THE SINGAPORE PARLIAMENT HOUSE COMPLEX (PHC) ORGANIC MATERIAL

A report on the molluscan and non-molluscan fauna recovered from the 1994-1995 PHC archaeological excavations (with indication of plant presence)

by
Barbara A. Lewis

Physical Anthropolgist
Bones and Beliefs: Research in Anthropology
Sagle, Idaho, USA 83860

June 30, 1998

Addendum to inventory list added August 23, 2023

INTRODUCTION

During the course of archaeological excavations at the Parliament House Complex (PHC) conducted in Singapore from November, 1994 to January, 1995, organic material was recovered in addition to cultural artifacts. The vertebrate and non-vertebrate faunal material retrieved from these excavations was examined macroscopically by the author in 1996 in order to produce a list of species present at the site and to obtain information regarding faunal distribution (Appendix I and II). The following report addresses the environmental, ecological and cultural implications of the PHC faunal inventory as they relate to interaction at the mouth of the Singapore River in the years spanning known human occupation of the site. Taken in conjunction with non-organic artifacts recovered from the PHC excavations, which have been used to date the site from the present to the fourteenth century (Miksic 1998: PHC site report), and with material recovered from subsequent archaeological excavations further down river at Empress Place (Miksic 1998: EMP site report), this information enlarges on and clarifies concepts ofpremodern life in Singapore.

BACKGROUND INFORMATION

The mouth of the Singapore River is located on the southeast side of the island of Singapore, a tropical island some 42 kilometres by 23 kilometres in size, which is located approximately 137 kilometres north of the equator. The island is separated from peninsular Malaysia by a strait approximately 640 metres wide at its narrowest point. The PHC excavation site is located on the north bank of the Singapore River and borders a natural circular basin formed by the river near its mouth. The PHC site extends inland from the river approximately 47 metres towards High Street and is roughly parallel to North Bridge Road (Miksic 1998: PHC site diagram).

Several reports indicate that the original natural vegetation of Singapore was dominated by lowland dipterocarp tropical rainforest. Beach forest lined a section of the eastern coast, but mangrove forest fringed most of the coast, penetrating inland along river banks, and was prevalent along the Singapore River. To this was added cultivated patches associated with human settlement north of the mouth of the Singapore River. Tiger was the dominant mammal on Singapore and a deterrent to human occupation of the extensive rainforest (Buckley 1965, Corlett 1992).

Some understanding of the physical environment of the area surrounding the Singapore River can be gained from historical records and anecdotes. Reports of English establishment in 1819 of a free port at Singapore associated with a factory or station of the English East India Company refer to a small Malay fishing village, Kampung Tumongong (properly spelled Temenggong, so named after the title of the official of the Sultanate of Riau who was the local authority), on the north bank of the river, sheltered by a few coconut trees, *Cocos nucifera*, and an uninhabited mangrove swamp on the south bank. Orang Laut (sea gypsies) customarily kept their boats near Kampung Tumongong. At a nearby site north of the river but bordering the sea, Kampung Glam (named for the Kayu Putih or Gelam tree common to the site, *Melaleuca leucodendron*), a faction of the Malay population made their living making kadjangs and mat sails. A plain north of the river was covered with scrub plants such as kamunting, *Rhodomyrtus tomentosa* and sendudok, *Melastoma malibathricum*. A “Forbidden Hill” behind the plain, referred to as Bukit Larangan, had been the place of residency of the Rajah in previous centuries. On this plain the English first established camp in 1819 and on the hill aresidency for Sir Stamford Raffles was also built, near which he planted nutmeg trees, *Myristica fragrans* (Ridley 1922-1925; Buckley 1965, Corlett 1992). The hill served as the residence of Singapore’s governors until 1860, and was therefore known as Government Hill. There is reference to a small Chinese population present in 1819 who cultivated gambier, *Uncaria gambir*, near the Singapore River as an extension of a gambier and pepper plantation industry of Riau (Savage 1992). Within a year of English presence, the Chinese population had grown to 5,000 and ships from Siam, Cambodia, Kelantan, Terengganu, Pahang, Brunei, western Borneo, Celebes and eastern Sumatra were recorded at this new port of Singapore (Courtenay 1972). Kampung Tumongong was relocated to a coastal

position south of the river, the north shore bordering the river was reserved for government buildings (however, there was a temporary incursion of English habitation on the north shore), and the south shore swamp was filled in for the location of a Chinese settlement. Replacing temporary tenements on stilts extending over the tide influenced south bank, a containment wall was built on the south side of the circular basin which became a centre for boating and commerce, the present Boat Quay (Buckley 1965). A colour lithograph from 1843-1847, Singapore River and Government Hill (Oh 1996) depicts the location of the PHC site as a sloping (?sandy mud) beach leading up from a small containment wall to several large masonry buildings, with one nearby structure referred to as Raffles landing shed; the opposite shore is contained and lined with warehouses and boats. This mid-19th century depiction reveals that no remnants of the previous Malay fishing village at the site remain, and commercial activity along the river is extensive.

In 1860 a new residence for the governors was erected on Mount Sophia; Government Hill became the site of a military base known as Fort Canning; the hill was renamed Fort Canning Hill.Growth and trade continued. It was estimated that, in the mid-1860's, three quarters of the island's greatly expanded trade was handled in this section of the Singapore River (Buckley 1965). Slash and burn agricultural practices and settlement explosion stripped and exhausted the island's soils, so that the Singapore River would have been exposed to extensive increased silting. It is reported that by the 1870's two-thirds of the islands soils were exhausted from rapid loss of the island's pristine forest (Savage 1992).

During the course of excavation, the PHC site was divided into fourteen squares and two test trenches (Miksic:site diagram). The excavation squares form two major groups as follows. **First Grouping:** Squares 1&T2, 3&12, 4&13, 5&14, and 6/7 form a group of adjacent squares further removed from the Singapore River than the second major grouping. In addition, Square 2 and Test Trench 1 are even further removed, closer to High Street. **Second Grouping:** Squares 8&9, 10a&10b, and 11 form a group of adjacent squares closer to the Singapore River than the First Grouping. Square 11 is closest to the Singapore River.

Three distinct soil types were encountered at the PHC excavation, and an understanding of the soil matrix at PHC enhances the faunal determinations. The PHC excavation can be roughly divided into two main vertical units, a surface light brown sandy mud and a sub-surface black sand. The surface layer was varied in depth and contained numerous small molluscs indicative of an intertidal zone with largely estuarine but also coral reef influence. This surface unit yielded numerous recent artifacts. Vertical spits numbered 1-7 through the sub-surface black sand contained numerous large molluscs indicative of an estuarine or mangrove environment. The primary retrieval of prehistoric artifacts occurred in this sub-surface black sand unit. Below the black sand a white sand was encountered which was not excavated and which appeared devoid of cultural artifacts. This white sand region, which may represent a former coral sand beach, marked the basal boundary of the excavation site.

The surface and sub-surface vertical units have several subdivisions. Within the surface light brown sandy mud, regions of surface shell concentrations were found (especially in Square 13, where deposits of dredged material may be a factor) as well as several "mixed" regions indicating influence from both soil divisions. These have been variously described as "surface," "shell layer," "brown layer," "mixed layer," or "top of black."

The black sand unit was excavated until the basal white sand boundary was reached. For the squares forming the first grouping (those further from the river) usually five but up to seven vertical sub-units of 10 cm depth were excavated; thus the depth of the black sand was usually 50 cm, though rarely extending to 70 cm. For the squares forming the second grouping (those closer to the river) usually three spits yielding faunal material were excavated, thus extending to 30 cm depth. Each vertical unit, or spit, represents a depth of 10 centimetres.

METHODS

A combination of dry brushing and washing was used to clean and then isolate the organic material from the non-organic material. During this process, soil samples were retrieved from representative samples for potential future analysis. Specimens were separated by major categories (molluscan fauna, non-molluscan fauna, plant fragments) for each sample bag within each square. The fauna was examined macroscopically and identified by reference to published works and available comparative collections. Identifications were made to various taxonomic levels; where possible, an attempt was made to assign reasonable, though often provisional, species designations to the faunal fragments in order to ascertain environments represented and/or exploited at the PHC site. Specimens were stored in bags labelled and assembled by square, spit, and sample bag number. Lists of taxonomic categories and enumerations for each square, spit, and sample bag number were compiled (Appendix I, II, III).

For the molluscan fauna, the enumerations included number of identified specimens present (NISP) and minimum number of individuals (MNI). Gastropod MNI could be more accurately assessed than bivalve MNI (Table 1a). The molluscan faunal list was subsequently divided according to primary association with the surface light brown sandy mud unit (Table 1b) or with the sub-surface black sand unit (Table 1c) and separate enumerations compiled for those categories. An alphabetical listing of PHC molluscan genera/species was generated to facilitate reference (Table 2). **[Note: In 2023 an addendum was added to Table 2 to account for numerous updates of taxonomic nomenclature over the past several decades. Identifications within the text should be referred to Table 2.]** The distribution of the molluscan fauna by spit and square, as recorded in Appendix I, was determined and concentrations noted as well as the presence of charred specimens (Tables 3a, 3b).

Non-molluscan fauna was initially identified taxonomically by class (Table 4). Where possible, fragments were pieced together to form one larger fragment and identification made of the skeletal element present. For each class, a list was compiled which included, where possible, genera present and probable species according to square, spit, and sample bag number. The number of identified specimens present (NISP) was also recorded (Appendix II). Enumerations were based on the NISP after articulation of bone fragments. This was usually insignificant except for the turtle bone in Square 8 for which numerous composites were formed. For example, three large composites from Square 8 contained 73 fragments; however these 73 bone fragments only added a count of 3 to the above enumerations. A taxonomic list derived from non-molluscan specimens from PHC was compiled according to class, family, genus, species, and common name (Table 5). The distribution of the non-molluscan fauna by spit and square, as recorded in Appendix II, was determined and concentrations noted as well as the presence of charred specimens (Tables 6a, 6b). These were then compared to similar determinations of distributions and concentrations of molluscan fauna by spit and square as derived from Appendix I (Tables 3a, 3b).

The plant material was examined macroscopically and isolated according to square, spit, and sample bag number. No attempt was made to identify or enumerate plant fragments. Indication was made of the general nature of the specimens (for instance charred or uncharred, wood, or seed). This information was recorded in Appendix III.

The fragmentary nature of the specimens coupled with lack of standard laboratory equipment and limited availability of comparative material imposed limitations on this study. Many of the taxonomic assignments are tentative, sometimes based only on bone quality for vertebrates or similarity to better represented specimens for molluscs. Undoubtedly, mistakes were made. Nonetheless, despite limitations, from the numerous and varied provisional designations, an overall sense of the environment represented emerges. Thus this archaeobiological sample provides pertinent information for gaining understanding of ecological and cultural interaction at the mouth of the Singapore River in the years spanning human occupation of the PHC site.

RESULTS

The Parliament House Complex excavations resulted in the recovery of 13,808 mollusc

fragments, 421 coral fragments, and 1,823 non-molluscan faunal fragments (Tables 1a, 4; Appendix I, II). For molluscs, 10,802 fragments were identified to a probable genus level, with provisional species designation indicated (Table 1, Appendix I). These molluscs represent a minimum number of 9,281 individuals (692 representing bivalves; 8,557 representing gastropods; 32 representing scaphopods).

Molluscan species diversity is great within the light brown sandy mud unit (Table 1b), with representatives present from 21 families, 29 genera, and 32 species. This compares to a similarly diverse molluscan representation within the black sand unit (Table 1c) of 18 families, 26 genera, and 31 species. The malacofauna of the light brown sandy mud unit is comprised of approximately 2% bivalves and 98% gastropods, with less than 1% scaphopod representation. This contrasts the black sand unit where the malacofauna is comprised of approximately 70% bivalves and 30% gastropods.

Molluscan species characteristic of the surface (Table 1b) are *Umbonium vestiarium* (known from sandy, mud bottoms), *Cerithidea* sp. (common to mud flats in mangrove areas), *Clithon oulaniensis* (known from the mouth of rivers) and a small fingernail size clam, which compares favourably with *Cardium impolitum* (known from inlet influenced areas and near shore). Most of the coral fragments recovered at PHC come from the surface of Square 13.

Molluscan species characteristic of the black sand region (Table 1c) represent an intermixture of three marine environments: mangrove or estuarine species, coral reef species, and intertidal rock species. Common representatives of mangrove are Ostreidae. Some may represent *Saccostrea cucullata*, known from mangrove areas, intertidal rocks or mouth of a river, and *Crassostrea* species such as *C. belcheri, C. gigas* or *C. lugubris*, regional species presently cultivated for consumption (Nateewathana 1996). Bivalves such as the arks *Anadara granosa* and *Barbatia decussata* (known from shallow, muddy water) are abundant [Although *A. granosa* was deferred to, some fragments may represent closely related species such as *A. nodifera* and *A. pilula*.] Large mud clams such as *Polymesoda erosa* (known from mangrove habitats) and large Venerid clams such as *Periglypta* sp. and *Gafrarium* sp. (intertidal sand/mud species) are present. Gastropods such as *Chicoreus capucinus* (a mangrove murex), *Telescopium telescopium* (known from mud flats near mangroves), Melongenas (known from shallow, muddy waters and mangrove), and *Nerita balteata* (known from mangrove and intertidal rocks) suggest both macro and micro environments centered around mangrove. Species commonly associated with reefs are represented by *Cymbiola nobilis* (known from sandy reef flats, but also from mangrove), *Strombus canarium* (known from shallow waters, sandy mud bottom), *Lambis lambis* (known from shallow waters, weeds and sand associated with coral reefs), and giant clams such as *Hippopus hippopus* and *Tridacna maxima* (known from coral reefs in shallow waters).

PHC non-molluscan fauna (Table 4) are represented by Crustacea (barnacles), Chondrichthyes (shark and ray), Osteichthyes (bony fish), Reptilia (mainly turtle), Aves (birds), and Mammalia (Eulipotypha, Rodentia, Primates, Carnivora, and Artiodactyla). Approximately twenty-three genera of non-molluscan fauna are indicated with a mixture of positive, probable, and feasible identifications to the species level (Table 5, Appendix II). Of these, one shark and five mammals (rodent, primate, otter, pig, and probable deer) are represented by teeth, and bony fish are represented by skull bones which would bear teeth (Figure 1). The MNI for the non-molluscan fauna was not determined, but can generally be stated to be extremely limited compared to the molluscan fauna.

Within the sub-surface black sand unit were concentrated regions of charred soil containing charred molluscs and faunal bone (Tables 3a, 3b, 6a, 6b). For the upper spits, charred molluscs and turtle are especially characteristic of Square 8, Spits 1-3. Square 11, Spit 1 is another region of concentration of edible molluscs as well as Square 10, Spit 1. For the lower spits, charred molluscs are prevalent in Square 1, Spit 5. Square 14, spits 4-5, is also notably represented by edible molluscs. Fish bone is prevalent in the lower spits of Square 1, Square 13, and Square 14. Charred turtle bone is also noted from Square 1, Spits 4-5; Square 13, Spits 3-5; and Square 14, Spits 4-5. Charred pig teeth and bones were recovered from the lower spits of Square 12 (Tables 6a, 6b).

DISCUSSION

Fauna by Spit

Because vertical Spits 1-5 at PHC roughly correlate with relative time frames, an understanding of the species present over time can be extrapolated from the faunal distribution. The time range for the PHC site, determined from non-organic artifacts, extends from the present to the fourteenth century (Miksic, JN 2013 *Singapore and the Silk Road of the Sea.* Singapore: NUS Press. Pp. 240-245).

PHC molluscs recovered from the surface. Species typical of the light brown sandy mud unit characterize the surface (Table 1b). There is a large concentration of small estuarine molluscs in Square 13 and numerous coral fragments. Some of this may be dredged material as well as naturally deposited shell. Most of the species listed in Table 1b are found on the surface of Square 13.
PHC vertebrates recovered from the surface. Surface recovery indicated evidence for chicken, pig, and other artiodactyls. Bony fish are indicated. Wading birds may be present. No turtle bone was recovered from surface excavations.

PHC molluscs recovered from Spits 1 and 2. Species typical of the black sand unit (Table 1c) are found in Spits 1 and 2, with some admixture from surface species. Concentrations of edible bivalve molluscs are found in Square 8 and Square 11, such as oysters, clams, and arks. Edible gastropods include *Strombus canarium* (dog conch), *Cymbiola nobilis* (noble volute) and Melongenas. Mangrove gastropods are common such as *Chicoreus capucinus* (mangrove murex), and *Telescopium telescopium* (telescope snail).
PHC vertebrates recovered from Spits 1 and 2. Spits 1 and 2 are characterized by large concentrations of charred turtle bone (especially Square 8, Spits 1&2). [Recall that Squares 8, 9, 10, 11 are the group of squares closer to the Singapore River, with Square 11 being the closest]. Besides green turtle, *Chelonia mydas*, and other large marine or estuarine turtles (some possibly *Batagur borneoensis*, the painted terrapin), there is evidence of an Asian soft-shelled turtle, possibly *Amyda cartilaginea*, and small turtles such as the Malayan snail-eating turtle, *Malayemys subtrijuga*. Fish bones are prevalent, and shark or ray vertebrae are evidenced. Presence of cat, rat, pig, and chicken are noted. Some of the unidentified mammal bone may represent Artiodactyls such as cattle, *Bos* sp., or deer.

PHC molluscs recovered from Spit 3. Species typical of the black sand unit (Table 1c) were dominant in Spit 3. In addition, several small species rare to the excavation were recovered, such as *Ficus gracilis* (graceful fig shell), *Cypraea* sp. (cowrie) and *Euchelus* sp.?*quadricarinatus* (four-keeled margarite). These latter three species are associated with an offshore or coral reef environment.
PHC vertebrates recovered from Spit 3. Several species of small turtle such as the Malayan box turtle, *Cuora amboiniensis*, and the Malayan snail-eating turtle, *Malayemys subtrijuga*., and a large Asian soft-shelled turtle, perhaps *Amyda cartilaginea,* are indicated for Spit 3. Marsh birds such as Rallidae or Ardeidae may be present (for instance, the little egret, *Egretta garzetta*). For mammals, only rat and tentatively deer are represented. Bony fish are more prevalent, with limited evidence for cartilaginous fish.

PHC Molluscs recovered from Spits 4, 5, and 6. Mangrove and estuarine molluscs are abundant. Species typical of the black sand unit (Table 1c) such as oyster and ark are found in Spits 4-6. Spit 5 of Square 1 has the greatest concentration of *Anadara granosa* (blood ark) recovered at PHC. Less prevalent species such as the giant clams *Tridacna maxima* and *Hippopus hippopus* and the spider conch, *Lambis lambis,* suggest nearby coral reef flats (Boncka et al. 1994). *Cymbiola nobilis* is a common large edible gastropod. All of these species have a long history of exploitation for food in Southeast Asia.
PHC vertebrates recovered from Spits 4, 5 and 6. The more deeply buried vertebrate material was recovered from the excavation squares further from the Singapore River (Squares 1,3,4,5,12,13,14).

No faunal material was recovered in Spits 4, 5, or 6 from excavation squares closer to the river (Squares 8,9,10,10a,11). Rodents are well represented in Spits 4, 5, and 6, especially commensal forms. Species represented could be *R. rattus* (the roof rat), *R. tiomanicus* (the Malayan field rat), or *Sundamys annandalei* (the Annadale's rat). Presence of the common house shrew, *Suncus murinus*, is also suggested. Other indicators of human habitation come from direct evidence for domestic species such as pig (*Sus scrofa*), chicken (*Gallus gallus*), and cat (*Felis catus*). In addition, these lower spits yield evidence of exploitation of non-domestic food sources such as an ulna with cut marks of the large marine green turtle (*Chelonia mydas*). Spits 4 and 5 of Squares 12, 13, and 14 contain numerous fragments of charred turtle bone. Fish, many of which appear to be large edible species such as mangrove red snapper (*Lutjanus* sp.), are well represented as well as shark (upper tooth of *Carcharhinus falciformis*, the silky shark) and ray (dorsal spine cf. *Neotrygon kuhlii*, the blue-spotted stingray). All of these species reflect or infer association with human habitation or exploitation.

Nonetheless, vertebrate species present in Spits 4-6 can also be viewed as indicative of the natural, undisturbed environment. Primates are represented by teeth suggesting presence of *Macaca fascicularis*, the crab-eating macaque. Presence of otter (canine tooth cf. *Aonyx cinerea*, the oriental small-clawed otter) is indicated. Some of the cat bone may derive from the leopard cat, *Prionailurus bengalensis*. Pig (*Sus scrofa*) bone and teeth may derive from wild boar, once prevalent on Singapore (Medway 1969). Artiodactyls known to inhabit swampy areas may be present. The red jungle fowl (*Gallus gallus*) is synonymous with the domestic chicken. Ardeidae, such as grey heron (*Ardea cinerea*), little egret (*Egretta garzetta*), black-crowned night-heron (*Nycticorax nycticorax*) and Rallidae, such as grey-headed swamphen (*Porphyrio poliocephalus*) and the white-breasted water hen *(Amauronis phoenicurus*) are tentative species suggestions. Numerous large fish bones, and presence of shark and ray are environmental indicators as well as possible food sources exploited. In addition, large marine turtles (ulnae of *Chelonia mydas*, the green sea turtle) are present. These fauna suggest an estuarine or mangrove environment with nearby swamp or coastal forest and a marine influence (Lekagul and McNeely 1977, Johnson 1978, Payne et al.1985, Briffett 1986, Ernst and Barbour 1989, Corbet and Hill 1992, Kuiter 1993).

Environments Indicated

The PHC molluscan faunal assemblage, being more prevalent and diverse, provides the better environmental indicators (Tables 1, 2, 3 and Appendix I). Mangrove large molluscan species are dominant in the black sand vertical units. Estuarine molluscs are common, especially small species from the surface brown sandy mud unit and large species from the black sand unit. Coral reef molluscs are present, but not dominant. The most common reef specimens are larger species excavated from the black sand unit. Many of these reef specimens are known to be exploited for food, such as giant clams, spider conch, dog conch, and noble volute. In addition, small reef species are present from the light brown sandy mud unit. The collection as a whole is characterized by bivalves and gastropods which regionally are important components of traditionally exploited marine molluscs.

The PHC molluscan assemblage includes herbivores, suspension feeders, and active predators. Several mollusc species are united as an ecological unit. For instance the gastropods *Cymbiola nobilis* and Melongeninae, such as *Pugilina cochlidium*, are known to prey on bivalves, especially oysters (Chou 1988, Abbott 1991). *Hemifusus pugilina* is a non-drilling predator of the commonly present *Anadara granosa* (Benny et al. 1996). *Chicoreus capucinus* preys on oysters such as *Saccostrea cucullata* and mud clams (Middlefart 1996). Evidence for predatory activity of mollusc "drills" is common in the PHC collection. *Anadara granosa* and *Anadara nodifera* are coexisting species common to mud or sandy mud (Rondo 1994, Vongpanich 1996).

Several of the mollusc species listed in Table 1 are presently on the endangered list for Singapore, threatened by habitat degradation and collection for food and ornamental trade (Ng and Wee 1994; Ng 1995). Species endangered or vulnerable and rare are *Strombus canarium*, *Cymbiola nobilis*, *Umbonium vestiarium*, *Trochus niloticus*, *Turritella terebra*, *Cerithidea obtusa*, and *Hippopus*

hippopus.

As reviewed previously, non-molluscan fauna also support presence or near presence of mangrove or estuaries and a proximate marine environment (Tables 4, 5,6, Appendix II). The oriental small-clawed otter, an endangered mammal, is known to inhabit mangrove, feeding on molluscs and crab. Crab-eating macaques are common to mangrove, coastal and riverine forests, exploiting crabs and other coastal invertebrates. Leopard cats, also endangered, are excellent swimmers and their diet includes lizards, amphibians, birds, rodents, and small deer. Roof rats are common to mangrove. Molluscs are an important part of the diet of the Malayan field rat. Wild boars are known to exploit crustaceans, fish, and mangrove molluscs and are a favourite prey of tiger. Interestingly, a single artiodactyl molar tooth recovered at PHC is similar in size and configuration to a deer known from swamp habitats, *Rucervus eldii*, the thamin or brow-antlered deer, a species not previously recognized from Singapore. There is no such direct evidence for *Rusa unicolor*, the sambar deer, which is known from Singapore. [This tooth specimen is similar in size but not configuration to *Rusa unicolor* and is similar in configuration, but not in size, to cattle, *Bos* species. For comparative material available to the author, it appears similar in both size and configuaration to a depiction of an upper third molar of *Rusa (Cervus) eldii* in Lecagul and McNeely 1977]. The marine green turtle, an endangered species, is known to feed in shallow water supporting an abundance of submerged vegetation and to nest on coastal beaches. Another large turtle present at the site may be *Batagur borneoensis*; the adults of this species inhabit estuaries and tidal reaches but eggs are deposited on coastal beaches. The Malayan snail-eating turtle inhabits canals and slow moving marshy rivers. The Malayan box turtle is aquatic. The Asian soft-shelled turtle is a predator of fish and crustaceans (Ernst and Barbour 1989). Water snake is tentatively identified. Over 300 bird species are known from Singapore, but *Gallus gallus*, known both as domestic chicken and red junglefowl, is the best represented bird species at PHC. In addition there is limited evidence for marsh birds of the Ardeidae family (herons) or Rallidae family (rails or gallinules). Marine or coral reef environments are represented by coral, barnacles, shark, ray, and large fish (such as snappers). Taken together, the PHC fauna form an ecological unit conforming to expectations for a mangrove dominated river mouth.

Also of interest are the faunal species which were not recovered at PHC. For instance, there is no evidence for several large species known from early Singapore such as tiger, clouded leopard, monitor lizard, or reticulated python. Medway (1969) includes the following mammals (shown with current taxonomic orders as in McKenna and Bell, 1997) as recorded from Singapore – many of which are now on the endangered or threatened list for Singapore (Ng and Wee 1994, Ng 1995). Only those marked with an asterisk have some evidence of presence at PHC: **Erinaceomorpha**–moonrat, **Soricomorpha**–*house shrew; **Scandentia**–treeshrew, **Dermoptera**–flying lemur; **Chiroptera**–flying fox, various fruit bats and other bats; **Primates**–slow loris, banded leaf monkey, *crab-eating macaque; **Cimolesta**–Malayan pangolin; **Rodentia**–giant cream-coloured squirrel, plantain squirrel, Prevost's squirrel, slender squirrel, *three-striped ground squirrel, shrew-faced ground squirrel, Horsefield's flying squirrel, red giant flying squirrel, house mouse, *roof rat, *Singapore rat, *Malayan wood rat, Polynesian rat, Norway rat, red spiny rat, Malayan porcupine; **Carnivora**–*oriental small-clawed otter, hairy-nosed otter; Malay civet; large Indian civet, large spotted civet, common palm civet, masked palm civet, small-toothed palm civet, tiger, leopard, clouded leopard, *leopard cat, flat-headed cat; **Artiodactyla**–*pig, lesser mouse deer, greater mouse deer, barking deer, *Sambar deer. In addition, from the order **Uranotheria**, infraorder **Sirenia**, the dugong or sea cow has been sighted near Singapore in previous years (Ng 1995).

Most plant material appears macroscopically to represent woody plants. Site characteristics determined from the fauna suggest that some of this plant material represents mangrove species. Mangrove known from Singapore includes *Rhizophora*, *Bruguiera*, *Avicennia* and *Sonneratia*. Historical accounts from 1819 give some indication of the natural flora:

> Every morning Mr. Farquhar was accustomed to walk about to examine the country, but it was covered with large jungle, except the centre of the plain where there were

only kurmunting [*Rhodomyrtus tomentosa*] and sikadudu bushes, with some kalat trees [*Eugenia* sp.], and the sea beach was covered with ambong [*Scaevola sericea*] and malpari [*Pongonia glabra*] and bulangan trees [*Gmelina villosa*], and branches of them were strewed about. On the other side of the river nothing was seen, but mangrove trees and jeraja. There was not a spot of good land, except a place ten fathoms wide, the rest was a mud flat except the hills. There was a large hill at the end of the mouth of the Singapore river (translation from Abdullah in Buckley 1965:62 with reference to Ridley 1922-1925).

Cooking Sites

Molluscs are an essential protein source for coastal inhabitants of Southeast Asia. Orang Laut traditionally exploited molluscs, and molluscs continue to be economically important throughout this region. Nearly all of the black sand molluscs are edible species familiar in Southeast Asian markets (Eriambang and Siegar 1995; Nateewathana 1995). Ark shells such as *Anadara granosa* are commonly encountered in prehistoric sites in Southeast Asia. For example, they are displayed at the Terengganu State Museum prehistoric section for East Coast Malaysia, were present at Niah Caves (Medway 1960) as well as the inland site of Gua Sireh in Sarawak (Datan 1993), and are listed for the Kota Cina site in Sumatra (Edwards McKinnon 1984). Nateewasthana (1995) includes in a list of edible molluscs found in west coast Thailand markets the following species also idicated for PHC:

Bivalves:	*Anadara granosa*	**Gastropods:**	*Nerita* sp.
	Anadara nodifera		*Cerithidea obtusa*
	Crassostrea belcheri		*Cerithidea rhizophorarum*
	Crassostrea lugubris		*Telescopium telescopium*
	Saccostrea cucullata		*Strombus canarium*
	Polymesoda erosa		*Polinices didyma*
	Gafrarium divaricatum		*Ellobium aurisjudae*
	Gafrarium tumidum		
	Anomalocardia squamosa		
	Clausinella chlorotica		

Though extensive, this list does not include several commonly consumed species which are traded or consumed directly. Besides numerous edible mangrove species, most of the PHC black sand or reef specimens are large edible species, such as *Strombus canarium*, *Lambis lambis*, *Cymbiola nobilis*, *Tridacna maxima*, and *Hippopus hippopus*. Their presence at PHC suggests exploitation of nearby coral reef flats (Svane 1996) as a food source by earlier inhabitants of this region. It is interesting that *Strombus canarium* is still in demand in Singapore as a food item, but the present supply for Singapore is concentrated on the Indonesian Island of Bintan (Riau) (Eriambang and Siregar 1995). Extensive exploitation of giant clams for food and shell use has contributed to their decline throughout the Indo Pacific region. *Cymbiola nobilis* and *Lambis lambis*, though once common to Singapore, are now threatened by habitat degradation and collection for food and marine ornamental trade (Ng 1995).

There is evidence for exploitation of turtle meat at the PHC site. In contemporary Malay coastal kampungs, turtle eggs are a valued protein source considered a delicacy and thought to be imbued with aphrodisiac powers. Although turtle meat is also relished and also considered aphrodisiac, Malays of the Islamic religion avoid turtle meat for religious reasons (Siow and Moll1982). However, this exclusion of turtle meat in the diet would not be characteristic of the Orang Laut or pre-Islamic Malays of this region for whom hunting sea turtles was part of the subsistence strategy. Chinese traders in the region would also have been apt to exploit turtle meat.

Within the black sand vertical spits were concentrated regions of charred soil containing

charred mollusc and faunal bone. The extensiveness and uniformity of the black sand does not suggest fire as the causative agent of this matrix; whereas the concentrated regions of charred faunal material suggest isolated cooking sites within this matrix. Analysis of the black sand would answer many questions concerning the nature and origin of this matrix, especially delineating the influence of successive mangrove deposition of organically rich detrital sediments, silting derived from river run-off of burnt forests and fields, other pollutants introduced from human activity, and source rock or volcanic deposition (Pitts 1992, Rahman 1992, Virdy and Gupta n.d.).

Change in cooking sites over time is suggested from the concentrated regions of charred fauna (Tables 3a, 3b, 6a, 6b). Square 1 and Square 14, sites further from the river, were a focus of charred faunal material from the deeper vertical spits. Squares 8 and 11, sites closer to the river, were a focus of charred and edible fauna from the upper spits. [It should be noted that many of the edible mollusc species would be boiled rather than charred.]

Some wood fragments appear to have been used for cooking fires. Some charcoal fragments may represent coal fragments or remnants of controlled fires. There are historical accounts of a fire destroying a Malaysian outpost on the Singapore River in 1613 (Ng 1994). Nonetheless, the concentrated regions of charred faunal material are more indicative of cooking sites than of a general holocaust. The papery bark of the Gelam tree, *Melaleuca leucodendron*, is traditionally used for starting fires (Ridley 1922-1925), and because of proximate location may represent some of the charred plant material present at PHC.

Relating the above information to the known history of settlement along the Singapore River suggests that many of the black sand faunal specimens represent pre-English settlement at the site. Although there was only a small Malay kampung near the site in 1819 together with boats of the Orang Laut and a very limited presence of Chinese cultivators, in previous centuries there was more extensive native trade at the site. Archaeological investigation at the PHC site by Dr. Miksic and Dr. Borrel-Seidel indicates that the black sand unit contained numerous ceramic artifacts related to the Yuan Dynasty (A.D. 1279-1368) and Ming Dynasty (A.D. 1368-1644) of China and coins extending to the T'ang Dynasty (A.D. 618-907) of China, with one coin indicating an early Ceylon interaction (Miksic 1998: PHC site report). This information supports a hypothesis by Miksic that Singapore was the centre of a local trade network in the fourteenth century. From a previous archaeological excavation at Fort Canning, Miksic et al. (1994) discern from the nature of glass beads recovered a decided emphasis on Chinese trade influence during this time period in Singapore. "During the fourteenth century Singapore probably provided the point at which Chinese glass beads and vessels, and ceramics were received from China and sent on to the Pulau Tujuh in exchange for sea products gathered locally" (Miksic et al 1994: 46).

There are additional clues from fragmented bits of historical information which suggest a long-established human occupation of the site. As far back as the third-century a Chinese account refers to Singapore as Pu-luo-chung or island at the end of a peninsula. By the mid-fourteenth century Singapore was referred to in the Javanese *Nagarakretagama* as Temasek or Sea Town, and by some time in the late fourteenth or early fifteenth century, its Sanskrit name, Singapura, was in use. Remnants of a sandstone stele which once stood at the mouth of the Singapore River bear characters written in a script similar to that used in Sumatra in the pre-Islamic period; the date of this inscription is not yet known. . In the early fifteenth century, Singapore was near the route of an influx of voyages from representatives of the Ming Dynasty in China which abruptly ceased in 1433, having extended to Melaka, Srilanka, and Africa. In 1613 the Portuguese reported burning down a Malay outpost at the mouth of the Singapore River. In 1819 Sir Stamford Raffles established a trading post at the mouth of the Singapore River and subsequently, as notedpreviously, relocated the original residents. Between 1820 and 1860 Singapore was transformed from a small fishing kampung into a major trading base in the East (Buckley 1965; Purcell 1965; Courtenay 1972; Ng 1994).

This historical outline suggests that the fauna and cooking sites excavated in the black sand region better correspond with pre-1819 rather than post-1819 settlement patterns and activity at the PHC site. Reasonable associations with Malay kampung lifestyles and subsistence strategies,

indigenous Orang Laut exploitations, and temporary regional trader living sites are indicated.

Non-Food Use

In addition to their established use as a food source, several representatives of the PHC fauna are valued for other purposes by regional populations (Bussarawit 1995). For example, *Chicoreus capucinus* is a source for a prestigious purple dye, Tyrian purple (Tan and Ng 1988) [Carnivorous members of the family Muricidae release purpura to induce paralysis in their victims]. The top shell, *Trochus niloticus* is harvested for mother-of-pearl. Large Tridacnid clams are exploited for ornamental reasons or as roofing tiles (Pringgenies et al 1995). Ark shells, such as *Anadara granosa*, are a source of lime for combining with the Areca nut involved in the custom of chewing betel nut (Datan 1993). Among the vertebrates, otter and leopard cat were sometimes kept as pets. Malay fishermen are known to train the small-clawed otter to catch fish. Bones and organs of the leopard cat are sometimes used in Chinese medicine as well as deer antler. Turtle oil has been used as a fuel source for lamps or for varnishing boats. Turtle eggs have in the past and continue to be sought for their alleged aphrodisiac and beautifying properties. Shark fins, turtle meat and eggs, and sea snake gall bladders are believed to be imbued with aphrodisiac and medicinal powers and prized by Orientals for these purposes (Dunson 1975, Lekagul and McNeely 1977, Chan and Liew 1991, Ng 1995).

Cultural Unity

The PHC site in Singapore forms a geographical unit physically and culturally with the east coast of Malaysia and the South China Sea. Along the peninsular east coast of Malaysia, river mouths are characterized by "kuala" settlements originally settled by semi-sedentary fishing tribes or sea nomads, the Orang Kuala or people of the river mouths. Prehistorically, the south bank of the river was a favored kuala settlement site for Malay fisherman, but as trade grew, Chinese settlements usually dominated the south bank and Malay kampungs migrated to the north bank (Airriess 1984). This situation was altered at Singapore. Historical accounts indicate that the south shore of the Singapore river was largely uninhabitable mangrove swamp, and did not become a Chinese settlement until the 19th century when Raffles ordered the swamp filled in and specifically designated it a region for Chinese settlement and a resettlement region for the Malay kampung. Another factor contributing to limited development along the Singapore River prior to English settlement was the piratical activity of Orang Laut in nearby straits, which successfully deterred extensive commerce in Singapore by compelling avoidance of the straits (Buckley 1965, Courtenay 1972).

Visits by the author in 1996 to Malay kuala kampungs on the north shore of the Terengganu River and Dungun River in Malaysia were informative as to earlier cultural patterns in Singapore before its expansion to a large trading port. Access to these kampungs is usually by small boats which provide avenues for frequent commerce between the north and south settlements. Typically, the Malay settlement is a fishing village, and there is a concentration of activity related to maintaining nets, boats, and drying, cooking and preserving fish. Chickens are a familiar site around the houses. Domestic mammals such as goat and cattle are evident. At Dungun, children had adopted an abandoned baby otter.

Important nesting grounds for large marine turtles, such as the leatherback and green turtle, are in close proximity to these kampungs. Although turtle meat is avoided as a consequence of the introduction of Islam in this region, a custom of eating turtle eggs is entrenched. Attempts to stop the collection of eggs on nesting beaches for environmental and endangered species concerns has met with resistance and not total compliance (Siow and Moll 1982). Marine turtle eggs are still sold in east coast Malaysian markets

Pre-historic evidence for bone at the PHC site in Singapore suggests a significant rodent presence, a situation not uncommon for coastal villages of the South China Sea and consistent with a

written report of an 1819 “war on rats” in Singapore translated from the Autobiography of Abdullah:

> A plague of rats set in at this time, and they are described as very large ones, which used to attack cats and get the better of them. Major Farquhar, as they became quite unbearable in his tent, offered a reward of one anna for each dead rat, and every morning the people came, some with 50 or 60, and some with 6 or 7....After this, great numbers of centipedes appeared, and stung people, so Major Farquhar paid for them also, and they gradually diminished (Buckley 1965: 53).

The Terengganu State Museum displays artifacts from archaeological excavations of East Malaysia. Typically, the displays include samples of the mollusc *Anadara granosa* and numerous Chinese coins similar to those excavated in Singapore.

Taphonomic Considerations

The preservative qualities of a calcium carbonate matrix provided by mollusc shells has been documented in subtropical prehistoric sites (e.g. Lewis 1995, 1997). The PHC excavation provides evidence for what bones are apt to preserve in a shell matrix in a tropical environment. Collection bias and taphonomic considerations have to be considered for the absence of numerous snakes, lizards, amphibians, and small birds.

Bone elements of shark or ray present. Although shark and ray have a cartilaginous skeleton, vertebrae of shark and ray do preserve. A shark tooth is present. Spines of ray are present.
Bone elements of fish present. Vertebral elements are prevalent. Robust sections of skull bones such as the quadrate, maxilla, premaxilla, dentary, preopercula, ceratohyal, and prevomer are apt to preserve. Pterygiophores (fin spine supports) and fin spines are present.
Bone elements of reptiles present. The ulna of large marine turtles is apt to preserve. There is one femur fragment from a large marine turtle. Carapace and plastron fragments from varied sizes of turtles are common. There is minute representation of reptilian epidermal scales.
Bone elements of birds present. Long bone fragments of chicken are common. Leg bones present are apt to be tibiotarsus, tarsometatarsus, femur, or phalanges, especially distal phalanges. Wing elements present are apt to be coracoid, scapula, humerus, radius, ulna, or carpometacarpus.
Bone elements of mammals present. Rodents are represented mainly by incisor teeth and bones of the lower extremity (pelvis, femur, tibia). Primates and otter are represented by teeth. Cat is represented by leg bones. Artiodactyla [*Sus* species (pig) and Cervidae (deer) or *Bos* species (cattle)] are represented by teeth and long bone fragments such as tibiae, metapodials, and phalanges. A few rib fragments of large mammals are present.

Looking at how accurately the test trenches predicted the results of this study, it can be seen that although test excavations predicted two of the important molluscan indicator species, Ostreidae and *Cymbiola nobilis*, the most prevalent and indicative species, *Anadara granosa*, was not retrieved in test excavations. For vertebrates, representative bone from shark, fish, turtle, bird, and large mammal was retrieved from the test trenches. However, bone of specific indicator vertebrate species, such as rat, pig, and chicken, was not recovered from the test trenches.

CONCLUSIONS

Evidence for charred fish and turtle bone, for the dominant presence of large edible mangrove and estuarine molluscs (some charred), and the dominant representation of domestic bird and mammal species or other commensal vertebrate fauna associated with human habitation, such as chicken, rat, cat, and pig, suggests human presence at the PHC site co-incident with the cultural artifacts recovered.

Coral reef mollusc species and fish, shark, ray, and sea turtle probably represent exploitation of a proximate marine source. Historical reference suggests that the fauna and cooking sites excavated in the black sand vertical unit are more indicative of pre-1819 rather than post-1819 subsistance and settlement patterns and activity at the PHC site. Reasonable associations with Malay kuala kampungs, indigenous Orang Laut exploitations, and temporary regional Chinese trader living sites are indicated. Tropical rainforest vertebrate species indicative of Singapore were not commonly recovered. One species not previously recorded for Singapore, *Rucervus eldii*, the brow-antlered deer, is provisionally identified. The black sand matrix encountered at the site might be the result of repeated detrital depositions in mangrove coastal flats. Alternatively, this matrix could represent post-1819 rapid extensive silting from rainforest destruction and burning or staining from pollutants. The PHC site is an example of archaeobiological preservation in a tropical setting in which a prevalence of calcium carbonate from mollusks is present in the matrix. In general, the PHC site organic material largely reflects an estuarine, mangrove ecosystem and a human subsistance system based on exploitation of present and proximate resources. Thus, both the natural environment and the exploited environment are represented. The proportionate contribution of domestic or commensal species juxtaposed with cultural artifacts and the known history of the site suggests human procurement patterns focused on the surrounding natural environment. Knowledge of the current endangered status for several of the molluscs and vertebrate species represented at PHC highlight the significant alteration and over-exploitation of this former natural environment of Singapore.

ACKNOWLEDGMENTS

The Singapore National Heritage Board sponsored the PHC archaeological project and the National Parks Board provided working facilities. I thank Dr. John Miksic of the National University of Singapore Southeast Asian Studies Programme and Archaeologist in charge of the PHCexcavation for granting access to the material studied. Dr. Brigette Borell assisted with the original excavation and along with student and civic volunteers, especially Lise G Young Lai of the Southeast Asian Ceramic Society, Karen Chin, Mohamed Faizal Mohamed bin Salim, and Anthea Whelan provided on-going assistance in separating organic material from non-organic material. I am grateful to Mrs. Yang Chang-Man for granting access to the Zoological Reference Collection at National University of Singapore. Kalvin Lim Kok Peng and Lua Hui Kheng were especially helpful in facilitating access to specimens in the NUS collection. Dr. L. Smith, herpetologist at the Museum of Western Australia, provided access to a Green turtle skeletal specimen, and other personnel at Museum of Western Australia provided preview of comparative material within their collection. Dr. Anthony Lewis, visiting Senior Fellow, Department of Geography, National University of Singapore, provided on-going technical and monetary support. Dr. Martin Perry, Department of Geography, National University of Singapore, generously granted use of his personal computer. I thank Dr. Anthony Greer, Department of Geography, National University of Singapore, for discussions on the fauna of Singapore. I thank Dr. Russell Ciochon, Department of Anthropology, University of Iowa, for advice on a fossil tooth and Dr. Christoph Schubart, Department of Biology, University of Southwestern Louisiana, for advice on an enigmatic marine fossil. Comparative collections at Louisiana State University Museum of Natural Science, the LSU School of Veterinary Medicine and the Department of Biology, University of Southwestern Louisiana, were utilized for follow-up research..

BIBLIOGRAPHY (entries marked with an asterisk are cited in the text)

*Abbott RT (1991) Seashells of Southeast Asia. Singapore: Graham Brash (Pte) Ltd.

*Airriess CA (1984) Kuala Settlements on the East Coast of Peninsular Malaysia: Site and Situation. MA Thesis, Department of Geography and Anthropology, Louisiana State University, Baton Rouge, Louisiana.

Allen GR, and Robertson DR (1994) Fishes of the Tropical Eastern Pacific. Honolulu: University of Hawaii Press.

Allen GR and Steene R (1994) Indo-Pacific Coral Reef Field Guide. Singapore: Tropical Reef Research.

Barry J (1996) Palau Saigon: A rescue site on the Singapore River (1988/89). Unpublished report on file with Dr. John Miksic, Southeast Asian Studies Programme, National University of Singapore.

*Benny A, Venmathimaran BA, and Ayyakkannu K (1996) Food and feeding habits of *Hemifusus pugilinus* (Gastropoda: Melongenidae). Phuket Marine Biological Center Special Publication 16:273-278.

Bernard FR, Ying-Ya Cai, and Morton B (1993) Catalogue of the Living Marine Bivalve Molluscs of China. Hong Kong: Hong Kong University Press.

*Boncka FB, Ompi M, and Andaki AP (1994) Occurrence of the common spider shell, *Lambis lambis* (L.) (Gastropoda:Strombidae) in the intertidal zone of Karatung,Sangihe Island, Indonesia. Phuket Marine Biological Center Special Publication 13:159-161.

*Briffett C (1986) A Guide to the Common Birds of Singapore. Singapore: Singapore Science Center.

*Buckley CB (1965) An Anecdotal History of Old Times in Singapore, Vols. 1-2. Kuala Lumpur: University of Malaya Press (with permission from Fraser @ Neave, Ltd.,Singapore).

*Bussarawit S (1995) The market value of rare and common molluscs, Phuket Island, Thailand. Phuket Marine Ciological Center Special Publication. 15:35-38.

*Chan EH, and Liew HC (1989) The Leatherback Turtle: A Malaysian Heritage. Kuala Lumpur, Malaysia: Tropical Press Sdn. Bhd.

Chou LM (1988) A Guide to the Coral Reef Life of Singapore. Singapore: Singapore Science Center.

*Corbet GB, and Hill JE (1992) The Mammals of the Indomalayan Region: A Systematic Review. New York: Oxford University Press.

*Corlett R (1992) The changing urban vegetation. **In** A Gupta and J Pitts (eds.): Physical Adjustments in a Changing Landscape: The Singapore Story, pp. 190-214. Singapore: Singapore University Press.

*Courtenay PP (1972) A Geography of Trade and Development in Malaya. London: G.Bell & Sons, Ltd.

*Datan I (1993) Archaeological excavations at Gua Sireh (Serian) and Lubang Angin (Gunung Mulu National Park), Sarawak, Malaysia. The Sarawak Museum Journal, Vol. XLV, No. 66 (New Series), Special Monograph No. 6.

Dharma B (1988) Siput dan kerang Indonesia (Indonesian Shells I). Jakarta: PT Sarana Graha.

Dharma B (1992) Siput dan kerang Indonesia (Indonesian Shells II). Wiesbaden, Germany: Verlag Christa Hemmen. Distributed by PT Sarana Graha, Jakarta, Indonesia.

Dudgeon D (1980) A comparative study of the Corbiculidae of Southern China. **In** B. Morton (editor): The Malacofauna of Hong Kong and Southern China, pp. 37-60. Hong Kong: Hong Kong University Press.

*Dunson WA (1975) The Biology of Sea Snakes. Baltimore: University Park Press.

*Edwards McKinnon E (1984) Kota Cina: Its Context and Meaning in the Trade of Southeast Asia in the Twelfth to Fourteenth Centuries, Volumes 1 and 2. Ph.D dissertation. New York: Cornell University.

*Ernst CH, and Barbour RW (1989) Turtles of the World. Washington D.C.: Smithsonian Institution Press.

*Eriambang T, and Siregar YI (1995) Ecological aspects and marketing of dog conch *Strombus canarium* Linné, 1758 at Bintan Island, Sumatra, Indonesia. Phuket Marine Biological Center Special Publication 15:129-131.

Fleagle JG (1988) Primate Adaptation and Evolution. San Diego: Academic Press.

Gans C, and Parsons TS (1973) Biology of the Reptilia, vol. 4, Morphology D. New York: Academic Press.

Gilbert BM (1993) Mammalian Osteology. Columbia: Missouri Archaeological Society.

Harrison J (1966) An Introduction to Mammals of Singapore and Malaya. Singapore: Malayan Nature Society, Singapore Branch.

Harrisson T (1960) Niah Cave oyster shell. Sarawak Museum Journal 9(15-16):380-381 (Note).

Harrisson T, and Medway L (1962) A first classification of prehistoric bone and tooth artifacts. Sarawak Museum Journal 10(19-20):335-362.
Hill DS (1980) The Neritidae (Mollusca: Prosobranchia) of Hong Kong. **In** B. Morton (editor): The Malacofauna of Hong Kong and Southern China, pp. 85-99. Hong Kong: Hong Kong University Press

Hill JE (1960) The Robinson collection of Malaysian mammals. Bulletin of the Raffles Museum 29:5-112

Hillson S (1996) Mammal Bones and Teeth: An Introductory Guide to Methods of Identification. London: University College London, Institute of Archaeology.

Hylleberg J (1994) Indo-Pacific cockles (Bivalvia:Cardiidae). Part 1. Generic diagnosis and an overviewof species with mention of taxonomic problems encountered in Thailand. Phuket Marine Biological Center Special Publication 13: 113-136.

*Johnson RH (1978) Sharks of Tropical and Temperate Seas. Singapore: Times Editions Pte Ltd.

*Kuiter RH (1993) Coastal Fishes of South-Eastern Australia. Honolulu: University of Hawaii Press.

*Lekagul B, and McNeely JA (1977) Mammals of Thailand. Bangkok: Association for the Conservation of Wildlife.

*Lewis BA (1995) Paleoecological aspects of a LateWisconsinan aquatic mollusk assemblage associated with mastodon bone recovered from the North Fork of Ward Creek, Baton Rouge, Louisiana. Tulane Studies in Geology and Paleontology. 28(3):57-81.

*Lewis BA (1997) Tchefuncte use of animal bone with inferences for Tchefuncte culture, ritual, and animal cosmologies. Louisiana Archaeology. 22:31-70.

Li Fu-xie and Gao Shi-he (1983) The ground-dwelling molluscan faunas of mangrove swamps in Hong Kong and Xiamen. **In** B. Morton and D. Dudgeon (editors): The Malacofauna of Hong Kong and Southern China II, pp. 449-455. Hong Kong: Hong Kong University Press.

Lovett DL (1981) A guide to the Shrimps, Prawns, Lobsters, and Crabs of Malaysia and Singapore. Occasional Publication No. 2. Serdang, Selangor, Malaysia: Universiti Pertanan Malaysia, Faculty of Fisheries and Marine Science.

*McKenna MC, and Bell SK (1997) Classification of Mammals Above the Species Level. New York: Columbia University Press.

McLelland J (1990) A Colour Atlas of Avian Anatomy. London: Wolfe Publishing Ltd.

*Medway L (1960) Niah shell1954-8. Sarawak Museum Journal 9 (15-16):368-379.

*Medway L (1969) The Wild Mammals of Malaya and Offshore Islands Including Singapore. London: Oxford University Press.

*Middlefart P (1996) Egg crystals and early development of ten muricid gastropods from the Thai waters. Phuket Marine Biological Center Special Publication 16:103-130.

*Miksic JN (1998) Singapore Parliament House Complex (PHC) and Empress Place (EMP) archaeological excavations: Site reports.

*Miksic, JN (2013) *Singapore and the Silk Road of the Sea.* Singapore: NUS Press.

*Miksic JN, Yap CT, and Hua Younan (1994) Archaeology and early Chinese glass trade in Southeast Asia. Journal of Southeast Asian Studies. 25:31-46.

Moyle PB, Cech, Jr., JJ (1996) Fishes: An Introduction to Icthyology. Upper Saddle River, New Jersey: Prentice Hall, Inc./Singapore: Simon & Schuster, Asia Pte Ltd.

*Nateewathana A (1995) Taxonomic account of commercial and edible molluscs, excluding cephalopods, of Thailand. Phuket Marine Biological Center Special Publication 15:93-116.

*Ng PKL and Wee YC, editors (1994) The Singapore Red Data Book. Threatened Plants and Animals of Singapore. Singapore: The Nature Society (Singapore).

*Ng PKL, editor (1995) A Guide to the Threatened Animals of Singapore. Singapore: Singapore Science Center.

*Ng PS, editor (1994) Singapore Facts and Figures 1994. Singapore: Ministry of Information and the Arts.

*Oh J (1996) Impressions of the past: 19th century prints of Singapore. Talk presented to Friends of the Museum, October 21, 1996. Singapore Museum of History.

Oliver PG (1992) Bivalved Seashells of the Red Sea. Cardiff: National Museum of Wales.

Olsen SJ (1979) Osteology for the Archaeologist. Papers of the Peabody Museum of Archaeology and Ethnology Vol 56, Nos. 3,4,5.

Cambridge: Harvard University.

*Payne J, Francis CM, and Phillipps K (1985) A Field Guide to the Mammals of Borneo. Kuala Lumpur: The Sabah Society with World Wildlife Fund Malaysia.

*Pitts J (1992) Landforms and geomorphic evolution of the islands during the quaternary. **In** A Gupta and J Pitts (eds.): Physical Adjustments in a Changing Landscape: The Singapore Story. Singapore:Singapore University Press. Pp. 83-143.

Polovina JJ and Ralston S (eds.) (1987) Tropical Snappers and Groupers: Biology and Fisheries Management. Boulder, Colorado: Westview Press.

Polunin NVC, and Nuitja NS (1981) Sea turtle populations of Indonesia and Thailand. **In** K.A. Bjorndel (ed.) Biology and Conservation of Sea Turtles. Washington D.C.: Smithsonian Institution Press.

Porter KR (1972) Herpetology. Philadelphia: W. B. Saunders.

*Pringgenies D, Suprihatin J, and Lazo L (1995) Spatial and size distribution of giant clams in the Karimunjawa Islands, Indonesia. Phuket Marine Biological Center Special Publication 15:133-135.

Pritchard PCH (1967) Living Turtles of the World. Jersey City, New Jersey: T.F.H. Publications, Inc.

Pritchard (1979) Taxonomy, evolution, and zoogeography. **In** M. Harless and H. Morlock, (eds.): Turtles:Perspectives and Research. New York: John Wiley, pp. 1-42.

Purcell V (1965) Malaysia. New York: Walker and Company.

*Rahman A (1992) Soil of Singapore. **In** A Gupta and J Pitts (eds.): Physical Adjustments in a Changing Landscape: The Singapore Story. Singapore: Singapore University Press. Pp. 144-189.

Reid DG (1986) The littorinid molluscs of mangrove forests in the Indo-Pacific region: The genus Littoraria. London: British Museum (Natural History) Publication No. 978.

*Ridley HN (1922-1925) The Flora of the MalayPeninsula., Vols. I-V. London: L. Reeve &Co., Ltd.

Rojo AL (1991) Dictionary of Evolutionary Fish Osteology. Boca Raton, Florida: CRC Press, Inc.

*Rondo M (1994) Coexisting species of *Anadara* in coastal waters of Sangihe Island, North Sulawesi. Phuket Marine Biological Center Special Publication 13:167-168.

*Savage VR (1992) Landscape change: From kampung to global city. **In** A Gupta and J Pitts (eds.): Physical Adjustments in a Changing Landscape: The Singapore Story. Singapore: Singapore University Press. Pp. 5-31.

*Siow KT, and Moll EO (1982) Status and conservation of estuarine and sea turtles in West Malaysian waters. **In** K. A. Bjorndal (ed.): Biology and Conservation of Sea Turtles. Washington D.C.: Smithsonian Institution Press. Pp. 339-347.

Soekendarsi E, and Santosa S (1995) Gastropoda from fish ponds along mangrove areas, Bone Gulf, South Sulawesi, Indonesia. Phuket Marine Biological Center Special Publication 15:127-128.

*Svane I (1996) Some recent advances in studies on the biology of giant clams (Tridacnidae). Phuket Marine Biological Center Special Publication 16:221-241.

*Tan LWH, and Ng PKL (1988) A Guide to Seashore Life. Singapore: Singapore Science Center.

Tikader BK, and Sharma RC (1985) Handbook of Indian Testudines. Calcutta: Zoological Survey of India.

Tweedie MWF (1978) Mammals of Malaysia. Kualu Lumpur: Longman Malaysia SDN. Berhad.

*Virdy M and Gupta A (n.d.) Late Quaternary offshore sedimentation, Singapore. Unpublished manuscript, Singapore: National University of Singapore, Department of Geography.

*Vongpanich V (1996) The Arcidae of Thailand. Phuket Marine Biological Center Special Publication 16:177-192.

Widdowson E (1995) Chapter 4, Environment and subsistence. **In** PR Rogers, N Leininger, S Mirchandani, J Van Den Bergh, E Widdowson (contributors): Tung Wan Tsai: A Bronze Age and Han Period Coastal Site. Antiquities and Monuments Office, Occasional Paper No. 3, pp. 45-66. Hong Kong: Government of Hong Kong.

Wilson B (1993) Australian Marine Shells. Volume 1. Kallaroo, Australia: Odyssey Publishing.

Wilson B (1994) Australian Marine Shells. Volume 2. Kalaroo, Australia: Odyssey Publishing.

*WoRMS Editorial Board (2023). World Regiester of Marine Species. Available from https://www.marinespecies.org at VLIZ. Accessed

2023-08-23.doi:10.14284/170.

Zangerl R, Hendrickson LP, and Hendrickson JR (1988) A Redescription of the Australian Flatback Sea Turtle, *Natator depressus*. Bishop Museum Bulletin in Zoology 1. Honolulu: Bishop Museum Pre

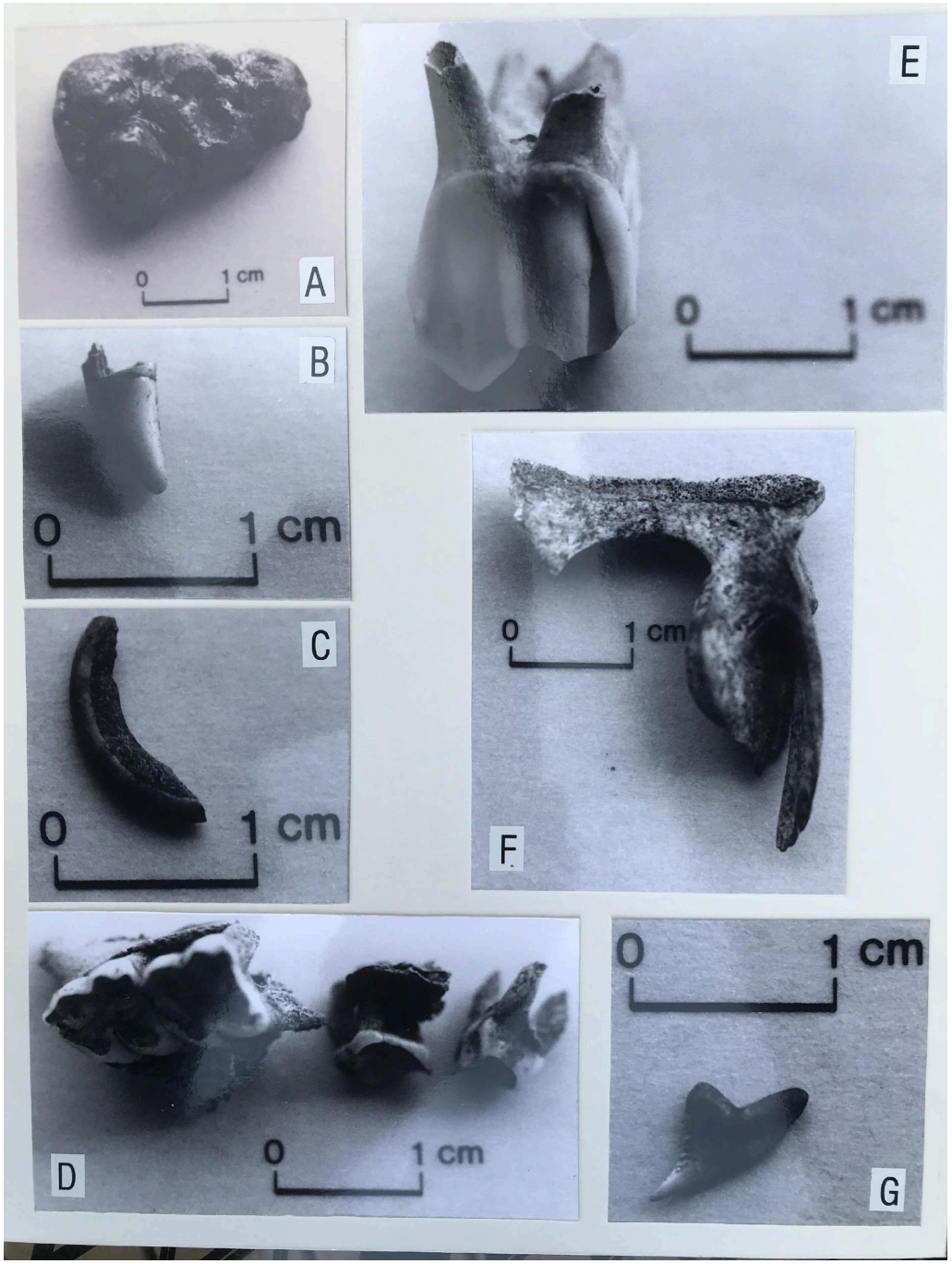

Figure 1. Examples of PHC vertebrate teeth.
A. Artiodactyla, upper third molar, Pig, *Sus scrofa*.
B. Carnivora, upper canine, cf. Oriental small-clawed otter, *Aonyx cinerea*.
C. Rodent, e.g., lower incisor, cf. Roof rat, *Rattus rattus*.
D. Primate, molars and premolars, cf. Crab-eating macaque, *Macaca fascicularis*.
E. Artiodactyla, molar, e.g., cf. Brow-antlered deer, *Rucervus eldii*.
F. Osteichthyes, premaxilla with dermal plates for tooth sockets, cf. *Lutjanus* sp.
G. Chondrichthyes, serrated tooth, upper jaw, cf. Silky shark, *Carcharhinus falciformis*.

Table 1 (1a, 1b, 1c): Malacofauna of the Parliament House Complex (PHC) Excavation.

The following codes are employed:

NISP	Number of Identified Specimens Present		
MNI	Minimum Number of Individuals		
*	Surface Unit (Light Brown Sandy Mud)		
**	Sub-surface Unit (Black Sand)		
†	Codes for Habitat:	est	estuary
		man	mangrove
		cor	coral reef
		srf	sandy reef
		int	intertide
		sti	subtide, sublittoral
		ati	above tide
		mud	mud
		san	sand
		smu	sandy mud
		roc	rock
		shw	shallow water
		osh	off shore
‡	Based on % of MNI within excavation unit. Those not listed are less than 1%.		

Table 1a. Mollusca of the PHC excavation with indication of location*, habitat†, NISP, and MNI.

	FAMILY	GENUS/SPECIES (cf. = compares favourably with)	HABITAT	NISP	MNI
	Class Bivalvia				
**	Ostreidae	cf. *Crassostrea* sp. [e.g. *C. belcheri, C. gigas, C. lugubris*] and some cf. *Saccostrea* sp. ? *cucullata*	est/man/roc	471	95
*	Isoognomonidae	cf. *Isognomon* sp.	roc/man/shw	4	3
**	Arcidae	cf. *Anadara granosa*, ?some *A. nodifera*, *A. pilula*	shw/mud	1035	304
**		cf. *Anadara uropigimelana*	shw/smu/sti	(1)	(1)
**		cf. *Barbatia decussata*	shw/mud	113	38
*		cf. *Barbatia fusca*	roc/int	2	2
*		cf. *Acar plicata*	roc/cor/int	3	3
*	Noetiidae	cf. *Striarca* sp.	roc/cor	6	5
**	Tridacnidae	cf. *Tridacna maxima*	cor/shw	62	29
**		cf. *Tridacna* sp. (giant clam)	cor/shw	2	2
**		cf. *Hippopus hippopus*	cor/shw	25	16
**	Corbiculidae	cf. *Polymesoda erosa*	est/man/mud	8	1
**	Veneridae	cf. *Periglypta* sp. (large mud/sand clam)	est/mud/san/int	127	38
**		cf. *Gafrarium* sp.	shw/int	29	18
**		cf. *Gafrarium tumidum*	shw/san/int	23	13
*		cf. *Clausinella chlorotica*	shw	16	9
*		cf. *Anomalocardia squamosa*	mud/int	18	14
*	Tellinidae	cf. *Tellina* sp.	shw/smu	10	10
*	Cardiidae	cf. *Cardium impolitum*	est	145	82
*		cf. *Fragum fragum*	shw	9	7
*		cf. *Vepricardium* sp.	shw/mud	1	1
*	Corbulidae	cf. *Corbula truncata*	shw/san	1	1
	TOTAL BIVALVIA			**2111**	**692**
	Class Gastropoda				
*	Trochidae	cf. *Umbonium vestiarium*	smu/shw	7734	7733
**		cf. *Trochus niloticus*	shw/int/sti/reef	44	6
**		cf. *Euchelus quadricarinatus*	roc/sti	3	2
*		cf. *Clanculus* sp.	roc/cor/int/sti	1	1
**	Neritidae	cf. *Nerita balteata*	man/roc/int	7	6
**		cf. *Nerita* sp. , ?*N. balteata/N. costata*	man/roc/int	5	5
*		cf. *Clithon* (*Neritina*) *oulaniensis*	man/int/shw/est	25	25
*	Littorinidae	cf. *Littoraria lutea*	man/int	1	1
*		cf. *Nodilittorina pyramidalis*	roc/ati/int	1	1
*	Turritellidae	cf. *Turritella terebra*	mud/san/cor/sti	13	13
*	Vermetidae	cf. *Serpulorbis* sp.	cor/roc/int	1	1
*	Potamididae	cf. *Cerithidea* sp. (small form)	man/mud	531	512
**		cf. *Cerithidea* sp., (e.g. C. *cingulata/C. rhizophorarum*)	man/mud	5	5
**		cf. *Cerithidea obtusa*	man/mud	3	3

**		cf. *Telescopium telescopium*	man/mud	13	10
**	Cerithiidae	cf. *Rhinoclavis aspera*	san/cor/sti	1	1
*		cf. Clypeomorus batillariaeformis	man/est	2	2
*	Xenophoridae	cf. *Stellaria solaris*	osh	1	1
**	Volutidae	cf. *Cymbiola nobilis*	srf	76	65
**	Strombidae	cf. *Strombus canarium*	smu/cor/shw/int	38	35
**		cf. *Lambis lambis*	cor/shw/int/sti	39	22
**	Cypraeidae	cf. *Cypraea* sp.	shw/cor	1	1
*	Naticidae	cf. *Polinices didyma*	san/mud/shw	1	1
		cf. *Natica* sp. (small form)	san/shw	5	5
**	Cerithiopsidae	cf. *Seila* sp.	(sponge)	10	10
**	Ellobidae	cf. *Ellobium aurisjudae*	man/mud/int	2	1
**	Ficidae	cf. *Ficus gracilis*	osh	1	1
**	Muricidae	cf. *Chicoreus capucinus*	man/roc/int	28	28
**		cf. *Thais kieneri*	man/roc/int	2	2
**	Melongenidae	cf. *Melongena pugilina,* *Pugilina cochlidium*, *Hemifusus pugilina*)	man/mud/shw/int/sti	45	43
*	Melongenidae	cf. *Volema paradisaca*	osh	3	3
*	Nassariidae	cf. *Nassarius distortus*	shw	1	1
*		cf. *Nassarius quadrasi*	cor/san	2	2
**		cf. *Nassarius globosus*	mud/int	1	1
*	Olividae	cf. *Oliva oliva*	san/int	1	1
*	Costellaridae	cf. *Vexillum radix*	cor/sti	4	4
*		cf. *Vexillum* sp.	sti	1	1
*		cf. *Vexillum curviliratum*	sti	1	1
*	Pyramidellidae	cf. *Otopleura auriscati*	shw/cor	1	1
	TOTAL GASTROPODA			**8654**	**8557**
	Class Scaphopoda				
*	Dentaliidae	cf. *Dentalium pseudohexagonum*	sti	37	32
	TOTAL SCAPHOPODA			**37**	**32**
	TOTAL IDENT. MOLLUSCA			**10802**	**9281**
	Unidentified			3006	
	TOTAL MOLLUSCA			**13808**	
	CORAL			421	
	ASSEMBLAGE TOTAL			**14229**	

Table 1b. **Mollusca characteristic of the PHC surface excavation unit (light brown sandy mud) with indication of habitat, NISP, MNI, and percent MNI within excavation units.**

FAMILY	GENUS/SPECIES	HABITAT†	NISP	MNI	%[1]
Class Bivalvia					
Isognomonidae	cf. *Isognomon* sp.	roc/man/shw	4	3	
Arcidae	cf. *Barbatia fusca*	roc/int	2	2	
	cf. *Acar plicata*	roc/cor/int	3	3	
Noetiidae	cf. *Striarca* sp.	roc/cor	6	5	
Veneridae	cf. *Clausinella chlorotica*	shw	16	9	
	cf. *Anomalocardia squamosa*	mud/int	18	14	
Tellinidae	cf. *Tellina* sp.	shw/smu	10	10	
Cardiidae	cf. *Cardium impolitum*	est	145	82	1%
	cf. *Fragum fragum*	shw	9	7	
	cf. *Vepricardium* sp.	shw/mud	1	1	
Corbulidae	cf. *Corbula truncata*	shw/san	1	1	
TOTAL SURFACE BIVALVIA			**215**	**137**	**2%**
Class Gastropoda					
Trochidae	cf. *Umbonium vestiarium*	smu/shw	7734	7733	91%
	cf. *Clanculus* sp.	roc/cor/int/sti	1	1	
Neritidae	cf. *Clithon (Neritina) oulaniensis*	est/man/int/shw	25	25	
Littorinidae	cf. *Littoraria lutea*	man/int	1	1	
	cf. *Nodilittorina pyramidalis*	roc/ati/int	1	1	
Turritellidae	cf. *Turritella terebra*	mud/san/cor/sti	13	13	
Vermetidae	cf. *Serpulorbis* sp.	cor/roc/int	1	1	
Potamididae	cf. *Cerithidea* sp. (small form)	man/mud	531	512	6%
Cerithiidae	cf. *Clypeomorus batillariaeformis*	man/est	2	2	
Xenophoridae	cf. *Stellaria solaris*	osh	1	1	
Naticidae	cf. *Polinices didyma*	san/mud/shw	1	1	
	cf. *Natica* sp. (small form)	san/shw	5	5	
Melongenidae	cf. *Volema paradisaca*	osh	3	3	
Nassariidae	cf. *Nassarius distortus*	shw	1	1	
	cf. *Nassarius quadrasi*	cor/san	2	2	
Olividae	cf. *Oliva oliva*	san/int	1	1	
Costellaridae	cf. *Vexillum radix*	cor/sti	4	4	
	cf. *Vexillum* sp.	sti	1	1	
	cf. *Vexillum curviliratum*	sti	1	1	
Pyramidellidae	cf. *Otopleura auriscati*	shw/cor	1	1	
TOTAL SURFACE GASTROPODA			**8330**	**8310**	**98%**
Class Scaphopoda					
Dentaliidae	cf. *Dentalium pseudohexagonum*	sti	37	32	
TOTAL SURFACE SCAPHOPODA			**37**	**32**	**<1%**

TOTAL IDEN. SURFACE MOLLUSCA			**8582**	**8479**	
Unidentified			1835		
TOTAL SURFACE MOLLUSCA			**10417**		
CORAL			391		
SURFACE ASSEMBLAGE TOTAL			**10808**		

Table 1c. **Mollusca characteristic of the PHC sub-surface excavation unit (black sand region) with indication of habitat, NISP, MNI, and percent MNI within excavation units.**

FAMILY	GENUS/SPECIES (cf. = compares favourably with)	HABITAT†	NISP	MNI	%MNI‡
Class Bivalvia					
Ostreidae	cf. *Crassostrea* sp. (e.g. *C. belcheri, C. lugubris, C. gigas*) and some cf. *Saccostrea cucullata*	est/man/roc	471	95	12%
Arcidae	cf. *Anadara granosa* (?some *A.nodifera, A. pilula*)	mud/shw	1035	304	38%
	cf. *Anadara uropigimelana*	smu/shw/sti	(1)	(1)	
	cf. *Barbatia decussata*	mud/shw	113	38	5%
Tridacnidae	cf. *Tridacna maxima*	cor/shw	62	29	4%
	cf. *Tridacna* sp. (giant clam)	cor/shw	2	2	
	cf. *Hippopus hippopus*	cor/shw	25	16	2%
Corbiculidae	cf. *Polymesoda erosa*	est/man/mud	8	1	
Veneridae	cf. *Periglypta* sp. (large mud/sand clam)	est/mud/san/int	127	38	5%
	cf. *Gafrarium tumidum*	shw/san/int	23	13	2%
	cf. *Gafrarium* sp.	shw/int	29	18	2%
TOTAL SUB-SUR. BIVALVIA			**1896**	**555**	**70%**
Class Gastropoda					
Trochidae	cf. *Trochus niloticus*	shw/int/sti/reef	44	6	1%
	cf. *Euchelus quadricarinatus*	roc/sti	3	2	
Neritidae	cf. *Nerita balteata*	man/roc/int	7	6	1%
	cf. *Nerita* sp. (e.g. *N. balteata/ N. costata*)	man/roc/int	5	5	1%
Potamididae	cf. *Cerithidea* sp. (e.g. *C. cingulata/C. rhizophorarum*)	man/mud	5	5	1%
	cf. *Cerithidea obtusa*	man/mud	3	3	
	cf. *Telescopium telescopium*	man/mud	13	10	1%
Cerithiidae	cf. *Rhinoclavis aspera*	san/cor/sti	1	1	
Volutidae	cf. *Cymbiola nobilis*	srf	76	65	8%
Strombidae	cf. *Strombus canarium*	smu/cor/shw/int	38	35	4%
	cf. *Lambis lambis*	cor/shw/int/sti	39	22	2%
Cypraeidae	cf. *Cypraea* sp.	shw/cor	1	1	
Cerithiopsidae	cf. *Seila* sp.	(sponge)	10	10	1%
Ellobidae	cf. *Ellobium aurisjudae*	man/mud/int	2	1	
Ficidae	cf. *Ficus gracilis*	osh	1	1	
Muricidae	cf. *Chicoreus capucinus*	man/roc/int	28	28	3%
	cf. *Thais kieneri*	man/roc/int	2	2	
Melongenidae	cf. *Melongena pugilina, Pugilina cochlidium, Hemifusus pugilina*)	man/mud/shw/int/sti	45	43	5%
Nassariidae	cf. *Nassarius globosus*	mud/int	1	1	
TOT. SUB-SUR. GASTROPODA			**324**	**247**	**30%**
TOT. SUB-SUR. IDEN. MOLLUSCA			**2220**	**802**	**100%**
Unidentified			**1171**		

TOTAL SUB-SUR. MOLLUSCA			**3391**		
CORAL			30		
SUB-SUR. ASSEMBLAGE TOTAL			**3421**		

Table 2. Inventory of provisional molluscan species recovered at the PHC excavation, 1994-1995. [includes August 2023 addendum to nomenclature as accepted by the World Register of Marine Species (WoRMS)]

Acar plicata (Dillwyn, 1817)	
Anadara granosa (Linnaeus, 1758)	Accepted as > *Tegillarca granosa* (Linnaeus, 1758)
Anadara nodifera von Martens, 1860	
Anadara pilula (Reeve, 1843)	
Anadara uropigimelana (Vincent, 1824)	
Anomalocardia squamosa (Linnaeus, 1758)	Accepted as > *Anomalodiscus squamosus* (Linnaeus, 1758)
Barbatia decussata (Sowerby, 1833)	
Barbatia fusca (Brugière, 1789)	Accepted as > *Barbatia amygdalumtostum* (Röding, 1798)
Cardium impolitum Sowerby, 1840	Accepted > *Acrosterigma impolitum* (G.B. Sowerby II, 1834)
Cerithidea cingulata (Gmelin, 1791)	Accepted as > *Pirenella cingulata* (Gmelin, 1791)
Cerithidea obtusa (Lamarck, 1822) [also cf. *Cerithidea quoyii* (Hombron &Jacquinot, 1848)]	
Cerithidea rhizophorarum A. Adams, 1855	
Chicoreus capucinus (Lamarck, 1816)	Accepted as > *Chicoreus capucinus* (Lamarck, 1822)
Clanculus Montfort, 1810	
Clausinella chlorotica (Philippi, 1849)	Accepted as > *Placamen chloroticum* (R.A. Phillipi, 1849)
Clithon (Neritina) oulaniensis (Lesson, 1831)	Accepted as > *Clithon oualaniense* (Lesson, 1831)
Clypeomorus batillariaeformis Habe & Kosuge, 1966	
Corbula truncata Reeve, 1843	
Crassostrea belcheri (Sowerby, 1871)	
Crassostrea gigas (Thünberg, 1793)	Accepted as > *Magallana gigas* (Thünberg, 1793)
Crassostrea lugubris (Sowerby, 1871)	
Cymbiola nobilis ([Lightfoot], 1786)	
Cypraea Linnaeus, 1758	
Dentalium pseudohexagonum (also cf. *D.elephantinum* Linnaeus, 1758)	Accepted as *Antalis pilsbryi* (Rehder, 1942)
Ellobium aurismidae (Linnaeus, 1758)	
Euchelus quadricarinatus (Holten, 1802)	Accepted as > *Euchelus asper* (Gmelin, 1795)
Ficus gracilis (Sowerby, 1825)	Accepted as > *Ficus gracilis* (G.B. Sowerby I, 1825)
Fragum fragum (Linnaeus, 1758)	
Gafrarium tumidum Röding, 1798 [also consider Grafrarium divaricatum (Gmelin, 1791)]	
Hemifusus pugilina ?ternatatus	Accepted as > *Brunneifusus ternatanus* (Gmelin, 1791)
Hippopus hippopus (Linnaeus, 1758)	
Isognomon [Lightfoot], 1786	
Lambis lambis (Linnaeus, 1758)	
Littoraria (Littorinopsis) lutea (Philippi, 1847)	Accepted as > *Littoraria lutea* (R.A. Phillippi, 1847)
Melongena pugilina (Born)	Accepted as>*Volegalea cochlidium* (Linnaeus, 1758)
Nassarius distortus (A. Adams, 1852)	
Nassarius globosus (Quoy and Gaimard, 1833)	
Nassarius quadrasi (Hidalgo, 1904)	
Natica Scopoli, 1777 (small form)	
Nerita balteata Reeve, 1855 [unaccepted synonyms: *N. lineata* Gmelin, 1791 and *N. articulata* Gould, 1847]	
Nerita Linnaeus, 1758 [consider *Nerita costata* Gmelin, 1791]	
Nodilittorina pyramidalis (Quoy & Gaimard, 1833)	
Oliva oliva (Linnaeus, 1758)	
Otopleura aruiscati (Holten, 1802)	
Periglypta Jukes-Browne, 1914 [cf. *P. lacerata* (Hanley, 1845)	Accepted as > *Antigona lacerata* (Hanley, 1845)]
Polinices didyma (Röding, 1798)	Accepted as > *Neverita didyma* (Röding, 1798)
Polymesoda (Geloina) erosa (Solander, 1786)	Accepted as > *Geloina expansa* (Mousson, 1848)
Pugilina cochlidium (Linnaeus, 1758)	Accepted as > *Volegalea cochlidium* (Linnaeus, 1758)
Rhinoclavis aspera (Linnaeus, 1758)	
Saccostrea cucullata (Born, 1778)	
Seila A. Adams, 1861[Turritellidae, *Colpospira* J.Donald, 1900.]	
Serpulorbis Sasso, 1827	Accepted as Thylacodes, Guettard, 1770
Stellaria solaris (Linnaeus, 1764)	
Striarca Conrad, 1882	
Strombus canarium Linnaeus, 1758	Accepted as > *Laevistrombus canarium* (Linnaeus, 1758)
Telescopium telescopium (Linnaeus, 1758)	
Tellina Linnaeus, 1758	
Thais kieneri (Deshayes, 1844) [also cf. *Thais bitubercularis* Lamarck]	Accepted as > *Reishia bitubercularis* (Lamarck, 1822)
Tridacna maxima (Röding, 1798)	
Tridacna Bruguière, 1797	
Trochus niloticus Linnaeus, 1767	Accepted as > *Rochia nilotica* (Linnaeus, 1767)
Turritella terebra (Linnaeus, 1758)	
Umbonium vestiarium (Linnaeus, 1758)	
Veneridae [for example, *Geloina coaxans* (Gmelin, 1791)]	
Vepricardium Iredale, 1929	
Vexillum curvilaratum (Sowerby, 1878)	Accepted> *Vexillum curviliratum* (G.B. Sowerby II, 1874)
Vexillum radix (Sowerby, 1874)	Accepted as > *Vexillum radix* (G.B. Sowerby II, 1874)
Vexillum Röding, 1798	

Volema paradisaca [Röding] Accepted as > *Volema pyrum* (Gmelin, 1791)

Table 3a
DISTRIBUTION OF PHC MOLLUSCAN FAUNAL GROUPS BY SQUARE

	T1	T2	1	2	3	4	5	6	7	8	9	10	11	12	13	12 13	14
Mollusca																	
†brown sandy mud species						x	-				-			-	♦	♦	-
‡black sand species	x	x	x	-	x	x	x	x		♦	x	x	♦	x	x	x	x
edible and/or charred mollusk concentrations			♦					x		♦	x	x	♦				x

Table 3b
DISTRIBUTION OF PHC MOLLUSCAN FAUNAL GROUPS BY SPIT

	Surface	Mixed	Spit 1	Spit 2	Spit 3	Spit 4	Spit 5	Spits 6/7
Mollusca								
brown sandy mud species†	♦	x	x					
black sand species‡	x	x	♦	x	x	x	♦	x
edible and/or charred mollusk concentrations			Sq. **8** Sq. 11	Sq. 8 Sq. 6		Sq. 14	Sq. 14 Sq. **1**	

† = Refer to Table 1b for listing of species and habitat
‡ = Refer to Table 1c for listing of species and habitat
x = presence indicated by sufficient numbers
- = present, but not indicative
♦ = notable presence

Table 4
PHC NON-MOLLUSCAN FAUNA BY CLASS: NUMBER OF IDENTIFIED SPECIMENS (NISP) AND PERCENTAGE OF TOTAL NISP

CLASS	**NISP**	**% TOTAL NISP**
Tetraclitidae (barnacle)	5	<1%
Elasmobranchii (shark, ray)	28	1%
Osteichthyes (Superclass: bony fish)	220	12%
Reptilia (Superclass)		
Order Testudines (turtle)	653	36%
Order Serpentes (snake)	1	<1%
Aves (bird)	266	15%
Mammalia (mammal)	148	8%
Unidentified	502	27%
TOTAL	**1823**	**100%**

Table 5. **Non-molluscan fauna list of the PHC excavation: Provisional list of fauna derived from fossil fragments recovered during the 1994/1995 PHC excavation.**

CLASS	FAMILY	GENUS/SPECIES (cf. = compares favourably with)	COMMON NAME
Anthozoa	Acroporidae, Oulastreidae, and other hard corals	cf. *Acropora* sp., *Oulastrea* sp. and other varied hard coral species	Coral
Thecostraca	Tetraclitidae	cf. *Tetraclita porosa*	cf. Acorn (volcano) barnacle
Elasmobranchii	Carcharhinidae	cf. *Carcharhinus falciformis*	cf. Silky shark
	cf. Dasyatidae	cf. *Neotrygon kuhlii*	cf. Blue-spotted stingray
Osteichthyes	cf. Lutjanidae and others	(varied fish species, some cf. *Lutjanus argentimaculatus)*	e.g. Mangrove red snapper and other large edible marine species
Reptilia	Geoemydidae/Cheloniidae/ Emydidae	Indetermined marine/estuarine turtle e.g., consider *Batagur borneoensis*	Marine/estuarine turtle e.g., consider Painted terrapin
	Cheloniidae	*Chelonia mydas*	Green turtle
	Geomydidae	cf. *Malayemys subtrijuga*	cf. Malayan snail-eating turtle
	Geomydidae	cf. *Cuora amboinensis*	cf. Malayan box turtle
	Trionychidae	cf. *Amyda cartilaginea*	cf. Asian softshell turtle
	e.g., cf. Elapidae	Indetermined snake. consider *Hydrophis* sp,	e.g., consider Sea snake
Aves	Phasianidae	*Gallus gallus*	Domestic Chicken, Red junglefowl
	e.g., cf. Rallidae	e.g., consider: *Porphyrio poliocephalus* *Amaurornis phoenicurus*	e.g., consider Grey-headed swamphen White-breasted waterhen
	e.g., cf. Ardeidae	e.g., consider: *Ardea cinerea* *Egretta garzetta* *Nycticorax nycticorax*	e.g., consider: Grey heron Little egret Black-crowned night heron
Mammalia	Muridae	cf. *Rattus rattus*/*Sundamys annandalei*/*Rattus tiomanicus*	cf. Roof or Ship rat/Annandale's rat/ Malaysian field rat
	Sciuridae	cf. *Lariscus insignis*	cf. Three-striped ground squirrel
	Soricidae	cf. *Suncus murinus*	cf. Asian house shrew
	Cercopithecidae	cf. *Macaca fascicularis*	cf. Crab-eating macaque
	Felidae	cf. *Felis catus*/*Prionailurus bengalensis* (small cat species)	cf. Domestic cat/ Leopard cat
	Mustelidae	cf. *Aonyx cinerea*	cf. Oriental small-clawed otter
	Suidae	*Sus scrofa/Sus domesticus*	Wild boar or Domestic pig
	Cervidae	cf. *Rucervus eldii*	cf. Thamin or Brow-antlered deer
	Indetermined Artiodactyla	Indetermined Artiodactyla (?*Bos* sp. and ?*Rusa (Cervus) unicolor)*	Artiodactyls (e.g. Cattle and Sambar deer)

Table 6a
DISTRIBUTION OF PHC NON-MOLLUSCAN FAUNA BY SPIT CAN THIS BE MODIFIED ? BRING UP CODES?

	Surface	Mixed	Spit 1	Spit 2	Spit 3	Spit 4	Spit 5	Spits 6/7
Crustacea								
cf. *Tetraclita porosa*	x							
Chondrichthyes								
cf. *Carchirhinus falciformis*							x	
cf. *Neotrygon kuhlii*					x		x	
unidentified shark/ray		x-ch, x	x	x-ch♦,	x-ch	x	♦	x
Osteichthyes								
unidentified fish	x	x	♦	x-ch, ♦	x-ch, ♦	x-ch, x	x-ch, ♦	
Reptilia								
cf. *Chelonia mydas*				x		x	x	
unidentified marine/estuarine turtle			x-ch	**♦-ch**				
cf. *Malayemys subtrijuga*			**♦-ch**		x-ch			
cf. *Cuora amboiniensis*					x-ch			
cf. *Amyda cartilaginea*				x-ch	?x-ch			
unidentified turtle		x-ch, x	**♦-ch**, x	**♦-ch**, x	**♦-ch**, x	**♦-ch**, x	**♦-ch**, x	x-ch
unidentified reptile (?snake)						x		
Aves								
cf. *Gallus gallus*	♦	♦	x			x	x-ch, x	
cf. Rallidae/Ardeidae				x	x	♦	♦	x
wading bird	♦							
unidentified bird	♦	♦	♦	x-ch, ♦		x	x	
Mammalia								
cf. *Suncus murinus*							x	
cf. *Rattus rattus/S.undamys annandalei/ Rattus tiomanicus*	x	x		x-ch, ♦	x	x	♦	
cf. *Lariscus insignis*							x	
cf. *Macaca fascicularis*								x
cf. *Felis catus/Prionailurus bengalensis*			x					
cf. *Aonyx cinerea*						x		
cf. *Sus scrofa/Sus domesticus*	♦	♦	x	x		**♦-ch, ?**	x-ch, ?	
cf. *Rucervus eldii*						x		
unidentified artiodactyla	♦		x		x			
unidentified large mammal	♦	♦	x	x	x-ch	x		
unidentified small mammal		x	x			x		
unidentified mammal	x	x						

Codes: x = present
♦ = significant presence
ch = charred specimens present

ch = significant presence of charred specimens

Table 6b
DISTRIBUTION OF PHC NON-MOLLUSCAN FAUNA BY SQUARE [CAN THIS BE MODIFIED TO BRING UP CODES

	T1	T2	1	2	3	4	5	6	7	8	9	10	11	12	13	12/13	14
Crustacea																	
cf. *Tetraclita sp.*			x	x													
Chondrichthyes																	
cf. *Carcharhinus falciformis*																	x
cf. *Neotrygon kuhlii*																	x
unidentified shark/ray	x	x	x			x	x	♦					x		x	cx	x
Osteichthyes																	
unidentified fish		x	♦		x	x	x	x		♦		x	x	x	♦	x	♦
Reptilia																	
cf. *Chelonia mydas*					x								x		x		
unidentified marine/estuarine turtle										♦							
cf. *Malayemys subtrijuga*										c							
cf. *Cuora amboiniensis*										c							
cf. *Amyda cartilaginea*								x							x		x
unidentified turtle		c	♦		c	c	♦	cx		♦		♦	cx	c	♦	♦	♦
unidentified reptile																	x
Aves																	
cf. *Gallus gallus*					♦	x	x						x	x	x	x	
cf. Rallidae/Ardeidae			♦			x		x							♦		♦
wading bird															x		
unidentified bird		x	x		♦	x	x			cx		x	x	♦	♦	♦	
Mammalia																	
cf. *Suncus murinus*			x														
cf. *Rattus rattus/Sundamys annandalei/ Rattus tiomanicus*			♦			x		x		cx	x				x	x	♦
cf. *Lariscus insignis*			x														
cf. *Macaca fascicularis*			x														
cf. *Felis catus/Prionailurus bengalensis*												x					
cf. *Aonyx cinerea*														x			
cf. *Sus scrofa/Sus domesticus*						x	x			x				♦	♦		
cf. *Rucervus eldii*															x		
unidentified artiodactyla		x				♦											
unidentified large mammal		cx			x	x							x	cx			x
unidentified small mammal			x			x											x
unidentified mammal			x		x	x	x							x			

Codes: x = present
♦ = significant presence
c = charred specimens present

Appendix I: PHC Mollusca and Coral by Square, Bag#, and Spit: Number of Identified Specimens Present (NISP) and Minimum Number of Individuals (MNI).

* = Reference example of species

Codes for Excavation Levels: sur = surface
sh/l = shell layer
br/l = light brown sandy mud layer
t/bl = top of black sand
mix = mix of black sand and light brown sandy mud
1-7 = vertical increments of 10cm each within black sand unit

Codes for Molluscan Class: B = Bivalvia
G = Gastropoda
S = Scaphopoda

Square:Bag #	Spit	Class	Description	NISP	MNI
TEST TRENCH 1					
T1:001	1	B	Ostreidae	2	1
T1:006	2		Unidentified	3	
T1:017	4	G	*Cymbiola* sp. ?*nobilis* Unidentified fragment	1 1	1
TEST TRENCH 2					
T2:003-004	?mix		Unidentified fragments	6	
T2:009	1		Unidentified fragments	4	
T2:011	2	B	Ostreidae Unidentified fragment	1 1	1
T2:013	3	B	Ostreidae	7	1
T2:015	3		Unidentified (?*Cymbiola nobilis*)	2	
T2:024	1-4		Unidentified	1	
T2:025 II	1	B	*Hippopus* sp. ?*hippopus*	2	1
T2:026 III	1		Unidentified fragments Coral	2 1	
T2:027 IV	1	B G	Ostreidae *Cymbiola* sp. ?*nobilis* Unidentified fragment	1 1 1	1 1
T2:028	-		Unidentified fragment	1	
T2:031	-	B G	Ostreidae *Gafrarium* sp. Unidentified	1 3 3	1 1
T2:033	-	G	*Cymbiola* sp. ?*nobilis*	2	2
T2:034	-		Unidentified fragment	1	
T2:036	-	G	*Cymbiola* sp. ?*nobilis* Unidentified	1 3	1
T2:038	-	B	Ostreidae Unidentified	2 1	1
T2:043	-	G	*Cymbiola* sp. ?*nobilis*	11	1
T2:046	-		Unidentified fragments (charred) Coral	4 1	
T2:053	cable		Unidentified	1	
ANOMALOUS					

Square:Bag #	Spit	Class	Description	NISP	MNI
	?	G*	*Stellaria* sp. ?*solaris*	1	1
	sur†	B B B B B B G G G	Ostreidae (one with imbedded metal) *Hippopus* sp. ?*hippopus* *Tridacna* sp. ?*maxima* Veneridae (large mud/sand clam) *Anadara* sp. ?*granosa* *Barbatia* sp. ?*decussata* *Cymbiola* sp. ?*nobilis* *Telescopium telescopium* *Turritella* sp. ?*terebra* Unidentified Coral	15 1 1 1 6 2 3 1 1 53 9	2 1 1 1 1 2 3 1 1
SQUARE 1					
1:001	-	G	*Cymbiola* sp. ?*nobilis* Unidentified fragments	1 2	1
1:002	mix	G	*Cymbiola* sp. ?*nobilis* Unidentified	1 3	1
1:003	mix	B G	*Anadara* sp. ?*granosa* *Lambis* sp. ?*lambis*	10 1	3 1
1:005	mix	B	*Anadara* sp. ?*granosa*	2	1
1:008	mix	B B	*Tridacna* sp. ?*maxima* *Anadara* sp. ?*granosa*	1 2	1 1
1:009	mix		Unidentified fragment	1	
1:011	mix	B B* B G G G G	Veneridae (large mud/sand clam) *Hippopus* sp. ?*hippopus* *Anadara* sp. ?*granosa* *Cymbiola* sp. ?*nobilis* Melongeninae *Chicoreus* sp. ?*capucinus* *Nerita* sp. Unidentified fragments	1 1 37 1 2 1 1 15	1 1 11 1 2 1 1
1:013	1	B G	Ostreidae *Cymbiola* sp. ?*nobilis* Unidentified fragment Coral	1 1 1 1	1 1
1:014	1	B	*Anadara* sp. ?*granosa* Unidentified fragment	1 1	1
1:016	1	B B G	Ostreidae *Anadara* sp. ?*granosa* *Cymbiola* sp. ?*nobilis*	2 1 1	1 1 1
1:017	2	B B G	Ostreidae *Hippopus* sp. ?*hippopus* *Cymbiola* sp. ?*nobilis* Unidentified fragment	2 5 1 7	1 1 1
1:018	2	B G	Ostreidae Melongeninae Unidentified fragment	1 1 1	1 1
1:020	2	G	*Lambis* sp. ?*lambis*	1	1
1:023	1	G G	*Cerithidea* sp. ?*cingulata* *Cymbiola* sp. ?*nobilis* Coral	1 1 1	1 1
1:024	2	B B G	Ostreidae *Hippopus* sp. ?*hippopus* *Lambis* sp. ?*lambis* Unidentified fragments	1 4 1 1	1 1 1
1:028	1	B B G	Ostreidae *Anadara* sp. ?*granosa* *Cymbiola* sp. ?*nobilis* Unidentified fragments	15 6 2 9	1 1 2
1:029	mix	G	*Strombus* sp. ?*canarium*	1	1

Square:Bag #	Spit	Class	Description	NISP	MNI
			Unidentified	1	
1:045	3		Unidentified fragment	1	
1:048	3	B G	Ostreidae *Cymbiola* sp. ?*nobilis*	5 1	1 1
1:050	4	B B B G* G G	Ostreidae *Anadara* sp.?*granosa* *Hippopus* sp. ?*hippopus* *Cymbiola* sp. ?*nobilis* Melongeninae *Lambis* sp. ?*lambis* Unidentified fragments	2 3 1 3 1 7 11	1 2 1 3 1 1
1:051	4	B	*Anadara* sp. ?*granosa*	1	1
1:052	4	B	Ostreidae	1	1
1:056	sur	G	*Cymbiola* sp.?*nobilis*	1	1
1:057	5	B	Ostreidae	1	1
1:058	5	B B B B G G G	Veneridae (large mud/sand clam) ?*Gafrarium* sp. *Anadara* sp. ?*granosa* *Barbatia* sp. ?*decussata* *Cymbiola* sp. ?*nobilis* *Strombus* sp.?*canarium* *Chicoreus* sp. ?*capucinus* Unidentifed fragments	1 1 210+ 9 2 2 1 5	1 1 52 1 2 2 1
1:062	5	B	*Anadara* sp. ?*granosa*	1	1
1:063	5	B B B G	Ostreidae *Anadara* sp. ?*granosa* *Barbatia* sp. ?*decussata* *Strombus* sp. ?*canarium* Unidentified fragments	1 144+ 4 1 3	1 35 1 1
1:064	5	B B B B	Ostreidae ?*Gafrarium* sp. *Anadara* sp. ?*granosa* *Barbatia* sp. ?*decussata* Unidentified fragments	1 1 167 8 9	1 1 41 2
1:066	5	B B G	*Anadara* sp. ?*granosa* *Barbatia* sp. ?*decussata* *Strombus* sp. ?*canarium* Unidentified fragments Unidentified minute fragments Coral + cemented shells	78 14 1 6 15 1	13 1 1
1:068	6	B	*Anadara* sp. ?*granosa* Unidentified fragments	1 2	1
1:070	7	B	*Anadara* sp. ?*granosa* Unidentified fragments	10 2	2
1:078	4	B B	Ostreidae *Anadara* sp. ?*granosa* Unidentified fragments	4 5 2	1 1
SQUARE 2					
2:002	-	G	*Cymbiola* sp. ?*nobilis* Unidentified fragments	1 4	1
2:008	3		Unidentified fragments	5	
2:009	3	G*	?*Ficus* sp. ?*gracilis*	1	1
2:010	4		Unidentified fragments	3	
2:012	5		Unidentified fragment	1	
SQUARE 3					
			Anadara sp. ?*granosa*	2	

Square:Bag #	Spit	Class	Description	NISP	MNI
3:001	mix	B	Unidentified fragments	2	1
3:002	mix	B	*Tridacna* sp. ?*maxima*	1	1
3:004	mix	G	*Cymbiola* sp. ?*nobilis* Unidentified fragment	1 1	1
3:005	mix	B G	?*Tellina* sp. *Turritella* sp. ?*terebra* Unidentified fragments	1 1 2	1 1
3:007	mix	G	Melongeninae Unidentified fragment Coral	1 1 2	1
3:010	sur	B B G G	Ostreidae ?*Tellina* sp. *Strombus* sp. ?*canarium* *Umbonium* sp. ?*vestiarium* Unidentified fragments Coral	3 1 1 3 5 3	1 1 3 3
3:014	1	B	*Tridacna* sp. ?*maxima* Unidentified fragments Coral	1 2 1	1
3:018	1	B B	Ostreidae *Anadara* sp. ?*granosa*	9 2	1 1
3:019	1	B	*Anadara* sp. ?*granosa* Unidentified	3 1	1
3:021	1	B G G	Ostreidae Melongeninae *Strombus* sp. ?*canarium* Unidentified fragments	3 1 2 15+	1 1 1
3:025	2	G	*Lambis* sp. ?*lambis*	2	1
3:026	3	B B B G	Ostreidae Veneridae (large mud/sand clam) *Anadara* sp. ?*granosa* *Umbonium* sp. ?*vestiarium* Unidentified fragments	11 1 3 1 3	1 1 1 1
3:028	3		Unidentified (?Ostreidae)	17	
3:031	3	B	*Anadara* sp. ?*granosa*	1	1
3:032	4	B* B B G	Ostreidae *Tridacna* sp. ?*maxima* *Anadara* sp. ?*granosa* *Chicoreus* sp. ?*capucinus* Unidentified fragments	10 1 38 1 8	1 1 4 1
3:034	4	B	*Anadara* sp. ?*granosa* Unidentified fragments	1 3	1
3:035	4	G* G	*Cymbiola* sp. ?*nobilis* *Lambis* sp. ?*lambis* Unidentified fragments	1 3 3	1 1
SQUARE 4					
4:004	mix	B B G	cf. *Isognomen* sp. *Anadara* sp. ?*granosa* ?*Strombus* sp. ?*canarium* Unidentified Coral ?Coral	1 2 1 2 1 1	1 1 1
4:006	mix	B G* G G S	Ostreidae *Strombus* sp. ?*canarium* *Turritella* sp.?*terebra* *Umbonium* sp. ?*vestiarium* *Dentalium* sp. ?*pseudosexagonum* Unidentified Coral	4 1 1 1 1 1 1	1 1 1 1 1
		G	?Melongeninae	1	1

Square:Bag #	Spit	Class	Description	NISP	MNI
4:007	mix	G	*Umbonium* sp. ?*vestiarium* Unidentified Coral	1 1 1	1
4:009	mix		Unidentified Coral	2 3	
4:010	mix	B B	Ostreidae *Hippopus* sp. ?*hippopus*	1 1	1 1
4:011	sur	B	*Anadara* sp.?*granosa* Coral ?Coral	1 1 1	1
4:013	sur	B B G	Veneridae(largemud/sand clam) *Hippopus* sp. ?*hippopus* *Nerita* sp. Unidentified	1 1 1 3	1 1 1
4:014	mix	B B	Veneridae (large mud/sand clam) *Anadara* sp. ?*granosa*	1 2	1 1
4:015	mix	B B B G G	Ostreidae Veneridae (large mud/sand clam) *Anadara* sp. ?*granosa* *Cymbiola* sp. ?*nobilis* *Umbonium* sp. ?*vestiarium* Unidentified Coral	1 1 1 1 1 6 1	1 1 1 1 1
4:018	mix	G	*Lambis* sp. ?*lambis* Unidentified	1 2	1
4:020	mix		Unidentified Coral	2 1	
4:021	mix		Coral	1	
4:022	mix	B G G G	*Hippopus* sp. ?*hippopus* *Cymbiola* sp. ?*nobilis* *Turritella* sp. ? *terebra* *Umbonium* sp. ?*vestiarium* Unidentified	1 2 1 1 1	1 2 1 1
4:023	1	B G G G	*Anadara* sp. ?*granosa* *Lambis* sp. ?*lambis* *Umbonium* sp. ?*vestiarium* *Cerithidea* sp. (small form) Unidentified	3 2 16 1 12	1 1 16 1
4:024	1	B G	*Hippopus* sp. ?*hippopus* *Cymbiola* sp. ?*nobilis* Unidentified Coral	1 1 3 1	1 1
4:025	1	B	Ostreidae	4	1
4:027	1	B	?*Barbatia* sp. ?*decussata*	2	1
4:028	1	B G	Ostreidae *Lambis* sp. ?*lambis* Unidentified	2 1 6	1 1
4:029	1	B G G	Ostreidae *Lambis* sp. ?*lambis* *Umbonium* sp. ?*vestiarium* Unidentified	4 1 1 2	1 1 1
4:030	1	B B G G	*Cardium* sp. ?*impolitum* *Barbatia* sp. ?*fusca* *Umbonium* sp. ?*vestiarium* *Cerithidea* sp. (small form) Unidentified	1 1 70 5 9	1 1 70 5
4:031	2	B	Ostreidae Unidentified	2 11	1
4:033	2&3	G	*Umbonium* sp. ?*vestiarium*	1	1
			Veneridae (large mud/sand clam)	1	

Square:Bag #	Spit	Class	Description	NISP	MNI
4:034	2	B	Unidentified	4	1
4:035	3	B B B G G G G G G*	*Hippopus* sp. ?*hippopus* *Cardium* sp. ?*impolitum* *Anadara* sp. ?*granosa* *Cymbiola* sp. ?*nobilis* Melongeninae *Turritella* sp. ?*terebra* *Umbonium* sp. ?*vestiarium* *Natica* sp. (small form) *Cypraea* sp. Unidentified	1 2 2 1 1 2 9 1 1 4	1 2 2 1 1 2 9 1 1
4:036	2	G	*Umbonium* sp.?*vestiarium* Unidentified	1 1	1
4:037	2	B G G	*Barbatia* sp. ?*decussata* *Umbonium* sp. ?*vestiarium* *Cerithidea* sp. (small form) Unidentified	1 1 1 4	1 1 1
4:038	2		Unidentified	1	
4:039	3	B	Ostreidae Unidentified	1 1	1
4:044	3	B B B G G*	*Tridacna* sp. ?*maxima* *Tridacna* sp. *Anadara* sp. ?*granosa* *Cymbiola* sp. ?*nobilis* *Euchelus* sp. ?*quadricarinatus* Unidentified Coral	1 1 1 1 1 4 2	1 1 1 1 1
4:049	4	G G	*Umbonium* sp. ?*vestiarium* *Cerithidea* sp. (small form) Unidentified Coral	9 1 4 3	9 1
4:052	4	B	Ostreidae	8	1
4:056	4		Unidentified	2	
4:059	5	G	*Cymbiola* sp. ?*nobilis* Unidentified Coral	1 1 3	1
4:067	3	B	*Anomalocardia* sp. ?*squamosa*	1	1
SQUARE 5					
5:001	mix	B G G	?*Cardium* sp. ?*impolitum* *Cerithidea* sp. (small form) *Umbonium* sp. ?*vestiarium* Unidentified	1 1 2 1	1 1 2
5:002	mix	B	Ostreidae	1	1
5:003	mix	B B B B G G G G G G	*Gafrarium* sp. *Anadara* sp. ?*granosa* *Acar* sp. ?*plicata* *Anomalocardia* sp.?*squamosa* *Cerithidea* sp. (small form) ?*Seila* sp. *Turritella* sp. ?*terebra* *Strombus* sp. ?*canarium* Melongeninae *Umbonium* sp. ?*vestiarium* Unidentified fragment	1 2 1 1 2 1 1 1 1 13 1	1 2 1 1 2 1 1 1 1 13
5:004	?mix	B	*Anadara* sp. ?*granosa* Unidentified fragment	1 1	1
5:005	mix	B	Unidentified Coral	2 1	
5:009	mix	B B B B	?*Tellina* sp. *Gafrarium* sp. *Anadara* sp. ?*granosa* *Barbatia* sp. ?*decussata*	1 1 1 3	1 1 1 1

Square:Bag #	Spit	Class	Description	NISP	MNI
		B G G*	*Clausinella* sp. ?*chloritica* *Umbonium* sp. ?*vestiarium* *Vexillum* sp. ?*curvilatrum* Coral	1 9 1 2	1 9 1
5:010	1	B G	Arcidae, ?*Anadara granosa* *Umbonium* sp. ?*vestiarium* Unidentified fragments	5 1 3+	1 1
5:018	2	B	*Anadara* sp. ?*granosa*	2	1
5:020	2	G	*Umbonium* sp. ?*vestiarium*	2	2
5:021	2	B B G	Ostreidae *Anadara* sp. ?*granosa* Melongeninae Unidentified fragments	5 8 1 3	1 1 1
5:022	2	B B	*Anadara* sp. ?*granosa* *Hippopus* sp. ?*hippopus* Unidentified fragments	1 2 3	1 1 1
5:023	2	G	*Umbonium* sp. ?*vestiarium*	3	3
5:027	3	B B	?*Gafrarium* sp. ?*Hippopus* sp. ?*hippopus* Unidentified fragments	1 1 3	1 1
5:028	3	B	Arcidae, ?*Anadara granosa*	1	1
5:030	4	B G	*Anadara* sp. ?*granosa* *Umbonium* sp. ?*vestiarium* Unidentified fragment	3 1 1	1 1
5:031	4	B	Arcidae, *Anadara* sp. Unidentified fragments	4 3	1
5:034	4	G	*Umbonium* sp. ?*vestiarium*	1	1
5:035	mix	B B B	?Ostreidae *Anadara* sp. ?*granosa* ?*Hippopus* sp. ?*hippopus* Unidentified fragments	1 1 1 3	1 1 1
5:036	3	B G	*Anadara* sp. ?*granosa* *Cymbiola* sp. ?*nobilis* Unidentified fragments	2 1 11	1 1
SQUARE 6					
6:005	-	G	*Cymbiola* sp. ?*nobilis* Unidentified fragment	1 1	1
6:011	2	B B	Ostreidae *Anadara* sp. ?*granosa* Unidentified fragments	15 11 5	2 4
6:013	2	B B G	Ostreidae *Anadara* sp. ?*granosa* ?*Cymbiola* sp. Unidentified fragments	3 6 1 12	1 2 1
6:016	3	B G	*Anadara* sp. ?*granosa* *Cymbiola* sp. ?*nobilis* Unidentified	1 1 9	1 1
6:020	2		Unidentified fragment	1	
6:022	1	B B G	Ostreidae Veneridae(large mud/sand clam) *Cymbiola* sp. ?*nobilis*	2 1 1	1 1 1
6:025	mix	B G	?*Barbatia decussata* *Umbonium* sp. ?*vestiarium* Unidentified fragment	3 2 ?1	1 1
6:028	2	B B B B	Ostreidae Veneridae (large mud/sand clam) ?*Gafrarium* sp. *Anadara* sp. ?*granosa*	8 1 4 19	2 1 1 6

Square:Bag #	Spit	Class	Description	NISP	MNI
		G G	*Cymbiola* sp. ?*nobilis* *Lambis* sp. ?*lambis* Unidentified fragments	1 4 13	1 1
SQUARE 8					
8:002	mix		Unidentified fragments	2	
8:003	mix	G	?*Seila* sp. Unidentified fragment	1 1	1
8:004	mix	B B B	Ostreidae Veneridae (large mud/sand clam) *Anadara* sp. ?*granosa* Unidentified fragment	2 9 1 1	1 1 1
8:008	1	B B B G G	Ostreidae *Anadara* sp. ?*granosa* *Tridacna* sp. ?*maxima* *Telescopium telescopium* *Cerithidea* sp. ?*obtusa* Unidentified fragments	1 1 1 1 1 7	1 1 1 1 1
8:011	1	B	Ostreidae	2	1
8:012	1	B	Ostreidae	3	1
8:013	1	B* B B B G G G G G	Ostreidae Veneridae (large mud/sand clam) *Tridacna* sp. ?*maxima* *Anadara* sp. ?*granosa* *Cymbiola* sp. ?*nobilis* *Chicoreus* sp. ?*capucinus* Melongeninae *Strombus* sp. ?*canarium* *Lambis* sp. ?*lambis* Unidentified fragments	10 26 3 10 1 7 2 2 1 9	1 5 1 4 1 7 2 2 1
8:014	1	B B B B	Ostreidae Veneridae (large mud/sand clam) *Anadara* sp. ?*granosa* ?*Gafrarium* sp.	6 3 2 1	1 1 1 1
8:015	1	B B B G G	*Tridacna* sp. ?*maxima* *Anadara* sp. ?*granosa* *Barbatia* sp. ?*decussata* Melongeninae ?*Lambis lambis* Unidentified fragments	2 2 2 1 1 9	1 1 1 1 1
8:016	1	B B B B B G G G G	Ostreidae (many charred specimens in Bag # 016) Veneridae (large mud/sand clam) *Tridacna* sp. ?*maxima* *Anadara* sp. ?*granosa* *Barbatia* sp. ?*decussata* *Cymbiola* sp. ?*nobilis* *Chicoreus* sp. ?*capucinus* Melongeninae *Strombus* sp. ?*canarium* Unidentified fragments Unidentified minute fragments (many oyster and ark shells)	75+ 6 1 15 12 2 3 4 7 42 250+	(7) 2 1 6 3 2 3 4 5
8:017	1		Unidentified fragments	2	
8:018	1		Unidentified fragment	1	
8:020	2	B G*	Arcidae, ?*Anadara granosa* *Cymbiola* sp.?*nobilis* Unidentified fragments	3 2 5	1 2
8:022	2	B B* B B B G	Ostreidae ?*Gafrarium* sp. ?*Tridacna* sp. ?*maxima* *Anadara* sp. ?*granosa* *Barbatia* sp. ?*decussata* Melongeninae Unidentified fragments	8 6 1 12 3 1 18	1 2 1 4 1 1
		B	Ostreidae fragment	1	1

Square:Bag #	Spit	Class	Description	NISP	MNI
8:033	3	B	Arcidae, ?*Anadara granosa*	1	1
8:034	3	B B B G	Ostreidae (charred) *Tridacna* sp. ?*maxima* *Anadara* sp. ?*granosa* *Strombus* sp. ?*canarium* Unidentified fragments	9 2 2 1 5	1 1 1 1
8:036	3		Unidentified fragments	4	
8:038	1		Unidentified fragment	1	
8:039	1	B B B G	Veneridae (large mud/sand clam) ?*Hippopus* sp. ?*hippopus* ?*Tridacna* sp. ?*maxima* *Cymbiola* sp. ?*nobilis* Unidentified fragments	7 1 2 2 7	1 1 1 2
SQUARE 9					
9:001	sur	B	Ostreidae	3	1
9:003	mix	B B G	Ostreidae *Anadara* sp. ?*granosa* *Umbonium* sp. ?*vestiarium* Unidentified fragment	5 4 2 1	1 2 2
9:007	1	B B B* B* B* B G G* G G G* G G* G*	Ostreidae *Anadara* sp. ?*granosa* *Barbatia* sp. ?*decussata* *Tridacana* sp. ?*maxima* *Gafrarium* sp. ?*tumidum* ?*Gafrarium* sp. *Cymbiola* sp. ?*nobilis* ?*Lambis lambis* *Telescopium telescopium* ?*Seila* sp. *Chicoreus* sp. ?*capucinus* Melongeninae *Thais* sp. ?*kieneri* ?*Ellobium* sp. ?*aurisjudae* Unidentified fragments	4 10 4 5 2 2 1 3 1 1 1 1 1 2 34	1 4 2 3 2 1 1 2 1 1 1 1 1 1
SQUARE 10					
10B:001	1	B	*Anadara* sp. ?*granosa*	1	1
10:001	t/bl	B B B	Veneridae (large mud/sand clam) *Anadara* sp. ?*granosa* *Barbatia* sp. ?decussata	2 1 1	1 1 1
10:005	1	B B* B B B B* G G G G G G	Ostreidae *Polymesoda* sp. ?*erosa* *Anadara* sp. ?*granosa* *Barbatia* sp. ?*decussata* *Gafrarium* sp. ?*tumidum* *Clausinella* sp. ?*chlorotica* *Cymbiola* sp. ?*nobilis* Melongeninae *Strombus* sp. ?*canarium* *Cerithidea* sp. ?*cingulata* *Umbonium* sp. ?*vestiarium* *Trochus* sp. ?*niloticus* Unidentified fragments Coral	6 8 12 1 1 1 4 1 1 1 6 7 64 1	1 1 1 1 1 1 4 1 1 1 6 1
10:006	1		Unidentified fragments	5	
10:010	1		Unidentified fragment	1	
10:011	1	B B	Ostreidae *Anadara* sp. ?*granosa*	3 1	1 1
10:012	1	B B B B G*	Ostreidae *Anadara* sp. ?*granosa* *Tridacna* sp. ?*maxima* *Gafrarium* sp. ?*tumidum* ?*Trochus* sp. ?*niloticus* Unidentified fragments	3 1 1 2 21 4	1 1 1 1 1

Square:Bag #	Spit	Class	Description	NISP	MNI
10:015	1		Unidentified fragments	6	
10:019	2	B B B G G	Ostreidae *Anadara* sp. ?*granosa* *Gafrarium* sp. ?*tumidum* *Telescopium telescopium* *Umbonium* sp. ?*vestiarium* Unidentified fragments	7 3 6 1 1 11	1 1 2 1 1
10:?(21-35)	1	B B B G G	Ostreidae Veneridae (large mud/sand clam) *Tridacna* sp. ?*maxima* Trochidae ?*Trochus* sp. ?*niloticus* Unidentified fragments	8 2 1 1 11	2 1 1 1
10:021	1	B B	Ostreidae *Tridacna* sp. ?*maxima* Unidentified fragment	2 2 1	1 1
10:022	1	B G	*Anadara* sp. ?*granosa* ?*Trochus* sp. ?*niloticus* Unidentified fragments	5 3 5	1 1
10:028/2	1	B* B B B G G	Ostreidae Veneridae (large mud/sand clam) *Anadara* sp. ?*granosa* *Gafrarium* sp. ?*tumidum* *Strombus* sp. ?*canarium* Melongeninae Unidentified fragments	13 3 1 2 1 2 22	2 1 1 1 1 2
10:033	1	G	*Strombus* sp. ?*canarium* Unidentified fragments	1 2	1
10:043	2	B B B B G	Ostreidae Veneridae (large mud/sand clam) *Barbatia* sp. ?*decussata* *Gafrarium* sp. ?*tumidum* *Telescopium telescopium* Unidentified fragments	2 1 2 4 5 6	1 1 1 2 2
SQUARE 11					
11:001	t/bl	B B G	*Anadara* sp. ?*granosa* *Barbatia* sp. ?decussata Cymbiola *sp. ?nobilis* Unidentified fragments Coral	1 2 1 4 5	1 2 1
11:003	t/bl	B B B	Ostreidae *Anadara* sp. ?*granosa* *Tridacna* sp. ?*maxima* Unidentified fragments	7 1 2 14	1 1 1
11:004	t/bl	B B	*Anadara* sp. ?*granosa* *Tridacna* sp. ?maxima Unidentified fragments	1 1 1	1 1
11:005	mix	B* B* B B* B B G* G G G G G* G* G* G* G	Ostreidae Veneridae (large mud/sand clam) *Tridacna* sp. ?*maxima* *Anadara* sp. ?*granosa* ?*Barbatia* sp. ?*decussata* ?*Gafrarium* sp. *Lambis* sp. ?*lambis* Melongeninae *Strombus* sp. ?*canarium* *Chicoreus* sp. ?*capucinus* *Telescopium telescopium* *Cerithidea* sp. ?*cingulata* *Cerithidea* sp. ?*obtusa* ?*Seila* sp. *Nerita* sp. ?*balteata* ?*Trochus* sp. ?*niloticus* Unidentified fragments Coral	1 13 1 4 9 1 1 2 1 1 2 1 1 1 2 1 9 1	1 3 1 3 4 1 1 2 1 1 2 1 1 1 2 1

Square:Bag #	Spit	Class	Description	NISP	MNI
11:007	1	B	Ostreidae	33	4
		B	Veneridae (large mud/sand clam)	25	6
		B	*Tridacna* sp. ?*maxima*	14	3
		B	*Anadara* sp. ?*granosa*	33	10
		B	*Barbatia* sp. ?*decussata*	18	4
		B	?*Gafrarium* sp.	1	1
		G	*Cymbiola* sp. ?*nobilis*	3	3
		G	*Chicoreus* sp. ?*capucinus*	11	11
		G	*Thais* sp. ?*kieneri*	1	1
		G	Melongeninae	6	6
		G*	*Strombus* sp. ?*canarium*	7	7
		G	*Telescopium telescopium*	1	1
		G	*Cerithidea* sp. ?*cingulata*	1	1
		G	*Cerithidea* sp. ?*obtusa*	1	1
		G*	?*Rhinoclavis* sp. ?*aspera*	1	1
		G	*Nerita* sp. ?balteata	4	3
		G	?*Trochus* sp. ?*niloticus*	11	1
			Unidentified fragments	201	
11:008	1	B	Ostreidae	2	1
		B	*Anadara* sp. ?*granosa*	5	2
		B	*Barbatia* sp. ?*decussata*	2	1
		G	Melongeninae	2	1
		G	*Strombus* sp.	1	1
		G	*Chicoreus* sp. ?*capucinus*	1	1
		G	*Nerita* sp.	2	2
			Unidentified fragments	13	
			Coral		
11:009	1	B	Ostreidae	1	1
		B	Veneridae (large mud/sand clam)	1	1
		G	*Cymbiola* sp. ?*nobilis*	1	1
		G	Melongeninae	1	1
			Unidentified fragment	1	
11:010	1	B	Ostreidae	6	1
		B	Veneridae (large mud/sand clam)	3	1
		B	*Anadara* sp. ?*granosa*	8	5
		B	?*Barbatia* sp. ?*decussata*	3	1
		G	*Strombus* sp. ?*canarium*	1	1
		G	Melongeninae	3	2
		G	*Chicoreus* sp. ?*capucinus*	1	1
		G*	*Telescopium telescopium*	1	1
11:011	1		Unidentified fragment	1	
11:012	1	B	*Tridacna* sp. ?*maxima*	2	1
11:014	-		Unidentified fragment	1	
11:015	1	B	Veneridae (large mud/sand clam)	1	1
		G	?*Lambis* sp.	1	1
11:018	1	B	Veneridae (large mud/sand clam)	10	1
		B	*Anadara* sp. ?*granosa*	3	1
		G	Melongeninae	4	4
		G	*Nerita* sp.	1	1
			Unidentified fragments	16	
11:022	mix	B	Ostreidae	4	1
		B	?*Gafrarium* sp.	1	1
		B	*Gafrarium* sp. ?*tumidum*	1	1
		B	*Anadara* sp. ?*granosa*	1	1
		B	*Barbatia* sp. ?*decussata*	1	1
		B	*Tridacna* sp. ?*maxima*	1	1
		G	*Lambis* sp. ?*lambis*	1	1
		G*	?*Euchelus* sp. ?*quadricarinatus*	2	1
		G*	?*Seila* sp.	5	5
		G	*Cerithidea* sp. ?*cingulata*	1	1
		G	*Umbonium* sp. ?*vestiarium*	2	2
			Unidentified fragments	10	
11:023	1	B	Ostreidae	12	1
		B	Veneridae (large mud/sand clam)	2	1
		B	*Anadara* sp. ?*granosa*	7	4
		B	*Barbatia* sp. ?*decussata*	4	1
		B	*Tridacna* sp. ?*maxima*	14	2
		B	*Hippopus* sp. ?*hippopus*	1	1
		B	*Gafrarium* sp. ?*tumidum*	5	3

Square:Bag #	Spit	Class	Description	NISP	MNI
		G	Melongeninae	2	2
		G	*Strombus* sp. ?*canarium*	2	2
		G	?*Seila* sp.	1	1
		G	*Nerita* sp. ?*balteata*	1	1
		G	*Umbonium* sp. ?*vestiarium*	1	1
			Unidentified fragments	14	
			Coral	1	
SQUARE 12					
12:007	mix	B	*Anadara* sp. ?*granosa*	1	1
12:009	1	B	*Anadara* sp. ?*granosa*	2	1
			Unidentified fragment	2	
12:011	1	B	Ostreidae	5	1
		G	*Cymbiola* sp. ?*nobilis*	1	1
12:015	2	B	Ostreidae	8	1
			Unidentified fragments	6	
12:016	2	B	Ostreidae	2	1
12:017	2	G	?*Strombus* sp. ?*canarium*	1	1
			Unidentified fragments	2	
12:023	3	B	*Anadara* sp. ?*granosa*	1	1
			Unidentified fragment	1	1
12:026	5	G	*Cymbiola* sp. ?*nobilis*	1	1
12:027	4	B	*Anadara* sp. ?*granosa*	1	1
12:028	4		Unidentified fragment	1	
12:030	4	G*	*Nassarius* sp. ?*globosus*	1	1
12:031	4		Unidentified fragments	3	
12:034	5	G	*Umbonium* sp. ?*vestiarium*	2	2
			Unidentified fragments	2	
12:035	5		Unidentified fragments (?shell)	2+	
12:037	5		Unidentified fragments	3	
12:042	?br/l	G*	*Oliva* sp. ?*oliva*	1	1
SQUARE 13					
13:001	sh/l	B	?*Cardium* sp. ? *impolitum*	58	31
		B	?*Tellina* sp.	2	2
		B	*Anomalocardia* sp. ?*squamosa*	6	5
		B	*Clausinalla* sp. ?*chlorotica*	8	3
		B	*Fragum* sp. ?*fragum*	6	4
		B	Noetidae, cf. *Striarca* sp.	2	2
		B	Arcidae, cf. *Acar plicata*	2	2
		G	*Umbonium* sp. ?*vestiarium*	2940	2940
		G	*Cerithidea* sp. (small form)	207	202
		G	*Clypeomorus* sp. ?*batillariaeformis*	2	2
		G	*Turritella* sp. ?*terebra*	2	2
		G	*Clithon* sp. ?*oulaniensis*	9	9
		G	*Natica* sp. (small form)	2	2
		G	*Vexillum* sp. ?*radix*	3	3
		G	*Vexillum* sp.	1	1
		G	*Nodilittorina* sp. ?*pyramidalis*	1	1
		S	*Dentalium* sp. ?*pseudosexagonum*	1	1
			Unidentified fragments	100	
			Unidentified minuet fragments	400+	
			Coral	168	
13:002	sh/l	B*	?*Cardium* sp. ?*impolitum*	73	37
		B*	*Anomalocardia* sp. ?*squamosa*	5	5
		B*	?*Tellina* sp.	4	4
		B*	*Barbatia* sp. ?*fusca*	1	1
		B*	Noetidae, cf. *Striarca* sp.	4	3
		B*	*Corbula* sp. ?*truncata*	1	1
		B	*Clausinella* sp. ?*chlorotica*	1	1
		B*	cf. *Isognomen* sp.	2	1
		B*	*Fragum* sp. ?*fragum*	3	3

Square:Bag #	Spit	Class	Description	NISP	MNI
		B*	?*Vepricardium* sp.	1	1
		G*	*Umbonium* sp. ?*vestiarium*	4502	4502
		G	*Cerithidea* sp. (small form)	295	281
		G*	*Clithon* sp. ?*oulaniensis*	16	16
		G	*Natica* sp. (small form)	1	1
		G*	*Turritella* sp. ?*terebra*	3	3
		G*	*Vexillum* sp. ?*radix*	3	3
		G*	*Volema* sp. ?*paradisaca*	3	3
		G*	Trochidae, ?*Clanculus* sp.	1	1
		G*	*Nassarius* sp. ?*distortus*	1	1
		G*	*Nassarius* sp. ?*quadrasi*	2	2
		G*	*Littoraria* sp. ?*lutea*	1	1
		G*	*Polinices* sp. ?*didyma*	1	1
		G*	?*Otopleura auriscati*	1	1
		G*	cf. *Serpulorbis* sp.	1	1
		S*	*Dentalium* sp. ?*pseudosexagonum*	18	13
			Unidentified fragments	146	
			Unidentified minute fragments	1000+	
			Coral	180	
13:003	sh/l		Unidentified fragment	1	
13:003/006	br/l	B	*Anadara* sp. ?*granosa*	1	1
		B	*Clausinella* sp. ?*chlorotica*	4	2
		B	*Anomalocardia* sp. ?*squamosa*	4	1
		B	?*Cardium impolitum*	1	1
		G	*Natica* sp. (small form)	1	1
		G	*Turritella* sp. ?*terebra*	1	1
		G	*Cerithidea* sp. (small form)	6	6
		G	*Umbonium* sp. ?*vestiarium*	46	46
			Unidentified fragments	6	
			Coral	8	
13:007	mix	G	*Umbonium* sp. ?*vestiarium*	2	2
13:011	mix	B*	*Anadara* sp. ?*granosa*	3	3
		B	?*Gafrarium* sp.	1	1
		B	?*Cardium impolitum*	1	1
		G*	Melongeninae	1	1
		G	*Cerithidea* sp. (small form)	2	2
		G	*Umbonium* sp. ?*vestiarium*	15	15
		S	*Dentalium* sp. ?*pseudosexagonum*	5	5
			Unidentified fragments	4	
13:012	loose	B	cf. *Isognomen* sp.	1	1
13:015	1	B	*Anadara* sp. ?*granosa*	2	1
		B	*Umbonium* sp. ?*vestiarium*	1	1
			Coral	1	
13:016	1	B	*Anomalocardia* sp. ?*squamosa*	1	1
		B	?*Cardium impolitum*	2	2
		G	*Cerithidea* sp. (small form)	1	1
		G	*Umbonium* sp. ?*vestiarium*	2	2
			Unidentified fragments	6	
			Coral	1	
13:017	1	B	*Anadara* sp. ?*granosa*	2	1
		S	*Dentalium* sp. ?*pseudosexagonum*	1	1
			Coral	1	
13:026	2	B	*Anadara* sp. ?*granosa*	1	1
13:027	2	B	?*Cardium impolitum*	1	1
			Unidentified fragments	2	
13:028	2	S	?*Dentalium* sp. ?*pseudosexagonum*	1	1
13:029	2		Unidentified fragments	4	
13:032	2	B*	Ostreidae (very large)	1	1
13:033	2		Unidentified fragment	1	
13:034	2	B	*Anadara* sp. ?*granosa*	1	1
			Unidentified fragments	3	
			Coral	1	
13:035	2	B	Ostreidae	4	1

Square:Bag #	Spit	Class	Description	NISP	MNI
		G	*Lambis* sp. ?*lambis*	1	1
13:047	3	B G	?*Tellina* sp. *Cymbiola* sp. ?*nobilis* Coral	1 1 1	1 1
13:050	3		Unidentified fragments	7	
13:051	3	B G G G G S	?*Cardium impolitum* *Lambis* sp. ?*lambis* Melongeninae *Cerithidea* sp. (small form) *Umbonium* sp. ?*vestiarium* ?*Dentalium* sp. ?*pseudosexagonum* Unidentified fragments	1 1 1 4 9 1 10	1 1 1 4 9 1
13:059	4		Unidentified fragments	2	
13:060	4	B B B G G	?*Cardium impolitum* *Clausinella* sp. ?*chlorotica* *Barbatia* sp. ?*decussata* *Strombus* sp. ?*canarium* *Umbonium* sp. ?*vestiarium* Coral	1 1 1 1 1 1	1 1 1 1 1
13:061	4	G S	*Umbonium* sp. ?*vestiarium* ?*Dentalium* sp. Coral	30 1 2	30 1
13:065	4	B B G	?*Tridacna* sp. ?*Cardium impolitum* *Umbonium* sp. ?*vestiarium* Unidentified fragments	1 1 3 3	1 1 3
13:070	5	B	Unidentified fragment	1	
SQUARE 12/13					
12/13:001	mix	B G S	?*Gafrarium* sp. *Cerithidea* sp. (small form) *Dentalium* sp. ?*pseudosexagonum* Unidentified fragment	1 1 1 1	1 1 1
12/13:002	mix	B B G G	?*Cardium impolitum* *Anadara* sp. ?*granosa* *Cerithidea* sp. (small form) *Umbonium* sp. ?*vestiarium* Unidentified fragments	2 1 1 6 4	2 1 1 6
12/13?003	1	G	*Umbonium* sp. ?*vestiarium*	2	2
12/13?004	1&2	B B B* G G G	Ostreidae ?*Gafrarium* sp. *Anadara* sp. ?*uropigimelana* *Cymbiola* sp. ?*nobilis* *Lambis* sp. ?*lambis* Melongeninae Unidentified fragments Coral	1 2 1 2 1 1 10 1	1 1 1 1 1 1
12/13:005	2	G	Unidentified (gastropod) Coral	1 2	
12/13:008	3	B	Unidentified fragment (?*Tridacna* sp.)	1	
12/13:009	3	B G G	*Anadara* sp. ?*granosa* *Cerithidea* sp. (small form) *Umbonium* sp. ?*vestiarium* Unidentified fragment Coral	2 1 6 2 1	1 1 6
12/13:012	3	G	*Umbonium* sp. ?*vestiarium*	1	1
12/13:015	2	S	*Dentalium* sp. ?*pseudosexagonum* Unidentified fragment	2 1	2
12/13:?	2	S	*Dentalium* sp. ?*pseudosexagonum* Unidentified fragments	1 3	1

Square:Bag #	Spit	Class	Description	NISP	MNI
SQUARE 14					
14:004	mix	G	*Umbonium* sp. ?*vestiarium* Unidentified	1 1	1
14:009	1	G	*Cymbiola* sp. ?*nobilis*	1	1
14:011	1	G	*Cerithidea* sp. (small form)	1	1
14:016	2	B* G S	Ostreidae Arcidae fragments, ?*Barbatia decussata* *Dentalium* sp.?*pseudosexagonum* Unidentified fragment	3 1 1 1	1 1 1
14:017	1	B	*Anadara* sp. ?*granosa* Unidentified fragments Coral	1 4 1	1
14:020	3	B B G S	Ostreidae *Anadara* sp. ?*granosa* *Umbonium* sp. ?*vestiarium* *Dentalium* sp. ?*pseudosexagonum* Unidentified fragments	1 7 1 1 10	1 1 1 1
14:026	3	B	*Anadara* sp. ?*granosa*	1	1
14:027	4	B B G G G	Ostreidae *Anadara* sp. ?*granosa* *Cymbiola* sp. ?*nobilis* *Ceirhidea* sp. (small form) *Umbonium* sp. ?*vestiarium* Unidentified fragments Coral	7 15 1 1 7 1	1 1 1 1 1
14:028	4	B B G	Ostreidae *Anadara* sp. ?*granosa* *Umbonium* sp. ?*vestiarium* Unidentified fragments	1 1 1 5	1 1 1
14:032	5	B B B B G	Ostreidae Veneridae (large mud/sand clam) *Anadara* sp. ?*granosa* *Barbatia* sp. ?*decussata* *Lambis* sp. ?*lambis* Unidentified fragments	40+ 6 10 1 4 22	2 1 3 1 1
14:042	-	B G	*Anadara* sp. ?*granosa* *Cymbiola* sp. ?*nobilis* Unidentified fragments	15 1 20+	5 1

Appendix II. PHC Non-molluscan fauna by Class, Square, Bag#, Spit: Number of Identified Specimens Present (NISP)

Codes for Excavation Levels:
s = surface
sh/l = shell layer
br/l = brown sandy mud layer
t/bl = top of black sand
mix = mixture of black sand and light brown sandy mud units
sh/mx = shell layer + mixture
1-7 = vertical increments of 10cm each within black sand unit

Square:Bag #	Spit	Class	Description (cf. = compares favourably with)	NISP	#/Sq	#/Cl.
1:001	-	Crustacea	cf. *Tetraclita* sp.	2		
Square 1 Total					2	
2:002	-	Crustacea	cf. *Tetraclita* sp.	3		
Square 2 Total					3	
PHC TOTAL		**Crustacea**				**5**
T:?	-	Chondrichthyes	vertebra (diameter = 12mm)	1		
T2:046	-	Chondrichthyes	vertebra, broken	1		
Test Trench Total					2	
1:057	5	Chondrichthyes	vertebra (diameter = 12mm)	1		
1:058	5	Chondrichthyes	vertebra (diameter = 13mm)	1		
1:065	5	Chondrichthyes	vertebra (diameter = 9mm)	1		
1:068	6	Chondrichthyes	vertebra(diameter = @ 9mm)	1		
Square 1Total					4	
4:059	5	Chondrichthyes	vertebral fragment (in 3 pieces)	1		
Square 4 Total					1	
5:016	1	Chondrichthyes	vertebra (diameter = 11mm)	1		
Square 5 Total					1	
6:011	2	Chondrichthyes	vertebrae (diameters = 6mm , 20mm)	2		
6:028	2	Chondrichthyes	vertebrae (diameters = 18mm, @18mm, 17mm, 5mm)	5		
Square 6 Total					7	
11:007	1	Chondrichthyes	vertebral fragment	1		
Square 11 Total					1	
13:070	5	Chondrichthyes	vertebra (diameter = 22mm)	1		
13:082	4	Chondrichthyes	vertebrae (diameters = 15mm, 12mm)	2		
13:083	4	Chondrichthyes	vertebra (diameter = 17mm)	1		
Square 13 Total					4	
12/13:004	1&2	Chondrichthyes	vertebra, charred (diameter = 16mm)	1		
12/13:012	3	Chondrichthyes	vertebra, in pieces, charred	1		
Sq. 12/13 Total					2	
14:020	3	Chondrichthyes	serrated spine fragments, cf. *Neotrygon kuhlii*	2		
14:027	4	Chondrichthyes	vertebra (diameter = 4mm)	1		
14:030	5	Chondrichthyes	vertebra (diameter = 2mm) tooth, serrated edge cf. *Charcharhinus falciformis*	1 1		

Square:Bag #	Spit	Class	Description (cf. = compares favourably with)	NISP	#/Sq	#/Cl.
14:032	5	Chondrichthyes	serrated spine fragment, cf. *Neotrygon kuhlii*	1		
Square 14 Total					6	
PHC TOTAL		**Chondrichthyes**				**28**
T:?	-	Osteichthyes	vertebra (diameter = 6mm)	1		
T2:024	1-4	Osteichthyes	vertebra, agetized (diameter = 6mm)	1		
T2:034	-	Osteichthyes	?pterygiophore, bulbous	1		
Test Trench Total					3	
1:008	mix	Osteichthyes	vertebra (diameter = 13mm)	1		
1:011	mix	Osteichthyes	vertebrae (diameters = 8mm, @10mm) minute fragment	2 1		
1:028	5	Osteichthyes	bulbous fragment, ?fish	1		
1:054	4	Osteichthyes	vertebrae (diameters = 12mm, @12mm)	2		
1:058	5	Osteichthyes	fin spine spine like fragment minute fragments	1 1 2		
1:059	5	Osteichthyes	vertebral fragment skull fragment, quadrate associated small fragments ?branchiostegal ray fragments	1 1 5 3		
1:069	6	Osteichthyes	vertebrae (diameters = 16mm, 10mm, 9mm 6mm) vertebral process, basapophysis neural spine associated minute fragment skull fragment, ?ceratohyal skull fragment, maxilla skull fragment, premaxilla	4 1 1 1 1 1 1		
1:070	7	Osteichthyes	skull fragment	1		
Square 1 Total					32	
3:001	mix	Osteichthyes	vertebra (diameter = 5mm)	1		
3:010	sur	Osteichthyes	spine-like fragment	1		
3:035	4	Osteichthyes	skull fragment, dentary	1		
Square 3 Total					3	
4:004	mix	Osteichthyes	fin spine	1		
4:008	mix	Osteichthyes	skull fragment, ?hypohyal	1		
4:031	2	Osteichthyes	skull fragment, prevomer	1		
4:035	4	Osteichthyes	?pterygiophore fragment spine-like fragment	1 1		
4:049	4	Osteichthyes	skull fragment, prevomer, charred skull fragment, ?premaxilla, charred	1 1		
4:056	4	Osteichthyes	?pterygiophore fragment, large fish	1		
Square 4 Total					8	
5:020	2	Osteichthyes	?skull fragment	1		
5:029	3	Osteichthyes	skull fragment, quadrate	1		
5:036	3	Osteichthyes	skull fragment, subopercle	1		
Square 5 Total					3	
6:013	2	Osteichthyes	vertebral process fragment skull fragment, dentary	1 1		

Square:Bag #	Spit	Class	Description (cf. = compares favourably with)	NISP	#/Sq	#/Cl.
			linear fragment	1		
6:020	2	Osteichthyes	?fin spine fragment, charred	1		
6:028	2	Osteichthyes	vertebrae, three charred (2fragments plus 5 whole) (diameters = 15mm, @10mm, 8mm, 7mm, 3mm) vertebral process, basapohysis ?fish fragment	7 1 1		
Square 6 Total					13	
8:013	1	Osteichthyes	bulbous fragment, ?fish	1		
8:016	1	Osteichthyes	vertebrae (diameters = @12mm, 7mm, 4mm) vertebral process, basapophysis skull fragments, dentary ?fin support fragment minute fragment	3 1 3 1 1		
8:017	1	Osteichthyes	vertebral process, basapophysis ?skull fragment, jaw complex	1 1		
8:018	1	Osteichthyes	bony plate, ?fish	1		
8:033	3	Osteichthyes	vertebra (diameter = 6mm) skull fragment bulbous fragment, ?fish	1 1 1		
8:034	3	Osteichthyes	vertebrae (diameters = 12mm, 6mm) fin spines (diam. of prox. articulation = 4mm, 14mm)	2 2		
8:036	3	Osteichthyes	vertebra (diameter = 11mm) skull fragment, ?ceratohyal,?preopercle minute fragments	1 1 2		
Square 8 Total					24	
10:005	1	Osteichthyes	vertebral fragment associated minute fragment	1 1		
10:015	1	Osteichthyes	vertebra (diameter = 13mm)	1		
10:021	1	Osteichthyes	skull fragment, ?dentary	1		
10:028	1	Osteichthyes	vertebra (diameter= 7mm)	1		
10:031	1	Osteichthyes	bulbous frag., ?pterygiophore (31mm x 29mm x 17mm)	1		
Square 10 Total					6	
11:003	t/bl	Osteichthyes	bony plate, ?fish	1		
11:007	1	Osteichthyes	vertebrae (diameters = 10mm, 7mm, 6mm) skull fragment, tooth plate with tooth skull fragment, ?maxilla ?pterygiophore fragment, ?large fish minute frag. associated with pterygiophore fin spines spine-like fragments associated minute fragments, ?fish	3 1 1 1 1 2 5 3		
11:008	1	Osteichthyes	skull fragment, prevomer	2		
11:014	1	Osteichthyes	vertebral fragments (diam. = @6mm, 5mm) vertebral fragments ?skull fragments, small associated minute fragment	2 2 2 1		
11:018	2	Osteichthyes	fin spine fagment linear fragment, small, curved	1 1		
11:023	1	Osteichthyes	bony plate, ?fish	1		
Square 11 Total					30	
12:007	mix	Osteichthyes	pterygiophore fragment fin spine	1 1		
12:015	2	Osteichthyes	vertebrae (diameters = 8mm, 8mm)	2		

Square:Bag #	Spit	Class	Description (cf. = compares favourably with)	NISP	#/Sq	#/Cl.
12:032	5	Osteichthyes	vertebra ?scale fragment	1 1		
12:036	5	Osteichthyes	skull fragment, ?hypohyal	1		
Square 12 Total					7	
13:002	sh/l	Osteichthyles	vertebrae (diameters = 6mm, 3mm) skull fragment	2 1		
13:003-005	sh/l	Osteichthyes	skull fragment, ?premaxilla pterygiophore fin spine (attached to pterygiophore)	1 1 1		
13:006	br/l	Osteichthyes	skull fragment, ?ceratohyal fin spine	1 1		
13:011	mix	Osteichthyes	vertebrae (4mm, 3mm) neural spine fin spine ?pectoral fin fragment	2 1 1 1		
13:016	1	Osteichthyes	neural spine fragment	1		
13:028	2	Osteichthyes	vertebra (diameter = 6mm) vertebra, three fragments ?fin spine fragment	1 1 1		
13:065	4	Osteichthyes	vertebra (diameter = 9mm) (attached process = @20mm length) ?skull fragments	1 2		
13:070	5	Osteichthyes	vertebral fragment (diameter = @ 5mm) neural spine skull fragments, dentary skull fragment, angular skull fragment	1 1 3 1 1		
13:075	6	Osteichthyes	skull fragment, ?dentary associated minute fragment	1 1		
13:082	4	Osteichthyes	skull fragment, premaxilla skull fragments, jaw complex fin spine fragments	1 3 2		
13:083	4	Osteichthyes	skull fragment, angular	1		
13:085	5	Osteichthyes	vertebral process, basapophysis	1		
Square 13 Total					37	
12/13:002	sh/mx	Osteichthyes	neural spine fragment skull fragment, ?dentary	1 1		
12/13:008	3	Osteichthyes	skull fragment, ?fish	1		
12/13:015	2	Osteichthyes	?neural spine fragment ?pterygiophore fragment	1 1		
Sq. 12/13Total					5	
14:008	1	Osteichthyes	skull fragment, premaxilla	1		
14:016	2	Osteichthyes	skull fragment, jaw complex	1		
14:019	3	Osteichthyes	skull fragment, prevomer	1		
14:020	3	Osteichthyes	vertebral fragment (diameter @ 10mm) skull fragments, ?quadrate skull fragment associated minute fragments	1 2 1 5		
14:027	4	Osteichthyes	skull fragments, ?quadrate bony plate, ?fish	3 1		
14:028	5	Osteichthyes	vertebra (diameter = @6mm) with process skull fragment, jaw complex bulbous fragment	1 1 1		
14:030	5	Osteichthyes	skull fragment, angulo-articulular	1		

Square:Bag #	Spit	Class	Description (cf. = compares favourably with)	NISP	#/Sq	#/Cl.
			bony plate fragments	2		
14:031	4	Osteichthyes	bony plate, ?fish	1		
14:032	5	Osteichthyes	?pterygiophore, bulbous associated minute fragments, ?fish	1 2		
14:034	3	Osteichthyes	vertebral fragment, charred associated minute fragments	1 2		
14:036	4	Osteichthyes	vertebral fragment, charred linear fragments, charred, ?fish	1 2		
14:037	5	Osteichthyes	vertebra, charred (diameter = @7mm) minute fragment,charred, ?fish	1 1		
14:041	4	Osteichthyes	skull fragment, angular, charred linear fragment, charred bony plate	1 1 1		
14:042	4	Osteichthyes	vertebrae (diameters = @9mm, 5mm) vertebra with basapophysis (diameter = @ 4mm) vertebral process, basapophysis skull fragment, basioccipital skull fragment fin spine, charred associated minute fragments	2 1 1 1 1 1 5		
Square 14 Total					49	
TOTAL PHC		**Osteichthyes**				**220**
T2:028	-	Reptilia: turtle	suture fragment, charred	1		
T2:032	-	Reptilia:turtle	suture fragment, semi-charred	1		
T2:046	-	Reptilia:turtle	?shell peripheral, charred	1		
Test Trench Total					3	
1:025	3	Reptilia:turtle	peripheral fragment, semi-charred, ?turtle associated minute fragments, charred	1 3		
1:027	4	Reptilia:turtle	?long bone fragment, charred, ?turtle	1		
1:028	4	Reptilia:turtle	?shell fragment associated fragments small fragment, charred	1 3 1		
1:051	4	Reptilia:turtle	shell fragment, semi-charred, serrated edge ?shell fragment, charred associated minute fragments	1 1 5		
1:052	4	Reptilia:turtle	shell fragment, ?carapace costal, calcined	1		
1:057	5	Reptilia:turtle	shell fragment, semi-charred charred fragments associated minute fragments	3 2 4		
1:058	5	Reptilia:turtle	?pectoral girdle fragment, semi-charred	1		
1:061	5	Reptilia:turtle	shell fragment, charred/calcined	1		
1:068	6	Reptilia:turtle	shell fragment, peripheral, semi-charred	1		
1:071	4	Reptilia:turtle	?shell fragment, semi-charred	1		
1:078	4	Reptilia:turtle	fragment, charred, calcined, ?turtle	1		
Square 1 Total					32	
3:027	3	Reptilia:turtle	small fragments, semi-charred	4		
3:034	4	Reptilia:turtle	ulna, uncharred, with cut marks, *Chelonia mydas* (74mm length, 29mm maximum diam. 14 mm mid-shaft diam., 24mm distal diam.)	1		
Square 3 Total					5	

Square:Bag #	Spit	Class	Description (cf. = compares favourably with)	NISP	#/Sq	#/Cl.
4:032	2	Reptilia: turtle	?shell fragment, charred	1		
4:037	2	Reptilia:turtle	?shell fragment, charred associated fragment, semi-charred	1 1		
4:040	3	Reptilia:turtle	?shell fragment, charred	1		
4:044	3	Reptilia:turtle	?shell fragment, charred	1		
4:059	5	Reptilia:turtle	?shell fragment, semi-charred	1		
Square 4 Total					6	
5:004	mix	Reptilia:turtle	shell fragment, carapace suture, uncharred	1		
5:029	3	Reptilia:turtle	shell fragment, carapace nuchal, uncharred (14mm x 15mm x 2mm)	1		
5:030	4	Reptilia:turtle	shell fragment, suture, semi-charred associated fragments, charred	1 4		
5:034	4	Reptilia:turtle	small fragments,semi-charred	2		
5:036	3	Reptilia:turtle	small fragment, semi-charred	1		
Square 5 Total					10	
6:005	-	Reptilia:turtle	?shell fragment, semi-charred, ?turtle	1		
6:011	2	Reptilia:turtle	shell fragment, uncharred (similar to 6:024) (45mm x 29mm x 11mm) small fragment, uncharred	1 1		
6:013	2	Reptilia:turtle	fragment, semi-charred,?turtle ?shell fragment, semi-charred, ?turtle	1 1		
6:020	2	Reptilia:turtle	shell fragment, semi-charred (patterned as softshell turtle) (19mm x 19mm x 5mm) cf. *Amyda cartilaginea*	1		
6:024	1	Reptilia:turtle	shell frag.ment carapace peripheral, semi-charred (35mm x 50mm x 13mm)	1		
Square 6 Total					7	
8:003	mix	Reptilia:turtle	?shell fragments, semi-charred	2		
8:004	-	Reptilia:turtle	?shell fragment, charred	1		
8:012	1	Reptilia:turtle	shell fragment, suture, semi-charred (composite of 5 fragments) (thickness @ 4mm) associated minute fragment, charred	1 1		
8:013	1	Reptilia:turtle	?long bone fragment, charred associated fragment, charred ?shell fragments, semi-charred associated minute fragment	1 1 2 1		
8:016	1	Reptilia:turtle	shell fragments, with sutures 4 peripherals, charred, includes nuchal (composite of 10) cf. *Malayemys subtrijuga* 1 carapace keel fragment cf. *Malayemys subtrijuga* 9 fragments, semi-charred (< 2mm depth) 1 fragment, uncharred (< 2mm depth) 1 fragment, uncharred (@ 3mm depth) 1 plastron peripheral fragment, uncharred (@ 6-10mm depth), large turtle long bone fragment, semi-charred fragment with nutrient foramen, charred shell frag. (@ 10mm depth), semi-charred minute fragments, semi-charred ?shell fragments, charred minute fragments, charred	17 1 1 1 2 25 35		
8:017	1	Reptilia:turtle	?shell fragments, charred shell peripheral fragments, charred	9 4		

Square:Bag #	Spit	Class	Description (cf. = compares favourably with)	NISP	#/Sq	#/Cl.
			associated minute fragments, charred	19		
8:018	1	Reptilia:turtle	?shell fragments, semi-charred ?shell fragments, charred associated minute fragments	6 4 6		
8:019	2	Reptilia:turtle	?shell fragments, charred associated minute fragment, charred ?shell fragments, semi-charred fragment, charred (15mm depth)	4 1 3 1		
8:022	2	Reptilia:turtle	?shell fragments, charred ?shell fragment, uncharred	7 1		
8:023	2	Reptilia:turtle	shell fragment, charred (Composite # 1 of 44 fragments) (43mm x 140mm x 210mm) shell fragment, charred (Composite # 2 of 12 fragments) (180mm x 110mm x 17mm) shell peripheral fragment, semi-charred (Composite # 3 of 17 fragments) shell peripheral fragment, semi-charred (Composite # 4 of 4 fragments) (with nodule) additional large fragments, charred additional small fragments, charred minute fragments, charred	1 1 1 1 4 8 25		
8:033	3	Reptilia:turtle	?shell fragment, charred associated minute fragments, charred ?shell fragments, semi-charred fragments, uncharred, ?turtle	1 5 5 5		
8:034	3	Reptilia:turtle	?shell fragments, charred shell fragments with sutures, semi-charred (@ 3-8mm depth) shell fragment, keeled carapace with suture, semi-charred (composite of 3 frags., depth @ 2-3mm) cf. *Malayemys subtrijuga* fragments, uncharred, ?turtle	4 4 1 8		
8:036	3	Reptilia:turtle	shell fragment, carapace nuchal, semi-charred (composite of 3 fragments) cf. *Cuora amboinensis* small fragments, charred minute fragments, charred ?shell fragment, semi-charred ?shell fragment, uncharred	1 3 3 1 1		
8:038	1	Reptilia:turtle	?shell fragment, semi-charred associated minute fragments, charred	1 6		
Square 8 Total					247	
10:020	3	Reptilia:turtle	?shell fragment, semi-charred	1		
10:031	1	Reptilia:turtle	?shell fragment, uncharred	1		
Square 10 Total					2	
11:016	1	Reptilia:turtle	shell fragment with suture, uncharred minute fragment, charred	1 1		
11:017	1	Reptilia:turtle	shell fragment with suture, charred	1		
11:018	2	Reptilia:turtle	distal femur, uncharred, cf. *Chelonia mydas* ?shell peripheral fragment associated minute fragment distal humerus trochlea, ?small turtle	1 1 1 1		
Square 11 Total					7	
12:034	5	Reptilia:turtle	shell fragment with suture, charred	1		
12:036	5	Reptilia:turtle	?pelvic girdle fragment, semi-charred associated minute fragment, charred, ?turtle	1 1		
12:037	-	Reptilia:turtle	distal humerus trochlea, charred (?small Emydidae turtle)	1		

Square:Bag #	Spit	Class	Description (cf. = compares favourably with)	NISP	#/Sq	#/Cl.
			?shell fragment, charred	1		
Square 12 Total					5	
13:039	3	Reptilia:turtle	shell fragment with suture, charred fragments, charred minute fragments, charred ?shell fragment,semi-charred, ?softshell turtle fragment, uncharred	1 2 2 1 1		
13:040	3	Reptilia:turtle	?shell fragment, uncharred	1		
13:042	3	Reptilia:turtle	fragment, semi-charred	1		
13:043	3	Reptilia:turtle	shell fragment with suture,charred	1		
13:046	3	Reptilia:turtle	shell fragment, semi-charred	1		
13:048	3	Reptilia:turtle	shell fragment, minute, charred minute fragment	1 1		
13:051	3	Reptilia:turtle	?shell fragments, large turtle associated minute fragment	3 1		
13:053	3	Reptilia:turtle	shell peripheral fragment, charred	1		
13:058	4	Reptilia:turtle	?shell fragment associated minute fragment	1 1		
13:061	4	Reptilia:turtle	shell frag., carapace costal, semi-charred, large turtle associated fragment, semi-charred associated minute fragments	1 1 4		
13:062-063	4	Reptilia:turtle	?shell fragment, large turtle	1		
13:065	4	Reptilia:turtle	?shell fragments, semi-charred, large turtle associated peripheral fragments, semi-charred associated minute fragments, semi-charred	3 4 11		
13:070	5	Reptilia:turtle	ulna, cf. *Chelonia mydas* shell peripheral fragments, large turtle associated fragments, semi-charred, ?turtle associated small fragments, semi-charred associated minute fragments (+ bone/wood dust)	1 2 12 13 50+		
13:071	5	Reptilia:turtle	?shell fragment, semi-charred ?shell fragment, uncharred	1 1		
Square 13 Total					125	
12/13:002	sh/mx	Reptilia:turtle	shell fragment, charred associated fragment, charred	1 1		
12/13:005	2	Reptilia:turtle	?shell fragment, semi-charred, large turtle (composite of 4 fragments) small fragment, charred long bone fragment, charred minute fragments, charred	1 1 1 7		
12/13:008	3	Reptilia:turtle	shell peripheral fragment, large turtle associated fragments	1 4		
12/13:009	3	Reptilia:turtle	shell peripheral fragments, large turtle associated small fragments associated minute fragments	2 10 15+		
12/13:012	3	Reptilia:turtle	shell peripheral fragments, charred ?shell fragments, semi-charred ?shell fragments, uncharred long bone fragment, charred associated fragment, charred minute fragments, charred/semi-charred	2 23 2 1 1 30		
12/13:015	2	Reptilia:turtle	?shell fragment, charred	1		
Sq. 12/13 Total					104	
14:013	2	Reptilia:turtle	?shell fragment, charred	1		
14:014	2	Reptilia:turtle	?shell fragments,semi-charred	2		

Square:Bag #	Spit	Class	Description (cf. = compares favourably with)	NISP	#/Sq	#/Cl.
			associated fragments, charred	15+		
14:019	3	Reptilia:turtle	shell frag., carapace, charred, ?softshell turtle shell fragment with suture, semi-charred associated minute fragments, charred	1 1 5		
14:020	3	Reptilia:turtle	?shell carapace peripheral frags., large turtle	3		
14:025	3	Reptilia:turtle	?shell fragment, charred	1		
14:?028	4	Reptilia:turtle	shell fragments with suture, charred shell sculpted fragments,charred shell peripheral fragment associated fragments, charred fragment, uncharred	2 2 1 2 1		
14:030	5	Reptilia:turtle	shell fragment with suture shell peripheral fragment,semi-charred ?shell fragments, charred ?shell fragments, semi-charred	1 2 11 5		
14:031	5	Reptilia:turtle	shell peripheral fragment, charred ?shell fragments, charred	1 8		
14:041	4	Reptilia:turtle	shell peripheral fragment,semi-charred shell fragment with suture, semi-chared associated minute fragments,semi-charred associated minute fragments, charred associated minute fragments	1 1 10 5 17		
14:042	4	Reptilia:turtle	shell fragment, carapace, with suture	1		
Square 14 Total					100	
PHC TOTAL		**Reptilia:turtle**				**653**
14:027	4	Reptilia:snake	fossilized epidermal scale fragment, ?snake	1		
Square 14 Total					1	
PHC TOTAL		**Reptilia:snake**				**1**
T:-	-	Aves	shaft fragment	1		
T2:024	1-4	Aves	cortex fragment	1		
Test Trench Total					2	
1:059	5	Aves	longbone shaft fragment, ?distal femur phalanges, distal (11mm, 9mm) cf. Rallidae/Ardeidae	1 2		
1:063	5	Aves	phalanx, distal (8mm) cf. Rallidae/Ardeidae	1		
1:069	6	Aves	phalanges, distal (15mm, 9mm) cf. Rallidae/Ardeidae	2		
Square 1 Total					6	
3:001	mix	Aves	long bone fragments tarsometatarsus shaft fragment, ?*Gallus gallus*	4 1		
3:010	sur	Aves	tibiotarsus proximal frag., ?*Gallus gallus* ?vertebral fragment ?fibula fragment, ?*Gallus gallus* phalanx, ?*Gallus gallus*	1 1 1 1		
Square 3 Total					9	
4:004	mix	Aves	long bone shaft fragment associated minute fragment	1 1		
4:006	mix	Aves	?femur shaft fragment ?coracoid fragments ?fibula fragment associated minute fragment	1 2 1 1		
4:007	mix	Aves	?sternum fragment	1		

Square:Bag #	Spit	Class	Description (cf. = compares favourably with)	NISP	#/Sq	#/Cl.
4:009	mix	Aves	?coracoid, ?galliforme (small) long bone shaft fragments ?thoracic process fragment associated minute fragment	1 3 1 2		
4:015	mix	Aves	shaft fragment	1		
4:020	mix	Aves	cortex fragment	1		
4:035	2	Aves	long bone shaft fragment, ?femur cortex fragments	1 6		
4:042	3	Aves	phalanx, distal (9mm) cf. Rallidae/Ardeidae	1		
4:049	4	Aves	shaft fragment	1		
4:056	4	Aves	scapula fragment, *Gallus gallus*	1		
4:059	5	Aves	tibiotarsus prox. frag., charred, *Gallus gallus* tibiotarsi distal frags., charred ?*Gallus gallus*	1 2		
Square 4 Total					30	
5:004	mix	Aves	humerus prox. frag., ?*Gallus gallus* minute fragments	1 5		
5:008	mix	Aves	shaft fragment	1		
5:018	2	Aves	shaft fragment	1		
5:021	2	Aves	small articulatory fragment	1		
5:023	2	Aves	shaft fragment	1		
5:035	-	Aves	long bone fragment V-shaped fragment associated minute fragments	1 1 4		
Square 5 Total					16	
6:011	2	Aves	phalanx, distal (9mm) cf. Rallidae/Ardeidae	1		
Square 6 Total					1	
8:016	1	Aves	skull bone, quadrate ?pelvic fragment linear fragment small articulatory fragment	1 1 1 1		
8:020	2	Aves	phalanx, distal fragments (7mm, 6mm) charred	2		
Square 8 Total					6	
10:001	t/bl	Aves	radius shaft	1		
10:019	2	Aves	small shaft fragment	1		
Square 10 Total					2	
11:007	1	Aves	vertebra, ?*Gallus gallus* small cortex fragments	1 3		
11:018	2	Aves	shaft fragment phalanx, distal fragments (12mm, 8mm) charred	1 2		
11:023	1	Aves	phalanx, ?*Gallus gallus*	1		
11:026	2	Aves	shaft fragment, ?tibiotarsus	1		
Square 11Total					9	
12:001	mix	Aves	shaft fragment	1		
12:007	mix	Aves	vertebral fragment ?clavicle fragment pelvic girdle fragment small fragments	1 2 1 3		
12:009	1	Aves	radius fragment shaft fragments, ?tibiotarsus	1 2		

Square:Bag #	Spit	Class	Description (cf. = compares favourably with)	NISP	#/Sq	#/Cl.
			long bone fragment, ?femur	1		
12:010	1	Aves	long bone shaft fragment	1		
12:011	1	Aves	cortex fragments	3		
12:015	2	Aves	pelvic girdle bone radius fragments ?ulna shaft fragments small long bone fragments minute fragments	1 2 2 6 10		
12:036	5	Aves	phalanx, ?*Gallus gallus*	1		
Square 12 Total					38	
13:003-005	sh/l	Aves	?humerus, distal fragment ?ulna, shaft fragments ?femur fragments, ?wading bird ?tibiotarsus fragments, ?wading bird ?tarsometatarsus shaft frags., ?wading bird shaft fragments scapula fragment	1 2 2 2 2 2 1		
13:006	br/l	Aves	phalanx ?tibiotarsus shaft fragment cortex fragments long bone shaft fragments	1 1 3 8		
13:007	mix	Aves	radius, ?*Gallus gallus* carpometacarpus, *Gallus gallus* ?ulna shaft fragment minute fragments	1 1 1 8		
13:011	mix	Aves	long bone fragments, ulna/radius + ?clavicle fragments fragments, ?bird	5 3 23		
13:017	1	Aves	cortex fragments	4		
13:028	2	Aves	small fused shaft fragment cortex fragments	1 3		
13:061	4	Aves	small fragments cortex fragments	2 2		
13:065	4	Aves	?tarsometatarsal fragment scapula fragment small fragments	1 1 5		
13:070	5	Aves	phalanx, distal (19mm) cf. Rallidae/Ardeidae phalanx, distal (9mm) cf. Rallidae/Ardeidae	1 1		
13:073	5	Aves	?humerus shaft fragment associated fragments	1 2		
13:075	6	Aves	phalanx, distal (7mm) cf. Rallidae/Ardeidae	1		
13:082	4	Aves	phalanges, dist. (12mm, 11mm) cf. Rallidae/Ardeidae	3		
13:085	5	Aves	phalanx, distal (11mm) cf. Rallidae/Ardeidae phalanges, dist. (9mm, 8mm) cf. Rallidae/Ardeidae	1 2		
Square 13 Total					98	
12/13:002	sh/mx	Aves	phalanx fragment, ?*Gallus gallus* long bone shaft fragments minute fragments	1 3 9		
12/13:004	1&2	Aves	shaft fragments, ?tibiotarsi small shaft fragments small fragments minute fragments	2 8 2 10		
12/13:005	2	Aves	long bone shaft fragments minute fragments	3 5		
12/13:?	2	Aves	small shaft fragment	1		
Sq. 12/13 Total					44	

Square:Bag #	Spit	Class	Description (cf. = compares favourably with)	NISP	#/Sq	#/Cl.
14:020	3	Aves	phalanx, distal (10mm) cf. Rallidae/Ardeidae	1		
14:034	3	Aves	phalanges, dist. (12mm,11mm) cf. Rallidae/Ardeidae	2		
14:035	3	Aves	phalanx, distal (14mm) cf. Rallidae/Ardeidae	1		
14:042	4	Aves	phalanx, distal (10mm) cf. Rallidae/Ardeidae	1		
Square 14 Total					5	
PHC TOTAL		**Aves**				**266**
Sector II:001	sur	Mammalia	metapodial shaft fragments, artiodactyla associated minute fragments	1 9		
Sector II Total					10	
T2:013	3	Mammalia	tibia prox. frag., charred, large mammal	1		
Test Trench Total					1	
1:008	mix	Mammalia	long bone shaft, small cat sized mammal (composite of 4 fragments)	1		
1:059	5	Mammalia	tibia shaft fragment (20mm length, 2mm width) e.g., cf. *Rattus rattus*, or *Suncus* sp. incisor tooth fragment, rodent e.g., cf. *Rattus rattus* or *Lariscus insignis* problematic fragment, ?claw/?teeth (2 anterior conical, 5 posterior , vestigial)	1 1 1		
1:069	6	Mammalia	teeth, molars and premolar, cf. *Macaca fascicularis* (2 maxillary molars with four roots) (2 premolars with three roots)	4		
1:077	5	Mammalia	femur, proximal, cf. *Rattus rattus*	1		
Square 1Total					9	
3:001	mix	Mammalia	spatulate incisor with root,, cf. *Sus scrofa*	1		
3:002	mix	Mammalia	?rib fragment, large animal (10mm - 15mm shaft diameter)	1		
3:010	sur	Mammalia	long bone shaft fragment, large animal small fragment	1 1		
Square 3 Total					4	
4:-	sur	Mammalia	long bone shaft fragment cortex fragment ?antler fragment, ?deer metapodial, distal fragment, ?deer pelvis fragment, ?deer	1 1 1 1 1		
4:001	-	Mammalia	long bone shaft fragment, large mammal long bone shaft fragment, small mammal	1 1		
4:007	mix	Mammalia	cortex fragments	2		
4:009	mix	Mammalia	pelvis frag. with acetabulum, cf. *Rattus rattus*	1		
4:011	sur	Mammalia	long bone fragment	1		
4:015	mix	Mammalia	molar tooth, ?2nd, very worn, *Sus scrofa* cortex fragment, large cortex fragment, small	1 1 1		
4:030	1	Mammalia	premolar tooth, unworn, *Sus scrofa* phalanx, artiodactyla, ?Cervidae	1 1		
4:035	2	Mammalia	femur fragment, cf. *Rattus rattus* tibia prox. frag., large mammal asociated minute fragment	1 1 1		
4:042	3	Mammalia	?antler fragments, ?deer associated small fragments	3 9		

Square:Bag #	Spit	Class	Description (cf. = compares favourably with)	NISP	#/Sq	#/Cl.
			associated minute fragments	17		
Square 4 Total					48	
5:009	mix	Mammalia	rib fragments (maximum diameter = 9mm) pelvic fragment, cf. *Sus scrofa* metacarpal (30mm length, 9mm width) cortex fragment small fragment (20mm length, 5mm width)	5 1 1 1 1		
Square 5 Total					9	
6:011	2	Mammalia	pelvic fragment, cf. *Rattus rattus* (28mm length, acetabulum diam @ 3.5mm)	1		
Square 6 Total					1	
8:017	1	Mammalia	tooth fragment, ?pig premolar	1		
8:022	2	Mammalia	tibia shaft frag., charred, cf. *Rattus rattus*	1		
Square 8 Total					2	
9:003	mix	Mammalia	femur, cf. *Rattus rattus* (31mm length, 4mm mid-shaft diam., @3.5 mm femur head diameter)	1		
Sqiare 9 Total					1	
10:015	1	Mammalia	tibia, distal, small cat (32mm length, 9mm shaft diam. 13mm width of distal articulation) cf. *Felis catus*/*Prionailurus bengalensis*	1		
Square 10 Total					1	
11:018	2	Mammalia	vertebral fragment, large animal associated minute fragment	1 2		
Square 11 Total					3	
12:006	mix	Mammalia	?clavicle fragment, large juvenile mammal	1		
12:007	mix	Mammalia	?rib fragment	1		
12:026	4	Mammalia	?mandibular condyle, charred, large juvenile animal, ?pig	1		
12:027	4	Mammalia	third molar, unerrupted, charred, *Sus scrofa* ?unerrupted premolar, ?artiodactyla problematic fragment, charred canine, small carnivore, cf. *Aonyx cinerea*	1 1 1		
12:030	4	Mammalia	long bone shaft frag., large juvenile animal	1		
12:034	5	Mammalia	?mandible fragment, ?charred, ?*Sus scrofa* associated small fragment small linear fragment, ?bone	1 1 1		
12:035	5	Mammalia	fragments + crumbled bone (appear similar to 12:030)	19		
Square 12 Total					29	
13:003-115	sh/l	Mammalia	pelvic frag. with acetabulum, cf. *Sus scrofa* metacarpal, cf. *Sus scrofa* fragments, ?pig	1 1 5		
13:011	mix	Mammalia	femur fragment with cut marks, cf. *Sus scrofa* fragments, ?pig	1 6		
13:012	loose	Mammalia	ulna fragment, ?pig radius fragment, ?pig	1 1		
13?028	2	Mammalia	femur shaft fragment, ?pig	1		
13:065	4	Mammalia	molar tooth,unworn, artiodactyla, cf. *Rucervus eldii*	1		
13:070	5	Mammalia	tibia shaft fragment, cf. *Rattus rattus*	1		
Square 13 Total					19	

Square:Bag #	Spit	Class	Description (cf. = compares favourably with)	NISP	#/Sq	#/Cl.
12/13:002	sh/mx	Mammalia	femur prox.fragment, cf. *Rattus rattus*	1		
Sq. 12/13 Total					1	
14:010	1	Mammalia	long bone fragment, large animal ?rib fragment cortex fragment	1 1 1		
14:020	3	Mammalia	femur prox. shaft frags., cf. *Rattus rattus*	2		
14:027	4	Mammalia	pelvic frag. with acetabulum, cf. *Rattus rattus* long bone shaft frag., small cat-sized mammal ?claw fragment, small carnivore	1 1 1		
14:032	5	Mammalia	pelvic frag. with acetabulum, cf. *Rattus rattus* tibia fragment, cf. *Rattus rattus*	1 1		
Square 14 Total					10	
PHC TOTAL		**Mammalia**				**148**
T:-	-	Unidentified	spine-like fragment, ?fish	1		
T2:005	1	Unidentified	long bone fragment	1		
T2:009	1	Unidentified	fragments, charred fragment, ?calcined, ?bone	2 1		
T2:011	2	Unidentified	small long bone fragments, calcined fragments, charred, ?turtle	2 2		
T2:013	3	Unidentified	fragment, charred, ?long bone associated charred fragments	1 2		
T2:018	3	Unidentified	fragments, semi-charred, ?turtle minute fragment	2 1		
T:020	6	Unidentified	minute, linear fragment, charred	1		
T2:028	-	Unidentified	minute fragments, charred	2		
T2:031	-	Unidentified	minute fragments, charred	2		
T2:032	?	Unidentified	spine-like fragment, charred long bone fragment, charred	1 1		
T2:035	-	Unidentified	minute fragments, charred	6		
T2:037	-	Unidentified	minute fragments, charred	7		
T2:046/5	?	Unidentified	long bone frag., semi-charred, ?turtle fragment, ?fish/?reptile associated minute fragments, charred	1 1 5		
Test Trench Total					42	
1:008	mix	Unidentified	small shaft frag., charred, ?reptile minute fragments, ?fish	1 2		
1:013	1	Unidentified	cortex fragment	1		
1:023	1	Unidentified	minute fragments	3		
1:028	5	Unidentified	?shell fragments, ?turtle	4		
1:048	3	Unidentified	minute fragment	1		
1:051	4	Unidentified	flat fragments minute fragments	2 3		
1:052	4	Unidentified	minute fragments	3		
1:058	5	Unidentified	minute fragments	3		
1:059	5	Unidentified	flat fragment, rough	1		
1:066	5	Unidentified	long bone fragment, small, ?turtle	1		

Square:Bag #	Spit	Class	Description (cf. = compares favourably with)	NISP	#/Sq	#/Cl.
1:069	6	Unidentified	vertebral fragment, ?bird flat fragment, rough	1 1		
1:071	4	Unidentified	shell fragments, ?turtle associated minute fragments	4 10		
1:082	-	Unidentified	minute fragment, ?bird	1		
Square 1Total					42	
3:027	3	Unidentified	articulatory fragment fragment, charred	1 1		
3:030	3	Unidentified	fragment, charred, ?bird distal phalanx	1		
3:031	3	Unidentified	minute fragment, ?turtle	1		
3:034	4	Unidentified	fragment, charred long bone fragment, uncharred	1 1		
3:035	4	Unidentified	flat fragment, charred	1		
Square 3 Total					7	
4:004	mix	Unidentified	flat fragment, charred	1		
4:024	1	Unidentified	flat fragments, charred	2		
4:028	1	Unidentified	fragment, ?bone	1		
4:030	1	Unidentified	minute fragment, charred	1		
4:031	2	Unidentified	long bone fragment, charred fragment, ?turtle associated minute fragment	1 1 1		
4:035	2	Unidentified	fragment, charred	1		
4:044	3	Unidentified	cortex fragments	3		
4:049	4	Unidentified	fragment, charred, ?reptile/amphibian minute fragment, charred cortex fragments, semi-charred	1 1 3		
4:059	5	Unidentified	long bone fragment, large, charred minute cortex fragments fragments, charred small fragments minute fragment, semi-charred	1 18 4 2 1		
4:067	3	Unidentified	small fragment, charred	1		
Square 4 Total					44	
5:003	mix	Unidentified	long bone fragments	2		
5:027	3	Unidentified	?vertebral fragment associated small fragments fragments, charred, ?turtle	1 5 4		
5:030	4	Unidentified	fragments, ?bone associated minute fragments minute fragments, charred	10 18 2		
5:036	3	Unidentified	flat fragments, ?turtle	2		
Square 5 Total					44	
6:011	2	Unidentified	fragments, charred, ?turtle	2		
6:028	2	Unidentified	fragment, ?bird smallfragment,?bird linear fragments,charred fragment, charred, ?turtle	1 1 3 1		
Square 6 Total					8	
8:013	1	Unidentified	long bone fragment	1		
8:015	1	Unidentified	fragments, calcined, ?turtle	3		

Square:Bag #	Spit	Class	Description (cf. = compares favourably with)	NISP	#/Sq	#/Cl.
8:016	1	Unidentified	small fragment, charred linear fragments, charred fragment,semicharred minute fragments	1 2 1 2		
8:017	1	Unidentified	long bone fragment minute fragments	1 2		
8:018	1	Unidentified	minute fragment	1		
8:019	2	Unidentified	minute fragment	1		
8:020	2	Unidentified	fragment, charred minute fragment	1 1		
8:022	2	Unidentified	articulatory fragment minute fragment	1 4		
8:036	3	Unidentified	minute fragments	10		
Square 8 Total					32	
10:006	1	Unidentified	fragment, charred	1		
10:011	1	Unidentified	fragments, ?turtle associated minute fragments	2 3		
10:017	2	Unidentified	small fragment	1		
10:019	2	Unidentified	minute fragments, semi-charred, ?fish fragments, calcined fragment, charred	5 2 1		
10:022	1	Unidentified	minute fragments	2		
10:033	1	Unidentified	minute fragments, ?reptile fragment, ?turtle fragment, uncharred	5 1 1		
10:?	1	Unidentified	flat fragments, charred minute fragment	3 1		
10B:001	1	Unidentified	fragments associated minute fragments	2 10		
10B:002	1	Unidentified	fragment, charred, ?bone, ?antler	1		
Square 10 Total					41	
11:007	1	Unidentified	fused craninal bones, ?fish/?reptile ?long bone fragment, ?large reptile	1 1		
11:010	1	Unidentified	minute fragments, ?fish	8		
11:014	1	Unidentified	cortex fragments minute fragments	3 2		
11:017	1	Unidentified	cortex fragment, charred	1		
11:018	2	Unidentified	fragmented bone	1		
11:026	2	Unidentified	minute fragments, ?fish	5		
Square 11 Total					22	
12:009	1	Unidentified	fragment, semi-charred small fragments, ?bone	1 2		
12:015	2	Unidentified	minute fragments	6		
12:020	3	Unidentified	fossilized layered fragment fragment, charred	1 1		
12:023	3	Unidentified	small fragment, ?mammal	1		
12:026	4	Unidentified	fragment fragment, scale-like, charred minute fragments	1 1 7		

Square:Bag #	Spit	Class	Description (cf. = compares favourably with)	NISP	#/Sq	#/Cl.
12:027	4	Unidentified	minute fragments	8		
12:035	4	Unidentified	?skull fragment, charred (?bone/?wood) minute fragments,charred	1 2		
Square12 Total					32	
13:001	sh/l	Unidentified	shaft fragment, small mammal minute fragment fragment, ?bone	1 1 1		
13:002	sh/l	Unidentified	cortex fragment, ?mammal minute fragment	1 1		
13:016	1	Unidentified	fragment, ?turtle	1		
13:017	1	Unidentified	minute fragments fragments, some minute, ?ray	3 13		
13:027	2	Unidentified	minute fragments (similar to 13:039-3)	4		
13:029	2	Unidentified	minute fragments, ?turtle	7+		
13:030	2	Unidentified	fragments, charred, ?turtle	2		
13:033	2	Unidentified	fragment, charred, ?turtle	1		
13:042	3	Unidentified	linear fragment	1		
13:056	4	Unidentified	fossilized fragments, semi-charred	7		
13:058	4	Unidentified	fragments, charred associated fragments	2 6		
13:059	4	Unidentified	fragment, charred	1		
13:061	4	Unidentified	small fragment,charred fragment, ?epiphysis	2 1		
13:061/062	4	Unidentified	fragment, charred	1		
13:064	4	Unidentified	fragment, charred,?turtle minute fragments	1 2		
13:065	4	Unidentified	fragments, charred, ?turtle	6		
13:067	4	Unidentified	fragment, charred, ?fish fragment, ?fish	1 1		
13:070	5	Unidentified	fragments, charred cortex fragment curved fragment, semi-charred ?cortex fragment	5 1 1 1		
13:071	1	Unidentified	curved shaft fragment, charred flat fragments, charred associated minute fragments	1 4 4		
13:085	5	Unidentified	tooth frag., @ 8mm ht., ?rodent incisor	1		
Square 13 Total					86	
12/13:002	sh/mx	Unidentified	flat fragment, ?turtle minute fragment, charred	1 1		
12/13:003	1	Unidentified	fragment, charred, ?turtle	1		
12/13:004	1&2	Unidentified	minute fragments	6		
12/13:005	2	Unidentified	minute fragments, semi-charred	2		
Sq. 12/13 Total					11	
14:013	2	Unidentified	minute fragments, charred	4		
14:016	2	Unidentified	fragment, charred and modified, ?bone/?antler	1		
14:017	1	Unidentifed	minute fragment, charred, ?turtle	1		
14:018	3	Unidentified	flat fragment, ?turtle	1		

Square:Bag #	Spit	Class	Description (cf. = compares favourably with)	NISP	#/Sq	#/Cl.
14:019	3	Unidentified	flat fragment, charred	1		
14:020	3	Unidentified	fragments, semi-charred small fragments minute fragments, charred	3 3 11		
14:024	3	Unidentified	?long bone fragment minute fragment, charred	1 1		
14:025	3	Unidentified	flat fragment (in pieces) minute fragments, charred insect egg casing (intrusive)	1 2 1		
14:027	4	Unidentified	minute fragments, charred, ?bone minute fragments, uncharred	10 7		
14:028	4	Unidentified	linear fragment fragment minute fragments	1 1 7		
14:030	5	Unidentified	long bone fragment minute fragments	1 3		
14:031	5	Unidentified	cortex fragment fragments, ?turtle fragment, ?fish scale-like fragments, ?fish	1 4 1 2		
14:032	5	Unidentified	fragment, ?fish ?tibia, proximal, small animal, charred long bone frag., small animal, charred fragment, charred, ?turtle	1 1 1 2		
14:035	3	Unidentified	minute fragment linear fragment minute fragments	1 3 5		
14:042	4	Unidentified	long bone fragments minute fragments	2 6		
Square 14 Total					91	
PHC TOTAL		**Unidentified**				**502**
TOTAL PHC NON-MOLLUSCAN FAUNA						**1823**

Appendix III. Presence of plant material at PHC by Square, Bag# , and Spit.

For the following descriptions, only those fragments overtly recognizable as wood are referred to as such, and other fragments are deferred to the general category of plant.

Charred = uncompressed, thoroughly charred plant or wood
Charcoal = compressed, charred plant or coal
* = larger samples or samples of interest.

Square:Bag #	Spit	Description
T1:002	?3	charred plant
T1:005	1	charred plant
T1:006	2	charred plant
T1:008	2	charred plant
T1:009	3	charred plant
T1:012	3	charred plant
T1:014	4	charred plant/?charcoal
T1:017	4	charred plant
T1:018	4	charcoal
T1:020	5	charred plant
T1:021	5	?charred plant
T2:008	1	charred plant
T2:009	1	charred plant
T2:011	2	charred plant
T2:013	3	charred plant
T2:019	5	charred plant
T2:020	6	charred plant/charcoal/disintegrating wood
T2:024 I	1-4	charred plant
T2:025 II	1	charred plant
T2:026 III	1	charred plant/charcoal
T2:027 IV	1	charcoal
T2:028	-	charred plant/uncharred leaf
T2:029	-	charred plant/charcoal
T2:030	-	charcoal/uncharred leaf/roots
T2:031	-	charred plant/charcoal
T2:032	-	plant/charcoal
T2:036	-	charcoal
T2:037	-	charred plant/charcoal
T2:038	-	charred plant/charcoal
T2:041	-	charred plant
T2:042	-	charred plant
T2:043	-	charred plant
T2:044	-	charred plant/charcoal

Square:Bag #	Spit	Description
T2:045	-	charred plant/charcoal
T2:046	-	charred and uncharred plant
T2:047	-	charred plant/charcoal
T2:049	-	charred plant/charcoal/uncharred leaves
T2:050	?	charcoal
T2/SQ 12:053	cable pipe	charred plant
T2:056	5	charred plant
1:005	mix	wood, semi-charred
1:012	mix	wood
1:016	1	charred wood
1:017	2	charred plant
1:025	3	charred wood
1:027	4	charred plant/wood
1:028	5	charred plant/wood*
1:048	3	charred wood
1:051	4	charred plant
1:052	4	charred plant
1:059	5	uncharred plant with cement matrix
1:061	5	charred and uncharred plant
1:063	5	charred plant*
1:065	5	charred plant
1:070	7	charred plant
1:071	4	charred plant
1:078	4	charred plant
2:005	1	charred wood*
2:008	3	charred plant/wood
2:009	3	wood
2:010	4	charred plant
2:011	4	uncharred wood (modified)/charred plant*
2:012	5	charred plant
2:016	6	charred plant
3:026	2	charred plant
3:027	3	charred plant
3:030	3	charred plant
3:032	4	charred and uncharred plant
3:034	4	charred plant
3:035	4	charred plant

Square:Bag #	Spit	Description
4:009	mix	charred plant
4:013	surface	wood*
4:016	mix	charred wood
4:024	1	charred and uncharred plant
4:025	1	uncharred plant
4:031	2	charred plant
4:032	2	charred plant
4:033	2 & 3	charred wood
4:034	2	charred plant
4:035	2	charred wood/plant
4:037	2	charred wood/plant
4:044	3	charred wood/plant
4:049	4	charred plant/charcoal
4:050	4	charred wood/plant
4:056	4	charred plant
4:059	5	charred wood/plant*
5:003	mix	wood
5:005	mix	wood
5:008	mix	plant
5:009	mix	painted wood*
5:018	2	plant
5:020	2	charred plant
5:023	2	wood
5:028	3	charred wood, uncharred plant
5:030	4	charred plant
5:034	4	plant
5:035	mix	uncharred plant
6:005	-	charred plant
6:008	1	charred plant, petrified plant
6:010	-	charred plant
6:011	2	charred plant
6:013	2	charred plant
6:025	mix	charred plant/charcoal
6:028	2	charred and uncharred plant
8:Feature	2	charred wood*
8:002	mix	charred plant/wood

Square:Bag #	Spit	Description
8:003	mix	charred wood/plant/charcoal
8:004	mix	charred plant
8:008	1	charred plant
8:013	1	charred plant
8:015	1	charred plant
8:016	1	charred and uncharred plant*
8:018	1	charred plant
8:022	2	charred plant
8:029 (Feature)	2	charred plant
8:034	3	charred plant
8:036	3	charred plant
8:042	1	charred plant
9:001	surface	charred and uncharred plant/charcoal
9:003	mix	wood
9:007	1	wood and charcoal
10:001	mix	charred plant
10:004	1	charcoal
10:005	1	charred wood/plant
10:008	1	charcoal
10:010	1	charred wood
10:014	1	charred plant/charcoal
10:015	1	charred plant
10:?	1	charred wood and charcoal
10:017	2	charred plant
10:018	2	charcoal
10:019	2	charred plant and charcoal
10:022	1	charred plant and charcoal
10:028	1	charred plant
10:033	1	charcoal, charred and uncharred plant/wood
10:043	2	charred plant and charcoal
10B:003	2	charred and uncharred plant
11: -	-	wood
11:001 & 002	t/bl	wood, charcoal, and charred wood/plant*
11:003	t/bl	charred plant/charcoal
11:007	1	charcoal, charred and uncharred wood/plant
11:008	1	charred wood/charcoal

Square:Bag #	Spit	Description
11:009	1	wood/charcoal
11:010	1	charred and uncharred plant
11:012	1	charred plant
11:014	1	charred plant
11:016	1	charred plant and charcoal
11:018	2	charred and uncharred wood/plant
11:022	mix	charred wood and charcoal
11:023	1	charcoal, wood, resin, and charred plant*
12:002	-	charred plant and charcoal
12:009	1	wood
12:011	1	charred plant
12:012	1&2	charred plant and seed pod
12:015	2	charred plant
12:017	2	charred plant
12:020	3	charred plant
12:023	3	charred plant
12:025	4	? plant (modified--blue colouration)*
12:026	4	charred plant/charcoal
12:027	4	charred and uncharred plant
12:028	4	charred plant
12:029	4	charred plant
12:030	4	charred plant
12:031	4	charred plant/charcoal
12:032	5	charred plant/charcoal
12:034	5	charred plant/uncharred seed pod*
12:035	5	charred plant
12:036	5	charred plant
12:037	5	charred plant
13:002	surface	uncharred plant/wood/leaves/stem
13:016 & 018	1	charred plant
13:027	2	wood (with roots)*
13:030	2	charred plant
13:033	2	charred plant
13:039	3	charred plant
13:040	3	charred plant
13:041	3	charred plant
13:042	3	charred plant
13:043	3	charred plant

Square:Bag #	Spit	Description
13:044	3	charred plant
13:047	3	charred plant/wood*
13:050	3	charred plant
13:051	3	charred and uncharred plant
13:052	3	charred plant
13:058	4	charred plant
13:059	4	charred plant
13:061	4	charred plant
13:062 & 063	4	charred plant
13:065	4	charred and uncharred plant/wood
13:067	4	charred plant
13:070	5	charred and uncharred plant
13:071	5	charred plant
13:083	4	wood
12/13:002	sh/mix	charred plant
12/13:003	1	charred plant
12/13:004	1&2	charred and uncharred plant
12/13:005	2	charred wood/plant
12/13:007	1&2	charred plant
12/13:009	3	plant
12/13:012	3	charred and uncharred plant/wood
12/13:013	1&2	charred plant
12/13:015	2	charred and uncharred plant
14:012	2	charred plant
14:013	2	charred plant
14:016	2	charred and semi-charred plant/charcoal
14:017	1	uncharred plant
14:020	3	charred and uncharred plant
14:021	3	charred plant
14:022	3	charred plant*
14:024	3	charred plant
14:025	3	charred plant
14:026	3	charred and semi-charred plant
14:027	4	charred and uncharred plant
14:028	4	charred plant
14:031	5	charred plant
14:032	5	charred plant
14:034	3	?charred plant

Square:Bag #	Spit	Description
14:035	3	charred and semi-charred plant
14:036	4	charred plant
14:041	4	charred plant
14:042	4	charred and uncharred plant