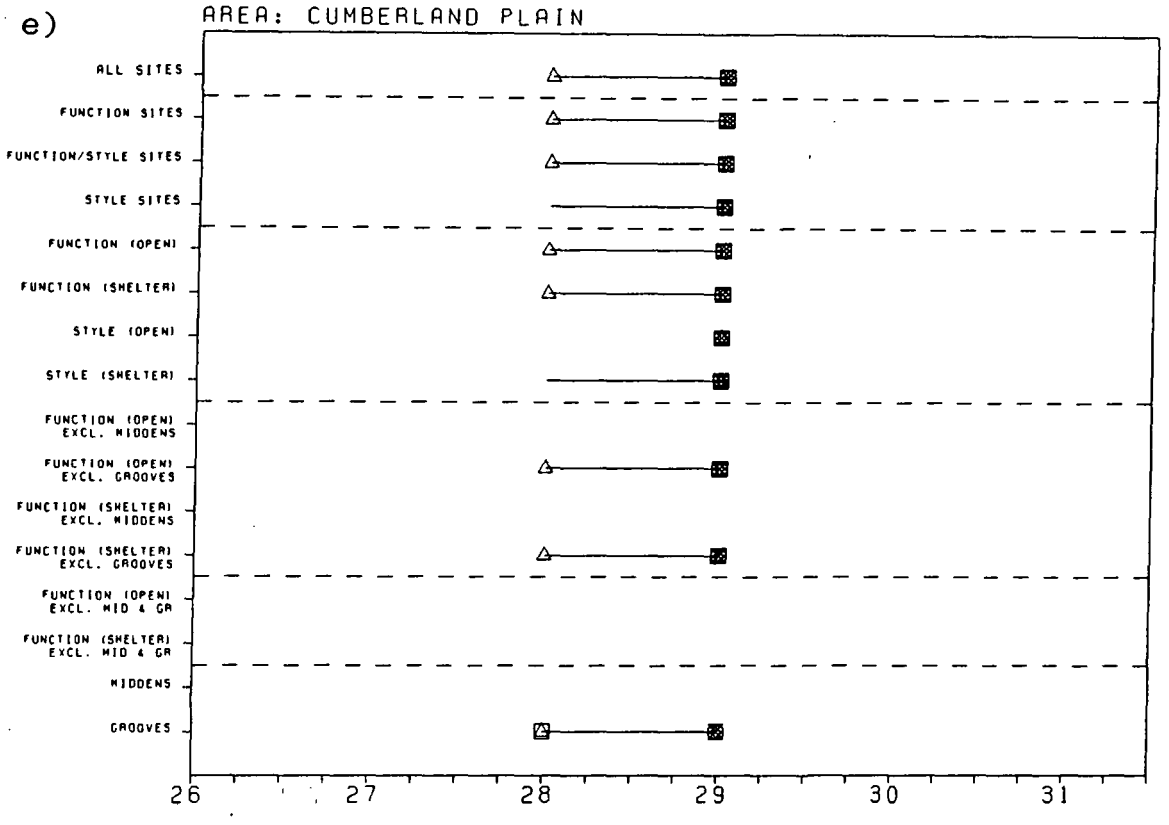
There is no obvious tendency for site population distributions to fall away from the modal value for the sub-region and no apparent statistical difference between Function and Style sites.

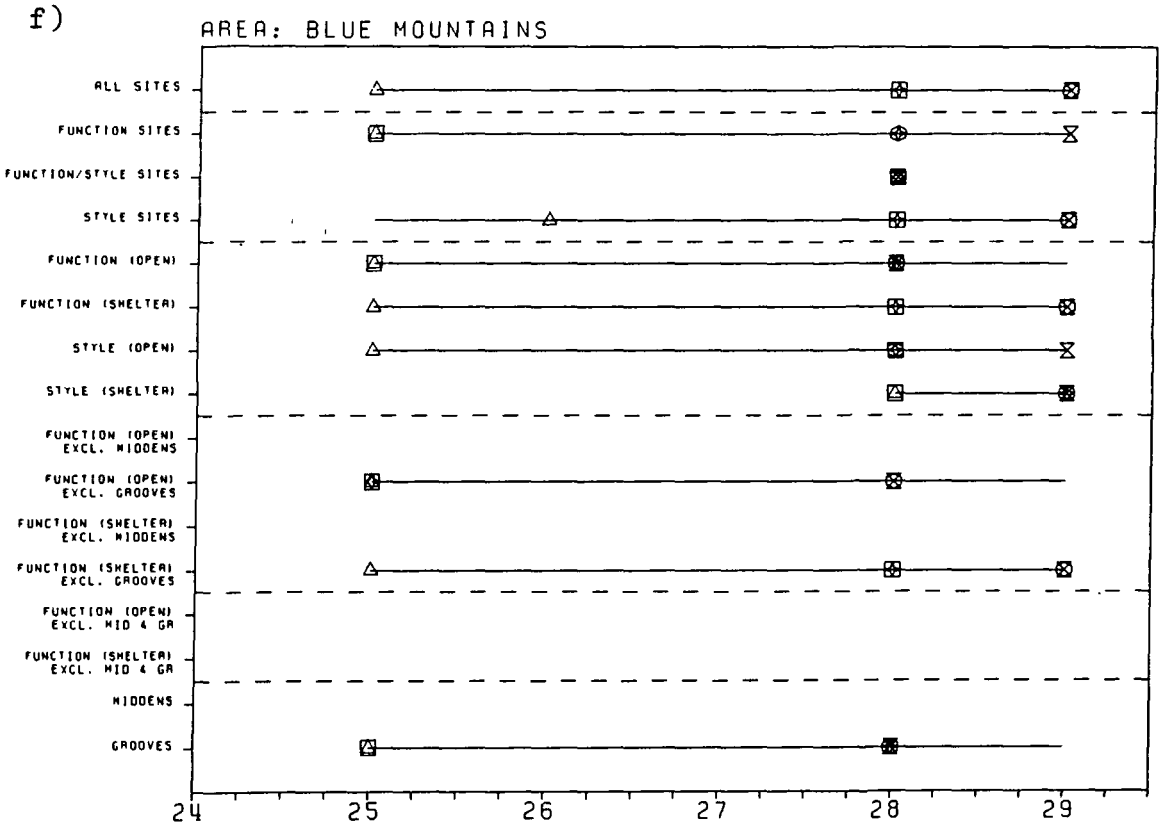
3. Cumberland Plain

The range in maximum summer temperature lies only between 28-29C (modal value 29C). A statistical assessment of the relationship between Function and Style and this variable is presented in Table D.87.

Table D.87

Populations	Mann-W 'U'	Att sig	sig?
F vs S	3710.0	.0172	Y
F vs F/S	2197.0	.5257	N
S vs F/S	531.0	.1928	N
FO vs SO	583.0	.0682	N
FS vs SS	790.5	.3658	N
FO vs FS	2977.5	.2031	N
SO vs SS	181.5	.3276	N
FOXGG vs FSXGG	2139.0	.5254	N
FOXGG vs SO	552.0	.3996	N
FSXGG vs SS	652.5	.3510	N





igure D.25 (cont.) : Aboriginal sites and average summer maximum temperature (C).

Interpretational notes

There is little evident tendency exhibited by any site population away from the modal value for the sub-region; and no evidence of a significant difference between Function and Style sites.

4. Blue Mountains

The actual range in this variable lies between 24-29C (modal value 28C); while the Aboriginal site range lies between 25-29C. A statistical assessment of the relationship between Function and Style and average maximum summer temperature is presented in Table D.88.

Table D.88

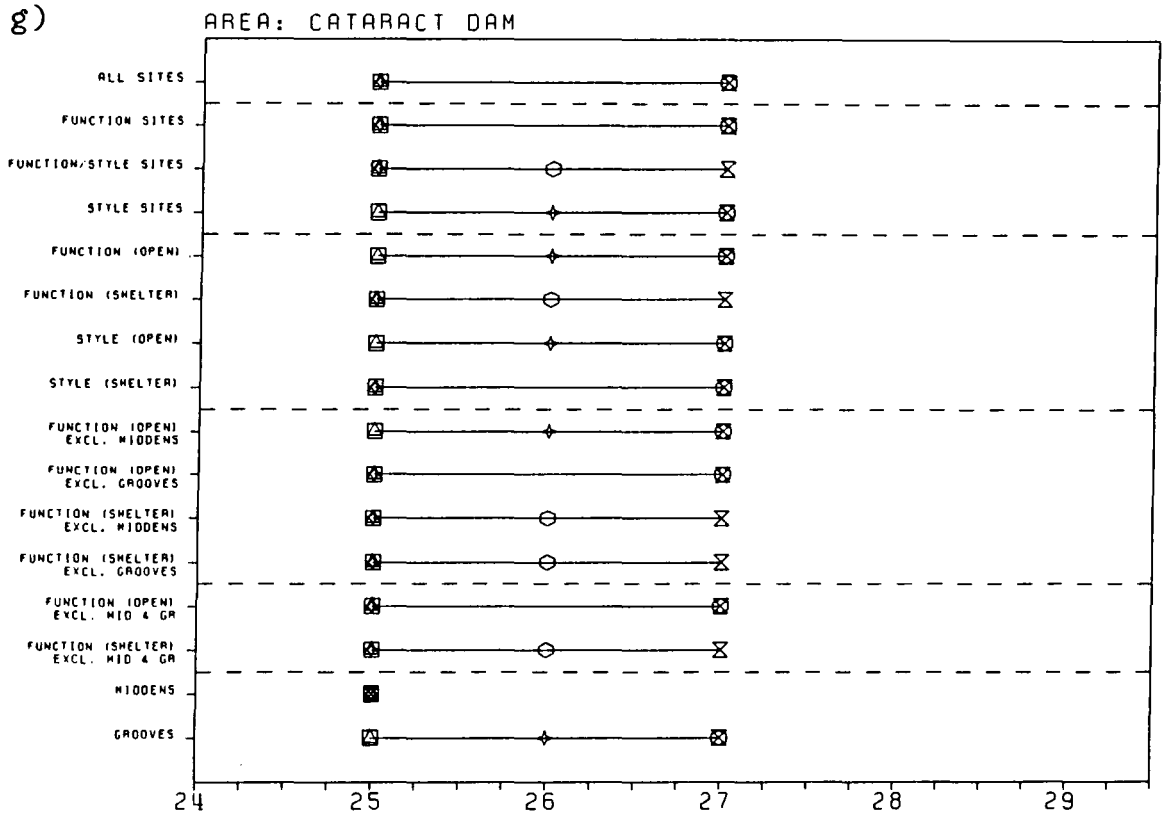
Populations	Mann-W 'U'	Att sig	sig?
F vs S	221.5	.0436	Y
F vs F/S	TOO FEW		
S vs F/S	TOO FEW		
FO vs SO	TOO FEW		
FS vs SS	TOO FEW		
FO vs FS	91.5	.0404	Y
SO vs SS	TOO FEW		
FOXGG vs FSXGG	53.5	.0269	Y
FOXGG vs SO	TOO FEW		
FSXGG vs SS	TOO FEW		

Interpretational notes

There is some evidence that Function sites vary from the modal value for the sub-region to a greater extent than Style sites. FO and FS sites have the appearance of being in consistently cooler areas than their Style counterparts (although there is no detectable statistical difference because of the small number of sites involved).

5. Cataract Dam

The range in maximum summer temperature lies between 25-27C (modal value 26C). A statistical assessment of the relationships between Function and Style and this variable is presented in Table D.89.



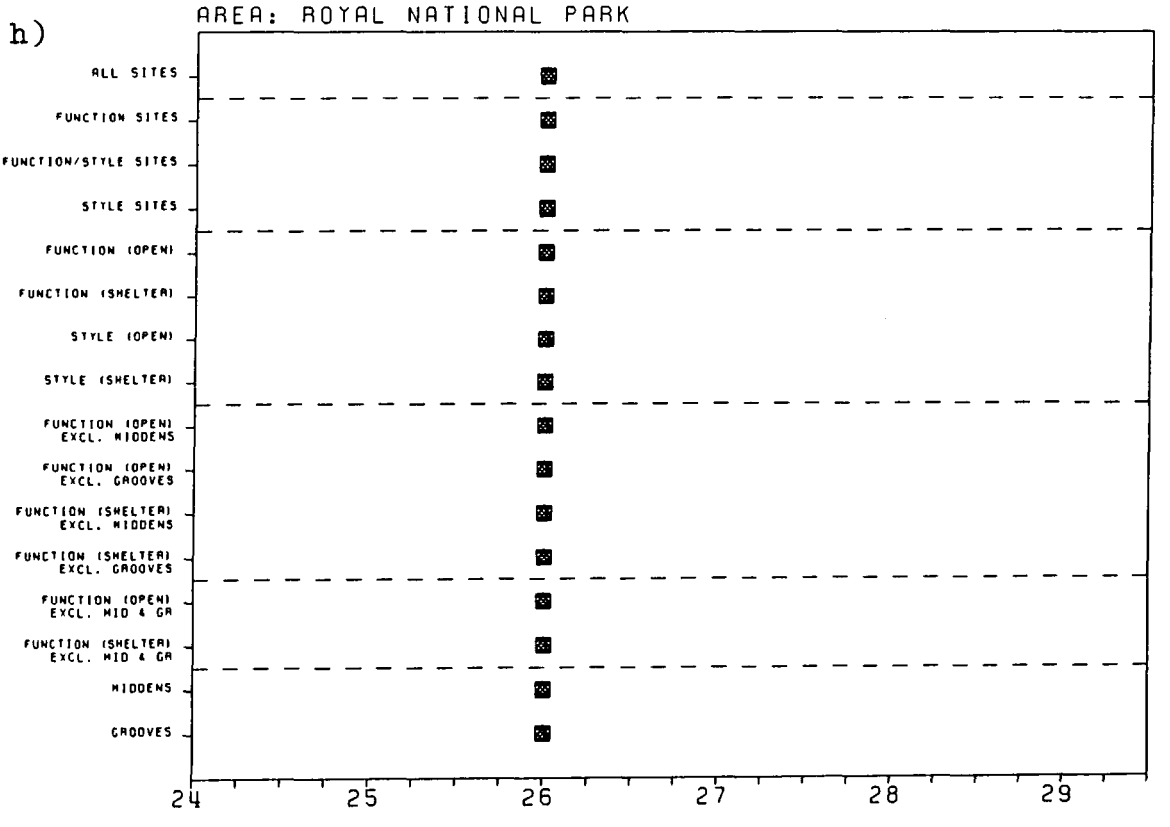


Figure D.25 (cont.) : Aboriginal sites and average summer maximum temperature (C).

Table D.89

Populations	Mann-W 'U'	Att sig	sig?
F vs S	44553.0	.1109	N
F vs F/S	18521.0	.2466	N
S vs F/S	13175.0	.0285	Y
FO vs SO	2259.0	.1839	N
FS vs SS	6497.0	.0007	Y
FO vs FS	7314.0	.0005	Y
SO vs SS	2051.5	.2625	N
FOXM vs FSXM	6184.5	.0273	Y
FOXGG vs FSXGG	1071.0	.0904	N
FOXMGG vs FSXMGG	835.0	.3002	N
FOXM vs SO	2251.0	.2008	N
FSXM vs SS	5537.0	.0327	Y
FOXGG vs SO	290.5	.1509	N
FSXGG vs SS	6369.0	.0012	Y
FOXMGG vs SO	285.5	.2176	N
FSXMGG vs SS	5409.0	.0522	N

Interpretational notes

There is some evidence that site population distributions tend to vary from the modal value for the sub-region. FS sites have a clear tendency to be found in areas of lower maximum temperature than the other site populations (when grinding grooves are removed from the analysis) - a characteristic clearly contributed by the presence of middens.

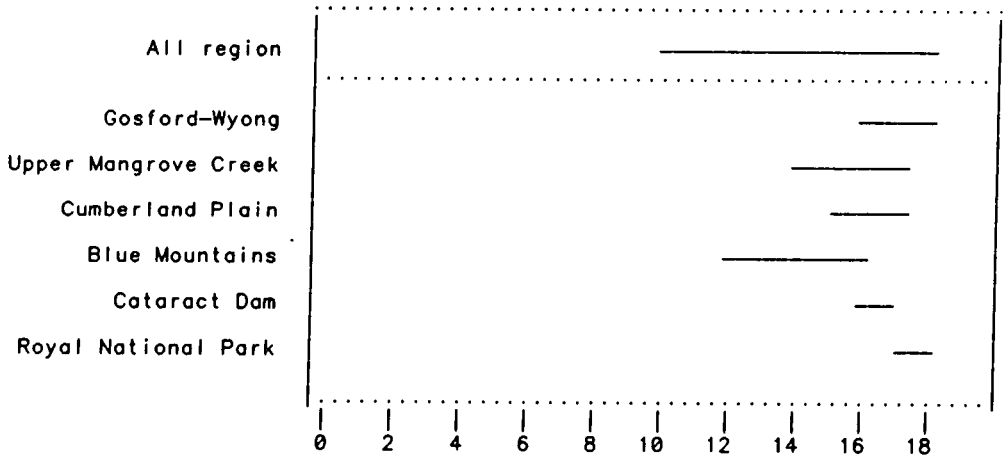
6. Royal National Park

There is no variation in this variable within the sub-region: all sites are associated with an average maximum summer temperature of 26C.

D-3.7 Average minimum temperature - summer

The range in average minimum summer temperature lies between 10-18C and decreases with distance from the coast and increase in height. The data concerning this variable are illustrated in Figure D.26 for the region as a whole and for each of the sub-regions; and a statistical assessment of

a)



b)

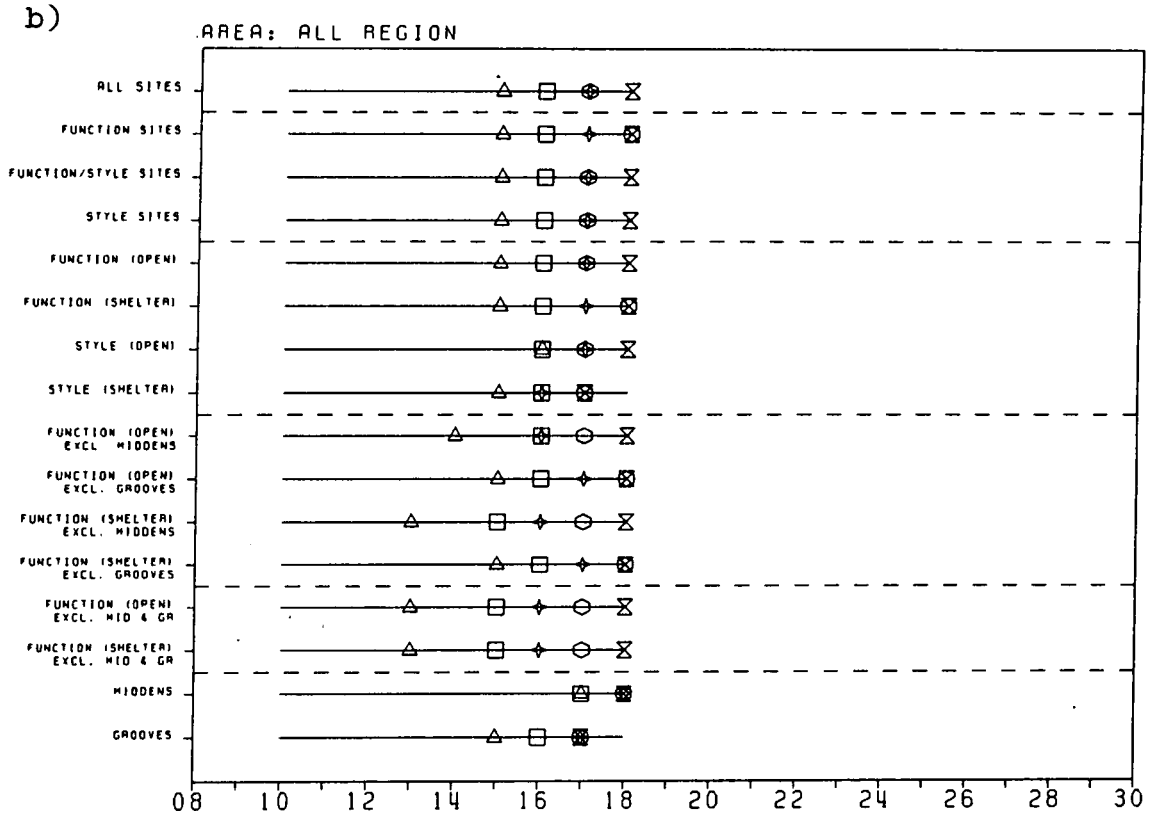


Figure D.26: Aboriginal sites and average summer minimum temperature (C).
a) range of data in the region and sub-region
b - h) the distributional characteristics in the region and sub-regions.

the relationship between Function and Style with regard to this variable is presented in Table D.90.

Table D.90

Populations	Mann-W 'U'	Att sig	sig?
F vs S	2078800.0	.0923	N
F vs F/S	534440.0	.0083	Y
S vs F/S	511540.0	.0966	N
FO vs SO	803520.0	.0000	Y
FS vs SS	191520.0	.0000	Y
FO vs FS	434890.0	.0011	Y
SO vs SS	332430.0	.0000	Y
FOXM vs FSXM	188450.0	.2407	N
FOXGG vs FSXGG	250590.0	.8375	N
FOXMGG vs FSXMGG	65167.0	.2761	N
FOXM vs SO	449420.0	.0000	Y
FSXM vs SS	137890.0	.1164	N
FOXGG vs SO	486930.0	.3045	N
FSXGG vs SS	178410.0	.0000	Y
FOXMGG vs SO	158890.0	.0000	Y
FSXMGG vs SS	130840.0	.3064	N

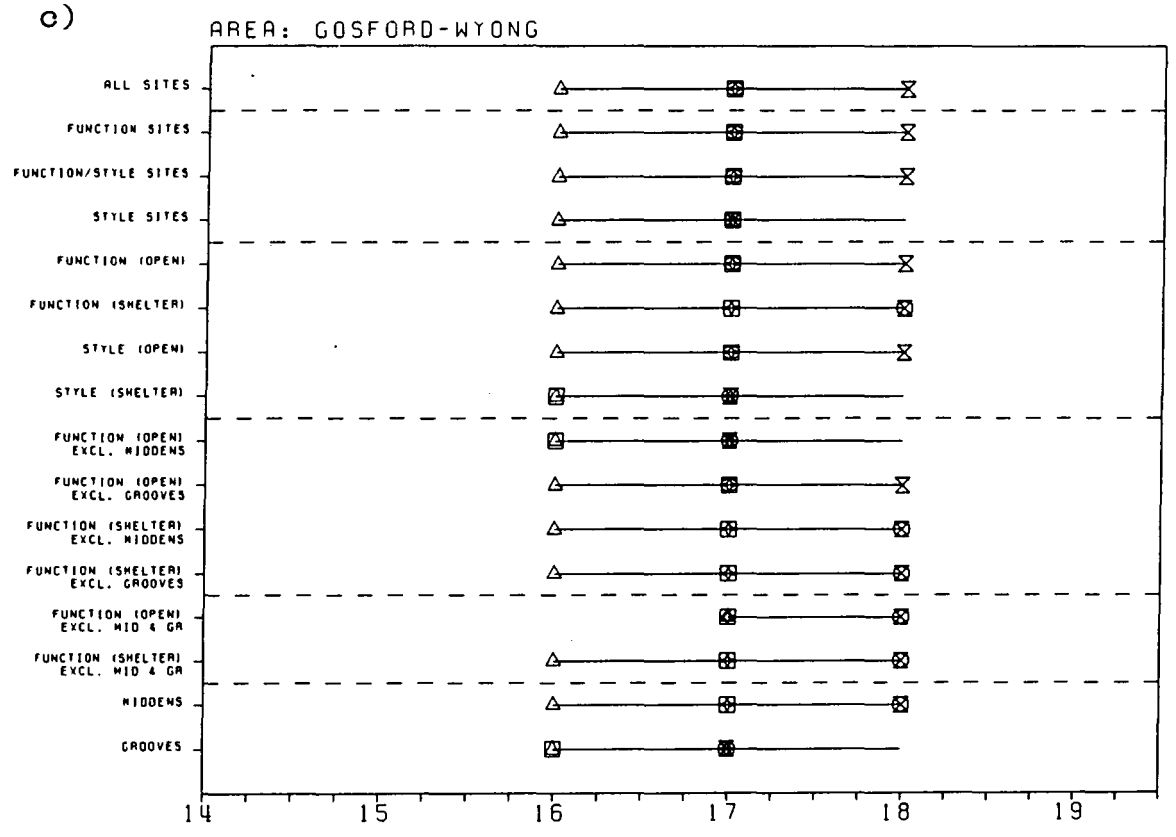
Interpretational notes

There is sufficient evidence to suggest that all site population distributions tend towards the warmer end of the range. However, there is no clear pattern in the relationship between Function and Style, though FS sites tend to be in warmer areas than SS sites. However, FO sites do not display the same tendency with regard to SO sites.

SUB-REGIONAL VARIATION

1. Gosford-Wyong.

The range in average minimum summer temperature lies between 16-18C (modal value 17C) within this sub-region. A statistical assessment of the relationship between Function and Style and this variable is presented in Table D.91.



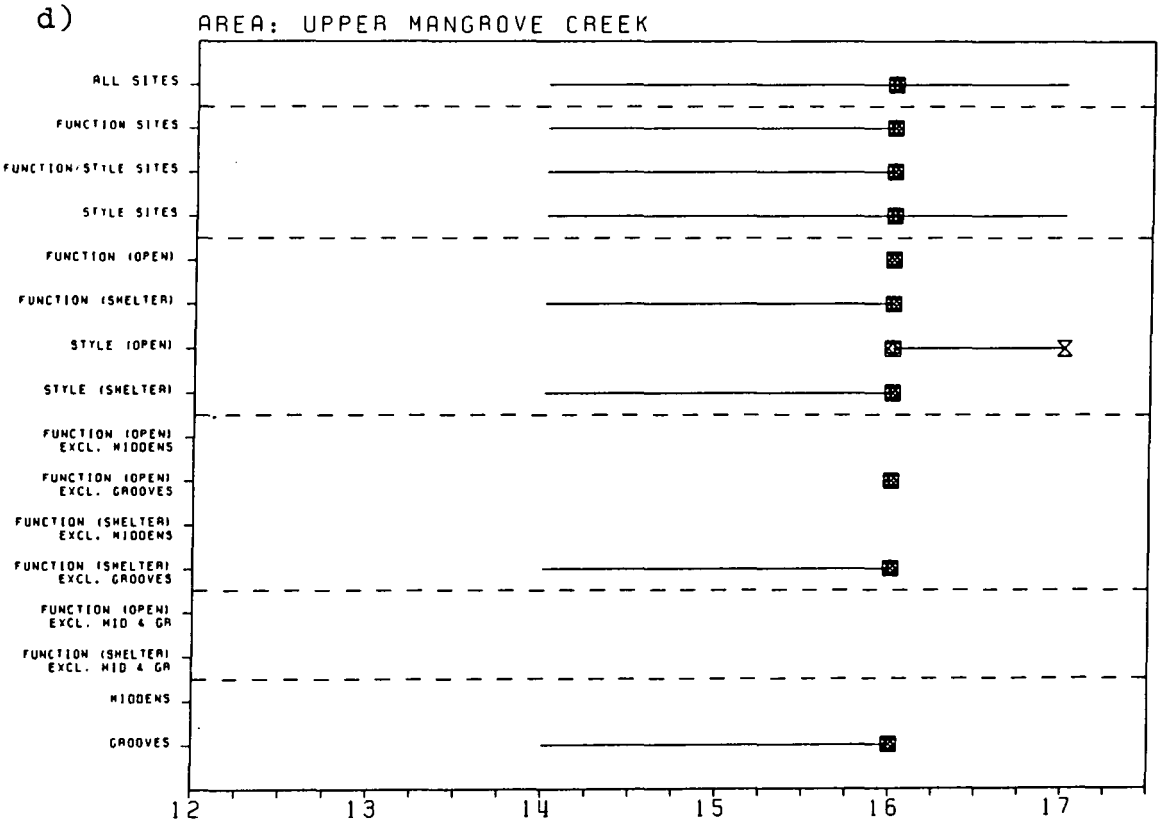


Figure D.26 (cont.) : Aboriginal sites and average summer minimum temperature (C).

Table D.91

Populations	Mann-W 'U'	Att sig	sig?
F vs S	103660.0	.0050	Y
F vs F/S	31614.0	.5349	N
S vs F/S	38365.0	.1517	N
FO vs SO	65065.0	.2568	N
FS vs SS	2742.0	.0000	Y
FO vs FS	13286.0	.0000	Y
SO vs SS	13508.0	.0001	Y
FOXM vs FSXM	1616.0	.0003	Y
FOXGG vs FSXGG	8477.5	.0021	Y
FOXMGG vs FSXMGG	161.5	.5307	N
FOXM vs SO	27265.0	.0001	Y
FSXM vs SS	802.5	.0003	Y
FOXGG vs SO	33105.0	.0118	Y
FSXGG vs SS	2740.0	.0000	Y
FOXMGG vs SO	1746.0	.0290	Y
FSXMGG vs SS	800.5	.0000	Y

Interpretational notes

There is little evidence to suggest that site population distributions tend away from the modal value for the sub-region. However, there is a consistent tendency for both Function groups to be located within areas of higher average minimum summer temperature than their Style counterparts.

2. Upper Mangrove Creek.

The range in this variable within the Upper Mangrove Creek sub-region lies between 14-17C (modal value 16C). A statistical assessment of the relationship between Function and Style and average minimum summer temperature is presented in Table D.92.

Table D.92

Populations	Mann-W 'U'	Att sig	sig?
F vs S	2340.5	.3015	N
F vs F/S	1059.0	.0552	N
S vs F/S	599.0	.1092	N
FO vs SO	501.5	.0121	Y
FS vs SS	543.0	.9655	N
FO vs FS	914.5	.1745	N
SO vs SS	280.5	.0490	Y
FOXGG vs FSXGG	375.0	.3692	N
FOXGG vs SO	212.5	.1007	N
FSXGG vs SS	525.5	.9475	N

Interpretational notes

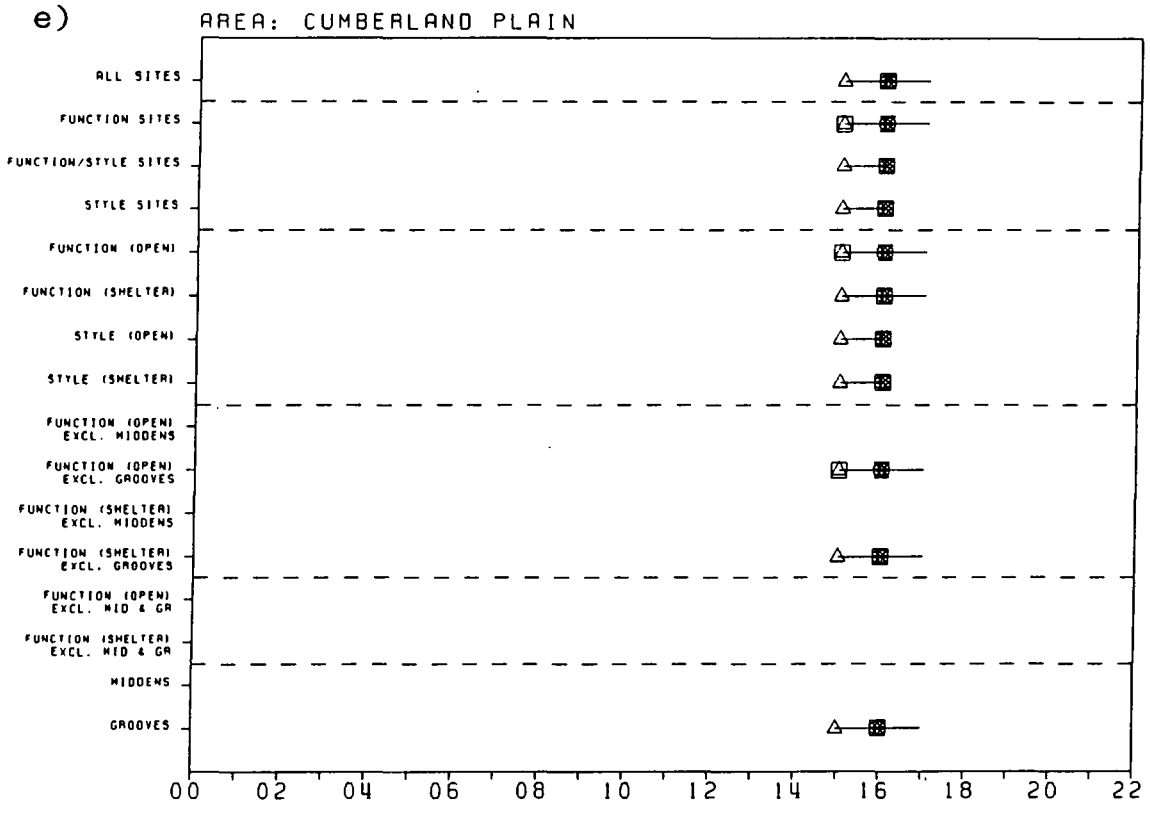
There is little evidence of variation from the modal value. However, SO sites tend to diverge from the other site groups in tending to be found in areas of higher minimum summer temperature.

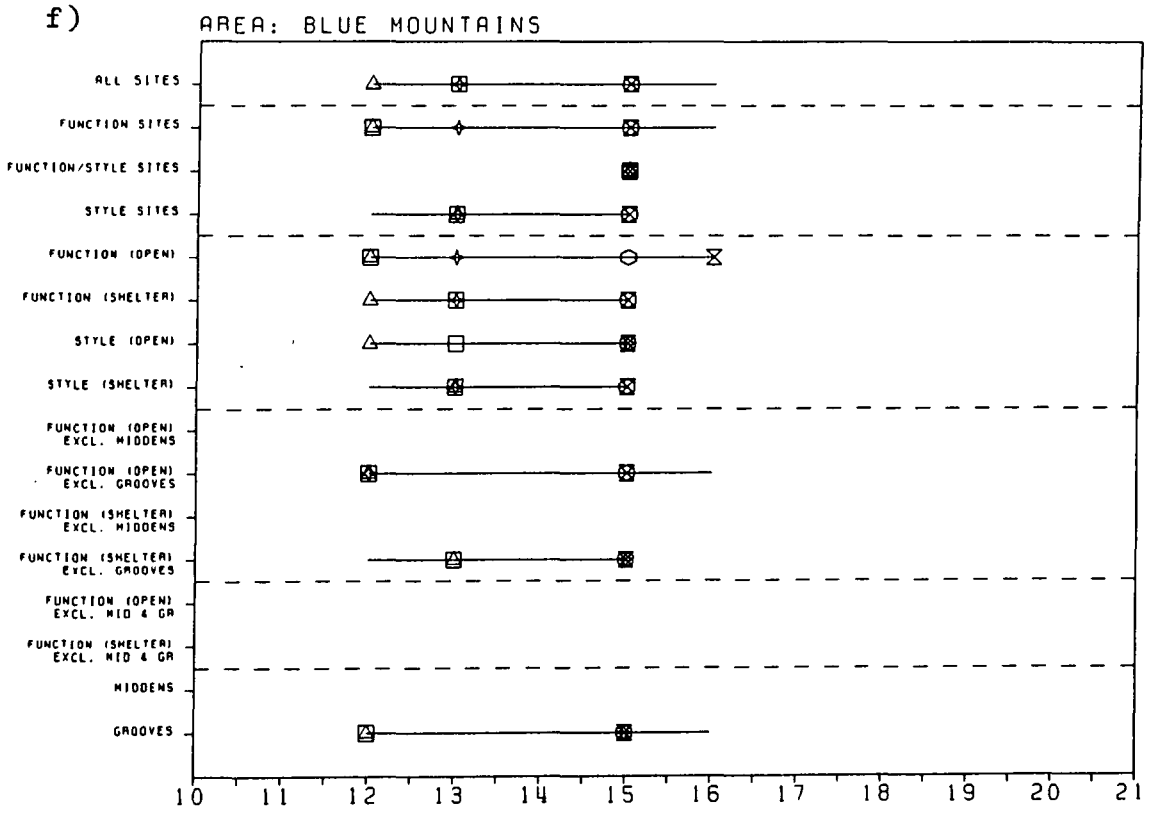
3. The Cumberland Plain.

The range in average minimum summer temperature lies between 15-17C (modal value 16C). A statistical assessment of the relationships between Function and Style and this variable is presented in Table D.93.

Table D.93

Populations	Mann-W 'U'	Att sig	sig?
F vs S	4175.0	.4972	N
F vs F/S	2240.0	.6676	N
S vs F/S	582.5	.9313	N
FO vs SO	695.0	.5403	N
FS vs SS	825.5	.6094	N
FO vs FS	2933.0	.1184	N
SO vs SS	195.5	.9266	N
FOXGG vs FSXGG	2008.0	.1425	N
FOXGG vs SO	552.0	.3996	N
FSXGG vs SS	709.5	.8773	N





gure D.26 (cont.) : Aboriginal sites and average summer minimum temperature (C).

Interpretational notes

There is little divergence from the modal value exhibited by any of the site groups; and no evident significant difference between Function and Style populations.

4. The Blue Mountains.

The range in average minimum summer temperature within this sub-region lies between 12-16C (modal value 15C). A statistical assessment of the relationships between Function and Style is presented in Table D.94.

Table D.94

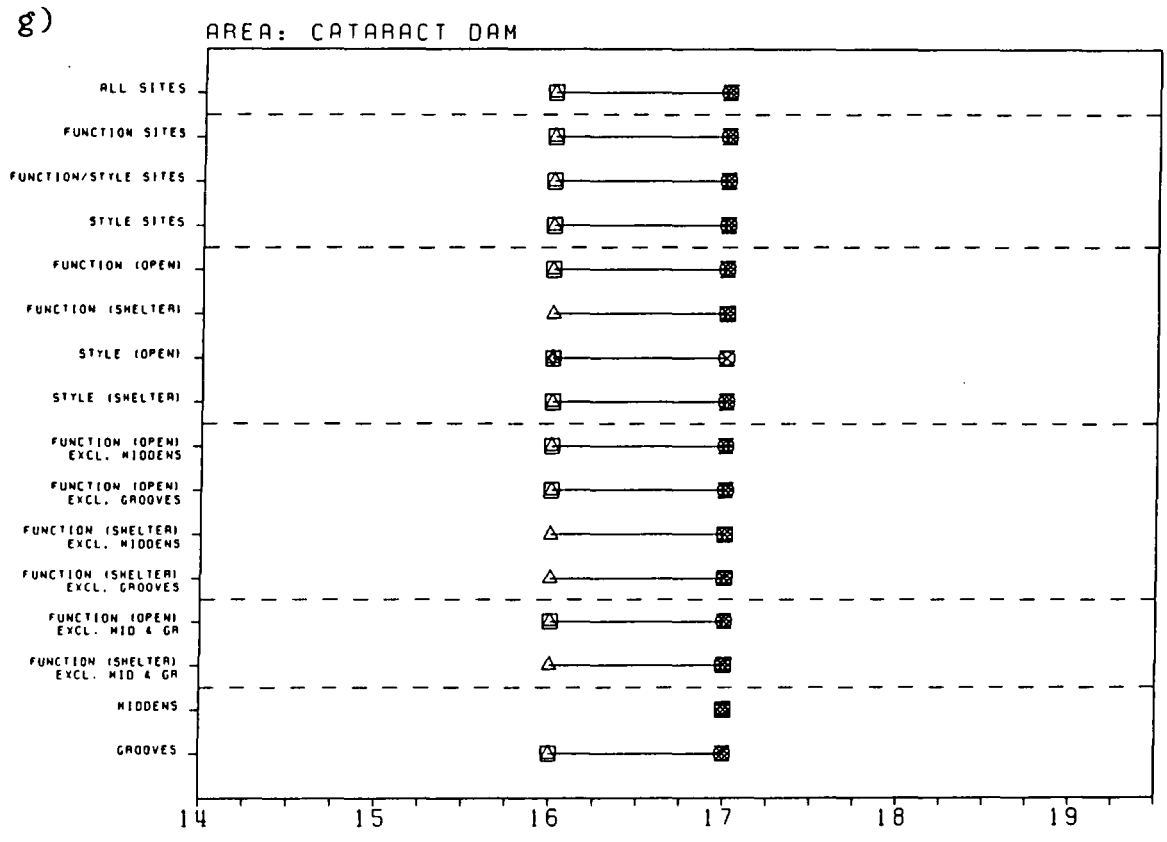
Populations	Mann-W 'U'	Att sig	sig?
F vs S	305.5	.7164	N
F vs F/S	TOO FEW		
S vs F/S	TOO FEW		
FO vs SO	TOO FEW		
FS vs SS	TOO FEW		
FO vs FS	132.5	.5531	N
SO vs SS	TOO FEW		
FOXGG vs FSXGG	71.0	.1700	N
FOXGG vs SO	No diff.		
FSXGG vs SS	No diff.	.1700	N

Interpretational notes

There is an apparent tendency for all site groups to be distributed in areas of higher minimum summer temperature than is modal for the area. However, there is no discernible significant difference between Function and Style sites.

5. Cataract Dam

The range in this variable lies between 16-17C (modal value 17C) within the Cataract Dam sub-region. A statistical assessment of the relationship between Function and Style and average minimum summer temperature is presented in Table D.95.



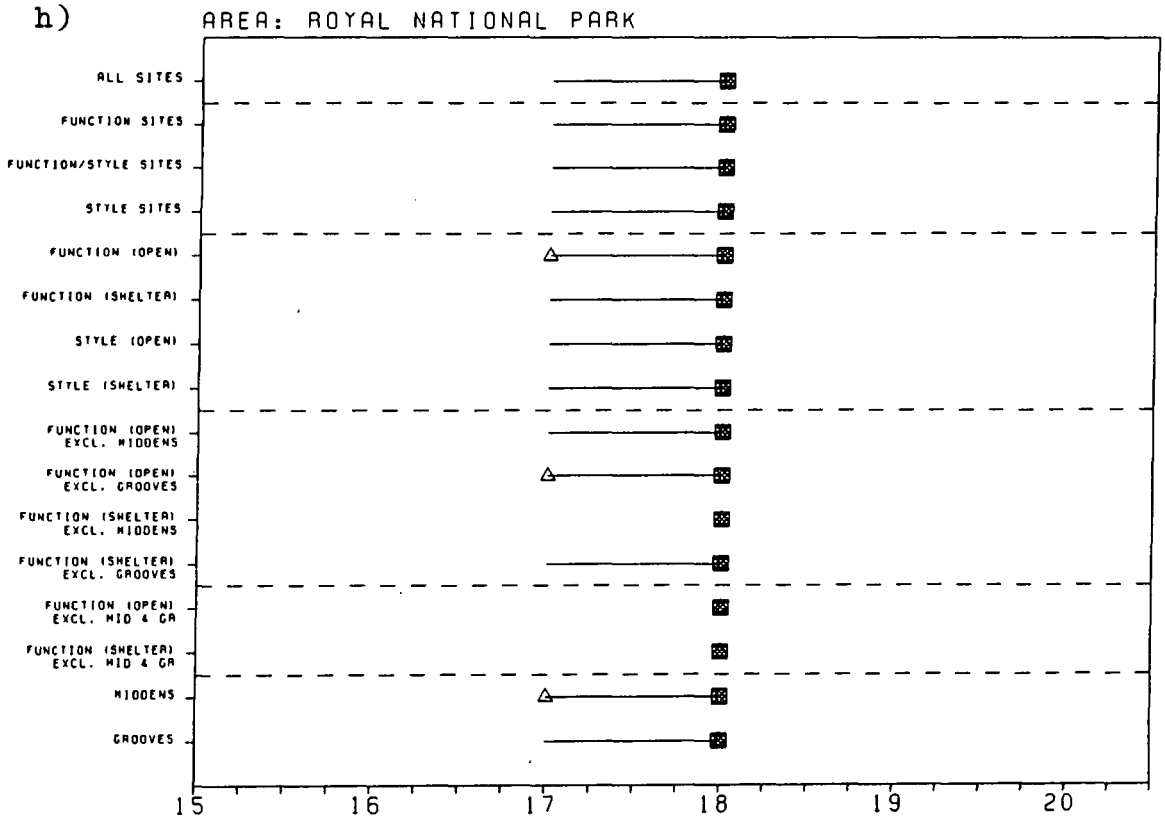


Figure D.26 (cont.) : Aboriginal sites and average summer minimum temperature (C).

Table D.95

Populations	Mann-W 'U'	Att sig	sig?
F vs S	44562.0	.0828	N
F vs F/S	15647.0	.2416	N
S vs F/S	13201.0	.0193	Y
FO vs SO	2322.5	.2097	N
FS vs SS	6423.0	.0001	Y
FO vs FS	7448.0	.0002	Y
SO vs SS	2070.0	.2592	N
FOXM vs FSXM	6026.0	.0061	Y
FOXGG vs FSXGG	987.0	.0070	Y
FOXMGG vs FSXMGG	746.0	.0326	Y
FOXM vs SO	2309.0	.2236	N
FSXM vs SS	5283.0	.0046	Y
FOXGG vs SO	318.0	.3106	N
FSXGG vs SS	6271.0	.0002	Y
FOXMGG vs SO	309.0	.3931	N
FSXMGG vs SS	5131.0	.0073	Y

Interpretational notes

There is a tendency toward areas possessing higher minimum summer temperature exhibited by all site groups. In addition, FS sites are consistently different from all other groups in that they are principally located in areas of higher minimum summer temperature.

6. Royal National Park

The range in this variable lies between 17-18C (modal value 18C) within the Royal National Park sub-region. A statistical assessment of the relationship between Function and Style and this variable is presented in Table D.96.

Table D.96

Populations	Mann-W 'U'	Att sig	sig?
F vs S	6711.0	.1119	N
F vs F/S	2630.0	.8436	N
S vs F/S	1307.0	.3032	N
FO vs SO	2150.5	.0063	Y
FS vs SS	865.0	.2412	N
FO vs FS	2963.0	.0010	Y
SO vs SS	627.5	.3746	N
FOXM vs FSXM	742.5	.0499	Y
FOXGG vs FSXGG	1596.5	.0002	Y
FOXMGG vs FSXMGG	No diff.		N
FOXM vs SO	1090.5	.0952	N
FSXM vs SS	427.5	.1336	N
FOXGG vs SO	1159.0	.0018	Y
FSXGG vs SS	865.0	.2412	N
FOXMGG vs SO	TOO FEW		N
FSXMGG vs SS	427.5	.1336	N

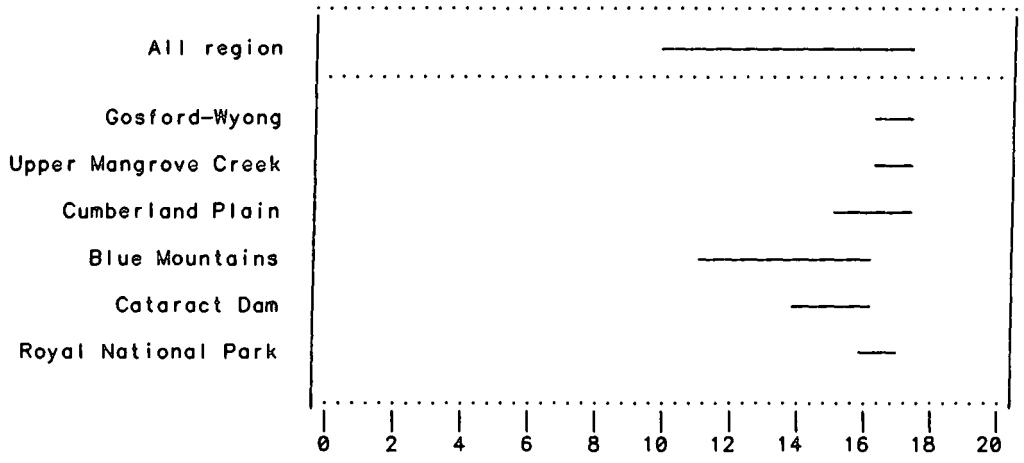
Interpretational notes

There is little evident variation away from the modal value and little evidence of significant difference between Function and Style sites; though FO sites tend to be found in areas with a lower average summer minimum temperature than SO sites, presumably as a function of the greater proximity of the latter group to the coast.

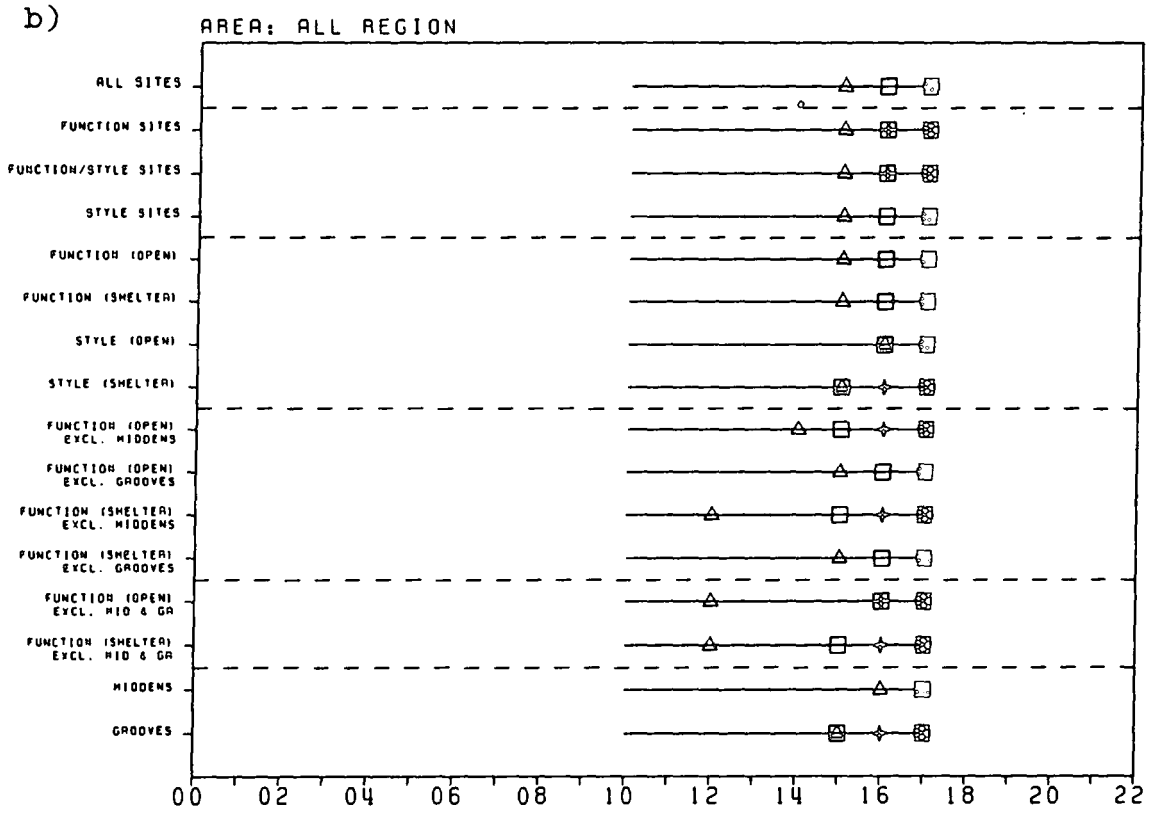
D-3.8 Average maximum temperature - winter

The range in average maximum winter temperature lies between 10-17C and decreases more or less steadily from the coast and with increasing height. The data concerning this variable are presented in Figure D.27 for the region as a whole and for the sub-regions; and a statistical assessment of the relationships between Function and Style and this variable is presented in Table D.97 for the region as a whole.

a)



b)



ure D.27: Aboriginal sites and average winter maximum temperature (C).
a) range of data in the region and sub-region
b - h) the distributional characteristics in the region and sub-regions.

Table D.97

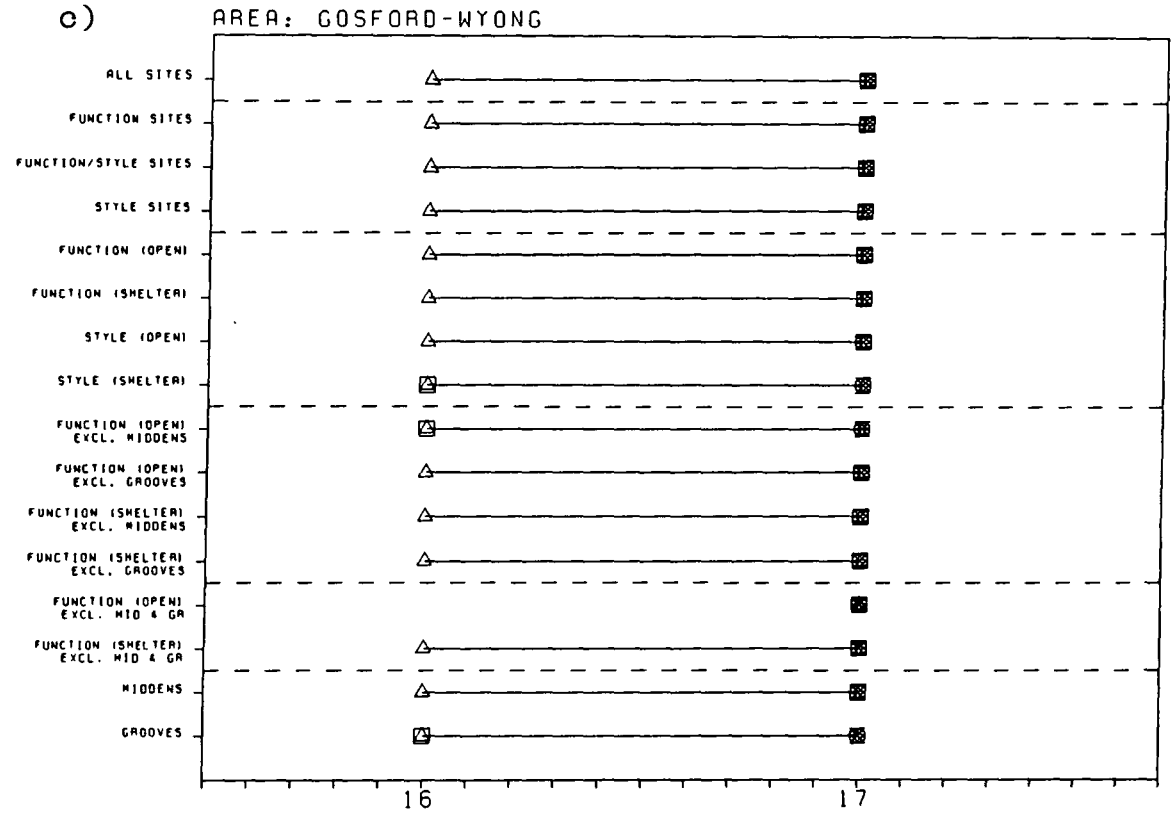
Populations	Mann-W 'U'	Att sig	sig?
F vs S	1952800.0	.0000	Y
F vs F/S	556820.0	.2704	N
S vs F/S	469030.0	.0000	Y
FO vs SO	649900.0	.0000	Y
FS vs SS	198650.0	.0000	Y
FO vs FS	426620.0	.0000	Y
SO vs SS	283110.0	.0000	Y
FOXM vs FSXM	188460.0	.2360	N
FOXGG vs FSXGG	241260.0	.1121	N
FOXMGG vs FSXMGG	65021.0	.2451	N
FOXM vs SO	375190.0	.0000	Y
FSXM vs SS	143700.0	.6647	N
FOXGG vs SO	439650.0	.0000	Y
FSXGG vs SS	190890.0	.0000	Y
FOXMGG vs SO	164970.0	.0000	Y
FSXMGG vs SS	135690.0	.9795	N

Interpretational notes

There is a clear tendency for all site population distributions to be located at the higher end of the range. There is also a consistent tendency for FO sites to be located in relatively cooler positions than SO sites, presumably as a function of the greater coastal orientation of the latter group. FS sites, in contrast, display a clear tendency (once grinding grooves have been removed) toward relatively warmer areas. Middens clearly make a major contribution to this tendency by being located only in the warmest, coastal areas.

SUB-REGIONAL VARIATION

1. Gosford-Wyong The range in maximum winter temperature lies only between 16-17C (modal value 17C). A statistical assessment of the relationship between Function and Style and this variable is presented in Table D.98.



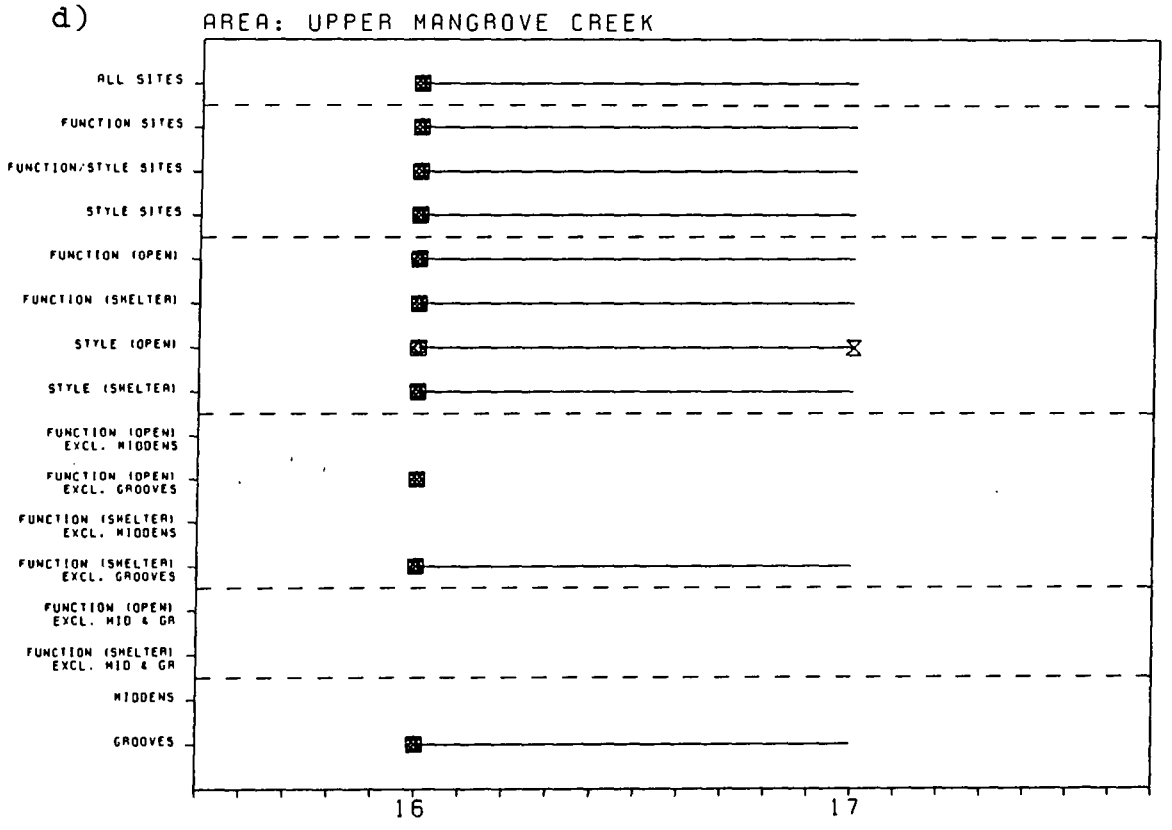


Figure D.27 (cont.) : Aboriginal sites and average winter maximum temperature (C).

Table D.98

Populations	Mann-W 'U'	Att sig	sig?
F vs S	113090.0	.7771	N
F vs F/S	32001.0	.6420	N
S vs F/S	40499.0	.7796	N
FO vs SO	63647.0	.8445	N
FS vs SS	3928.5	.0005	Y
FO vs FS	17603.0	.0515	N
SO vs SS	14265.0	.0002	Y
FOXM vs FSXM	1994.0	.0295	Y
FOXGG vs FSXGG	10296.0	.7319	N
FOXMGG vs FSXMGG	154.0	.1752	N
FOXM vs SO	28147.0	.0001	Y
FSXM vs SS	1008.5	.0161	Y
FOXGG vs SO	85709.0	.2823	N
FSXGG vs SS	3904.0	.0006	Y
FOXMGG vs SO	2051.0	.1147	N
FSXMGG vs SS	984.5	.0198	Y

Interpretational notes

All site type distributions possess a tendency to be found around the level which is modal for the sub-region. SS sites show a consistent pattern of location in areas which are cooler than those associated with any of the other site groups.

2. Upper Mangrove Creek

The range in average maximum winter temperature within this sub-region lies only between 16-17C (modal 16C). A statistical assessment of the relationship between Function and Style and this variable is presented in Table D.99.

Table D.99

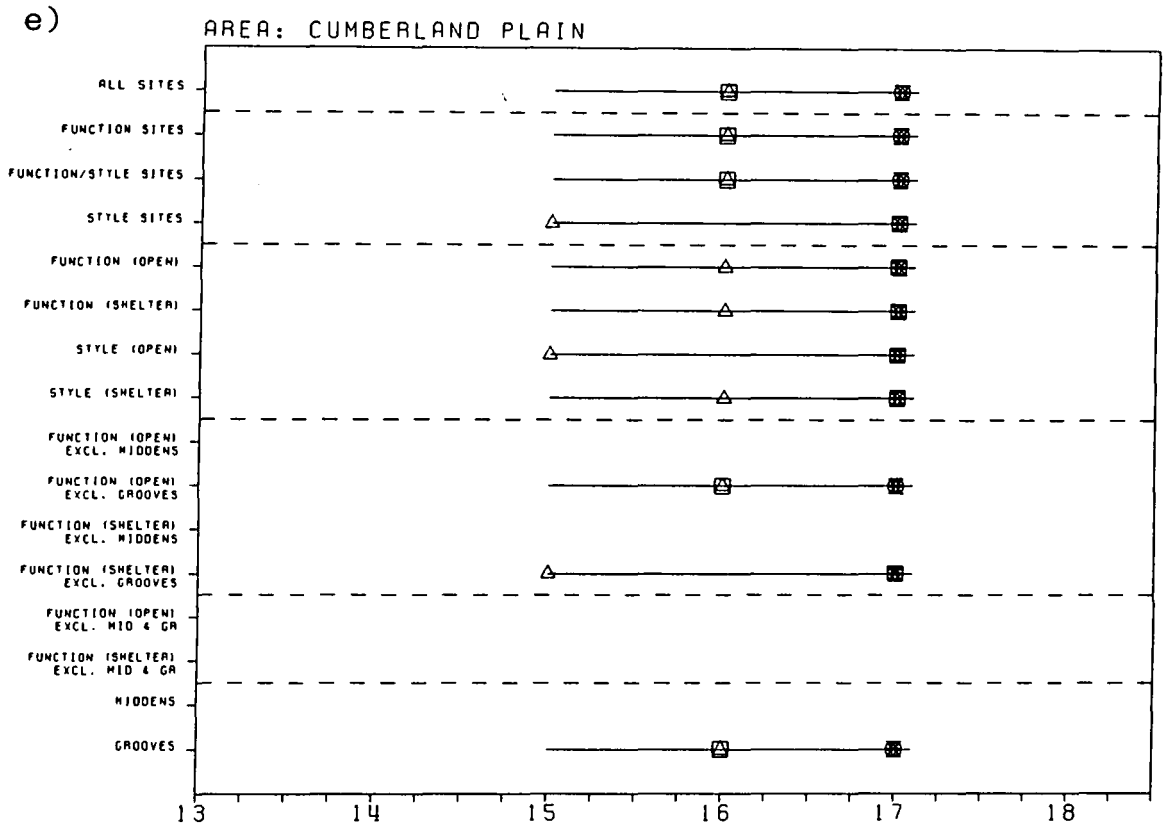
Populations	Mann-W 'U'	Att sig	sig?
F vs S	2282.5	.1226	N
F vs F/S	1117.0	.6166	N
S vs F/S	639.0	.5531	N
FO vs SO	481.5	.0161	Y
FS vs SS	543.0	.9655	N
FO vs FS	980.5	.6586	N
SO vs SS	281.5	.0926	N
FOXGG vs FSXGG	375.0	.3692	N
FOXGG vs SO	200.0	.0419	Y
FSXGG vs SS	525.5	.9475	N

Interpretational notes

There is little evident tendency for site population distributions to differ from the modal value for the sub-region; and little evidence of significant differences between Function and Style sites, though SO sites tend to diverge slightly from the other groups in being found in relatively warmer areas.

3. Cumberland Plain

The range in average maximum winter temperature within this sub-region lies between 15-17C (modal value 17C). A statistical assessment of the relationships between Function and Style and this variable is presented in Table D.100.



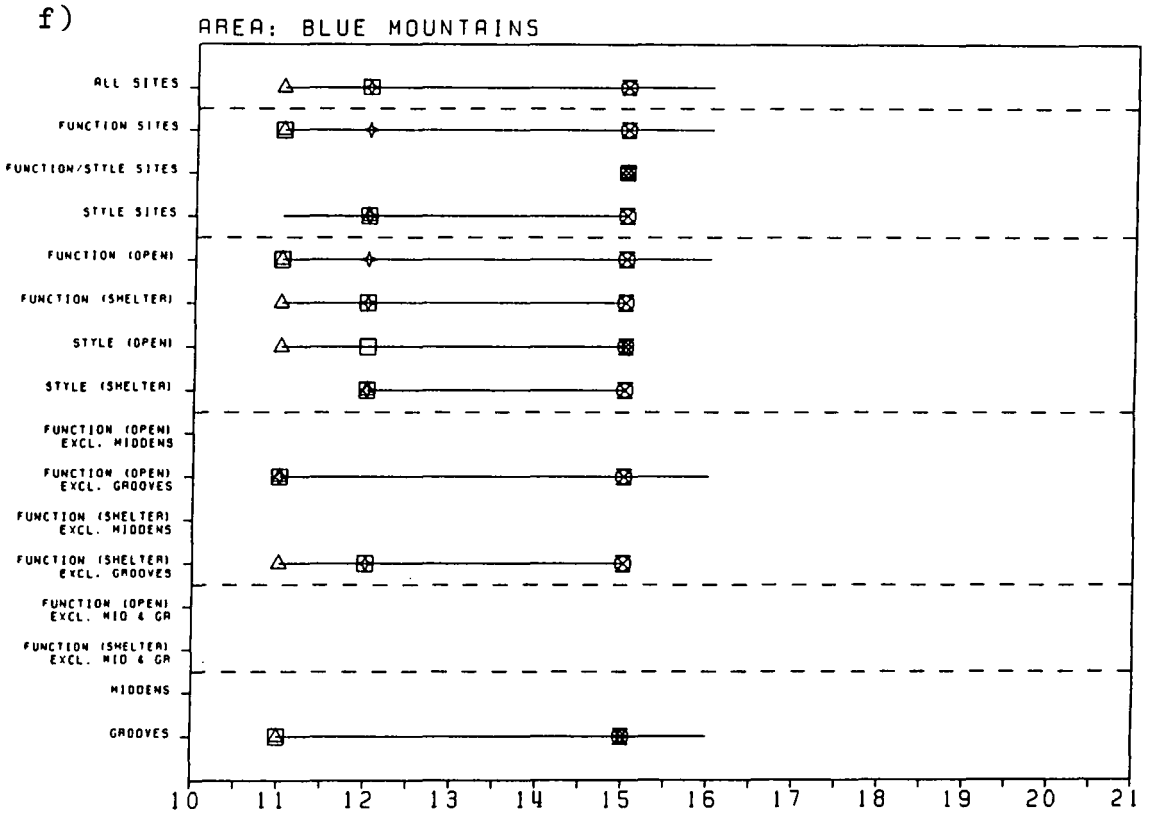


Figure D.27 (cont.) : Aboriginal sites and average winter maximum temperature (C).

Table D.100

Populations	Mann-W 'U'	Att sig	sig?
F vs S	3665.0	.0346	Y
F vs F/S	2101.0	.3322	N
S vs F/S	554.5	.5815	N
FO vs SO	568.0	.1027	N
FS vs SS	No diff.		N
FO vs FS	2667.5	.0156	Y
SO vs SS	192.5	.8401	N
FOXGG vs FSXGG	1908.0	.0609	N
FOXGG vs SO	475.5	.1155	N
FSXGG vs SS	708.5	.8695	N

Interpretational notes

All sites population distributions display a tendency toward the higher end of the range (above the value which is modal for the sub-region). However, there is little evidence of a significant difference between the Function and Style populations.

4. Blue Mountains

The range in maximum winter temperature lies between 9-16C (modal value 13C). The Aboriginal site range lies between 11-16C. A statistical assessment of the the relationship between Function and Style sites and this variable is presented in Table D.101.

Table D.101

Populations	Mann-W 'U'	Att sig	sig?
F vs S	305.5	.7164	N
F vs F/S	TOO FEW		
S vs F/S	TOO FEW		
FO vs SO	TOO FEW		
FS vs SS	TOO FEW		
FO vs FS	132.5	.5531	N
SO vs SS	TOO FEW		
FOXGG vs FSXGG	71.0	.1700	N
FOXGG vs SO	TOO FEW		
FSXGG vs SS	73.5	.6897	N

Interpretational notes

There are no Aboriginal sites within the range 9-10C, but there is a strong tendency overall toward the warmer end of the range. However, there is no evidence to suggest that there is a significant difference between the Function and Style populations. However, in the absence of statistical inference it can be suggested that FO sites display a tendency toward cooler areas than SO sites; a tendency which may also be apparent in the relationship between FS and SS sites.

5. Cataract Dam

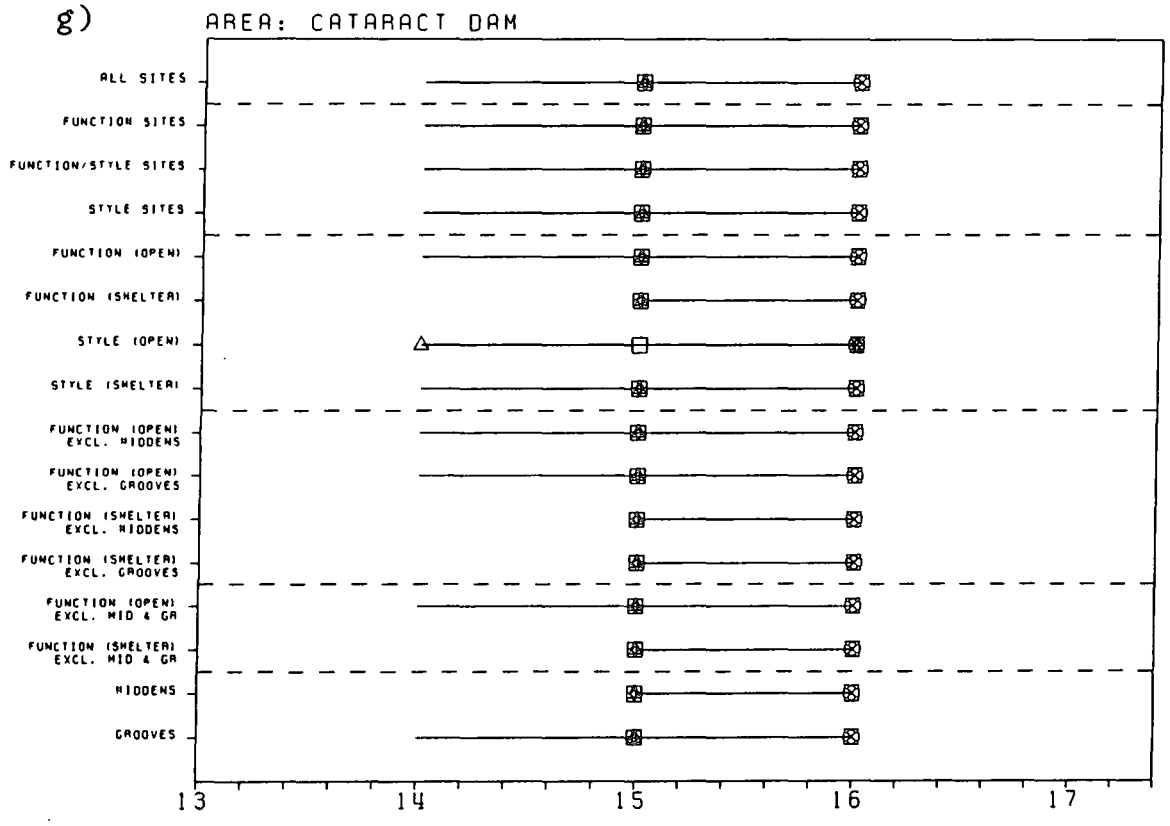
The range in average maximum winter temperature lies between 14-16C (modal value 15C). A statistical assessment of the relationships between Function and Style populations and this variable is presented in Table D.102.

Table D.102

Populations	Mann-W 'U'	Att sig	sig?
F vs S	45037.0	.1608	N
F vs F/S	19125.0	.5238	N
S vs F/S	13686.0	.0950	N
FO vs SO	2601.0	.7267	N
FS vs SS	2386.0	.0491	Y
FO vs FS	8872.0	.2043	N
SO vs SS	2360.5	.9332	N
FOXM vs FSXM	7139.0	.5309	N
FOXGG vs FSXGG	1236.0	.6931	N
FOXMGG vs FSXMGG	933.0	.9185	N
FOXM vs SO	2576.5	.7332	N
FSXM vs SS	6043.5	.2275	N
FOXGG vs SO	342.5	.6056	N
FSXGG vs SS	7257.0	.0735	N
FOXMGG vs SO	323.5	.5900	N
FSXMGG vs SS	5914.5	.3240	N

Interpretational notes

The site population distributions fall around the modal value for the sub-region and there is little evidence of a significant difference between the Function and Style populations.



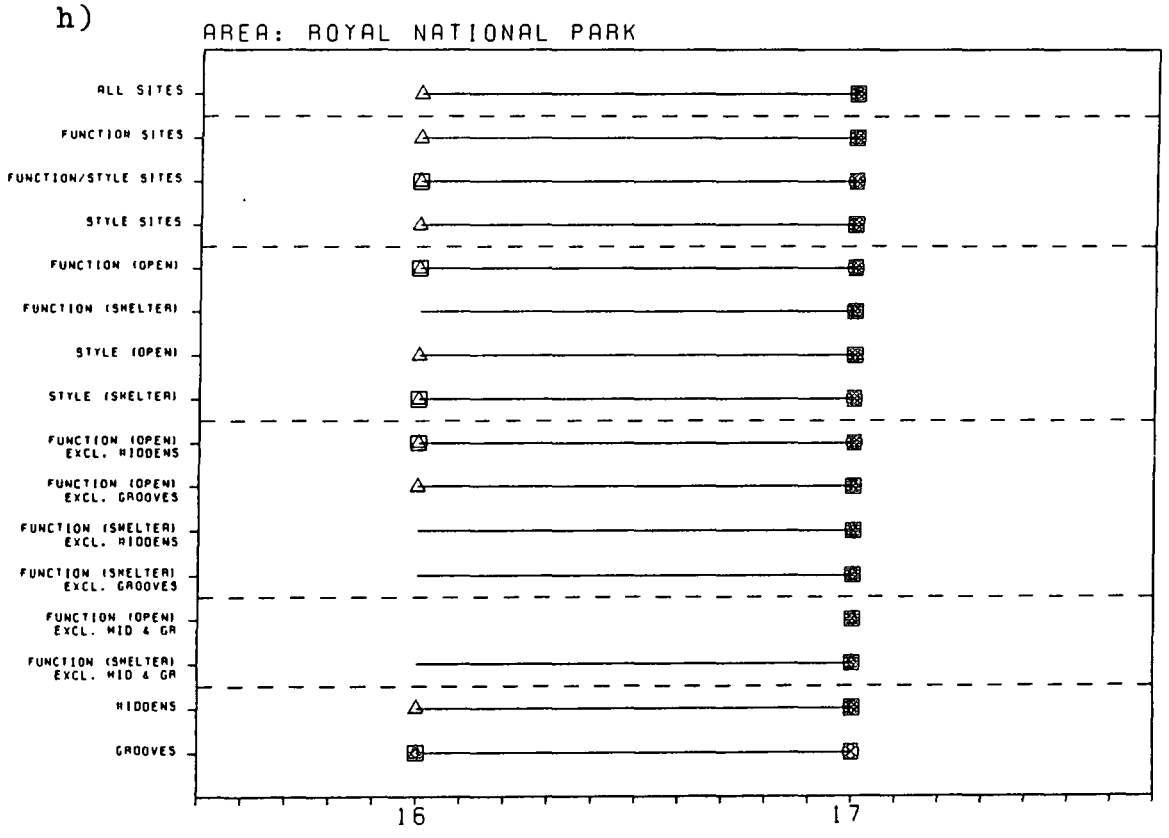


Figure D.27 (cont.) : Aboriginal sites and average winter maximum temperature (C).

6. Royal National Park

The range in maximum winter temperature lies only between 16-17C (modal value 17C) within this sub-region. A statistical assessment of the relationships between Function and Style and this variable are presented in Table D.103.

Table D.103

Populations	Mann-W 'U'	Att sig	sig?
F vs S	6459.5	.1083	N
F vs F/S	2175.0	.0175	Y
S vs F/S	1228.0	.2977	N
FO vs SO	2216.5	.1651	N
FS vs SS	580.0	.0000	Y
FO vs FS	2537.0	.0000	Y
SO vs SS	520.0	.0714	N
FOXM vs FSXM	549.0	.0004	Y
FOXGG vs FSXGG	1616.0	.0029	Y
FOXMGG vs FSXMGG	No diff.		N
FOXM vs SO	949.0	.0409	Y
FSXM vs SS	300.0	.0010	Y
FOXGG vs SO	1384.5	.9069	N
FSXGG vs SS	580.0	.0000	Y
FOXMGG vs SO	TOO FEW		
FSXMGG vs SS	300.0	.0010	Y

Interpretational notes

The site population distributions tend to centre around the value which is modal for the sub-region. However, there does appear to have been a consistently significant difference between FS and the other site groups. The former group are located within areas of higher maximum winter temperature than the other groups (including SS sites which are derived from the same potential population).

D-3.9 Average minimum temperature - Winter

The range in average minimum winter temperature lies between 0-9C; the Aboriginal site range lies between 1-9C. The temperature declines with distance from the coast and concurrently with increase in altitude. The

data concerning this variable are illustrated in Figure D.28 for the region as a whole and for each of the sub-regions; and a statistical assessment of the relationships between Function and Style and this variable is presented in Table D.104.

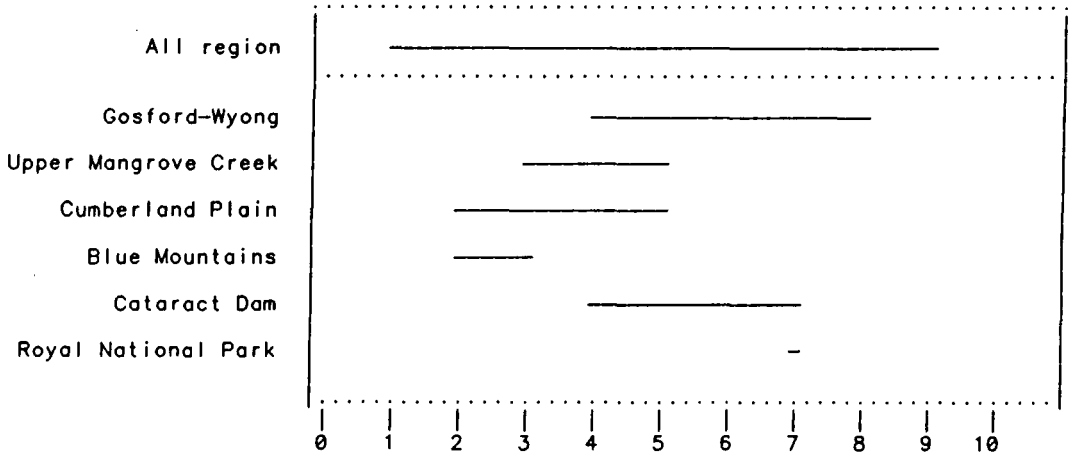
Table D.104

Populations	Mann-W 'U'	Att sig	sig?
F vs S	2120400.0	.5658	N
F vs F/S	527440.0	.0026	Y
S vs F/S	491220.0	.0028	Y
FO vs SO	763260.0	.0000	Y
FS vs SS	180840.0	.0000	Y
FO vs FS	451240.0	.0569	N
SO vs SS	273650.0	.0000	Y
FOXM vs FSXM	191080.0	.4515	N
FOXGG vs FSXGG	225960.0	.0006	Y
FOXMGG vs FSXMGG	62718.0	.0552	N
FOXM vs SO	385170.0	.0000	Y
FSXM vs SS	138040.0	.1354	N
FOXGG vs SO	477340.0	.0775	N
FSXGG vs SS	167330.0	.0000	Y
FOXMGG vs SO	144400.0	.0000	Y
FSXMGG vs SS	131410.0	.3801	N

Interpretational notes

Within the region as a whole there is a consistent tendency for all site population distributions to be located within the warmer end of the range. In addition, there is a consistent pattern of significant difference between the Function and Style populations in which the Function elements are distributed in areas which are warmer - most importantly in the case of FS sites in relation to SS sites (when grinding grooves are removed from the analysis). It is clear that middens make a particularly strong contribution to this tendency; but the difference is maintained in the FO population even when this sub-category is removed from the analysis.

a)



b)

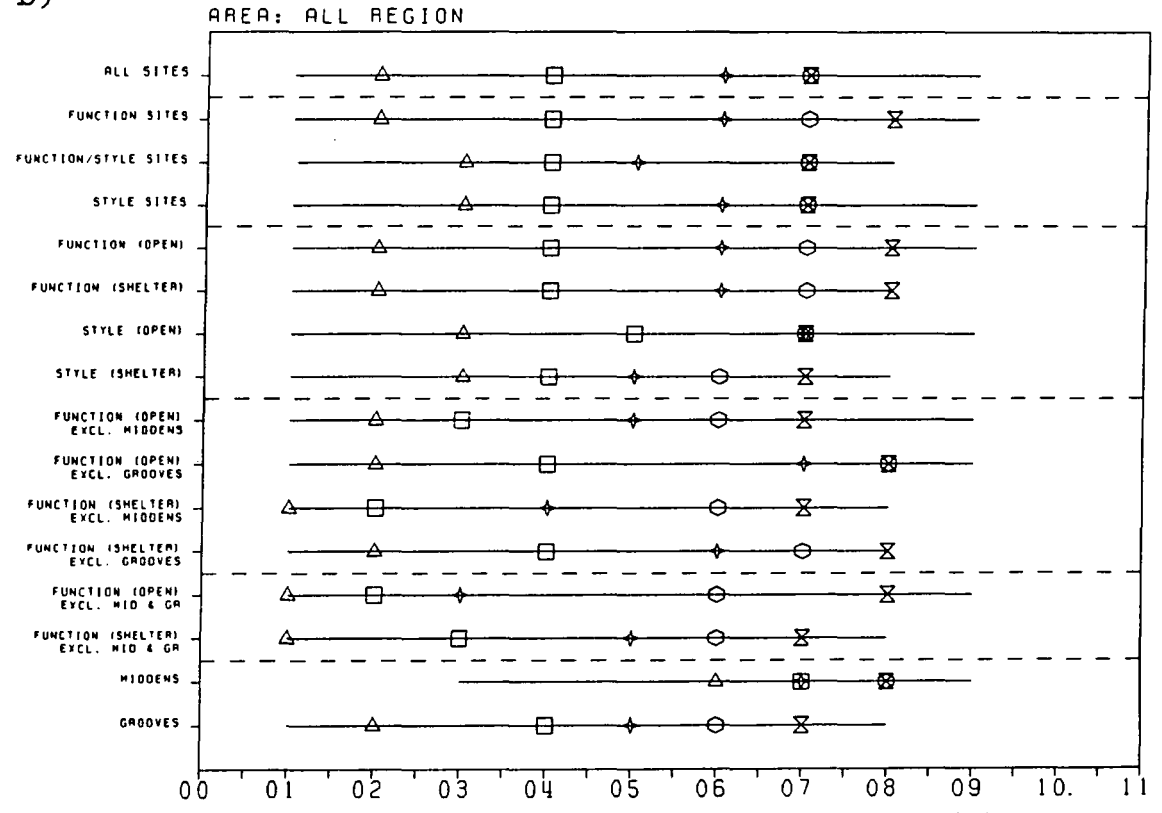


Figure D.28: Aboriginal sites and average winter minimum temperature (C).
a) range of data in the region and sub-region
b - h) the distributional characteristics in the region and sub-regions.

SUB-REGIONAL VARIATION

1. Gosford-Wyong

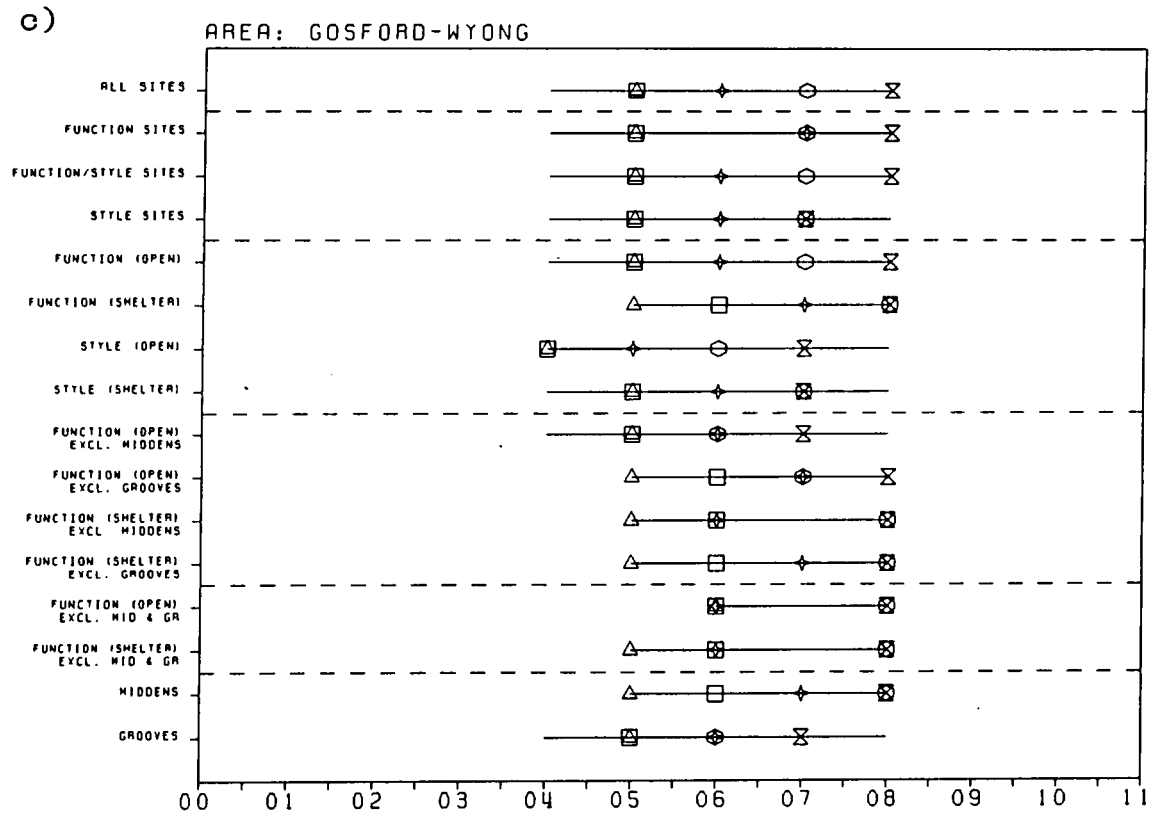
The range in average minimum winter temperature lies between 4-8C (modal value 6C) within this sub-region. A statistical assessment of the relationship between Function and Style and this variable is presented in Table D.105.

Table D.105

Populations	Mann-W 'U'	Att sig	sig?
F vs S	96077.0	.0000	Y
F vs F/S	27647.0	.0041	Y
S vs F/S	40628.0	.8864	N
FO vs SO	265.0	.0078	Y
FS vs SS	2404.5	.0000	Y
FO vs FS	12206.0	.0000	Y
SO vs SS	14492.0	.0094	Y
FOXM vs FSXM	1332.5	.0000	Y
FOXGG vs FSXGG	8777.0	.0135	Y
FOXMGG vs FSXMGG	170.5	.7535	N
FOXM vs SO	24429.0	.0000	Y
FSXM vs SS	809.0	.0009	Y
FOXGG vs SO	26217.0	.0000	Y
FSXGG vs SS	2402.5	.0000	Y
FOXMGG vs SO	104.5	.0049	Y
FSXMGG vs SS	807.0	.0017	Y

Interpretational notes

There is a clear and consistent tendency shown by the elements of the Function population to be located in areas of higher minimum winter temperature than their Style counterparts. While middens clearly contribute to this characteristic, the relationship holds true even when this sub-group (and grinding grooves) are removed from the analysis.



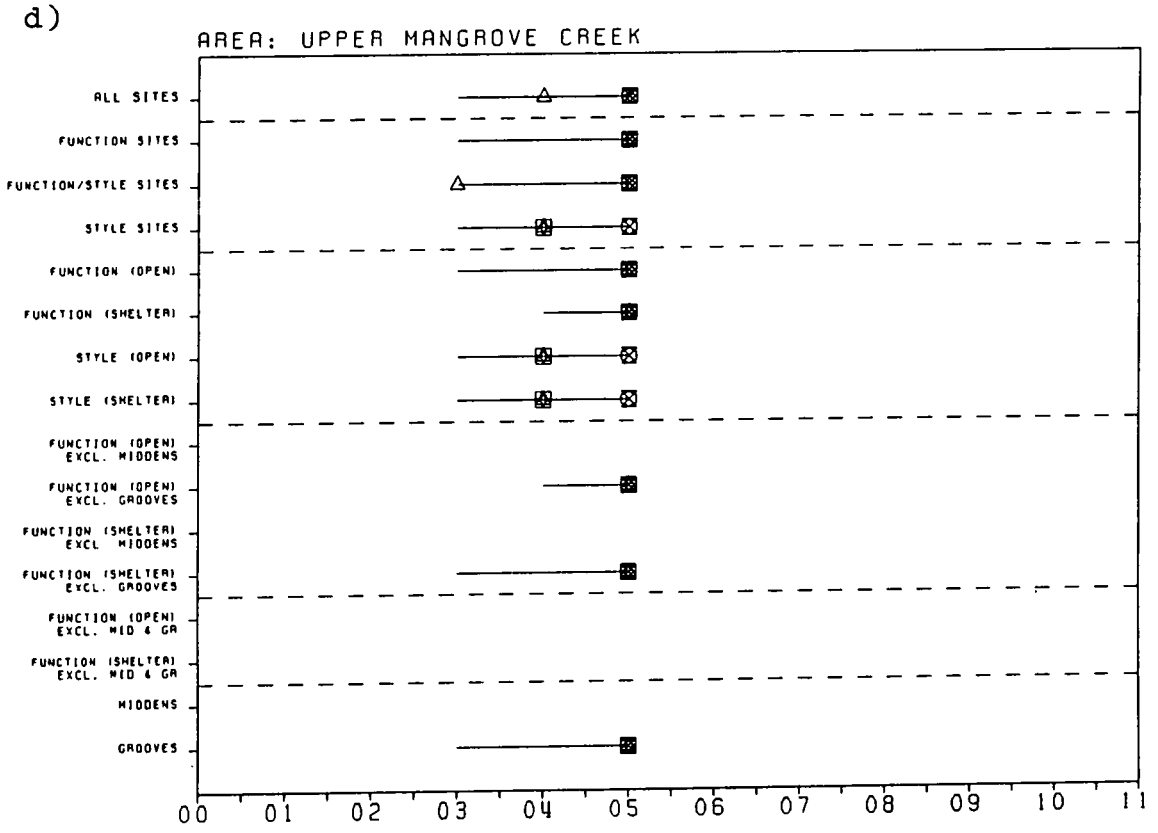


Figure D.28 (cont.) : Aboriginal sites and average winter minimum temperature (C).

2. Upper Mangrove Creek

The range in minimum winter temperature lies between 3-5C (modal value 4C) in this sub-region. A statistical assessment of the relationship between Function and Style and this variable is presented in Table D.106.

Table D.106

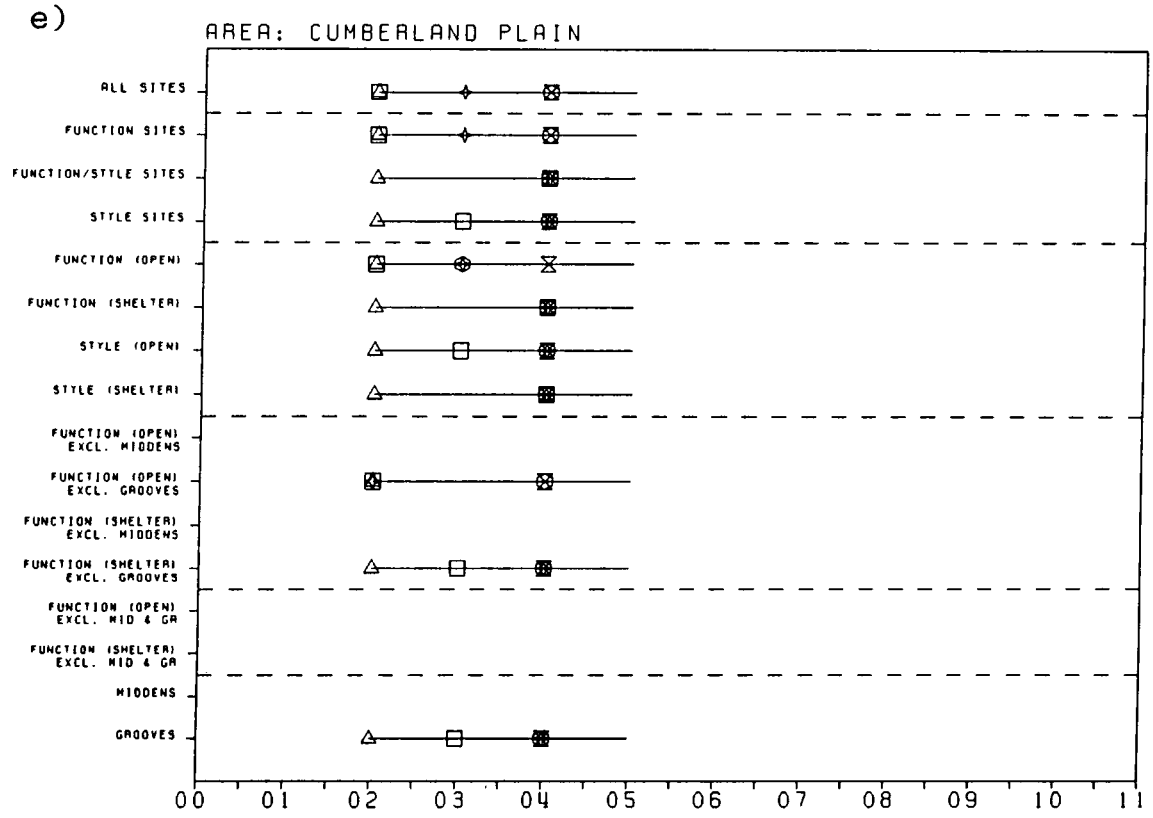
Populations	Mann-W 'U'	Att sig	sig?
F vs S	1675.5	.0000	Y
F vs F/S	1005.5	.0436	Y
S vs F/S	553.5	.1442	N
FO vs SO	259.5	.0000	Y
FS vs SS	456.0	.0020	Y
FO vs FS	916.0	.5123	N
SO vs SS	434.0	.4574	N
FOXGG vs FSXGG	377.0	.6574	N
FOXGG vs SO	109.0	.0001	Y
FSXGG vs SS	443.0	.0013	Y

Interpretational notes

There is a clear tendency exhibited by all site population distributions toward the warmer end of the range (rather than about the modal value). Both Function elements display a greater tendency toward the warmer end of the range than is exhibited by the Style population.

3. Cumberland Plain

The range in minimum winter temperature lies between 2-5C (modal value 4C) in this sub-region. A statistical assessment of the relationship between Function and Style and this variable is presented in Table D.107.



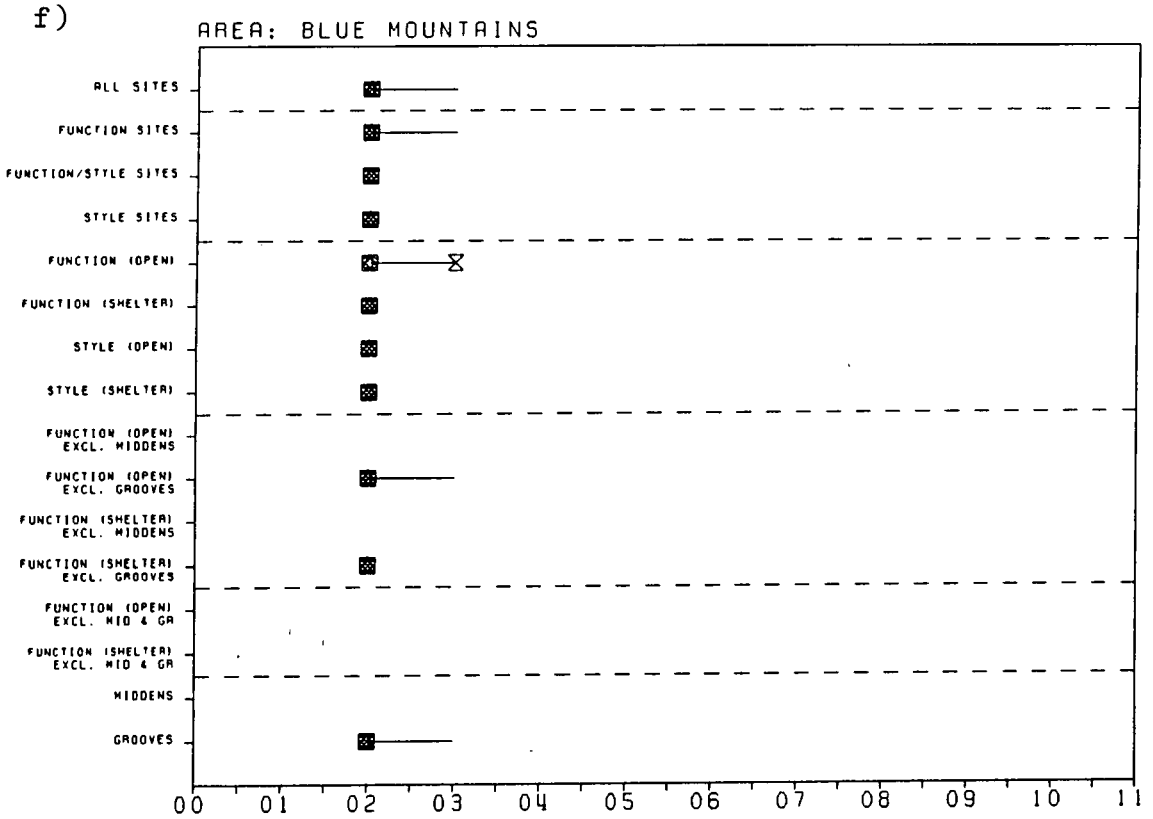


Figure D.28 (cont.) : Aboriginal sites and average winter minimum temperature (C).

Table D.107

Populations	Mann-W 'U'	Att sig	sig?
F vs S	2634.0	.0000	Y
F vs F/S	1393.5	.0005	Y
S vs F/S	581.5	.9252	N
FO vs SO	382.0	.0028	Y
FS vs SS	863.5	.9951	N
FO vs FS	1392.0	.0000	Y
SO vs SS	176.0	.4680	N
FOXGG vs FSXGG	896.0	.0000	Y
FOXGG vs SO	268.5	.0005	Y
FSXGG vs SS	703.0	.8112	N

Interpretational notes

Although site population distributions tend to fall about the modal value there is a clear tendency towards lower temperatures: FO sites have a consistent tendency to be lower in temperature than SO sites, while FS and SS sites are not consistently different. The differences between FO and the other groups is consistent with the peripheral status of the other groups.

4. Blue Mountains.

The range in minimum winter temperature lies between 0-3C (modal value 3C) within this sub-region; while the Aboriginal site range lies between 1-3C. A statistical assessment of the relationship between Function and Style and this variable is presented in Table D.108.

Table D.108

Populations	Mann-W 'U'	Att sig	sig?
F vs S	306.0	.3127	N
F vs F/S	TOO FEW		
S vs F/S	TOO FEW		
FO vs SO	TOO FEW		
FS vs SS	TOO FEW		
FO vs FS	126.5	.0563	N
SO vs SS	TOO FEW		
FOXGG vs FSXGG	90.0	.1573	N
FOXGG vs SO	TOO FEW		
FSXGG vs SS	No diff.		N

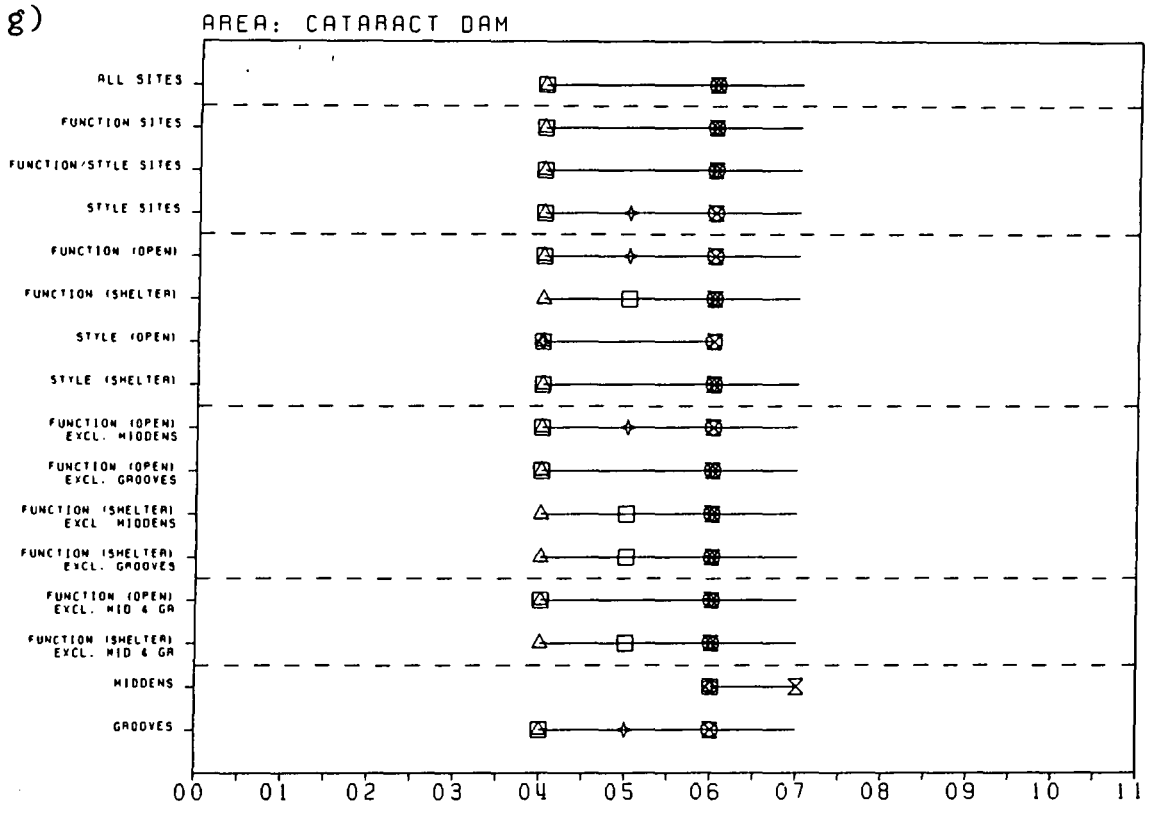
Interpretational notes

There are no known sites at the lowest minimum winter temperature (0C) within the sub-region. However, there is a general trend for all site population distributions to tend toward the lower end of the range (below the modal value for the sub-region). There is no significant difference between Function and Style, though it appears that FO sites may display a slight tendency toward warmer areas.

5. Cataract Dam

The range in minimum winter temperature lies between 4-7C (modal value 5C) in this sub-region. A statistical assessment of the relationship between Function and Style and this variable is presented in Table D.109.

g)



h)

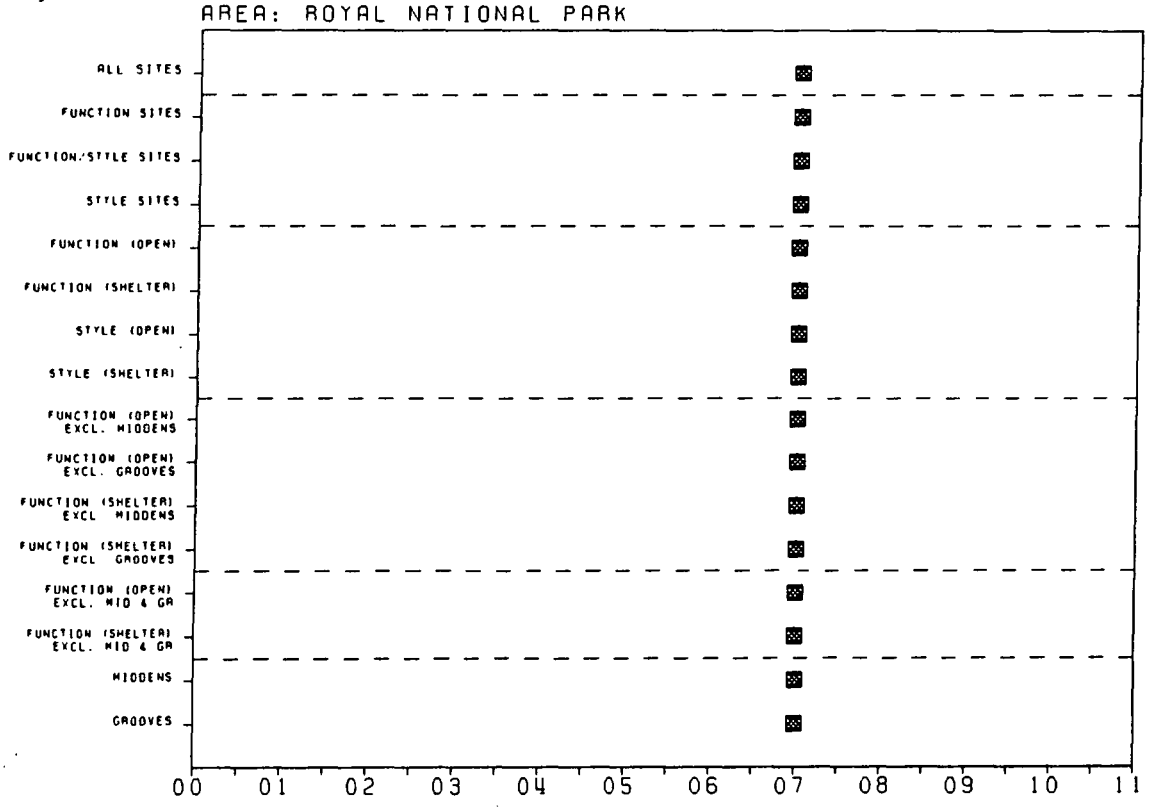


Figure D.28 (cont.) : Aboriginal sites and average winter minimum temperature (C).

Table D.109

Populations	Mann-W 'U'	Att sig	sig?
F vs S	44938.0	.1603	N
F vs F/S	18446.0	.2233	N
S vs F/S	13188.0	.0297	Y
FO vs SO	2143.0	.0938	N
FS vs SS	6255.0	.0002	Y
FO vs FS	6968.0	.0002	Y
SO vs SS	1871.5	.0836	N
FOXM vs FSXM	5997.5	.0116	Y
FOXGG vs FSXGG	1053.0	.0787	N
FOXMGG vs FSXMGG	820.5	.2456	N
FOXM vs SO	2138.0	.1043	N
FSXM vs SS	5479.0	.0251	Y
FOXGG vs SO	274.0	.0809	N
FSXGG vs SS	6126.0	.0003	Y
FOXMGG vs SO	271.5	.1289	N
FSXMGG vs SS	5350.5	.0403	Y

Interpretational notes

Site population distributions clearly tend away from the modal value and toward the warmer end of the range. Middens clearly contribute to this directionality in the Function population. However, FS sites are separated from the other site groups in being located in warmer areas even when middens are removed from the analysis.

6. Royal National Park.

There is no observable variation within the sub-region for this variable. All the sub-region and hence all the sites have a average minimum winter temperature of 7C.

D-3.10 Aspect

The measures of aspect used here were taken directly from the NPWS record where recorded, and refer to the direction in which the site faces. As a consequence the number of sites used in the analysis is, in some cases, extremely low.

In addition, expressions of aspect are, of course, largely meaningless in open sites. Here open site data are included only when there was a clear tendency for a site on (for example) a ridge side, to face in a certain direction. The lack of large samples has meant that the following section relies heavily on trends in the data without the support of statistical inference; and for this variable alone a 0.05 significance level was used at the regional level.

The data concerning aspect are illustrated in Figure D.29 to D.35 for the region as a whole and for the sub-regions; and a statistical assessment of the relationships between Function and Style and this variable is presented in Table D.110 for the region as a whole.

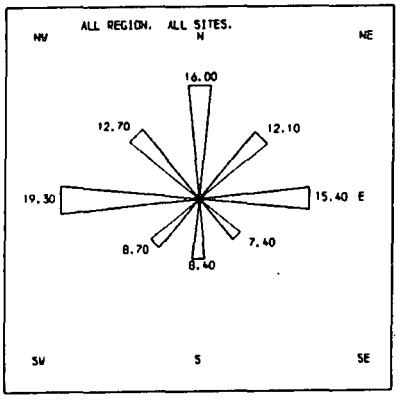
Table D.110

Populations	chi-sq	df	sig?
F vs S	14.219	7	Y
F vs F/S	22.107	7	Y
S vs F/S	9.932	7	N
FO vs SO	9.821	7	N
FS vs SS	11.685	7	N
FO vs FS	7.719	7	N
SO vs SS	1.095	7	N
FOXM vs FSXM	13.481	7	N
FOXGG vs FSXGG	12.866	7	N
FOXMGG vs FSXMGG	2.785	1	N
FOXM vs SO	12.565	7	N
FSXM vs SS	17.327	7	Y
FOXGG vs SO	13.561	7	N
FSXGG vs SS	9.744	7	N
FOXMGG vs SO	2.637	1	N
FSXMGG vs SS	14.077	7	Y

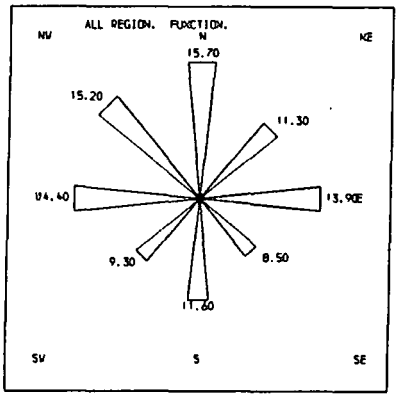
Interpretational notes

There is a tendency for all sites to shelter away from the south-easterly storm winds. FO sites have a strong easterly and southerly component (in the shade and out of the wind?). Middens have strong northerly, easterly and westerly components and a marked reluctance to face SE (out of storm winds; facing the sun; out of the winter wind or facing the sea; or sheltered from onshore breezes).

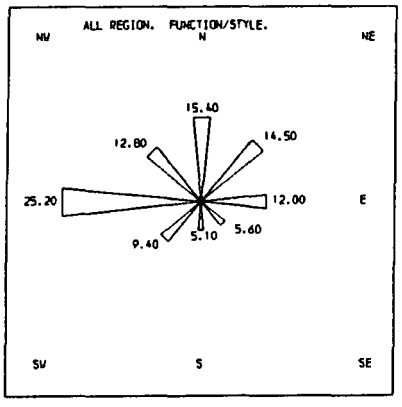
ALL



F



F/S



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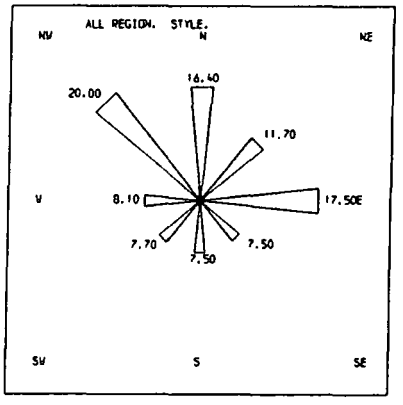

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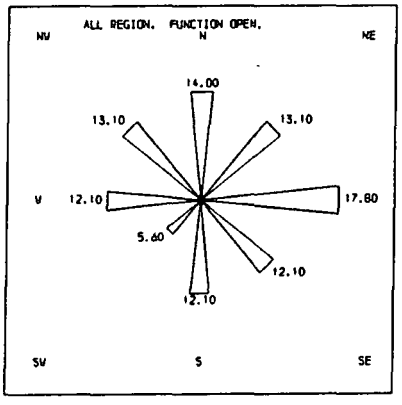

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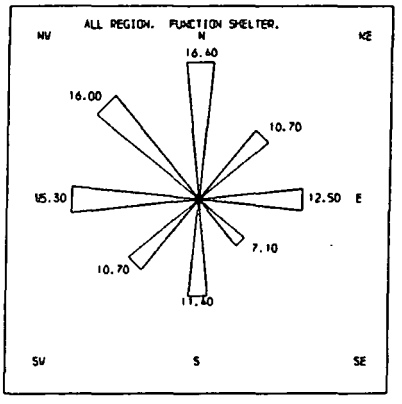
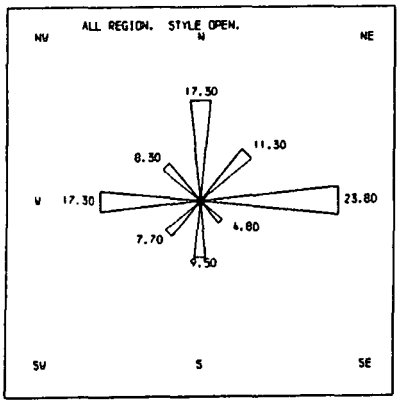


SO



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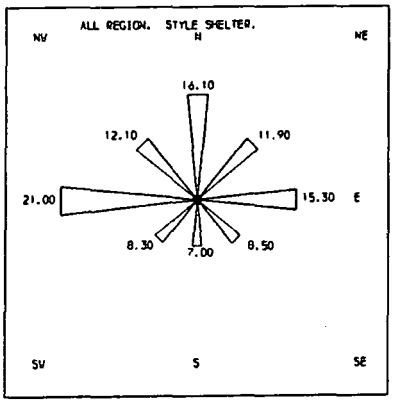
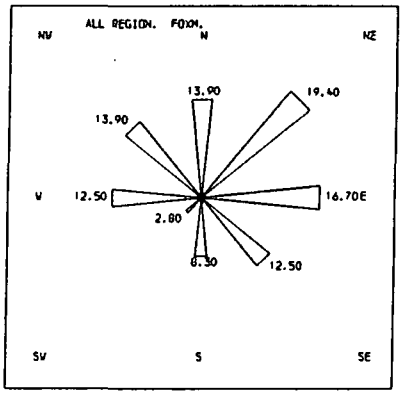
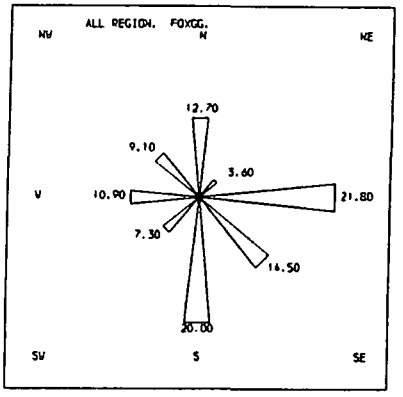


Figure D.29: Aboriginal sites and aspect - All region.

FOXM



FOXGG



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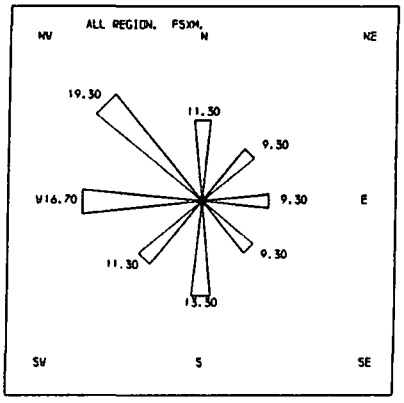

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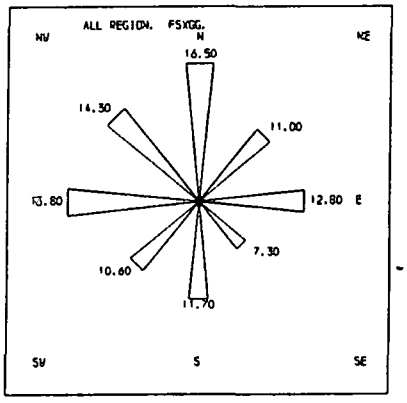

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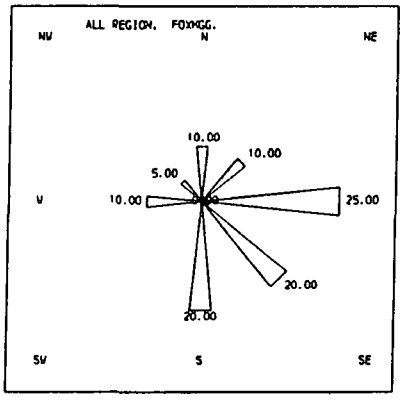
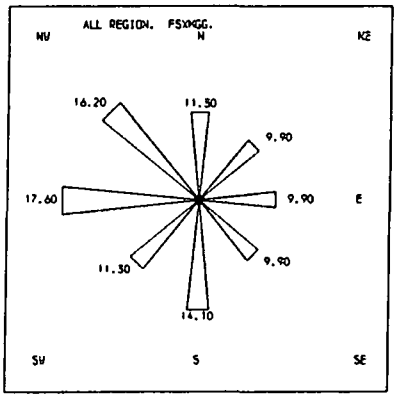
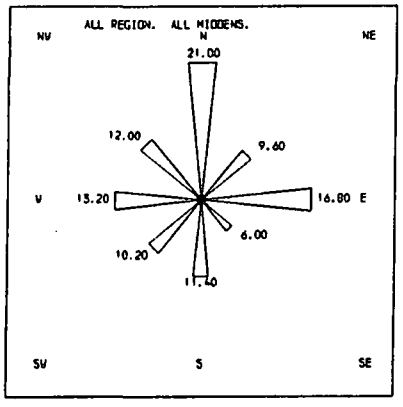


FSXMGG



MIDDENS



GROOVES

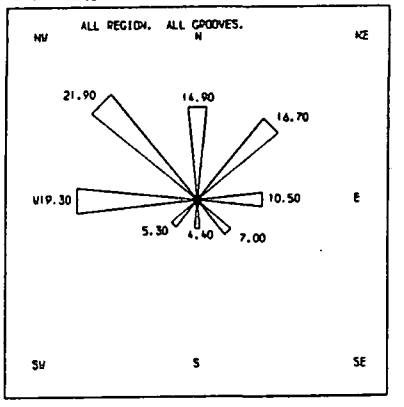


Figure D.29 (cont.): Aboriginal sites and aspect - All region.

FS sites have fewer directional tendencies than their Style counterpart; there is perhaps a tendency for them to face north to west (in the sun and out of the onshore wind?); while Style shelters possess a strong westerly component.

1. Gosford-Wyong

Owing to the low number of sites involved it was necessary to amalgamate categories and compare sites from SW-N against sites NE-S (Figure D.30). A statistical assessment of the relationship between Function and Style and aspect is presented in Table D.111.

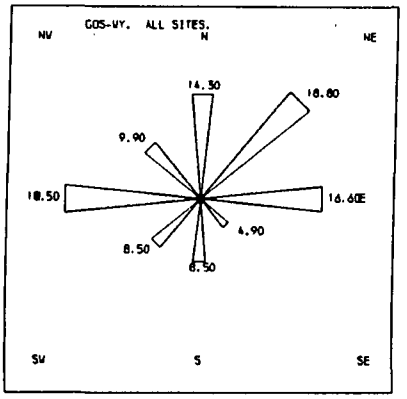
Table D.111

Populations	chi-sq	df	sig?
F vs S	12.958	7	N
F vs F/S	8.218	1	N
S vs F/S	14.267	1	Y
FO vs SO	0.082	1	N
FS vs SS	15.198	7	Y
FO vs FS	15.198	7	Y
SO vs SS	3.871	1	N
FOXM vs FSXM	TOO FEW		
FOXGG vs FSXGG	TOO FEW		
FOXMGG vs FSXMGG	TOO FEW		
FOXM vs SO	TOO FEW		
FSXM vs SS	0.307	1	N
FOXGG vs SO	TOO FEW		
FSXGG vs SS	2.837	1	N
FOXMGG vs SO	TOO FEW		
FSXMGG vs SS	0.030	1	N

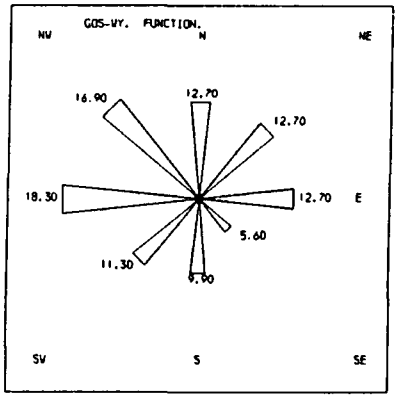
Interpretational notes

There is a tendency displayed by all sites to face away from the SE, which is the direction of the principal storm winds; and this characteristic is most pronounced in middens. Style shelters have a marked tendency to face toward the NE while FS tend to face N to W (with a strong westerly component). FO sites have a tendency to face south (in the shade?), while SO sites face predominantly east.

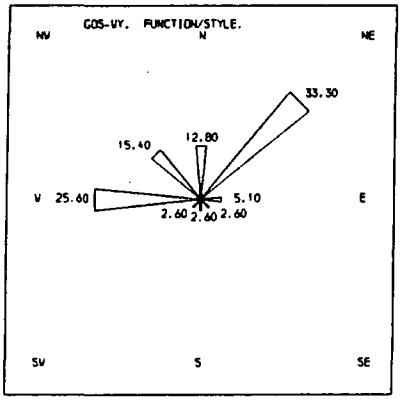
ALL



F



F/S



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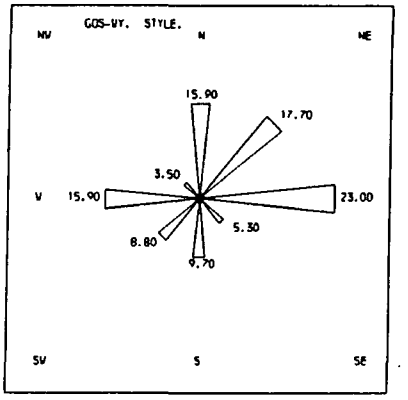

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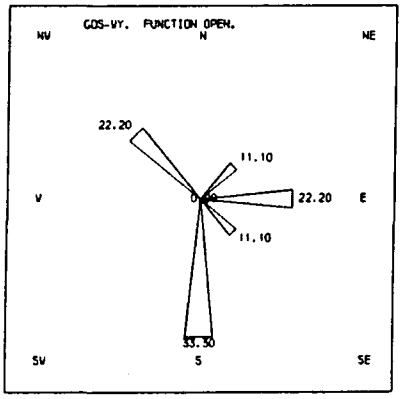

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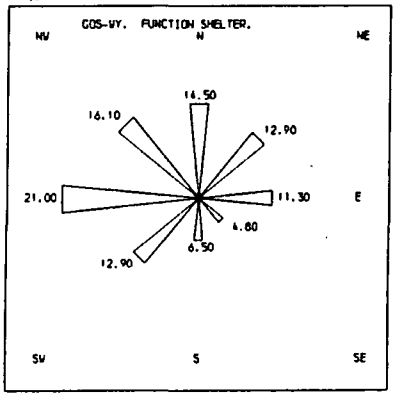

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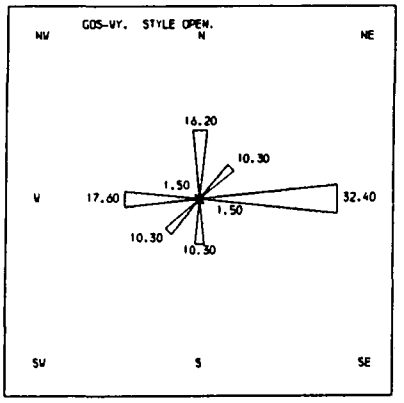

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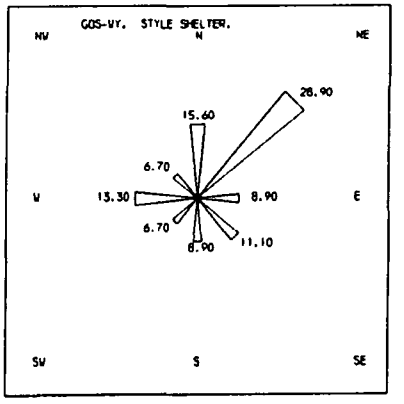
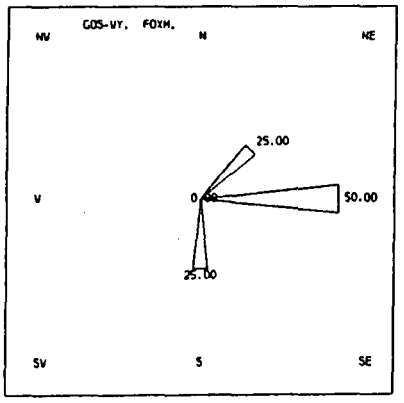
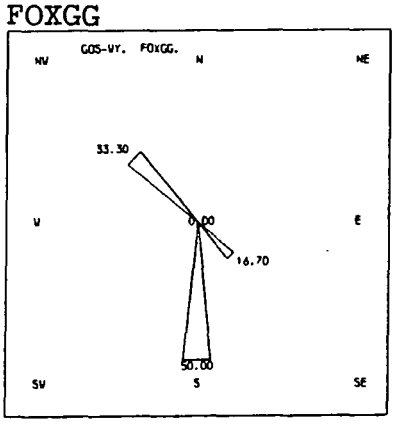


Figure D.30: Aboriginal sites and aspect - Gosford-Wyong.

FOXM



FOXGG



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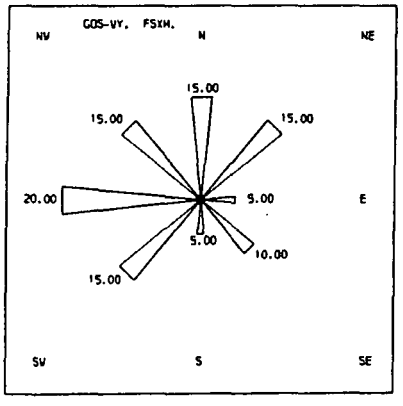

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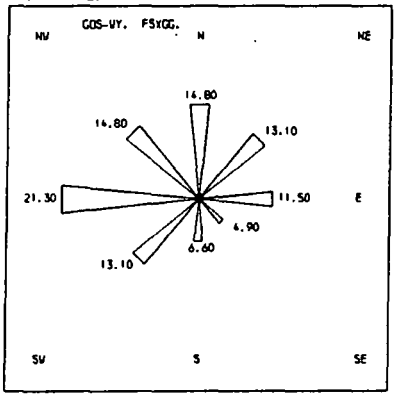

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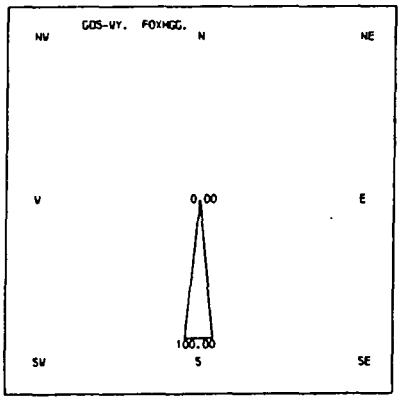

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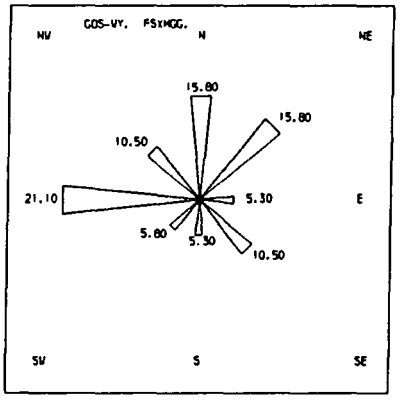
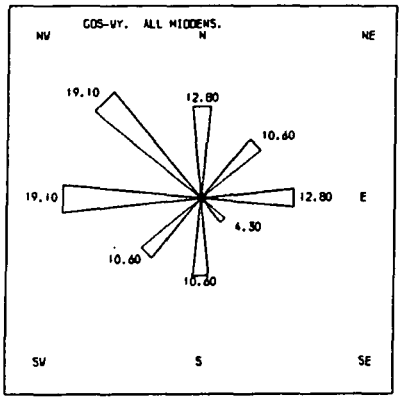


MIDDENS



GROOVES

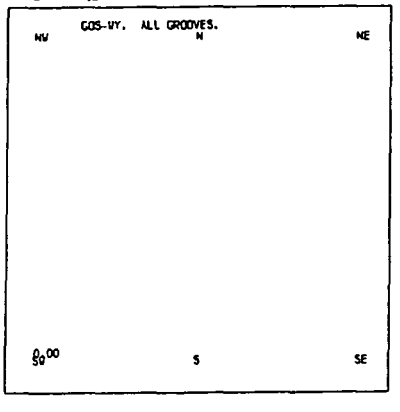


Figure D.30 (cont.): Aboriginal sites and aspect - Gosford-Wyong.

2. Upper Mangrove Creek

Due to the lack of data it was necessary to use the Chi-square test upon amalgamations of site data from SW-N and NE-S (Figure D.31). A statistical assessment of the relationship between Function and Style and aspect is presented in Table D.112.

Table D.112

Populations	chi-sq	df	sig?
F vs S	4.013	1	N
F vs F/S	TOO FEW		
S vs F/S	TOO FEW		
FO vs SO	TOO FEW		
FS vs SS	0.114	1	N
FO vs FS	TOO FEW		
SO vs SS	TOO FEW		
FOXGG vs FSXGG	TOO FEW		
FOXGG vs SO	TOO FEW		
FSXGG vs SS	0.320	1	N

Interpretational notes

There is a clear reluctance exhibited by all site types to face SE - the direction of storm winds. FS sites have a tendency to face NE or NW towards stable warm winds, a characteristic which appears to be shared by FO sites. SS and SO sites, however, appear to face toward NW-W to a greater degree.

3. Cumberland Plain.

There are too few data to compare statistically. The majority of sites upon the Cumberland Plain are open sites and cannot really be said to have an 'aspect'. FS sites upon the periphery of the Plain appear to have a pronounced NW (facing warm wind?) and SW aspect (shelter & overlooking the plain?) (Figure D.32).

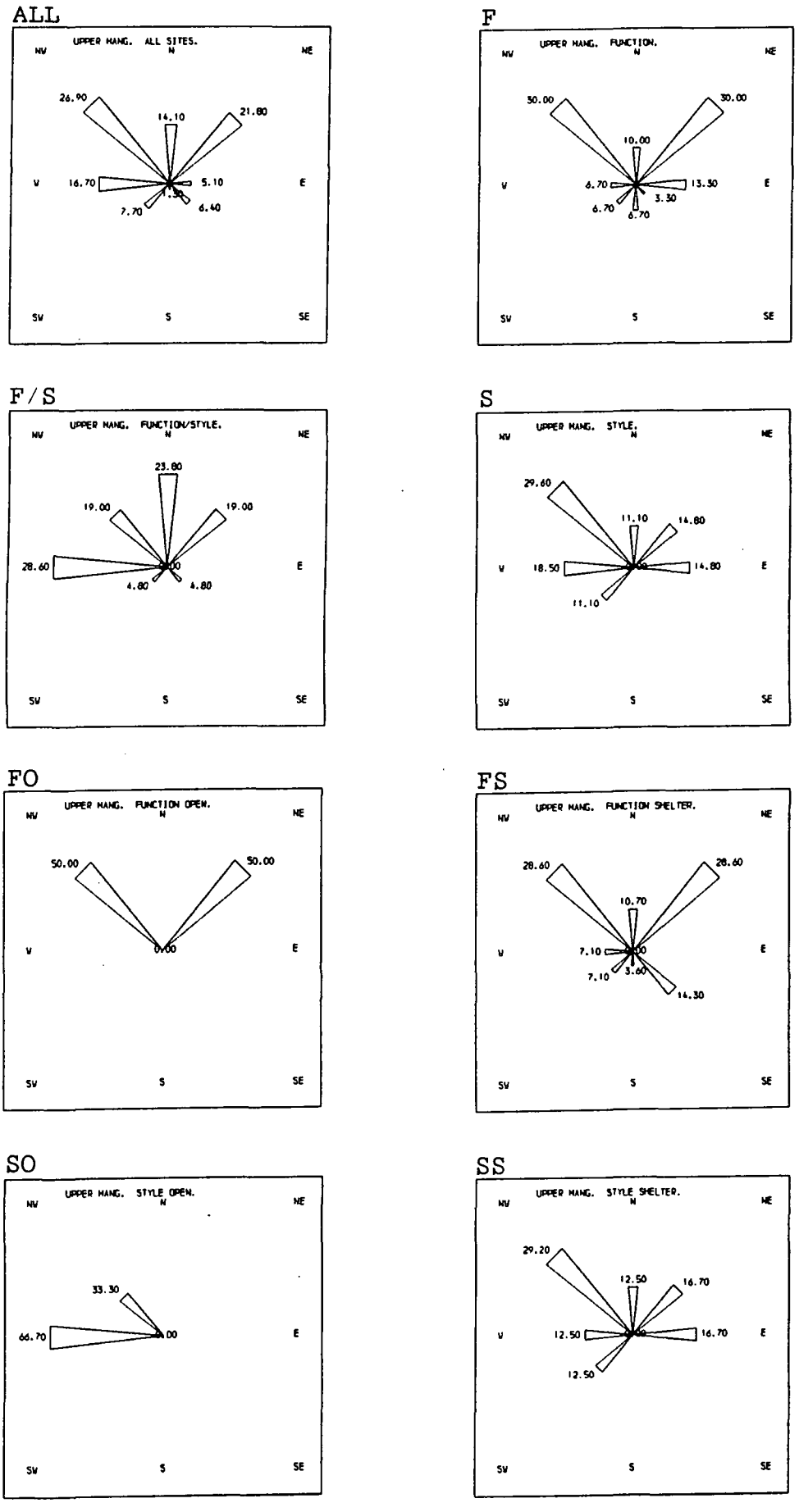
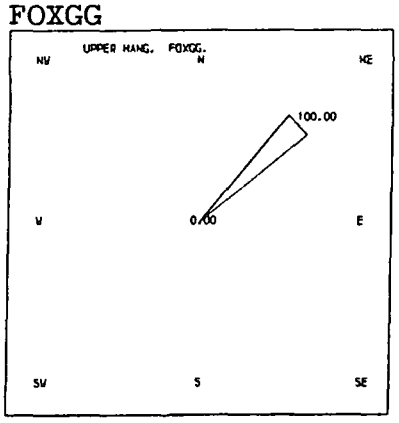


Figure D.31: Aboriginal sites and aspect - Upper Mangrove Creek.

FOXM

NOT APPROPRIATE IN THIS SUB-REGION

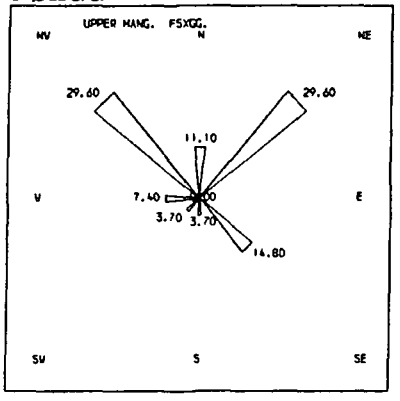
FOXGG



FSXM

NOT APPROPRIATE IN THIS SUB-REGION

FSXGG



FOXMGG

NOT APPROPRIATE IN THIS SUB-REGION

FSXMGG

NOT APPROPRIATE IN THIS SUB-REGION

MIDDENS

NOT APPROPRIATE IN THIS SUB-REGION

GROOVES

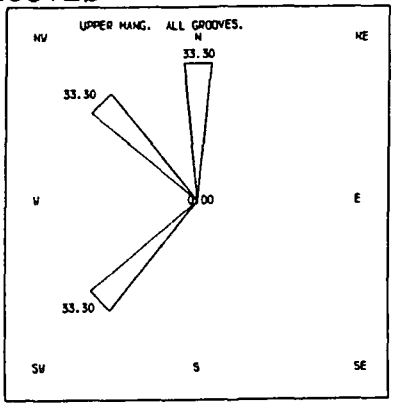
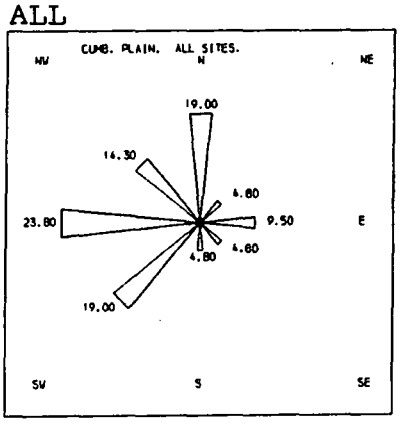


Figure D.31 (cont.): Aboriginal sites and aspect - Upper Mangrove Creek.

ALL



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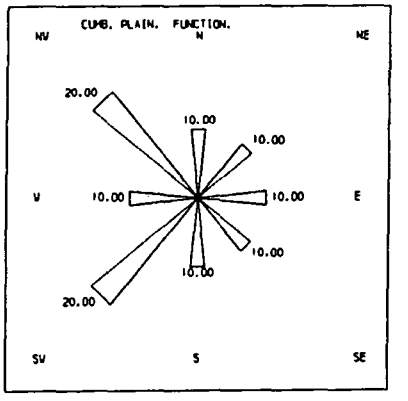
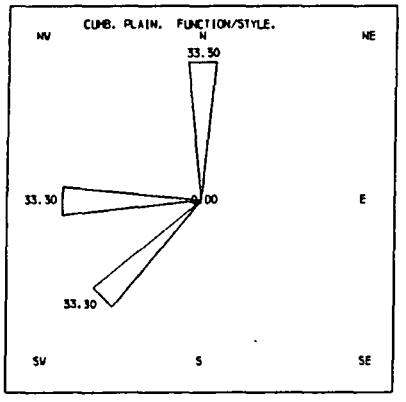


F/S



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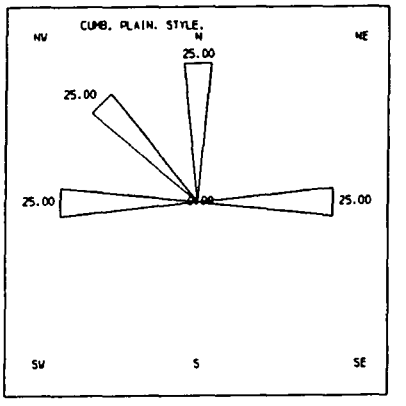

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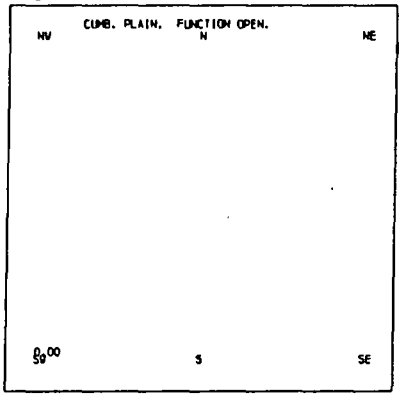

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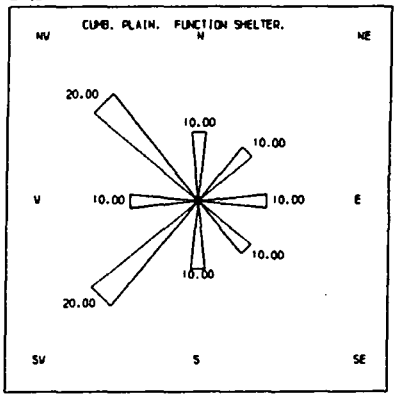

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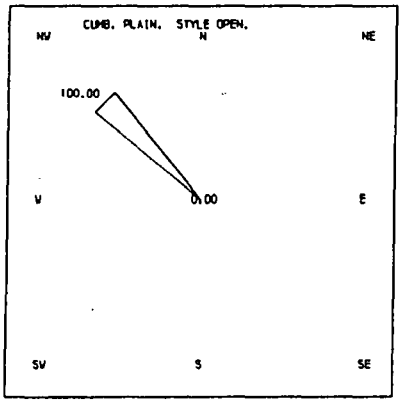


SS

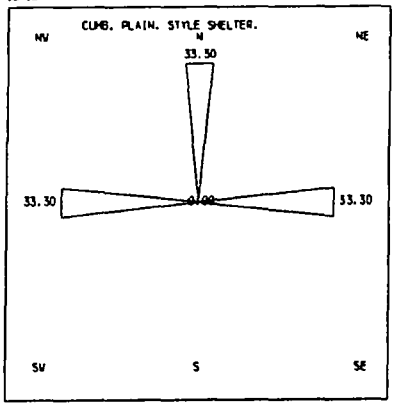
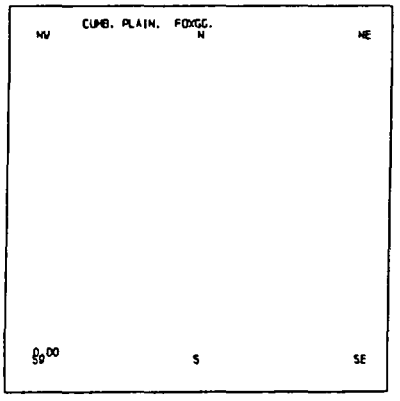


Figure D.32: Aboriginal sites and aspect - Cumberland Plain.

FOXM

NOT
APPROPRIATE
IN THIS
SUB-REGION

FOXGG



FSXM

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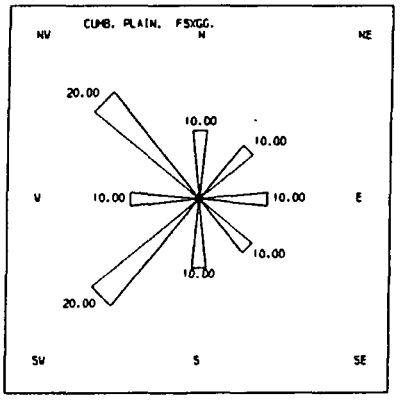
APPROPRIATE
IN THIS
SUB-REGION

FSXGG



FOXMGG

NOT
APPROPRIATE
IN THIS
SUB-REGION

FSXMGG

NOT
APPROPRIATE
IN THIS
SUB-REGION

MIDDENS

NOT
APPROPRIATE
IN THIS
SUB-REGION

GROOVES

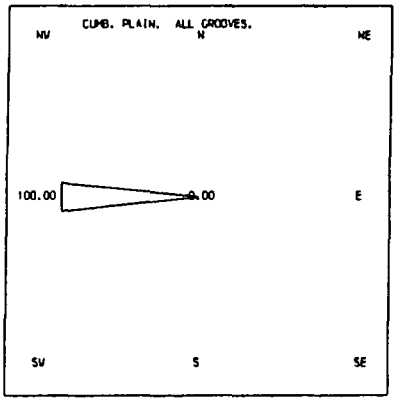


Figure D.32 (cont.): Aboriginal sites and aspect - Cumberland Plain.

4. Blue Mountains

There are too few data to compare statistically. FS sites have a tendency to face towards the west (sheltered from summer winds?) and north (in the sun). Style shelters, in contrast, have a strong SE and NW component (Figure D.33).

5. Cataract Dam A statistical assessment of the relationship between Function and Style and aspect is presented in Table D.113 (Figure D.34).

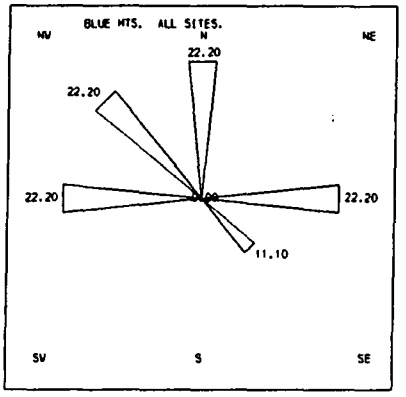
Table D.113

Populations	chi-sq	df	sig?
F vs S	18.643	7	Y
F vs F/S	8.470	7	N
S vs F/S	2.817	7	N
FO vs SO	TOO FEW		
FS vs SS	3.665	1	N
FO vs FS	5.587	1	N
SO vs SS	TOO FEW		
FOXM vs FSXM	7.181	1	N
FOXGG vs FSXGG	TOO FEW		
FOXMGG vs FSXMGG	TOO FEW		
FOXM vs SO	TOO FEW		
FSXM vs SS	3.956	1	N
FOXGG vs SO	TOO FEW		
FSXGG vs SS	3.665	1	N
FOXMGG vs SO	TOO FEW		
FSXMGG vs SS	3.956	1	N

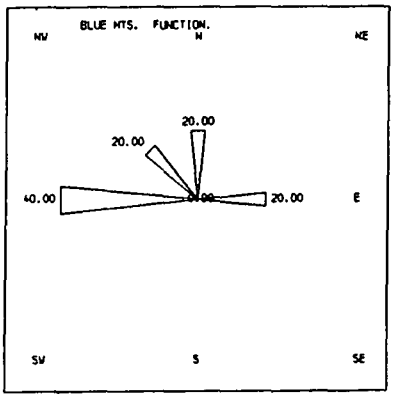
Interpretational notes

FS shelters have a strong southerly component (shade?) and a strong westerly (shelter from onshore winds?) and easterly (shelter from winter winds; overlooking the sea?) component. SS sites, however, also have a strong westerly and easterly component. FO sites have a strong N and NE component (warm, and warm wind?). While middens possess a strong NE component (warm winds?).

ALL



F



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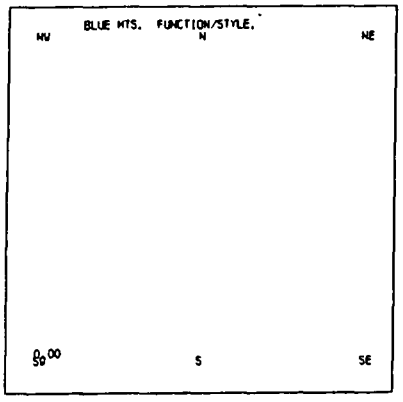

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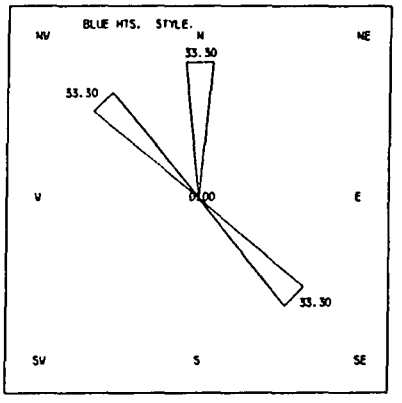

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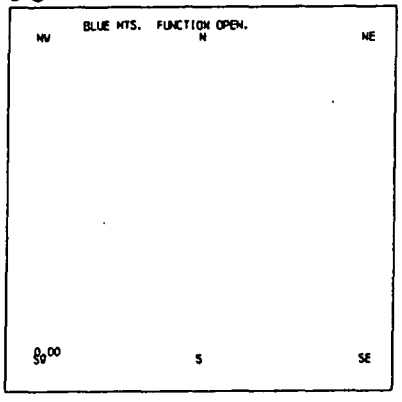

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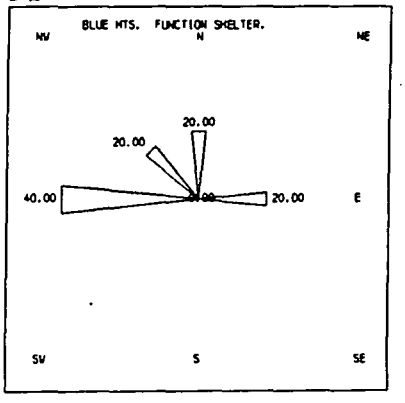

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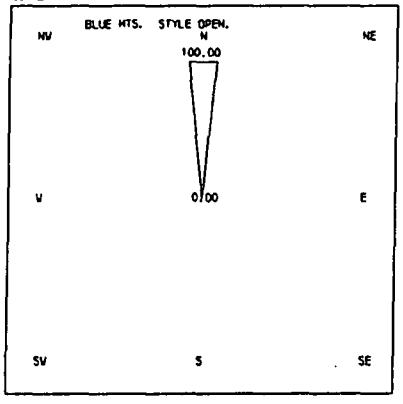

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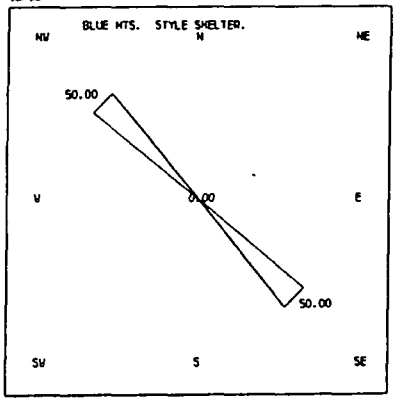
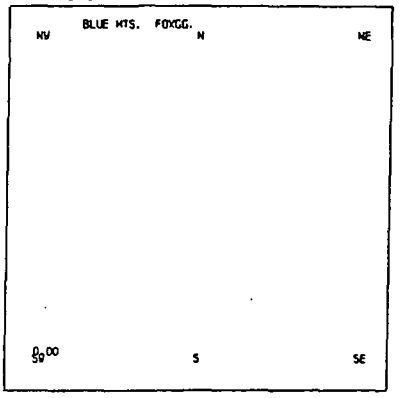


Figure D.33: Aboriginal sites and aspect - Blue Mountains.

FOXM

NOT
APPROPRIATE
IN THIS
SUB-REGION

FOXGG



FSXM

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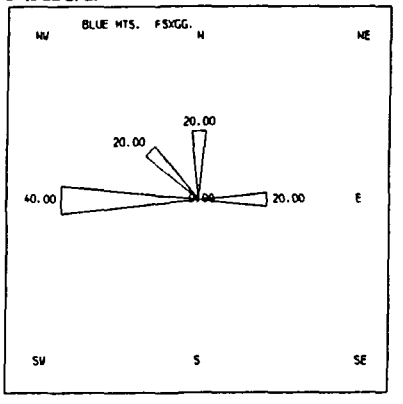
APPROPRIATE
IN THIS
SUB-REGION

FSXGG



FOXMGG

NOT
APPROPRIATE
IN THIS
SUB-REGION

FSXMGG

NOT
APPROPRIATE
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SUB-REGION

MIDDENS

NOT
APPROPRIATE
IN THIS
SUB-REGION

GROOVES

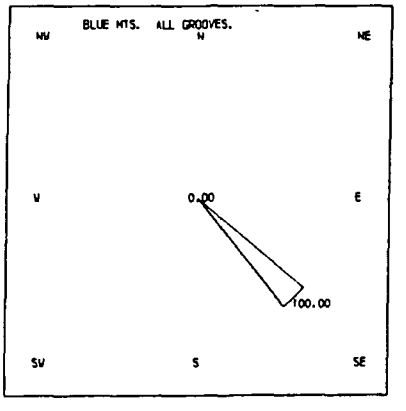
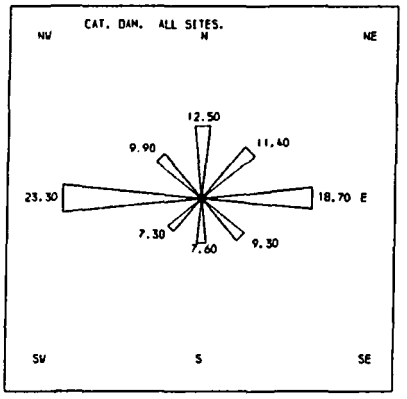


Figure D.33 (cont.): Aboriginal sites and aspect - Blue Mountains.

ALL



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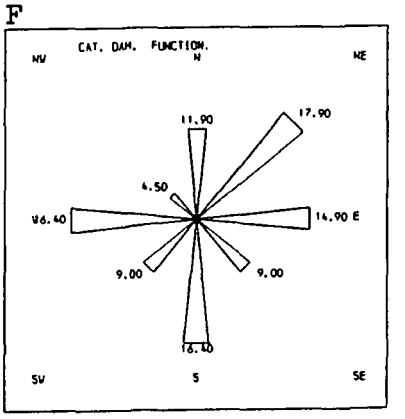
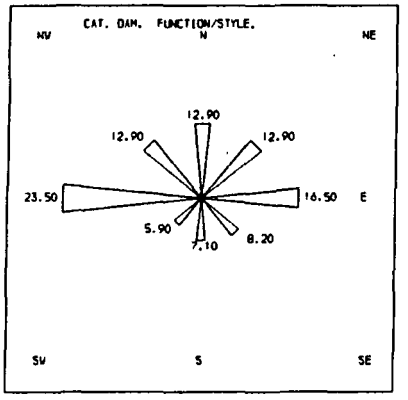
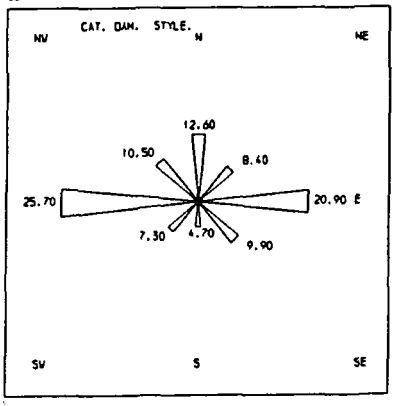


F/S



S



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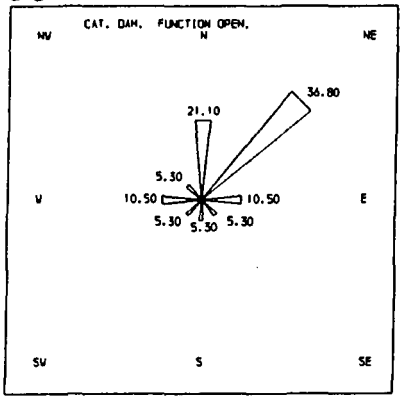

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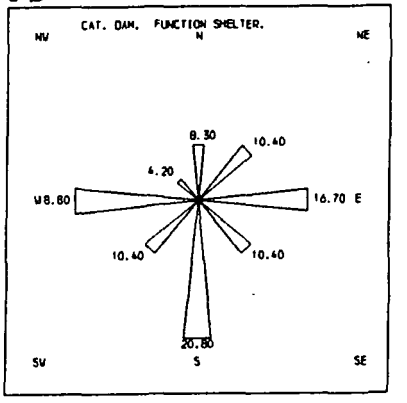

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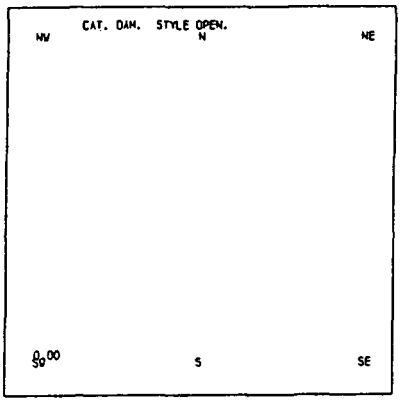

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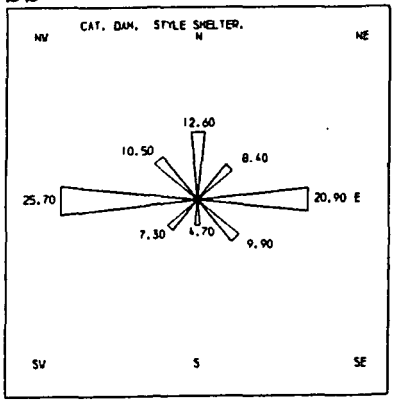
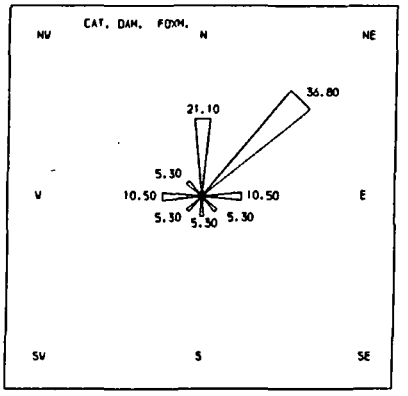


Figure D.34: Aboriginal sites and aspect - Cataract Dam.

FOXM



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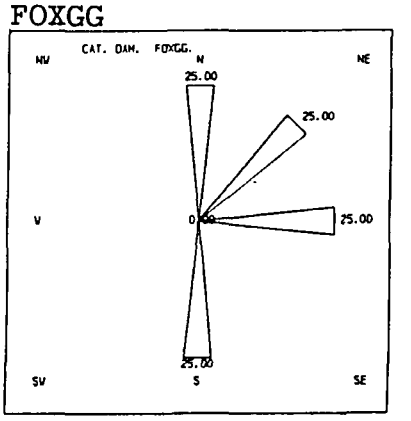
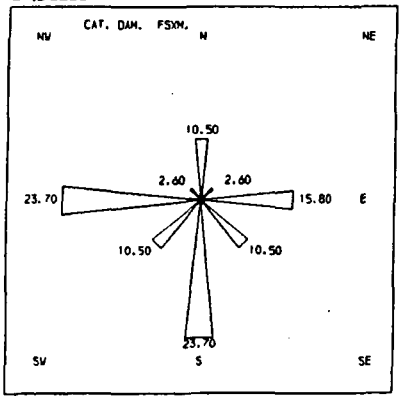


FSXM



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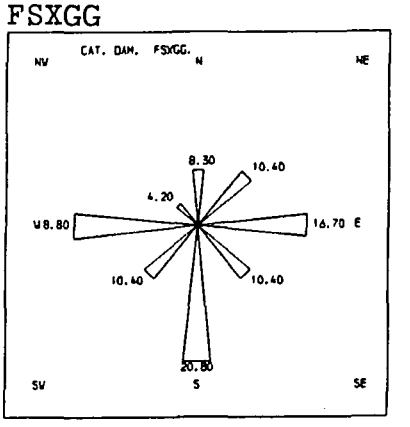

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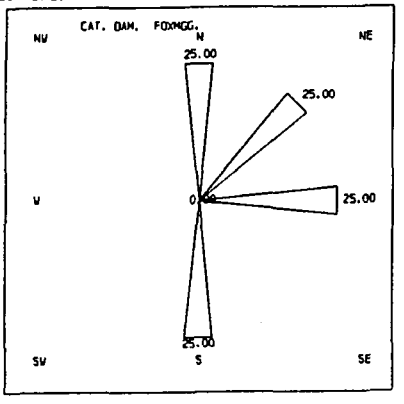

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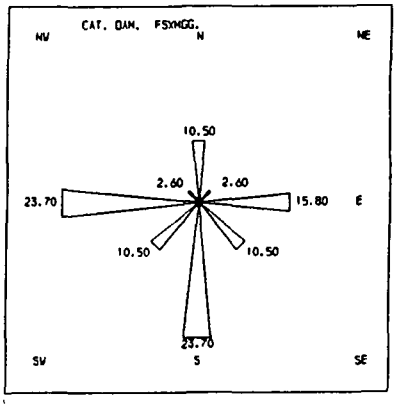
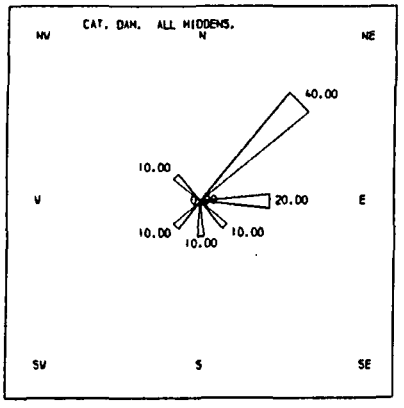


MIDDENS



GROOVES

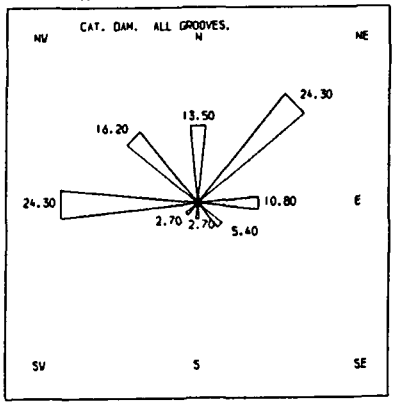


Figure D.34 (cont.): Aboriginal sites and aspect - Cataract Dam.

6. Royal National Park.

There are too few data to test statistically except upon the level of the gross Function and Style populations (Figure D.35; Table D.114).

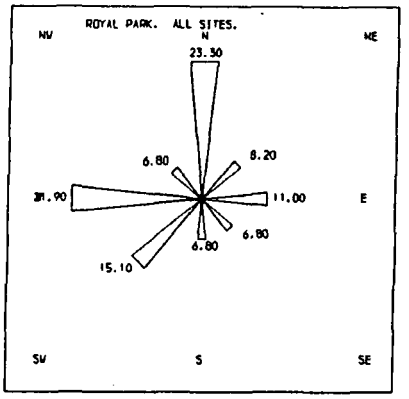
Table D.114

Populations	chi-sq	df	sig?
F vs S	0.691	3	N

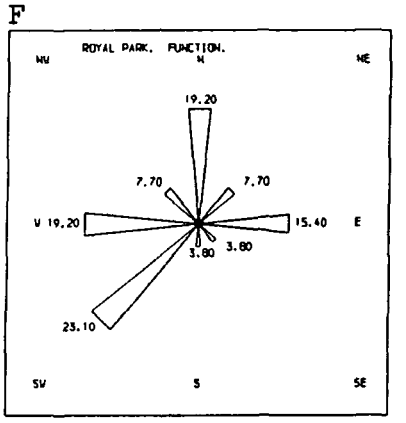
Interpretational notes

All sites display a marked reluctance to face SE into the direction of storm winds. FS sites possess strong NW (stable warm winds?), north (facing the sun?), west (shelter from the summer winds?) and east (shelter from winter winds?) components. Middens clearly influence this pattern in the Function population. Style sites, by contrast, possess a strong northerly component.

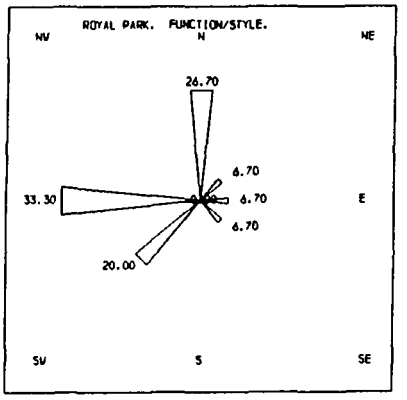
ALL



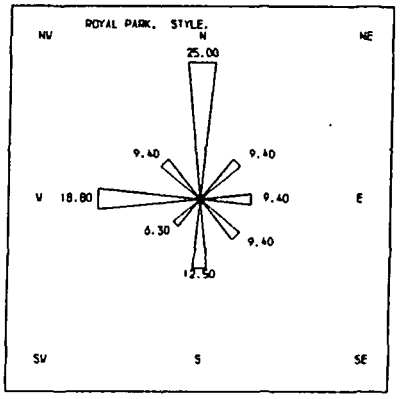
F



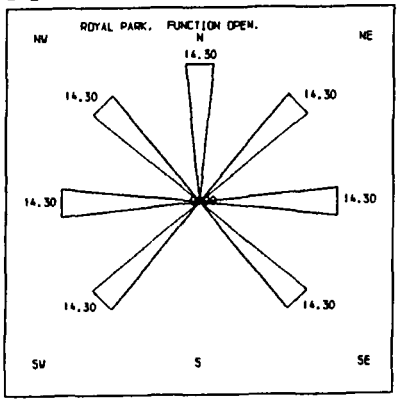
F/S



S



FO



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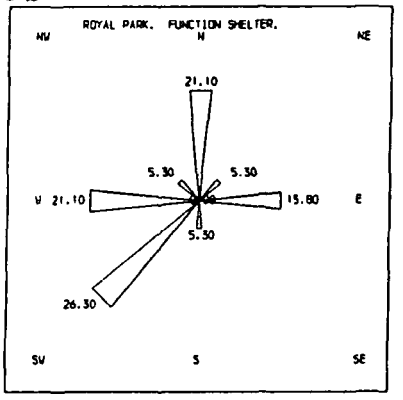
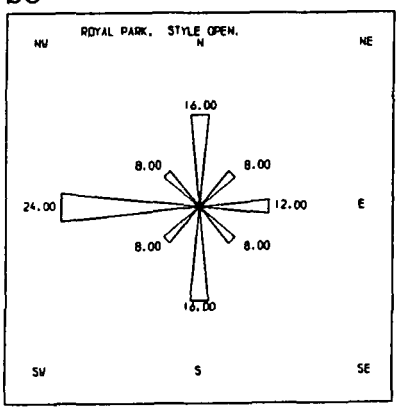


SO



SS

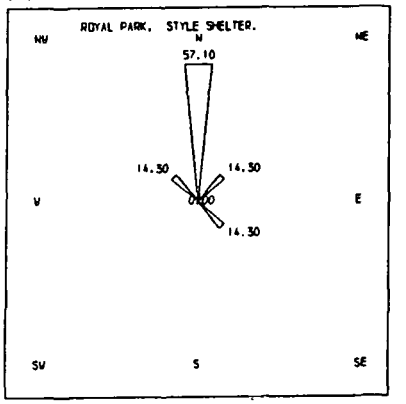
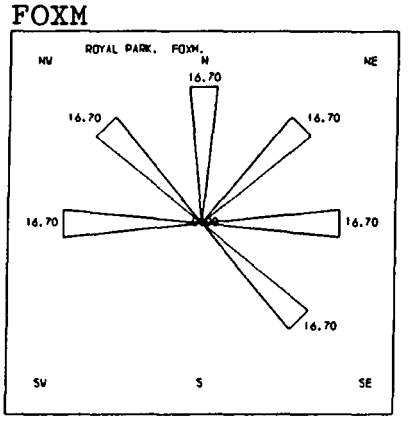
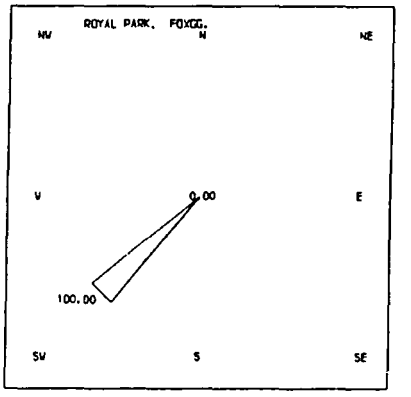


Figure D.35: Aboriginal sites and aspect - Royal National Park.

FOXM



FOXGG



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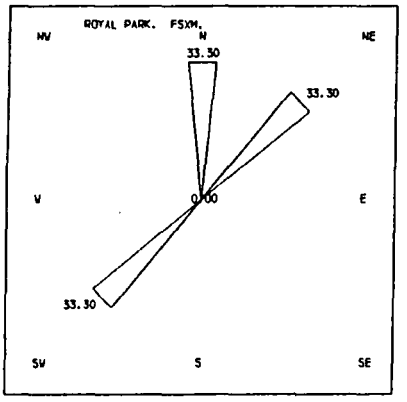
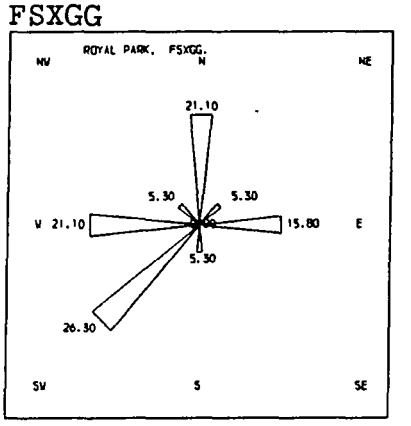


FSXGG



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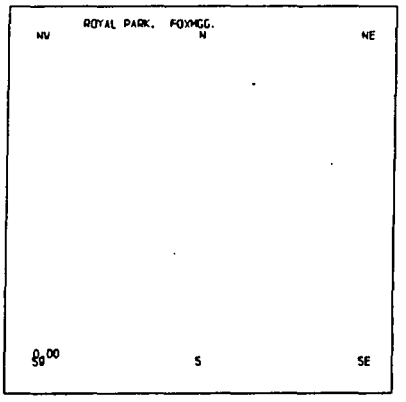

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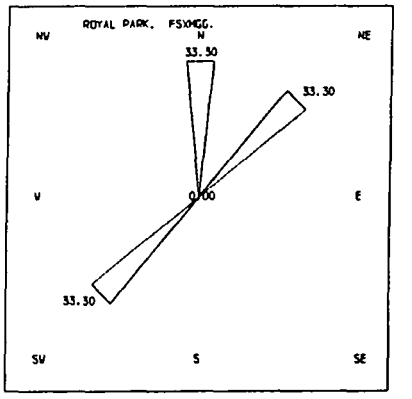
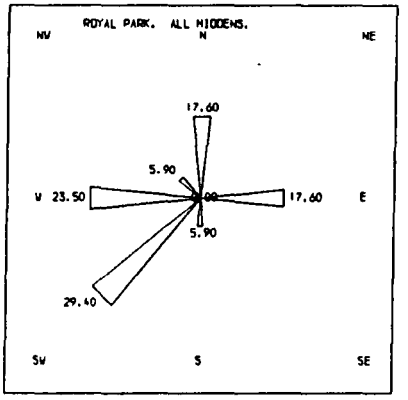


MIDDENS



GROOVES

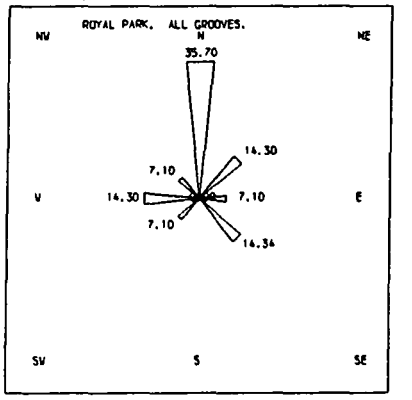


Figure D.35 (cont.): Aboriginal sites and aspect - Royal National Park.