

Prehistoric Sea Mammal Hunting in Palliser Bay

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INTRODUCTION

In the coastal areas of the circumpolar, subarctic and subantarctic regions, the exploitation of sea mammals almost invariably forms some part of prehistoric economies. The importance of sea mammals varies considerably throughout these regions. At one extreme, the prehistoric occupants of the Aleutian Islands maintained an economy based largely around the varying seasonal abundances of a wide range of sea mammals (McCartney, 1974:156). These animals provided the basis of the Aleut dietary requirements as well as the raw materials for a considerable number of artefacts (Denniston, 1974:150-1). In contrast, the occasional scavenging of stranded sea mammals — principally whales — forms the simplest type of sea mammal exploitation. This undoubtedly occurred throughout most areas of the world in which these animals occur, and has been particularly well documented for prehistoric and early historic times along the Atlantic seaboard of Europe (Clark, 1947). Clark's reconstruction also indicates that while stranded whales were of considerable economic importance, providing large quantities of food, skins, blubber, oil and bone, by the very nature of the means of their procurement they could not be considered a reliable and consistent basis for an economy.

The contrast between these two incidences highlights one of the central questions in the study of any example of prehistoric sea mammal exploitation — the importance of these animals in the total economic pattern. A number of variables are involved in determining this. Of prime importance is availability, both in terms of the range of species and the abundance of each present. Obviously a situation of limited availability will tend to reduce the potential importance of these animals in an economy. Availability is influenced by a wide range of factors, including the distributions of the species concerned, the ease with which they can be hunted or otherwise procured, and the hunting technology of the people involved in their exploitation.

A second major variable is the reliability of sea mammals as an economic resource. This is dependent, at least in part, on seasonal fluctuations in the distribution and abundance of the species, also on some of their behavioural characteristics, and on local environmental and climatic conditions. Finally, the assessment of the part played by sea mammals in the total economic pattern requires that they be considered in relation to other aspects of economic activity. This paper explores these questions, within the limitations of the available evidence, in the context of prehistoric occupation on the coast of Palliser Bay, Wairarapa, New Zealand.

MATERIALS AND METHODS

Sea mammal remains were recovered from four sites during the University of Otago Anthropology Department's research programme in Palliser Bay — the Washpool Midden (N168/22) excavated by B. F. Leach (1976), and three of Anderson's (1973) Black Rocks middens (all designated N168/77): the Pond Midden (BR2), the Black Midden (BR3), and the Crescent Midden (BR4). While all this material had been identified and analysed previously by the excavators, a thorough re-examination was considered worthwhile in the light of recent developments in the study of sea mammals

from archaeological contexts (Smith, 1976). The use of more adequate comparative material has required alterations to some of the identifications previously reported, and to the minimum numbers of some of the species represented. Major alterations will be detailed in the appropriate sections below.

Analysis of this material presented a number of problems which have some bearing on the interpretation of the results. Accurate identifications were not always possible because of the extremely fragmentary nature of much of the material. Almost half of the mammalian bone examined from the Washpool Midden was not able to be identified to species level for this reason. Identification of the cetacean bone was further hampered by a lack of appropriate comparative material. As a result the range of species identified from each site may have been narrowed, and the minimum numbers by which each was represented may have been lowered.

A further problem, which arose in the Washpool Midden, was that some of the larger pieces of bone were thicker than the soil layers in which they were found, leading to problems in establishing precise temporal location. To overcome this, the minimum number of individuals for each species was calculated for each cultural level within the site (Leach, 1976:137-9), rather than for each stratigraphic layer. As this problem did not arise in the Black Rocks sites minimum numbers were calculated for each stratigraphic layer.

Seven assemblages of sea mammal material are considered in this paper: the Washpool Midden level I, Washpool level II, the Pond Midden layer 1, the Black Midden layer 1, the Black Midden layer 2, the Crescent Midden layer 1, and the Crescent Midden layer 2. Details of the dating of these assemblages are presented by Leach (*ibid.*) for the Washpool Midden, and Anderson (1973:87) for Black Rocks. The earliest level of the Washpool Midden and layers 1 and 2 of the Black Midden have been dated to the 12th century, and it has been argued that they represent the initial period of occupation in the Palliser Bay area. Both layers of the Crescent Midden, and level II of the Washpool Midden are dated to the 13th and 14th centuries respectively. The final stage of prehistoric occupation in the area is represented by layer 1 of the Pond Midden, dated to the late 18th or early 19th century.

Identification of the pinniped bones was undertaken by the author using comparative material in the Anthropology Department, University of Otago, and in the Otago Museum. The cetacean bone was identified by the excavators with the assistance of Dr A. N. Baker of the National Museum and Mr R. J. Scarlett of the Canterbury Museum. The minimum numbers of individuals by which each species was represented were calculated on the basis of the most commonly occurring bone of the species concerned within each assemblage. This method was refined slightly for the pinniped species, with estimates of the age and sex of the individuals present built into the calculation. All bones were assigned to one of five age/sex categories — adult male, adult female, sub-adult male, juvenile, and pup (Smith, 1976:5-6) — and a minimum number of individuals calculated for each category. The five categories represent behavioural groupings within seal populations which are osteologically distinguishable (*ibid.*:40-63). Consideration of the age/sex structure of prehistorically exploited seal populations provides a means of assessing the seasonal nature of seal hunting, as regular and predictable changes in the population occur throughout the year and each age/sex category will be available for hunting in differing proportions throughout the year (*ibid.*:13-19). Osteological methods for distinguishing members of each age/sex group are more advanced for the New Zealand fur seal (*Arctocephalus forsteri*) than for the other species under consideration here, so some reservations must be held about the estimates made for these other species. The lack of adequate comparative material and insufficient background research into osteological growth prevents the assessment of age and sex for the cetacean species.

Further analysis involved consideration of the seasonal nature of sea mammal hunting, both through analysis of the age and sex of the seals and with reference to seasonal alterations in the distributions of the species present. Finally the various strategies involved in procuring these animals were considered, and the evidence for butchering briefly examined.

MINIMUM NUMBERS

The minimum numbers of individuals by which each species was represented in each assemblage are presented in Table 1, and the age/sex status of the identified pinnipeds is given in Table 2.

The most commonly occurring species is the New Zealand fur seal (*Arctocephalus forsteri*). As this is the most widely distributed and abundant pinniped in New Zealand waters (Wilson, 1974) the frequency with which it occurs is not unexpected. A fur seal non-breeding colony today exists at Cape Palliser (ibid.:193), and it is possible that further colonies existed in suitable localities during the prehistoric period. The minimum numbers of this species previously reported for each of the Washpool assemblages (Leach, 1976:183) have been reduced from three to one as a result of more accurate aging and sexing criteria. Sub-adult males dominate the assemblages, with five of the seven individuals belonging to this category. The predominance of this group, and the absence of females and pups strongly indicates that these fur seals were being hunted at non-breeding colonies (Smith, 1976:17).

Table 1: Minimum Numbers of Sea Mammals

SPECIES	Washpool		Pond Midden	Black Midden		Crescent Midden		TOTAL
	Level I	Level II	Layer 1	Layer 1	Layer 2	Layer 1	Layer 2	
fur seal	1	1	2	1	1	1		7
sea lion	1	1						2
elephant seal	2							2
pilot whale		2						2
dolphin	1		1				1	3
baleen whale	1?							1
TOTAL	6	4	3	1	1	1	1	17

The other two pinniped species — the New Zealand sea lion (*Phocarctus hookeri*) and the Southern elephant seal (*Mirounga leonina*) — occur only in the Washpool Midden. The two elephant seals were previously identified as leopard seals (*Hydrurga leptonyx*). These are both sub-adult males, and it is this group that are the most common members of this species to visit the New Zealand coast (Gaskin, 1972:148-9). The two sea lions presented some difficulties in aging and sexing because of the fragmentary nature of their remains. One individual is almost certainly a sub-adult male, while the other may be an adult female. This species is restricted in its modern distribution to the southern South Island and subantarctic islands (ibid.:155), and its presence in the Washpool Midden provides further evidence of the suggested alterations to the distributions of various pinnipeds in New Zealand waters during the last millennium (Smith, 1978).

Table 2: Age/sex status of the Palliser Bay Pinnipeds

SPECIES	Assemblage	Number	Age/Sex group
fur seal	Washpool Level I	1	Sub-adult male
	Washpool Level II	1	Sub-adult male
	Pond Midden layer I	1	Sub-adult male
		1	Juvenile
	Black Midden layer 1	1	Adult male
	Black Midden layer 2	1	Sub-adult male
	Crescent Midden layer 1	1	Sub-adult male
sea lion	Washpool Level I	1	Adult female?
	Washpool Level II	1	Sub-adult male
elephant seal	Washpool Level I	2	Sub-adult male

The pilot whale (*Globicephala melaena*) is represented by two individuals in level II of the Washpool Midden. This species is relatively common in New Zealand waters, and is prone to mass strandings (Gaskin, 1972:115-8). The two remaining cetacean species were not able to be identified accurately. In all three assemblages in which dolphin remains occurred only a few bones were present, and in no case did these include the diagnostic cranial bones. All three individuals present belong to either the *Lagenorhynchus* or *Delphinus* genera. With respect to the distribution of dolphins in New Zealand waters they are most likely to be either the Dusky dolphin (*L.obscurus*) or the Common dolphin (*D.delphis*). Finally, four fragments were tentatively identified as plates from a baleen whale, Order Mysticeti.

SEASONALITY

For a number of reasons the sea mammal material does not provide clear cut indications of seasonality. The small number of individuals by which each species is represented in each assemblage reduces the reliability of seasonal estimates, which are based primarily on the probability of a species, or age/sex group of a species being present in the area at a given time of the year. Furthermore, alterations to the distributions of some of the species concerned have been suggested (Smith, 1978) and this confuses the prediction of seasonality from modern distribution patterns. The problem with identification of the dolphins has withdrawn a potentially valuable seasonal indicator, as *L.obscurus* is more common in the Cook Strait area during the winter, while *D.delphis* is more common in the summer (Gaskin, 1968; 1972:126, 135). Nevertheless, some indications of seasonality can be gained from the sea mammals. Autumn or more probably winter occupation of the Washpool Midden is suggested by both the sea lions and the elephant seals. These species are most commonly found on the New Zealand coast during the winter, although

today seldom as far north as Palliser Bay (Gaskin, 1972:146, 149). The pilot whale is slightly more common in Cook Strait during the spring and early summer (*ibid.*:117), but cannot be considered a totally reliable seasonal indicator as many strandings have been recorded outside these months.

The fur seals initially appear to indicate occupation during the winter months. It has already been argued that the predominance of sub-adult males reflects exploitation of a non-breeding colony. In the Cook Strait area these colonies have their maximum population in mid-winter when much of the male population migrates northwards from the breeding grounds (Wilson, 1974:72-6). However a number of factors suggests that this interpretation does not adequately account for the presence of fur seals in the Black Rocks sites. Almost all the other indications of seasonality from these sites suggest summer and/or autumn occupation (Anderson, 1973:116-8), and adverse climatic and sea conditions in the vicinity of Black Rocks during the winter argue strongly against winter occupation. Furthermore, the number of fur seals in each site appears to be less than one would expect if they were being hunted during the winter months — the time of their population maximum. As sub-adult male fur seals would have been available during the remainder of the year, although in much smaller numbers, it appears likely that the few fur seals present reflect exploitation during the summer or autumn.

The only suggestion of deviation from this pattern is the presence of an adult male fur seal in the Black Midden Layer 1 assemblage. Adult males would be most unlikely visitors during the summer months as they congregate at breeding colonies further to the south at this time of the year (Wilson, 1974:94-103). Therefore autumn or possibly winter occupation would be suggested for this layer. Another indication of autumn/winter occupation of this layer is provided by the relatively large number of parakeets (*Cyanoramphus* sp.) (Anderson, 1973:115-6, Table 7).

The apparent restriction of occupation in almost all the Black Rocks sites to summer and/or autumn is not evidenced in the Washpool Midden. Here there are positive indications of winter occupation from the sea lions and elephant seals, a suggestion of spring or early summer occupation from the pilot whales, and the possibility that fur seals were being taken at almost any time of the year, although autumn or winter exploitation must be accorded a higher probability. That this indicates year-round occupation is confirmed by analysis of other seasonal indicators (Leach, 1976:201-3).

Explanation of the different seasonal patterns exhibited by the Washpool Midden site on the one hand, and the Black Rocks sites on the other can be found in their different functions within the reconstructed settlement patterns of the prehistoric communities in Palliser Bay (Leach, 1976:288-93, 311-4). The Washpool Midden appears to have been a permanently occupied settlement, probably the base village for a community resident in the Makotukutuku Valley. The Black Rocks sites are viewed as temporary camps occupied by members of another community (based at Ngawi) for the purpose of fishing, collecting shellfish, and hunting sea mammals during a restricted season of the year.

PROCUREMENT STRATEGIES

Three different strategies appear to be involved in procuring the Palliser Bay sea mammals. The simplest of these is best described as 'scavenging' — the collecting of dead or dying stranded animals. Most likely to have been acquired in this way are the pilot whales and the tentatively identified baleen whale. The former is among the species most commonly stranded on the New Zealand coast (Gaskin, 1968), and the immense size of the baleen whales suggests that they were unlikely to have been captured at sea. As pilot whales are commonly stranded in groups, rather than individually, it is probable that the two individuals in level II of the Washpool Midden were the result of a single mass stranding.

Clearly, all the other sea mammals could have been acquired as a result of strandings; individuals of all the species are occasionally found dead or dying on New Zealand beaches. However, consideration of various behavioural characteristics of these species suggests other, more probable methods of capture. Dolphins are the most common cetaceans in New Zealand waters, but reported incidences of their stranding are extremely low (Gaskin, 1968). This is almost certainly a result of their highly developed echolocating capabilities and their presumed knowledge of inshore coastal waters (Gaskin, 1972:135-6). Despite this, dolphins occur more frequently and in larger numbers in the Palliser Bay sites than do species such as the pilot whale which are known to strand more often. Thus it is improbable that strandings alone could account for their presence in these proportions, and an alternative procurement strategy – hunting from canoes at sea – must be suggested. The presence of a harpoon head in level 1 of the Washpool Midden (Leach, 1976:216, fig. 60g) would appear to corroborate this suggestion.

While the hunting of sea mammals at sea has not been securely documented for prehistoric New Zealand, a number of factors aside from the behavioural characteristics of dolphins indicate that it almost certainly did occur. There can be no doubt that the maritime technology necessary for sea hunting was within the capabilities of the Polynesian inhabitants of New Zealand. Furthermore, harpoon heads occur frequently in early New Zealand sites (Skinner, 1974:138-46). Dolphins and porpoises – the most likely prey of sea hunters with harpoons – appear to be more common in early sites, although this is difficult to document accurately with the lack of properly identified cetacean material from New Zealand sites. This apparent association of harpoon heads and small cetaceans has also been recognised in early Marquesan sites (Kirch, 1973:33).

The third procurement strategy concerns the taking of seals on land. All three species represented in the Palliser Bay assemblages haul out on land at regular intervals, obviating the need to take them at sea, or to wait for animals to become stranded. Although there are no ethnographic accounts of the methods employed by the Maori to take seals on land, numerous accounts from other parts of the world (for example for the Moriori by Shand, 1911:8; and for the Aleuts by Jochelson, 1933:44) indicate that it is a relatively simple process requiring no more than a little stealth and strategy to prevent the animals escaping into the sea, and a heavy club of some description to despatch them with.

BUTCHERING PATTERNS

The small quantity of material, and in particular the small number of bones by which each animal is represented, prohibit any detailed analysis of butchering patterns. However examination of a number of features provide some clues as to the manner in which the carcasses of these animals were treated.

There is a suggestion in the fur seal material from Black Rocks that these animals were killed and butchered, but not consumed there. The most commonly represented bones are from the extremities of the flippers and the lower back, body parts which yield little or no meat, and therefore would probably have been discarded when the animals were being butchered. Conspicuously absent are bones from the upper limbs, neck, shoulders and upper trunk; the body parts providing the greatest quantities of meat. This pattern of body parts representation accords well with the suggested function of the Black Rocks sites as temporary camps occupied during short periods of resource collection. It is highly unlikely that a complete fur seal carcass would be consumed during a short period at such a site. Rather, most of the meat would be returned to a more permanent settlement for consumption or preservation. Unfortunately the Washpool Midden fur seal remains are too few to indicate a similar or complementary pattern.

The only other species for which any information on butchering can be derived is the pilot whale. Butchering marks, probably made by an adze, are visible on a number of vertebrae (Plate 1). The spinous processes and dorsal surfaces of the transverse processes have been removed during the adzing, which was presumably undertaken to remove the massive musculature along the dorsal surface of the spinal column.

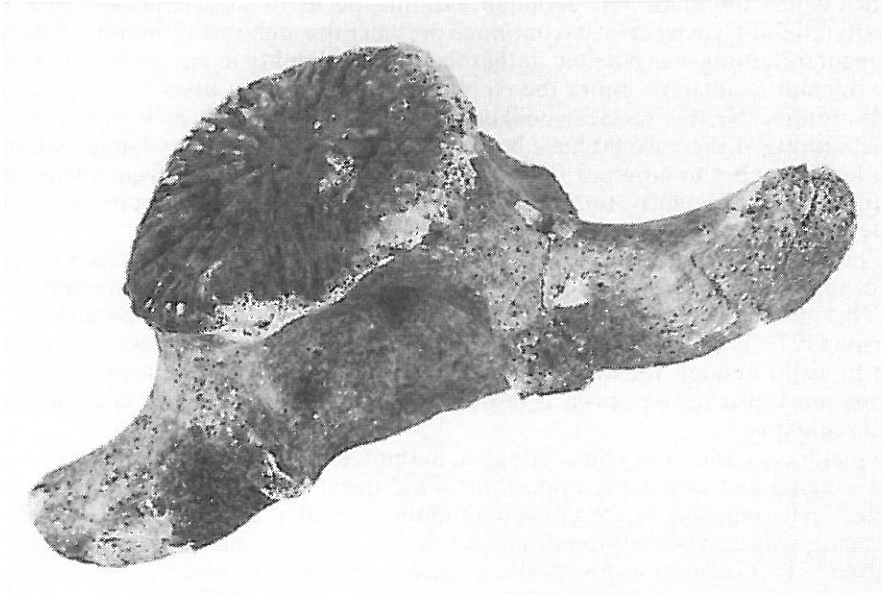


Plate 1: Vertebra of a pilot whale (*Globicephala melaena*) showing adze marks.

DISCUSSION

The Palliser Bay sea mammals present a somewhat anomalous picture when viewed in relation to other New Zealand sea mammal assemblages from archaeological sites. On the one hand they include a wider range of species than do most other assemblages, which commonly consist of the ubiquitous fur seal, often one and sometimes two other pinniped species, and occasionally a single cetacean species. Few sites have as many as the six species represented in the Washpool Midden. However, most other assemblages have considerably larger numbers of individuals; for instance Rotokura (S14/1) with 35 (Smith, n.d. a), Tiwai Point (S181-2/16) 31 (Smith, n.d. b), and Tairua (N44/2) 12 (Smith, 1978). The four Palliser Bay sites have a combined total of only 17 individuals.

The wide range of species may in part reflect the location of these sites on the margins of Cook Strait, which is undoubtedly a focal point in the distributions and migration patterns of many sea mammal species. However, it may also be a response to difficulty in acquiring sufficiently large numbers of a more restricted range of species. This raises the questions of availability and reliability of sea mammals as an economic resource. Certainly a wide range of species were available; this is evidenced in the excavated sites. But the identified faunal assemblages would tend to suggest that no single species was available in any great abundance. In this regard the small number of fur seals is particularly instructive. The species is represented altogether by only seven individuals, and in only one assemblage is more than one individual present. As it is the most common sea mammal in most parts of New Zealand, including the Palliser Bay area, it would

appear that factors other than simple numerical abundance must have influenced its availability. During the discussion of seasonality it was argued that adverse marine and climatic conditions in the vicinity of the Black Rocks fur seal colony restricted access in the winter months, the time of greatest abundance in fur seal numbers. Thus when viewed as a 'catchable' resource, fur seals would have been available only when conditions permitted hunting, principally during the summer months when they were numerically less abundant. The dominance of this species in the assemblages probably reflects its reliability, in terms of its continued presence throughout the months of the year when regular hunting was possible, rather than its availability in any great abundance.

It is difficult to imagine either the elephant seals or the sea lions as a particularly reliable resource. Neither species would have been present regularly or in great numbers, and the hunting of these would have been restricted to the occasions when they hauled out on local beaches to moult or to rest from long sea journeys northwards from their breeding grounds. Similarly, the collection of stranded whales could not be viewed as a reliable form of economic activity.

The hunting of dolphins at sea would also have had restrictive limitations. Putting to sea in canoes would have been limited to those days on which conditions were sufficiently calm. This immediately suggests a restriction of this activity to the summer months, and Anderson (1973:126) has argued that no more than half the days in an average summer would be calm enough for intertidal foraging, let alone offshore sea hunting. Thus dolphins must also be viewed as a resource of restricted availability and somewhat limited reliability.

The picture generated by considering sea mammal exploitation in this light is one of a wide ranging and essentially opportunist food quest. A wide range of species were exploited, at least in part as a response to limitations on their availability and reliability. Only the fur seals can be considered a truly reliable resource, and these with a restricted availability. This equates well with the picture of the overall economic pattern of the prehistoric inhabitants of Palliser Bay suggested by Leach (1976:299-306). A broad spectrum of subsistence activities were undertaken ranging from kumara horticulture to hunting and gathering a wide range of species from the forest and the sea. He views this economic system as an adaptation to conditions generally unfavourable to horticulture and therefore requiring a more wide ranging food quest.

Within the confines of this paper it is difficult to fully assess the part played by sea mammals in this economy. There is inadequate background information to permit the calculation of the edible meat weights provided by the sea mammals, or indeed by many of the other components of the faunal assemblages. Thus the place of the sea mammals cannot be evaluated in quantitative terms. Two factors tend to enhance their importance beyond that described by a mere examination of a table of minimum numbers. The immense size of these animals in relation to the other sources of protein in the sites (principally fish, shellfish, birds and dogs) quite obviously influences their importance within the economy. Furthermore, the excavated evidence from Palliser Bay indicates that moa were already locally extinct by the time Polynesian man settled in the area. These large birds appear to have been an important meat source in early sites in other parts of New Zealand (see for instance Shawcross, 1972:612), and their absence in Palliser Bay must have enhanced the reliance placed upon sea mammal hunting — the only alternative source of large meat-bearing animals.

CONCLUSION

Sea mammal hunting has seldom been considered in detail as an aspect of prehistoric economy in New Zealand. Preliminary investigation of this activity at a number of sites (Smith, 1978; n.d. a, b) indicates that it was an important component of the economic system in at least some parts of New Zealand, particularly during the early prehistoric period. In most of these sites sea mammals appear to have played a somewhat larger part in the total economy than was the case in Palliser Bay. Analysis of the present material, although hampered by some serious limitations in the evidence, has indicated a degree of variability not previously encountered.

Perhaps more importantly it has demonstrated the coexistence of specialised forms of hunting activity in the form of dolphin hunting from canoes and land based seal hunting with specialised horticultural activities. The traditional dichotomy between hunter-gatherers and horticulturalists appears to be inappropriate in this instance, and by implication should be examined critically in other areas. It is only through detailed studies of all aspects of economic activity that such traditional explanatory devices can be evaluated, and if necessary reformulated or replaced.

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