

LATE HOLOCENE SUBSISTENCE AND SETTLEMENT IN SUBCOASTAL SOUTHEAST QUEENSLAND.

IAN LILLEY
Prehistory, R.S.Pac.S.
Australian National University

INTRODUCTION

Australian archaeologists have been examining the nature of east coast cultural systems for more than twenty years. Many of the studies carried out in that time focussed at least partly on the problem of coast-hinterland dichotomies in Aboriginal adaptive strategies. Despite the relatively long history of research, published opinion remains divided on the question as it concerns the three most intensively researched parts of the eastern seaboard. Some scholars, such as Flood (1982), McBryde (1974), and Poiner (1976), have argued that coastal people ranged inland, in some cases over considerable distances. Their position negates or at least minimizes the possibility of coast-hinterland differences. Others, including Coleman (1982) and Lampert (1971a, 1971b), offer a contrary view. They highlight evidence for specialized marine orientations and (at least in northeastern New South Wales) semi-sedentary occupation of the coastal margins. Such arguments clearly imply that coast-hinterland variation existed.

In southeast Queensland we have only recently reached a point from where we can contemplate the problem in any depth. From studies of coastal and island adaptations (e.g. Draper 1978, Richardson 1979, Robins and Hall 1981) there has emerged a picture of semi-sedentary populations which, while not entirely marine-oriented, had "no need at any time of year ... to move far from the coastal strip" (Hall 1982:87). Like the work of Coleman and Lampert, this view recognizes that coastal and hinterland adaptive patterns were different. Aiming to augment these coastal researches, my studies (1982, 1978) address the question of late Holocene variation from a hinterland-oriented perspective, and present amongst other things a static subsistence-settlement model for the last 2,500 years of subcoastal prehistory. This paper outlines the results of that work.

THE STUDY AREA

Topography, Geology and Soils: The subcoastal zone consists of that part of the Brisbane River drainage basin west of the D'Aguilar and Beechmont Ranges (Figure 1). Within this area there are three broad geographic units:

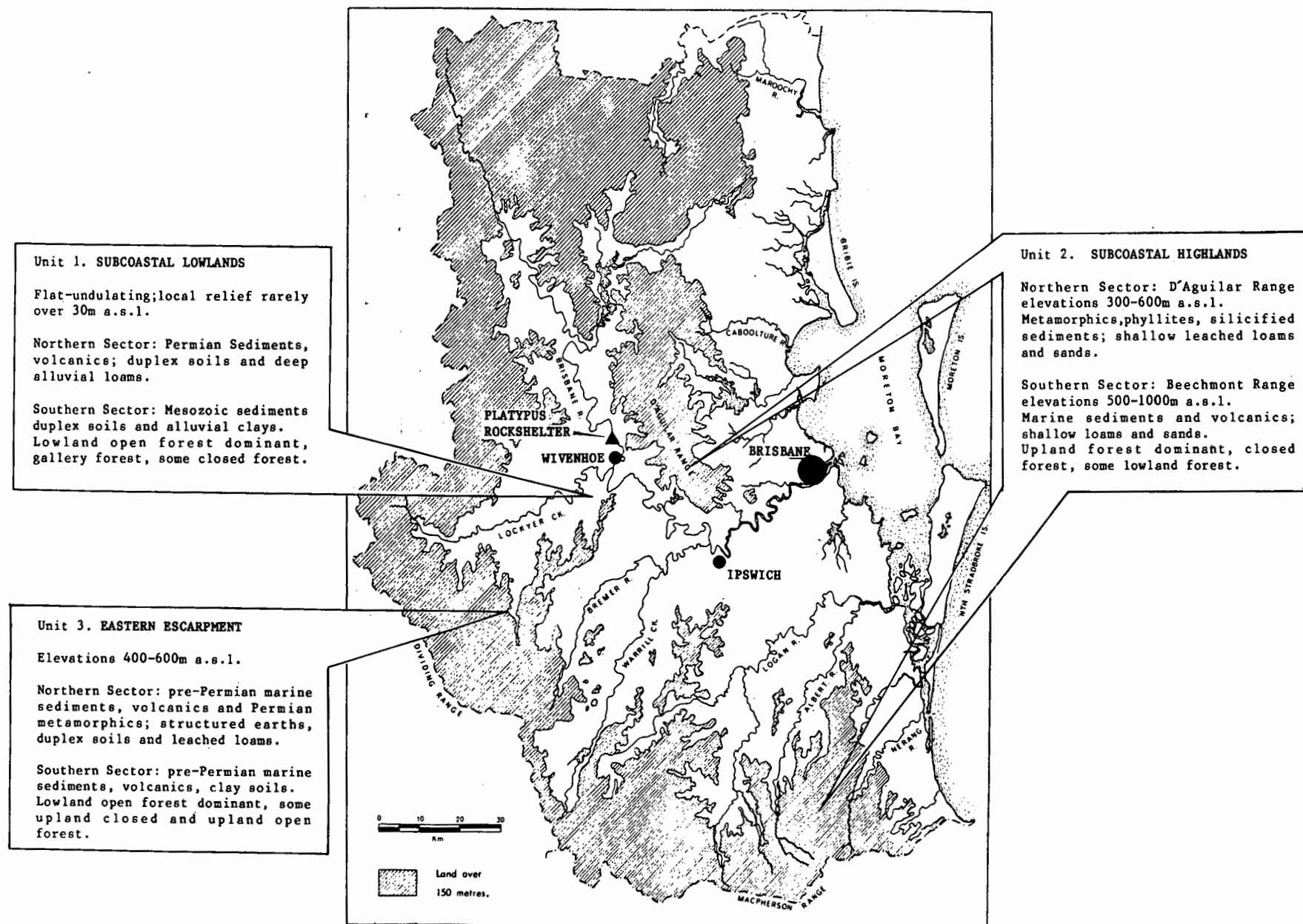


Figure 1. Map of the Moreton Region southeast Queensland showing major geographical subdivisions, topographic features and places mentioned in the text.

1. the Subcoastal Lowlands
2. the Subcoastal Highlands
3. the Eastern Escarpment

Unit 1 occupies the largest portion of the study area. Unit 2 is divided into two major subunits, the Conondale-D'Aguilar Ranges in the north and northeast, and the Darlington-Beechmont Ranges in the south and southeast. These ranges form most of the study area's boundaries. Unit 3 is part of the Great Dividing Range, and comprises the western edge of the subcoastal zone. The salient topographic, geologic and edaphic features of these units are summarized in Figure 1.

Climate: Like most of Australia's central east coast, the subcoastal zone has a relatively moist subtropical climate (Gentilli 1972). There are only two recognizable seasons: summer (October to March) and winter (April to September). Throughout this paper the terms summer and winter refer to the periods noted here. Temperatures are mild, ranging through 13-30C in summer and 6-25C in winter. Frosts occur infrequently, most areas being frost-free for at least 10 months a year. Humidity is high, with a range of 60-75%. The cross-station annual average rainfall is 885mm, 70% of which usually falls in summer. However, this regime is highly variable. Over the long term, there is more than 20% deviation from annual means, usually on the lower side, because summer cyclones sometimes inflate the figures. The distribution of rain across the study area varies widely too. The mountainous periphery - especially in the east - often receives up to twice the amounts recorded in central parts.

Flora and Fauna: Southeast Queensland as a whole occupies an intermediate position between tropical and temperate biotic provinces (Keast 1981). As a consequence the region harbours an unusual diversity of both tropical and subhumid flora and fauna. This was first documented by Oxley and Cunningham in 1824. In addition to making extensive notes on a range of temperate gallery and open forest plants, Cunningham "procured many new ... species ... hitherto believed only to exist in the tropics" (Steele 1972:145, 155-156).

Although the pre-contact structure and distribution of plant and animal communities have been radically altered it is possible to reconstruct a reasonably accurate picture of the subcoastal biota just prior to European colonization. Four broad habitat zones can be identified (see Figure 1):

1. fringing forest/aquatic
2. lowland open eucalypt forest
3. highland open eucalypt forest
4. upland closed forest

The fringing forest/aquatic zone occupied by far the smallest proportion of the study area, being restricted to the watercourses, lakes and their immediate surrounds. The floristic structure and composition of the fringing forests are partially dependent on the nature of surrounding non-riparian vegetation, but they usually retain a distinctive character. In addition to a range of riverine/aquatic animals - including elements of the regionally unique Krefftian fluvifauna - this zone is frequented by many non-riverine species, particularly in the dry season.

Eucalypt open forests (Zones 2 and 3) covered the greater part of the lowlands, foothills and lower ranges. There is a high degree of community differentiation within the two main forest types because many of the constituent associations are sensitive to minor microenvironmental variations (Pryor 1976:40-46). The open forests provided the primary habitats for most subcoastal animal species.

Upland closed forests were limited in their distribution, primarily by edaphic factors (Webb 1956). Floristically complex tall closed forests occupied fertile, high rainfall areas in the perimeter ranges. Hoop-pine forests were found in the poorer, less well-watered foothills and lower ranges. Closed forests did not contain as great a variety of animal species as any of the other habitat zones.

Past Environment: Available evidence indicates that the environmental patterns just described have obtained for at least the last 2,500 years. In brief, from the end of the Pleistocene to the last marine transgression, southeast Queensland probably had an equable humid climate and widespread vineforests in the lowlands and uplands (Bell 1979). Between about 5,000 and 3,000 years ago sea level fell to its present position (P. Flood 1980), the Brisbane River changed course, and the climate became drier and more seasonal (Hekel et al. 1979:17). At the same time biotic changes resulted in a retreat of the vine forests and a spreading of eucalypt open forests (cf. Churchill 1968, Dodson 1974, Hope 1974, Martin 1973). Thus, between 2,000 and 3,000 years ago, the environment began to stabilize in a mixed configuration similar to that documented by the first European explorers.

THE PROBLEM AND APPROACH

An initial review of the evidence for Aboriginal adaptations in the study area found that all the earliest European explorers observed groups of 25-40 people in various places along the major waterways in winter. Some also saw large camps either on the rivers or near freshwater lakes. One of the camps would have housed about 100 people, another about 45 people (Table 1). Unfortunately, the explorers **only** travelled through the area in winter, and rarely strayed far from the rivers. Consequently, while they provided a tantalizing clue concerning hinterland adaptations they left no hints as to who these people were, why they were grouped on the watercourses, what they did in other seasons, or whether there were any other people in the subcoastal zone at the same or other times of year. My research focusses on finding answers to these questions.

Three aspects of Aboriginal adaptations are explored. First, the nature of the resource base is reconstructed. My concern is to identify those broad spatiotemporal patterns in the nature and availability of resources which would have fundamentally affected Aboriginal economies. Second, I attempt to find how a human population may have been organized at a regional scale in relation to the resource base. This involves consideration of social organization, the nature and disposition of group territories and intra- and supra-regional mobility. Third, evidence for subsistence technologies, settlement types and locations and the organization of subsistence activity is examined to see how constituent elements of the population exploited the resources accessible to them.

Four historical sources provide cornerstones for the arguments presented. These are Thomas Petrie's reminiscences of early European settlement around Moreton Bay, as recorded by his daughter (C. Petrie 1875); Mathew's account of his life with two "tribes" in the region (1910); a compilation of information given by an elderly local Aborigine to Dr L.P. Winterbotham, founder of the Queensland University Anthropology Museum (Winterbotham 1957); and the letters of Dr S. Simpson, Crown Lands Commissioner and Protector of Aborigines from 1842-1853 (transcribed by Langevad 1979). These documents are supplemented with the incidental observations made by the first European explorers and settlers, the anthropological literature and other scientific sources, in an attempt to project as accurate a picture as possible from the limited data available.

Discussion is limited to the late Holocene in order to avoid some of the pitfalls of direct historical modelling (cf. Ascher 1961:319 ff, Binford 1967, Chang 1967). There is substantial evidence for clear changes in the Australian archaeological record after the last marine transgression. It is generally accepted that there were changes in stone technologies and exploitative patterns, and an intensification of site use (Bowdler 1981, Hughes and Djohadze 1980, Lampert 1971a). There is also evidence of more recent changes in adaptive strategies, most noticeably in technology and perhaps in subsistence-settlement patterns (e.g. Mulvaney 1975:238-248). For this reason I have restricted the reconstructions tendered here to the most recent period of environmental stability in the region, namely the last 2,500 years.

THE ABORIGINAL RESOURCE BASE

This section postulates that the subcoastal resource base was characterized by a seasonal dichotomy in the spatial distribution of water, food, and, to lesser degree, raw material resources. It is abstracted from previous work (Lilley 1982, 1978), and the reader is referred there for further detail and supportive arguments.

Water Resources: In winter, water was scarce in non-riverine areas. Despite an average annual rainfall that is reasonably high by Australian standards, the subcoastal zone is not as well-watered as it may seem. The marked summer dominance in the rainfall regime and high evapotranspiration rates result in a long dry period in winter. Prior to the introduction of modern water control techniques the rainfall deficiency would have led to a considerable reduction in the amount of surface water available in non-riverine areas. Most subcoastal waterways do not have large flow volumes at any time of year, and most either stopped flowing or dried up completely during the winter months (Figure 2). Even the Brisbane River stopped flowing on several occasions in historical times (Mr G. Cossins, Brisbane City Council Department of Water Supply and Sewerage, pers comm. 1978).

There are large reserves of underground water in the study area. Sandstone aquifers occur in some places and major storages are held in the alluvial gravels associated with most large watercourses. Virtually all of these storages are at considerable depths (the mean depth in eight localities is nine metres) and by current standards most of the water is not fit for day-to-day human consumption (per Queensland Water Resources Commission 1980).

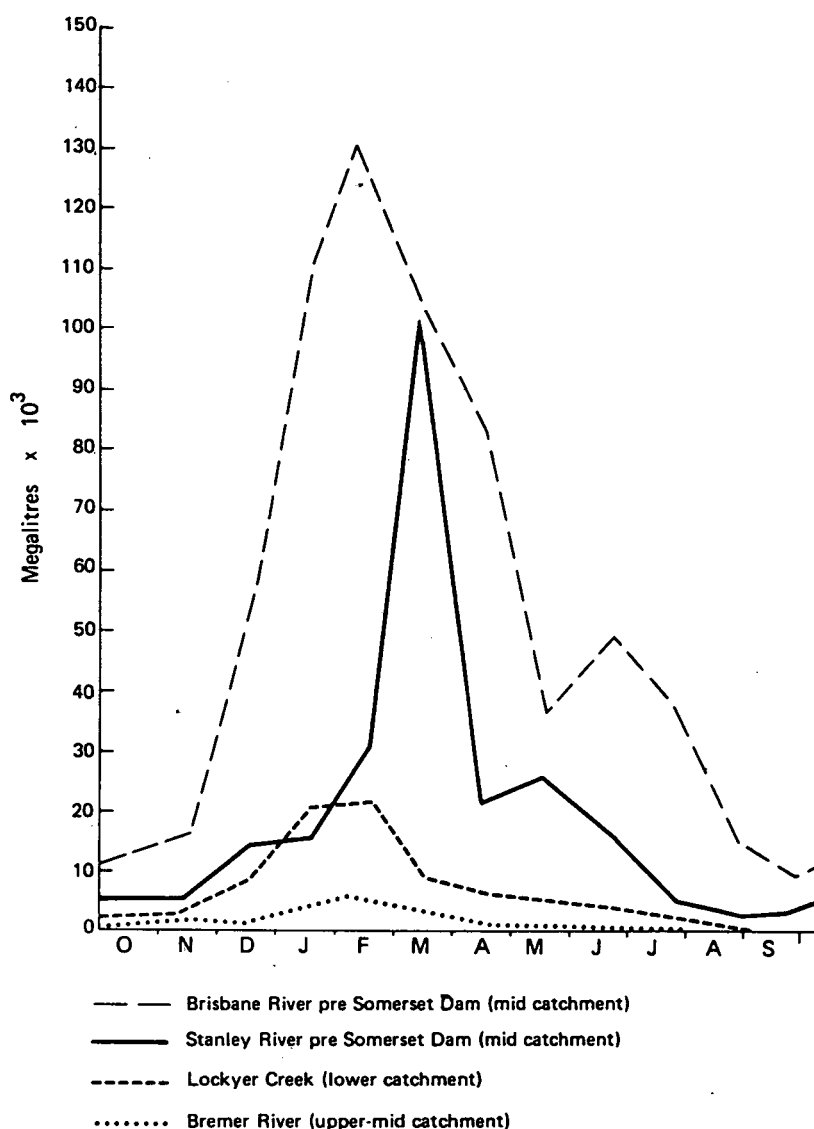


Figure 2. Monthly flow volumes for selected major subcoastal streams (per information from the Queensland Water Resources Commission 1980).

The journals of early explorers support the picture of very dry winters. When travelling through the subcoastal zone in September 1824, Oxley noted several times that the area bore "the marks of severe drought", and that "all the northern and southern watercourses are dry" (Steele 1972:141-145). Cunningham, accompanying Oxley, observed that "such have been the effects of the drought of the year that the vegetation appears in a state of inactivity" (Steele 1972:165). That the conditions noted were a normal annual event rather than the product of widespread drought is indicated by a), the explorers' total lack of comment to this effect and, b), the fact that a few days after recording those comments they were caught in the severe late winter thunderstorms which almost invariably follow the dry season.

These data suggest that finding adequate supplies of potable water would not have been a probable in summer, whilst in the dry season it may well have been difficult to predict the location of reliable water sources in non-riverine areas.

Plant Foods: In overall terms, the range of plant food products was a positive function of distance from the central rivers. The fringing forest/aquatic zone had the least diversity and the upland closed forests the greatest, a situation which obtained throughout the year (Figure 3, upper curve). The spatial distribution of presumed staple products, however, did not reflect the broader picture.

In summer, the closed forests and fringing forest/aquatic zone contained the greatest variety while open forests contained a slightly lower number of products. In winter, the situation was much the same. The diversity of the gallery forest/aquatic zone remained relatively stable and although there was a minimal decrease, closed forest variety stayed on a similar level. Open forests contained about half the number of products found in the other two zones. Clearly, instead of the positive and generally linear relationship between diversity and distance from the central watercourses, the relationship just described expressed a bimodality, most marked in winter (Figure 3, lower curve).

This bimodal distribution of staples should be viewed with due regard for the overall situation. In terms of the far greater overall range available as a backstop, closed forests appear to have been the zone of most potential throughout the year. In summer open forests offered a more competitive overall range than the fringing forest/aquatic zone. In winter the greater number of both staple and supplementary products in the fringing forests would have reduced the open forests to the zones of least potential.

To retain a balanced perspective, however, the spatial variation in plant food availability should be considered against the backdrop of surface water availability. With the major winter decrease in the amount of free water available in non-riverine habitats, the foothills and uplands were probably not as favourable as the diversity of plant foods suggests. I argue that where the riverine and upland areas are distinguished by the fact that the latter had more supplemental foods while the former had reliable water, the riverine zone should be regarded as having been the zone of greatest exploitative potential during the dry season.

Animal Foods: Lowland open forest contained by far the greatest overall variety of prey species throughout the year. In summer the fringing forest/aquatic zone and upland open forests had approximately the same range, while in winter fringing forest gained slightly through the immigration of waterfowl and some fish species (Figure 4, upper curve). Closed forest had the least overall variety throughout the year. This general pattern was mirrored in the distribution of presumed staples in summer. Open forests had twice the number of staples found in either closed forests or the fringing forest/aquatic zone (Figure 4).

In winter the distribution of staples changed. The riverine life-zone emerged as the most favourable area, harbouring twice the number of staple species found in open forests and five times as many as closed forests (Figure 4). This situation arose from two factors. First, both immigrating and resident fish species bred in this season in shallow ephemeral pools. It is suggested that the resultant abundance and concentration of fish would have made them a prime winter target. Second, waterfowl congregated in the riverine area in winter. While both prey types were undoubtedly present throughout the year, they are not included as summer staples because their diversity and abundance was dramatically reduced in that season.

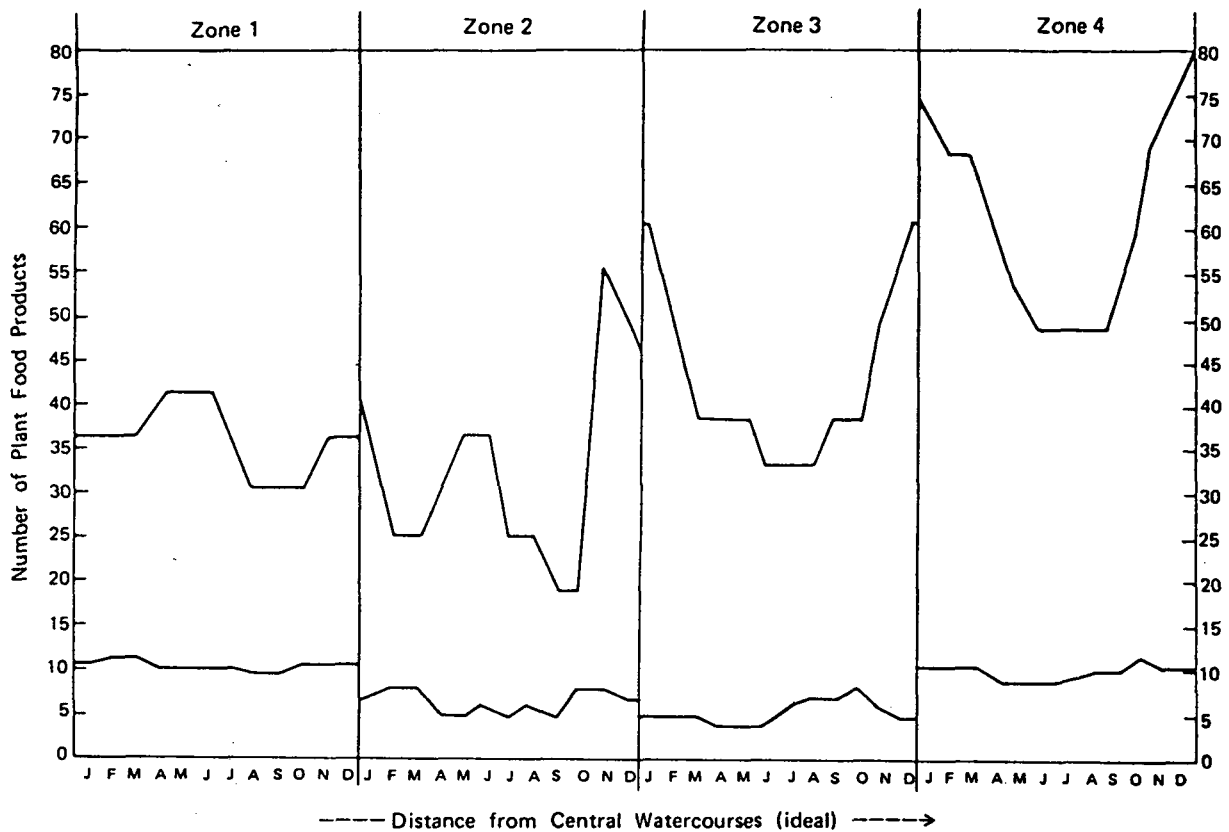


Figure 3. Seasonal and zonal variation in all plant foods (upper curve) and commonly used products (lower curve) (see Lilley 1982).

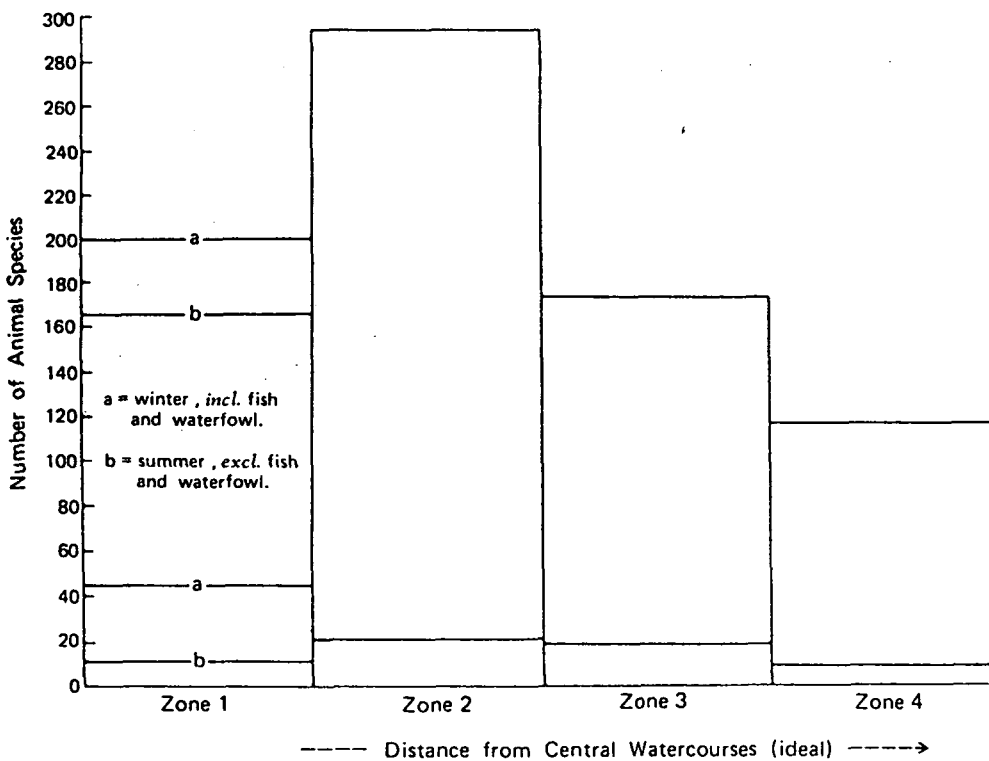


Figure 4. Graph showing the total potential animal foods per zone (upper lines) and commonly used animal foods per zone (lower curve).

In sum, the data indicate that with regard to overall diversity, lowland open forest was potentially the most favourable zone throughout the year, most particularly in summer. In winter the riparian zone had by far the greatest number of staples and a range of supplementary species second only to the lowland forests. As with plant foods, the dry season attraction of the riverine zone was heightened by the availability of comparatively reliable water.

Raw Materials: At least 24 species of plants supplied a range of raw materials, poisons and other non-food products. At least half of these also provided food products. Open forests and closed forests contained most of these species, particularly those used in the manufacture of implements. Gallery forests mainly contained species probably used to make facilities such as baskets. Identified fish poisons were found in equal numbers in all major habitat zones and salt substitutes grew in all areas except fringing forests. Birds, mammals and bivalve molluscs were also used in various manufacturing processes. Most of the species which were probably exploited for these purposes were found in open forests and the riparian zone.

Stone suitable for tool manufacture could have been found throughout the study area. Outcrops of various types occur in all habitat zones, but an enormous variety of silicified sediments, volcanics and metamorphic rocks can be found in the alluvial gravel beds of most streams. In terms of abundance, variety, and ease of acquisition, the riverine zone is likely to have been the most favoured source of stone material.

DISCUSSION

The foregoing has outlined the nature of the subcoastal resource base, highlighting a spatiotemporal distinction in resource availability. In summer, the upper-middle reaches of major tributary streams and the ranges were the most productive areas with the most competitive range of plant and animal foods and raw materials. In winter the opposite was true, with riparian areas providing comparatively reliable water, the greatest variety of animal foods, a diversity of staple plant foods equal to that of the generally more bountiful closed forests, and a range of organic and stone raw materials.

Examples from the literature help in raising two dual propositions to accommodate this evidence and early observations of winter population concentrations. First, there may have been two separate populations which either:

1. operated different strategies throughout the year, one in the lowland/riverine zone and one in the uplands, like contiguous rainforest and open-forest groups in North Queensland (Tindale 1974:121-123), or
2. operated conjoining strategies, with upland groups merging with lowland groups in winter to avoid resource scarcity, in a similar way to groups in Victoria and South Australia (Lourandos 1977:215-218, Tindale 1974:65).

Second, there may have been a single subcoastal population which either:

1. operated entirely within the lowland/riverine zone through logistically organized "collection" strategies (Binford 1980), or
2. aggregated on the central watersources in winter to focus on localized resources and fragmented in summer to exploit the more dispersed resources of the non-riverine (including upland) areas. Instances of pulsation strategies like this abound in the literature (e.g. Allen 1972: Chap. 3, Lawrence 1967: Chap. 4).

To determine which of these secondary propositions is the more plausible it is necessary to first examine the organization of population at a regional level.

POPULATION ORGANIZATION

Some fundamental aspects of subcoastal demography are clearly described in the historical record. The family was by all accounts the basic socioeconomic unit in all areas. Usually, several families would co-operate in highly flexible groups labelled by Mathew as "communities" (Table 1). The diaries of the early explorers and settlers and Winterbotham's data suggest that these communities made up loose bands which regularly exploited a particular range or territory. The size, composition and location of the band within its range varied in response to social and economic demands (Table 1, cf. Berndt and Berndt 1977:141-143, Lourandos 1977, Mulvaney 1975:65-67, Maddock 1974:32, Stanner 1965:2).

It can be inferred that groups of bands formed relatively unstructured tribes, defined here as band clusters (cf. Turner 1976:190). There were at least three such units. One, the Jinibara, used the northern and northeastern sections of the study area. Another, the Jagara, used the central and southwestern portions, while the last, the Jukumbe, claimed the southeast sections. The Giabel, centred on the Darling Downs to the west of the Great Dividing Range, may have used a small area in the far west of the subcoastal zone, but have been excluded from discussion owing to an almost complete lack of data.

There are adequate grounds to argue that these tribes formed a recognizable regional population, seen to be different by both Aborigines and white settlers. Europeans differentiated between coastal and subcoastal groups by referring to the latter as inlanders and/or by detailing differences in habit (e.g. Petrie 1975:55). Aboriginal informants stated that the "saltwater" groups labelled the subcoastal groups as inlanders, while Darling Downs people distinguished themselves from the subcoastal "Biriin" people, and between the "Biriin", coastal groups and the montane "Waapa" groups who lived immediately north of the study area and operated upland-oriented economies (Tindale 1974:124-126).

How the population was organized on a regional scale in relation to resources cannot be adduced directly from the historical sources. Unfortunately the evidence relating to this problem is patchy and often contradictory. Tindale, who synthesized the available information

Table 1. Selected historical references to the subcoastal population with emphasis on group size and composition.

OBSERVER / DATE	COMMENT AND REFERENCE
<u>Oxley</u> 23/9/1824	<u>Pine Mountain area</u> . "The country did not seem ill-peopled, fires being seen in every quarter from the eastern ranges...to the most distant west" (in Steele 1972:145).
25/9/1824	The party "passed a family of natives" (in Steele 1972:146, see Cunningham, same date, below).
<u>Cunningham</u> 20/9/1824	The party could see "smokes, the indications of Natives, rising from the interjacent vallies or lower grounds" (in Steele 1972:162).
25/9/1824	The explorers saw "a small fire around which were seated...a Man, some Women and Children,...a group of six persons" (in Steele 1972:171).
<u>Lockyer</u> 23/9/1825	<u>Confluence of the Brisbane and Stanley Rivers</u> . "Here I was in hope of falling in with a large tribe of natives - 9 huts being directly opposite where we landed...we saw several kangaroo and fish bones" (in Steele 1972:197).
25/9/1825	"From the marks of their fires, their empty huts and the number of trees barked, I should think them very numerous in this neighbourhood" (in Steele 1972:197).
3/10/1825	<u>Fernvale area</u> . The party saw "two men, a woman and three children" (in Steele 1972:201).
<u>Cunningham</u> 18/6/1829	<u>Laidley area</u> . While setting up evening camp the party saw "two women and some children", and later in the same place "two men..., two boys and a young woman" (in Steele 1972:314).
30/6/1829	<u>Hansford's Plain</u> . Near a large lagoon the party "numbered upwards of twenty frames of huts" (in Steele 1972:324).
3/7/1829	<u>Esk area</u> . The explorer saw "a small native family...resting at their little fires" (in Steele 1972:326).
8/7/1829	<u>Upper Brisbane River</u> . When setting up camp, the party was approached by "a man, two women, a youth and three children" (in Steele 1972:332).
13/7/1829	The explorer saw several columns of smoke rising from the river bank, and saw a small group of people near the river. A little further on, he saw another small group, which joined the first, "making a body of about twenty-four persons" (in Steele 1972:339).
14/7/1829	<u>Confluence of the Brisbane and Stanley Rivers</u> . The party saw a group of "about twenty persons" and, a little further on, another "much larger party" of about thirty individuals (in Steele 1972:340-341).
16/7/1829	<u>Sandy - Middle Creeks area</u> . The explorer saw several huts "of ancient construction" that appeared to have been recently used (in Steele 1972:343).
<u>Simpson</u> 1843	In documenting the "mountain tribes", he noted "they are very numerous, perhaps not less than 1500, and are divided into small tribes". He numbered the "river dwellers" at about 200 individuals (Langevad 1979:13).
<u>Mathew</u> 1910	"The family, consisting of husband and wife, or wives, with their children, constituted a distinct social unit. They occupied the same gunyah..., they ate together, they travelled together" (:153).
"	"A few families claiming the same territory usually camped and travelled together, sometimes in smaller, sometimes in larger groups. I characterize such groups as communities" (:128-129).
Winterbotham 1957	"The number of persons in the Dungidau area varied from time to time, as they were always on the move - therefore the number of people in a camp also varied for the different groups would combine and then separate" (:72).

argues that the population was divided, with each subpopulation operating separate exploitative strategies. One population consisted entirely of the Jinibara, who were restricted to the ranges in the north and east, and whose economy focussed on upland resources. The Jagara and Jukumbe formed the other population, and were situated to take advantage of the undulating river country and foothills in the centre and south of the study area (Tindale 1974:124-125).

Tindale's thesis is that the Jinibara were descended from a relict Barrinean population. It is based on two sets of information: 1) myths related to Winterbotham about Djandjarri or "Denderri Pygmies" (1957:116-118), and 2) Simpson's documentation of mountain peoples in southeast Queensland (Langevad 1979:12-13). Djandjarri are described by Winterbotham as red, hairy little people who lived in caves and made miniature tools and weapons. Mathew (1910:170) described "Jonjari" as "benevolent spirits whose haunts were mineral springs". I do not accept that Djandjarri myths result from corporate memories of Barrinean ancestry. Without entering the tri-hybrid origins debate (Kirk and Thorne 1976), the fact that similar stories about Djandjarri are told throughout Queensland reduces the credibility of Tindale's speculations (R. Robins, Griffith University; P. Smith, Archaeology Branch, Community Services, Brisbane, pers comms 1978-1980).

Simpson's records cannot be dismissed so lightly. He suggested that for convenience of documentation the Aborigines under his jurisdiction could be separated into three categories: "Inhabitants of the Sea Coast, of the Mountain Ranges, or of Inland Creeks and Rivers" (Langevad 1979:12-13). The mountain people were described as those living in the ranges ringing the study area and in mountain areas to the north. He went on to say they were very numerous (Table 1), and were divided into small groups "occupying principally the heads of the Creeks and Rivers". The river dwellers, on the other hand, were only about 200 strong, this number being spread between three small groups. They were seen to be "serving an apprenticeship to civilization" because they usually lived in or near European settlements in the lowlands. They were considered distinct from the mountain groups who were "in every sense of the word wild Blacks, rarely or never visiting the Stations in the vicinity of the Ranges except for the purposes of pillage and bloodshed".

When considering these data it should be noted that Simpson's brief included supervision of Aboriginal groups in the Wide Bay region, which extends north from the present boundary of the Moreton Region to Frazer Island. For physiographic reasons there could only have been two of Simpson's classes present in the region, namely mountain people and coast dwellers. As already noted, neither the Wide Bay mountain people nor coastal people were identified as part of the subcoastal population, and even Simpson differentiated them as "Wide Bay Blacks" (Langevad 1979:16). Excluding these groups, the present discussion need only concern the inhabitants of the perimeter ranges and river flats in the study area.

The problem is whether the two classes of inhabitants were really separate subpopulations which operated different economies. There are two sets of evidence suggesting they were not: 1) implications drawn from Simpson's letters regarding the validity of his trichotomous schema and 2) the more tenuous information in tribal boundary maps.

Three things in Simpson's letters suggest that his mountain groups claimed and used lowland territories prior to European colonization. First, in using the term "head" when referring to creeks and rivers,

Simpson seems to be describing upper-middle catchment areas and/or major tributaries in the foothills, not the actual source areas in the ranges. For example, he described Sandy Creek as "one of the heads of the Brisbane" (Langevad 1979:7). In this reference, Sandy Creek is one of two possibilities: a large upper-middle catchment tributary of the Brisbane River or a similar stream feeding into the Stanley River. In other words, it seems that the mountain people lived on larger tributary streams, not in the ranges proper.

Second, the raids against settlers by these "wild Blacks" usually penetrated some distance into the lowlands, for example onto properties around Wivenhoe (Figure 1, Petrie 1975:146-149). This suggests that the raiders were probably people who originally possessed territory extending from the ranges out onto the river flats. Upon European encroachment they may have retreated up less accessible valleys in the foothills - where troopers would not venture (Langevad 1979:24) - and from there directed their incursions against the settlers.

Finally, the creek and river dwellers were not the only people who decided that there were advantages in relatively peaceful relations with Whites. It is clear from the records of the McConnel family (A.J. McConnel n.d.) that several of the supposedly aggressive groups in the foothills were also attracted to the homesteads and lived in comparative harmony with the settlers, even to the extent of protecting them from raiders from other areas. In summary, information gained from a careful reexamination of historical records seriously undermines the dichotomy upon which Tindale's arguments pivot. I argue that the division between subcoastal mountain and river dwellers was largely a manifestation of postcontact dislocation and stress.

Maps delineating band and/or tribal territories lend some support to this idea (Figure 5). As Mitchell pointedly remarked, the actual position of any boundary line (if not the whole concept of lines) is likely to be wrong (1949:109). Nonetheless the maps are based on informant testimonies received by Winterbotham and Tindale and the use of specific major geographical features to mark boundaries conforms with modern ethnographic experience (cf. Doolan 1979, Lewis 1976, Lourandos 1977, Peterson 1976). Viewed in these terms the maps provide at least plausible guidelines as to how territories were arranged in relation to resources.

The maps show that all but the two northernmost Jinibara groups had access to a major subcoastal water source. Further, all territories - with the same two exceptions - included areas of all four habitat zones present in the study area. Band ranges seem to have been aligned at right angles to the general trend of environmental zones. As suggested below, it is possible that the two anomalous Jinibara groups had more in common with Wide Bay mountain people, possibly to the extent that their economies reflected a similar upland orientation.

There seem to have been strict rules preserving the integrity of territories of the sort discussed above. Movement through someone else's land was subject to compliance with prescribed social conventions and the use of any resource remained the prerogative of the group upon whose land it occurred. Nowhere in the historical record is there mention of inter-territorial gathering for prosaic purposes such as the exploitation of normal seasonal resources or the circumvention of resource scarcity (Sullivan 1977:32-33, 51-59).

It is clear, however, that there were social and economic connections both among subcoastal groups and between these groups and those

from surrounding areas (Sullivan 1977). There seems to have been a noticeable directionality in these relations. It can be inferred from Winterbotham's data that the most northerly of the Jinibara appear to have had closer ties with the Wide Bay mountain people, while the southern elements had stronger ties with the Jagara. The Jinibara seem to have had few direct links with the coast. A.J. McConnel (n.d.) recorded that those bands using the western side of the D'Aguilar Range would seek protection from settlers if coastal groups were on the eastern slopes. In contrast, the Jagara and probably the Jukumbe spoke the same or a similar language to the coastal people and there seem to have been close ties between them, probably best developed in those areas where coastal groups ranged close to subcoastal territories (Petrie 1975: various, Sullivan 1977:11-12). On occasion these inter-group ties resulted in the coming together of large congregations, primarily for warfare, ceremonies, trade and extraordinary resource exploitation cum social gatherings (Sullivan 1977).

Discussion: This section has put forward the idea that the subcoastal population was a recognizable, albeit loosely organized, entity. All constituent groups - with the possible exception of peripheral elements - operated wholly within the study area in territories disposed so as to permit access to all major subcoastal habitats. While people moved between their territories on special occasions, territorial rights seem to have been exercised in a manner precluding ready access to resources by people outside the recognized land-using group. This eliminates the notion that there were two separate populations operating either separate or two-into-one strategies. It remains to be seen whether technological factors or the organization of settlement or subsistence activities tip the balance of evidence in favour of a pulsation strategy or riverine occupation throughout the year.

TECHNOLOGIES, AND THE ORGANIZATION OF SETTLEMENT AND SUBSISTENCE

Technology: There is not a great deal of evidence for specifically subcoastal procurement technologies because most sources simply lump all observations concerning southeast Queensland. It appears the toolkit as a whole was relatively undiversified, with a narrow range of generalized implements and facilities being used for a variety of tasks (Tables 2 and 3). Hunting, riverine fishing and foraging techniques seem to have been much the same throughout the region. Apart from fishing and waterbird hunting technologies, there is no suggestion in the literature that the use of any item or technique was restricted to particular seasons or places. Nor, with the same exceptions, is there any indication that technological factors would have precluded the exploitation of any subcoastal habitat.

It can be argued that fishing and waterbird hunting technologies were specialized for use in the main riverine areas in winter. All early references to non-marine fishing in southeast Queensland specify that it was a shallow water activity and/or describe non-discriminatory shallow water technologies (e.g. Hamlyn-Harris 1916, see also Tables 2 and 3). It can be inferred from the environmental evidence that such technologies would have been most readily applied in winter, employed when subcoastal watersources were at their lowest. It will be recalled

Table 2. A list of major material items recorded historically for the Moreton Region.

ITEM		COMMENT	REFERENCES
Shelter	A	Usual shelters consisted of a wind-break made of brush.	Petrie 1975:15
	B	Semicircular bark and/or grass structure supported on a frame of bent and tied saplings. Houses up to five.	Mathew 1910:84 Petrie 1975:13,99 Winterbotham 1957:100
	C	Note: a larger, more permanent type of the same design, housing up to ten people, was used on the coast.	Petrie 1975:100
Spear	Hunting Fishing Fighting	A straight shaft, six to ten feet long, unbarbed, no prongs, no stone or bone point. Hand-thrown as there were no spear-throwers.	Cunningham, 1929, in Steele 1972:340 Mathew 1910:86,118,122 Winterbotham 1957:80
	B	Note: a specialized pronged spear was used for fishing by coastal people.	Petrie 1975:102
Yam stick		A thick shaft, four to six feet long, pointed at both ends.	Petrie 1975:103 Winterbotham 1957:88
Club	Hunting Fighting	There were a variety of these short, thick implements. They were pointed at one end, with a hand-grip at the other.	Mathew 1910:85-86 Petrie 1975:102-104 Winterbotham 1957:80-81
Boomerang Hunting Fighting Games		There were two basic types. The one used for hunting and fighting was straight and non-returning. The one used for games was of the curved, returning type.	Mathew 1910:90 Petrie 1975:90,100-101 Winterbotham 1957:51,80-83
Stone axe		Flaked from a river pebble blank, edge-ground, and hafted with vine, cord and resin.	Mathew 1910:118-119 Petrie 1975:104-105 Winterbotham 1957:88
Stone knife Cutting Scraping Fighting		Usually primary flakes on fine-grain siliceous rock. Flakes were seldom modified by retouch, but Petrie notes they were occasionally hafted.	Mathew 1910:86,119-120 Petrie 1975:105 Winterbotham 1957:88
Shell	Cutting Scraping	Sharp pieces of mussel shell of indeterminate size were used for a variety of tasks.	Mathew 1910:86,120,122-123 Petrie 1975:101,105 Winterbotham 1957:75,84,87
Net	A	For hunting, a three to four inch mesh, strung along the ground to snare terrestrial game, and in trees for birds (often in conjunction with throwing sticks). Made from fibre.	Mathew 1910:87,121 Petrie 1975:84,86,90
	B	For fishing, a small hand-held scoop net, or tow-row, was used.	Mathew 1910:90,121 Petrie 1975:73-75 Winterbotham 1957:28-29
Dillybag		Made of grass, bark or hair fibre, of varying dimensions. Winterbotham also mentions the use of cane.	Mathew 1910:121 Petrie 1975:93,106-107 Winterbotham 1957:85
Canoe		Constructed of bark sheets, bunched and tied at both ends and held open by stretchers. Mathew notes "the construction of bark canoes was understood, but they were rarely called into requisition".	Mathew 1910:121 Petrie 1975:97-98

Table 3. A compilation of historical references to major foods and their usual methods of acquisition in the Moreton Region (from Mathew 1910, Petrie 1975 and Winterbotham 1957).

RESOURCE	EQUIPMENT USED	COMMENT
Macropods and other marsupials eg. bandicoots	Spears, clubs, nets	The game was driven by fire and/or beaters to waiting hunters who then speared and/or clubbed the animals to death. Petrie and Mathew also describe the use of nets, as noted in Table 5. Game was also hunted with spears by individuals or small groups, by stalking around waterholes.
Freshwater fish and eels	Spears, tow-rows, brush weirs, poison	Petrie describes the use of nets and spears in co-ordination with fish weirs in shallow water. Mathew mentions the use of spears and tow-rows in shallow water, and Winterbotham records fish poisoning in smaller pools or in still water.
Possums and other phalangerids	Axes and climbing vines, clubs	The animals were either cut out of trees and flung to the ground or caught on the ground and clubbed to death.
Freshwater tortoises	Nets	Men would swim up to basking tortoises and grab them from underneath. Petrie also describes capture by netting.
Freshwater mussels	None	The shells were felt for in the mud with the feet. Neither Mathew nor Winterbotham mention mussels as food.
Honey	Axes, honey rags, dillybags	Hives were cut into and the honey either put into a dillybag or soaked up with a honey rag.
Echidna	Clubs	The animals were dug out and clubbed to death. Petrie mentions that dogs were used in the search.
Emus	Spears, clubs, nets	The animals were usually speared from a hide near a water source. Petrie mentions a technique using nets similar to those used for hunting macropods.
Ducks	Boomerangs and nets	Nets were placed in the birds' flight path near a water source. Flights of ducks were frightened into the nets by thrown boomerangs intended to simulate hawks.
Reptiles	Axes, digging sticks, clubs	Snakes and lizards were caught on the ground or dug out or cut out and clubbed to death.
Root vegetables	Digging sticks	Roots were grubbed out by digging.
Fruit, nuts, seeds	Dillybags	These foods were consumed raw at or near the extraction point and/or collected in dillybags for later processing and consumption in camp.
Grubs	Axes, sharp sticks	Grubs were either cut out with an axe or dug out with a sharp stick. Petrie mentions there was some management of grub populations on the coast.

that this is also the time at which fish populations are most abundant and concentrated, which lends support to the idea that the tools and methods were specifically directed to exploit this resource when it was most profitable to do so (cf. Bowdler 1976, McCarthy & McArthur 1960).

The technology of waterbird hunting also seems to have been aimed at harvesting prey populations in winter, when they were at their most abundant and concentrated. The use of nets strung across watersources in conjunction with boomerangs and throwing sticks would be labour-intensive and so it can be suggested that the returns would not have justified the effort in summer, when only small populations of birds were present.

In addition to providing further reasons for winter aggregation in the central riparian zone, the foregoing implies that there was no technological restriction on the operation of a pulsatory subsistence strategy. It is possible, however, that certain technological capacities may have removed or reduced the need for such a strategy; year-round occupation of the rivers could have been enabled by resource management.

There are several historical references to anthropogenic modification of the environment and/or resource management by fire and other means (e.g. Cunningham 1824, 1829, in Steele 1972:171, 313, Lockyer 1825 in Steele 1972:201). However, there is no suggestion of activities of the types recorded in Victoria (Lourandos 1980, Mulvaney 1975: Chap. 9), or of the use of fire on the scale observed in southwest Western Australia (Hallam 1975). Both the general ethnography and the notes and map annotations of the early explorers show that pyro-modification was probably practised, but few provide clues as to the seasonality or frequency of burning.

It seems likely that the country was periodically fired to clear shrub layers and surface debris in open forest and open forest-closed forest ecozones. The explorers travelled through extensive areas of "thin" forest and grassland, mostly on the central riverine plain. Such features probably resulted from burning off to facilitate the movement of people and prey, to make the area generally more liveable and to reduce the risk of destructive uncontrolled fires (cf. Hallam 1975). Such widespread clearance burning was probably infrequent. Anthropological and botanical studies suggest a three to five year cycle for this sort of activity (Hallam 1975:54-55, Pryor 1976:65-66).

There probably was more frequent smaller-scale firing too. It can be argued that game drives using fire were part of a regular seasonal burning cycle carried out towards the end of winter. At this time the resource base would have been at its most impoverished, particularly for large groups along the rivers. Fishing would have begun to decline in importance as breeding populations diminished, and other migratory prey types would have started to disperse. Further, just prior to or during the initial stages of late winter rains, lowland groundcover would have been driest and the rain would have promoted rapid regrowth of pasture and other habitats.

Such a management regime would have had two desirable results. By taking advantage of environmental conditions and the postulated concentration of people to conduct fire-assisted drives in and around the riverine plains, a wide variety of prey could have been made available at a generally unfavourable time. This and perhaps some additional burning off may also have prolonged the presence of more mobile migratory species by improving their habitats, thus maintaining some degree of stability in the late winter resource base.

The lack of documentation notwithstanding, it is possible that purposive environmental modification and management were both more common and more effective than it seems. In the past people may have been able to manipulate their resource base to such a degree that they could live on the rivers all year. However, I contend that resource control would have become less effective as summer progressed. Mobile prey species would have become increasingly less dependent on centralized sources of feed and water, the accessibility of remaining fish populations would have gradually been minimized and rich sources of plant foods would have been coming into season elsewhere. In short, it may have been difficult to feed large groups in the riverine zone. I argue, therefore, that while resource management may have **delayed** late winter fragmentation to some degree, the basic pulsation strategy would not have been affected. What needs to be considered is whether settlement and subsistence activities were structured to facilitate "collection" strategies (Binford 1980) enabling year-round occupation of the lowlands.

Settlement Types and Locations: The meagre evidence for local settlement implies there were two classes of camps: base camps and "satellite extraction", work" or "dinner-time" camps (Binford and Binford 1969:71, Jochim 1976:61, Meehan 1977:366; see Mathew 1910:83, Petrie 1975:13, Winterbotham 1957:56, 73). Base camps can be defined as those occupied by families or groups either overnight, when mobile, or for intermediate periods up to two or three weeks. It was in such camps where most food preparation and redistribution would have taken place and where most maintenance activities would have been pursued. The second type of camp were extremely short-term foci of specific extractive activities. There is no evidence of their being used for habitation.

In addition to facilitating access to desired resources, the actual siting of base camps apparently hinged mainly on the liveableness of a location rather than defensive requirements or the need to observe people and/or game (cf. Cassels 1972, Jochim 1976:50). Attractive conditions included sandy or relatively stone-free surfaces, reasonably flat but well-drained places, the presence in the immediate area of fuel and raw materials for shelters and the absence of undesirable plant and animal species (Petrie 1975:100, Winterbotham 1975:81, cf. Mitchell 1949:108).

The most important inference to be drawn from these data is that there was none of the camp types associated with logistically organised "collection" strategies (i.e. long-term residential bases, field camps, and caches; Binford 1980:19). It appears that base camps were moved between suitable places allowing access to targeted resources which were then exploited on a daily (or less frequent) basis. This idea is supported by information on the organization of subsistence activities.

The Organization of Work: Subcoastal groups seem to have organized their activities along sex lines in the same way as most other low-latitude hunter-gatherers. Although it is difficult to find specific references, it is likely that women collected most if not all water, low risk, steady return plant foods and small prey for in-camp use. Men are more likely to have pursued high risk, uncertain return prey and to have done most of the fishing (Petrie 1975:73, 92, 94, cf. Bowdler 1981, 1976).

Sex differences in organization probably also extended to exploitation ranges. Winterbotham provided the only specific historical evidence for this in noting that women usually gathered food within a 3-5km

radius from their base camp (1957:77). This allows the assumption that local mobility patterns - viewed as a function of subsistence organization - would have approximated those recorded ethnographically in other areas. They were probably characterized by a sexual division in priorities and distance thresholds which contrasted a variety of bio-social restrictions on female ranges with comparative freedom of movement within the band territory for males (Bowdler 1976, Hiatt 1974, McCarthy and McArthur 1960, Yellen 1977).

There is no indication that labour or mobility were organized at more complex levels. There is no evidence that specialized parties such as all-male hunting groups left their base camps for comparatively long periods to get large quantities of resources to be returned to camp or to establish food caches for later use. This is not to say that overnight camps were not used by procurement parties or that food was not stored for short periods. I am arguing that these practices were extraordinary and that the organization of subsistence activities seems to have been typical of a "foraging" as opposed to a "collecting" strategy (Binford 1980). In short, base camps would have to have been sited close to "female" resources and moved when those resources ran out.

Discussion: The preceding discussion has shown that subcoastal groups did not have the technological capacity, settlement types or sort of labour organization that would be necessary for them to operate exclusively in the lowland/riverine areas. It also implies that in the absence of technological restraints, the organization of settlement and labour would have virtually necessitated a subsistence-settlement strategy of cyclical aggregation and dispersal.

THE MODEL AND CONCLUSION

When the evidence examined here is integrated, a reasonable medium-grained scenario emerges. In winter, large extrafamilial base camps would have been clustered near major rivers and lakes to allow access to the resources of the fringing forest/aquatic zone and adjacent lowland open forests. The main focus of subsistence would have been fish and waterbird populations and a variety of mostly aquatic plant foods. Camps would generally have been situated in flat sandy places close enough to reliable water to permit easy collection but not so close as to attract insects or scare game. As the groups involved were large and targeted resources localized, it is likely that winter bases were extensive linear arrangements moved relatively infrequently over short distances along or around focal water sources.

Most summer base camps would have been placed where the desired set of on-site conditions coincided along major tributary streams in the foothills. This would have allowed female access to non-perennial water sources and associated fringing/aquatic zones as well as the rich upland resources. It would also have given comparatively unhindered access to mobile prey in the open forests of the valleys and lower foothills. As summer groups were smaller and more mobile than in winter, summer camps were probably ephemeral affairs moved quite frequently between patches of food resources.

This model is intended as a testable interpretation of evidence for late Holocene subcoastal subsistence and settlement patterns. While its archaeological implications have not been explored here, the model per se obviously strengthens the case for clear differences between coast and hinterland in southeast Queensland. This in itself should contribute in the longer term to a clearer view of an interesting unresolved problem in Australian prehistory.

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