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Mermaids of The Arabian Gulf: Archaeological Evidence for the Exploitation of Dugongs from Prehistory to the Present

Mark J. Beech

Abstract

After Northern Australia the Arabian Gulf contains the second largest population in the world of sea cows or dugongs (*Dugong dugon*). These shy large marine mammals have been exploited for more than 7,000 years within this region. This paper highlights the economic and ritual use of dugongs by both prehistoric and historic coastal populations. Dugongs provided economically valuable products in terms of meat, oil, fat and hide, but the animals themselves were also venerated at a special monumental site constructed around 5,500 years ago on Akab Island in Umm Al-Qaiwain emirate. Their remains were also used in association with Islamic burial practice during the recent historical period on Marawah Island in Abu Dhabi emirate.

Introduction

The sea cow or dugong (*Dugong dugon*) is a large marine mammal which is one of the four living species of the order Sirenia. It is the only surviving representative of the once-diverse family Dugongidae. It is found in the waters of at least 37 countries throughout the Indo-Pacific, although the majority of dugongs live in the northern waters of Australia between Shark Bay and Moreton Bay¹ (Figure 1).

Dugongs have a long lifespan of 70 years or more, as well as a slow rate of reproduction, which makes them extremely vulnerable to exploitation. Dugongs can reach an average adult length of 2.7 metres and can weigh up to 300 kilograms. An adult's length rarely exceeds 3 metres, and females tend to be larger than males. Dugongs eat seagrass and are thus dependent on extensive seagrass beds in order to feed themselves. Such habitats are however under severe threat in the Gulf due to coastal reclamation, the

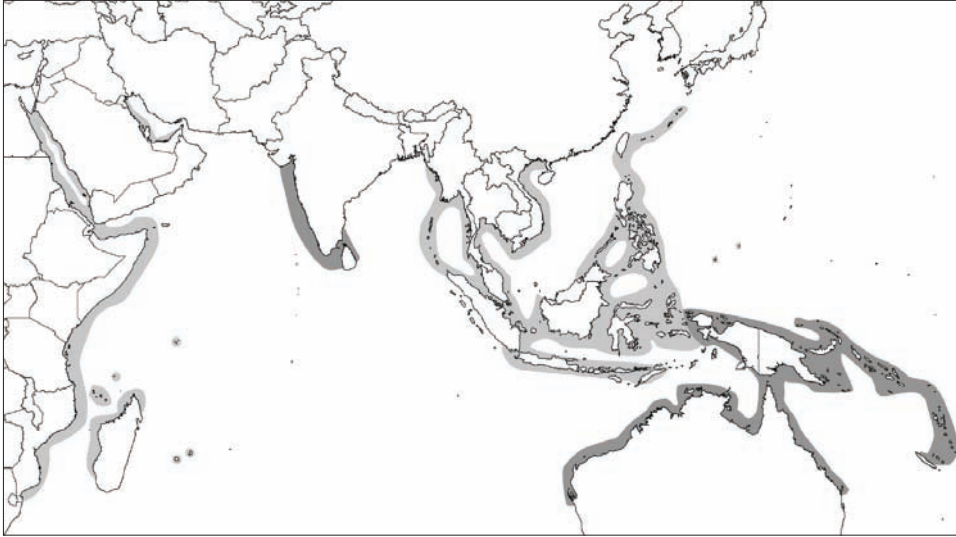


FIGURE 1. Modern Distribution of Dugongs in the World (after Marsh et al. 2002, Fig.1).

construction of artificial islands and the impact of construction along the shorelines of the region.

The second largest population of dugongs outside of Australia are those inhabiting the Arabian Gulf. This shy animal is now a protected species in Gulf waters. The modern population is estimated to comprise about 5800 individuals, and the most important habitats for it occur around Marawah island in the UAE, between Qatar and the UAE, as well as between Qatar and Bahrain². The IUCN Lists the dugong as a species vulnerable to extinction, and the Convention on International Trade in Endangered Species (CITES) limits or bans the trade of derived products from dugongs. Despite being legally protected in many countries throughout their range, the major causes of population decline are anthropogenic in origin, such as hunting, habitat degradation and fishing-related fatalities such as being accidentally caught in nets³.

Earliest Evidence for the Exploitation of Dugongs in the Arabian Gulf

The earliest evidence for the exploitation of dugong in the Arabian Gulf dates back to more than 7,500 years ago⁴. Dugong bones were found during archaeological excavations directed by the present author on the island of Marawah in the western region of Abu Dhabi emirate (Figures 2-3). This demonstrates the apparent longevity of the importance of dugong in this region of the Gulf.

At the site of MR11, on Marawah Island, butchered segments of dugong were transported to the site to be consumed by the site's inhabitants. Radiocarbon dating indicates that the site was occupied between about 5700-4400 cal BC (2 sigma

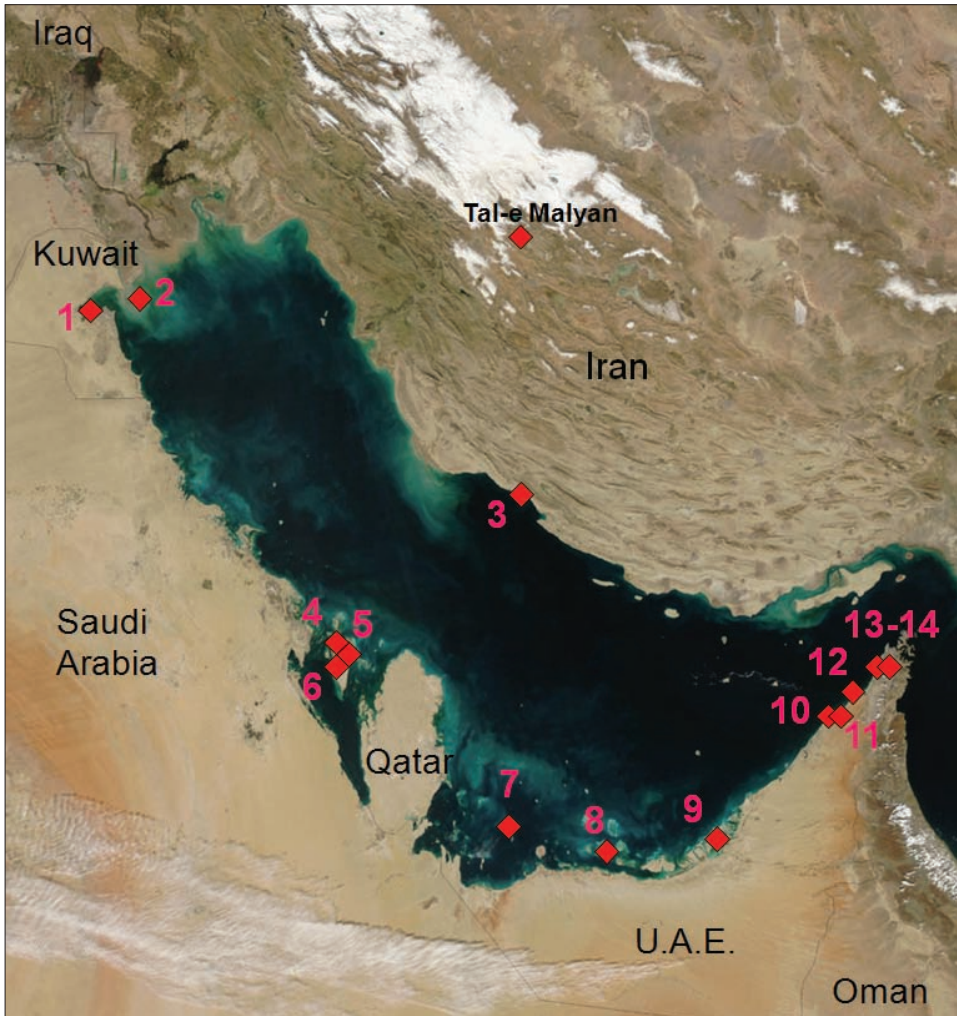


FIGURE 2. Records of Dugongs on Archaeological Sites in the Arabian Gulf and its vicinity.

Key:

1. Tell Akaz, Kuwait (n=68), Age: 50 BC - 700 AD, Period: Pre-Islamic.
2. F5 Failaka, Kuwait (n=142), Age: 300 BC - 100 AD, Period: Hellenistic.
3. Siraf, Iran (n=12), Age: 400 AD - 1600 AD, Period: Sasanian/Islamic.
4. Qalat al-Bahrain, Bahrain, Site 519 (n=104), Age: 1450 - 500 BC, Period: Dilmun.
5. Qalat al-Bahrain, Bahrain, Site 520 (n=7), Age: 2150 BC - 1200 AD, Period: Dilmun.
6. Saar, Bahrain (n=12), Age: 2000 - 1800 BC, Period: Dilmun.
7. Al Markh, Bahrain (common in later phase), Age: ?5000 - 4000 BC, Period: Ubaid/Late Stone Age.
8. DA11, Dalma island, Abu Dhabi, UAE (present), Age: 5100 - 4500 BC, Period: Ubaid/Late Stone Age.
9. MR11, Marawah island, Abu Dhabi, UAE (present), Age: 5700 - 4400 BC, Period: Ubaid/Late Stone Age.
10. MR4, Marawah island, Abu Dhabi, UAE (many), Age: 1400-1900 AD, Period: Later Islamic period
11. Umm an-Nar, Abu Dhabi, UAE (n=3000+), Age: 2600 - 2000 BC, Period: Umm an-Nar/Bronze age
12. Akab, Umm al-Qaiwain, UAE (frequent), Age: 4769-3400 BC, Period: ?Ubaid/4th mill BC settlement, and later dugong mound c.3500 BC.
13. Tell Abraq, Sharjah/Umm al-Qaiwain, UAE (n=78), Age: 2300 - 1800 BC, Period: Umm an-Nar/Iron age.
14. Ed-Dur, Umm al-Qaiwain, UAE (present but rare), Age: 300BC - 200AD, Period: Ed-Dur.
15. JH57, Jazirat al-Hamra, Ras al-Khaimah, UAE (n=3), Age: ?5000 - 4000 BC, Period: ?Ubaid/Late Stone Age.
16. Shimal, Ras al-Khaimah, UAE (n=10), Age: 1200 - 800 BC, Period: Iron Age.



FIGURE 3. Dugong remains discovered during Archaeological Excavations of site MR11 on Marawah Island, Abu Dhabi emirate. Dugong rib (top) and scapula (bottom) found in Room 1. These deposits date to more than 7000 years old (Photographs: Dr Mark Beech).

calibrated date range). Excavations during the 2004 season of the occupation horizon inside Room 1 revealed a number of dugong rib fragments as well as a shoulder blade (scapula) discarded in the corner of the room (Figure 3). These may have been debris resulting from consumption, although the room also contained disturbed human remains and so they may have been also deliberately deposited as food offerings with the dead.

Small quantities of dugong bones were also noted in the late 6th/early 5th millennium BC Ubaid-related settlement on Dalma island⁵ (Beech 2000). These consisted of a number of poorly preserved rib fragments.

A dugong 'butchery site' dating to the 5th-4th millennium BC was initially discovered by a team of French palaeontologists on Akab island in Umm al-Qaiwain⁶. Here a range of skeletal elements were represented, many of which were butchered. A more recent re-investigation of this site by a team of French archaeologists and archaeozoologists has however provided an important re-interpretation of this site as a sacred ritual sanctuary⁷. These excavations revealed that an Ubaid-related settlement dating to the 5th-4th millennium BC was later followed in around 3500 BC by the construction of a special dugong bone mound. This is discussed in further detail below.

Dugong bones were reported as being common in the later phase at the Ubaid-related site of Al-Markh in Bahrain⁸. The later Dilmun period levels at Qalat al-Bahrain also contained moderate numbers of dugong bones⁹. A small quantity were also noted at the Dilmun settlement at Saar¹⁰.

Dugongs were also clearly exploited during the Bronze age of the southern Gulf, as witnessed by finds at both Umm an-Nar and Tell Abra^q¹¹. More than 3,000 dugong bone fragments were reported from the original excavations at Umm an-Nar.

Distribution of Dugongs: Ancient and Modern

The distribution of modern dugongs in the Arabian Gulf is primarily restricted to the south-west and southern Gulf, between Ras Tanura on the Saudi coast, to Ras Ghanadha, close to the Abu Dhabi-Dubai border in the UAE. Some dugongs occur north-east of Ras Ghanadha, but the shoreline aerial surveys conducted in this area in 1986 and 1999 suggest that there is limited dugong habitat in this region¹².

The presence of butchered dugong ribs at the Neolithic period site of JH57 at Jazirat al-Hamra, as well as the presence of dugong bones in Iron Age period levels at Shimal, both in Ras al-Khaimah in the northern Emirates is therefore of some note¹³. Dugongs were also present but rare at the coastal site of Ed-Dur which was occupied from around 200 BC to 300 AD¹⁴.

Even more remarkable is the discovery of fragments of dugong in Kuwait. Pre-Islamic period dugong remains dating to between 50 BC – 700 AD were identified at the site of Tell Akaz in Kuwait Bay¹⁵. Moderate quantities of dugong bones were also

recovered from Hellenistic period excavations at site F5 on Failaka Island, and these included a dugong rib with butchery chop marks¹⁶. This is well outside the modern day distribution of dugongs in the Gulf. A recent survey in the central and southern Gulf noted no dugongs along the northern coast of Saudi Arabia¹⁷. Earlier studies have observed that dugongs do not normally occur in the waters of Kuwait, Iraq and Iran¹⁸.

There are however archaeological records of dugong bones being found in Iran. Small quantities of dugong bones were recorded in Sasanian/Islamic period levels at the coastal site of Siraf¹⁹. Their remains have even been noted at Tal-e Malyan, a second millennium BC highland urban site. It is also reported that artefacts were also manufactured from dugong bones and tusks at a number of prehistoric sites²⁰.

Dugongs may of course had a bigger distribution throughout the Gulf in the past than at the present day, and it is also likely that some pieces of dugong meat were maybe bartered, exchanged or traded by neighbouring coastal communities. Similarly their skulls, tusks and bones provided valuable raw material for working into artefacts. It is perhaps not surprising that relatively few dugong tusks have been recovered from archaeological sites. This may be because they were carefully curated as useful hand tools or amulets.

Elsewhere in the Indian Ocean dugong bones have been discovered at a number of sites. At Quseir in Egypt on the Red Sea it was observed that Roman levels occasionally included mostly large chunks of dugong ribs, some of them chopped. Islamic period levels at the same site contained a humerus from an immature individual, as well as a metapodial²¹. In Sri Lanka dugong bones have been discovered inland, as well as at Mantai on the north-west coast dating to between 800 BC to 1200 AD²². In the South China Sea at Duyong Cave on the island of Palawan in the Phillipines, thousands of dugong bones were found associated with jar burials dating to between 300 to 500 BC as part of ceremonial deposits²³. The most well known accumulations of dugong bones are those found in the Torres Strait Islands, located between Australia and Papua New Guinea. Some of these sites date back to the 14th century AD although some are also comparatively recent in date. These are generally believed to be part of ceremonial deposits. Extensive work on these has been carried out by Ian McNiven and colleagues²⁴.

Selection of Particular Elements

The skeletal anatomy of dugong was first described in detail by Everard Home in 1832²⁵ (Figure 4). It has extremely dense heavy bones for a marine mammal which makes the identification of even fragmentary pieces fairly straightforward.

Where dugong bones have been found on archaeological sites in the Gulf they are commonly represented by rib fragments²⁶. A number of points should be considered though. Dugongs are heavy animals which are difficult to manoeuvre out of the

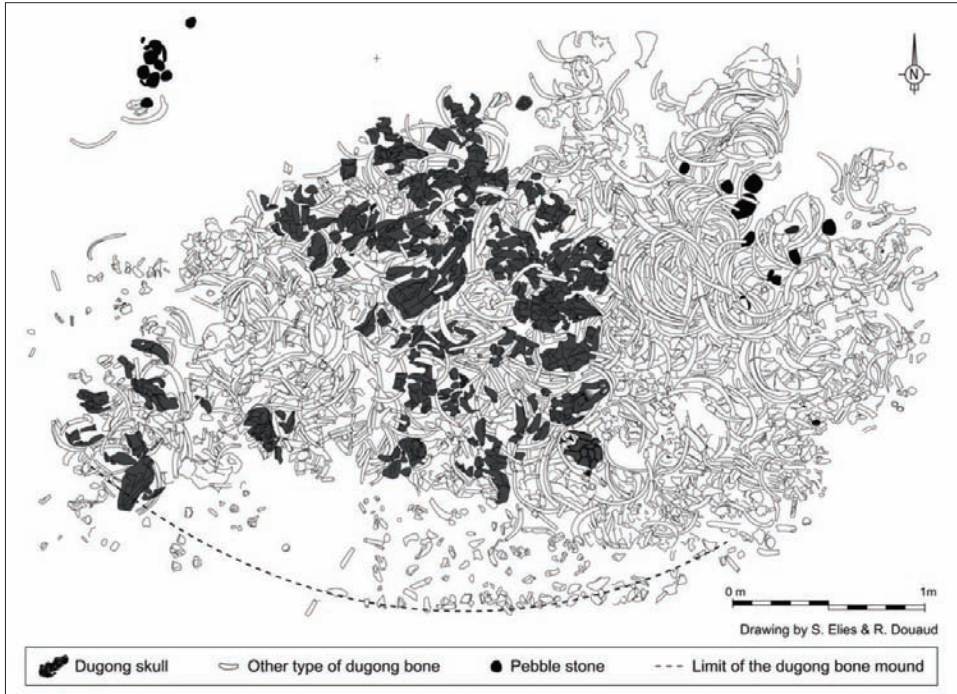


FIGURE 4. Plan of the ritual dugong bone mound (top) and view during excavation and recording (bottom) on Akab island, Umm Al-Qaiwain emirate. This dates to around 5500 years ago (Photograph and Plan courtesy of Dr Sophie Mery and Vincent Charpentier, French Archaeological Mission to the United Arab Emirates).

water. Butchered segments would have undoubtedly been removed from the dugong carcass soon after their capture. It makes sense to remove slabs of dugong meat as rib steaks from the carcass, as such segments would be more manageable to transport. Dugong ribs are relatively heavy and dense, so they clearly survive the ravages of time comparatively well. This is probably why they commonly occur on coastal sites of the region.

The bones from the paddle-shaped flipper also occur on archaeological sites. It is worth noting that again this may represent the removal of the flipper from the carcass of dead animals. The author witnessed a number of illegally hunted dugongs on Marawah island in the United Arab Emirates in the mid-1990's which consisted of carcasses minus their flippers. This limb contains a good chunk of meat which was preferentially removed by the poachers, as it was back in the past. Thankfully, today modern environmental legislation, the presence of the Marawah Marine Protected Area, along with patrol officers from the Environment Agency Abu Dhabi, help to protect dugongs from such poaching activities.

Most dead dugongs recovered along the coast of Abu Dhabi today result from accidental bycatch in fishing nets, boat strikes and natural deaths due to the degradation of their habitat by coastal reclamation activities²⁷.

Dugongs: an Economic Resource

Dugongs would have provided a rich resource of meat, oil, fat and hide to the prehistoric and historic coastal communities of this region. Dugong meat would have been an extremely rich source of protein and fat. The oil from dugongs had many uses including for cooking, massage, as fuel for lamps, for conditioning wooden boats, and even as medicine. It was reportedly often mixed with its bones, being burned then ground into a preparation. It was considered by some to be an aphrodisiac, and for this reason in the past it has been traded to many countries²⁸. A number of websites claim to sell dugong tears ("air mata"), "semen" and "pearls" as aphrodisiacs²⁹, but these bogus sites are usually selling nothing more than rock salt, glass or mineral items moulded or polished into appropriate shapes!

There are however genuine traditional uses for dugong products. Its hide was used by Arabian Bedouin to make sandals. In Egypt it was also used as shoe leather. Its hide/skin was also used for soldier's helmets, shields and other protective gear by the populations of the Red Sea and North-East Africa³⁰.

In the UAE, dugongs were traditionally captured for their meat, being sold in the fish markets. The caudal and rostral disk muscle were eaten fresh and salted, whereas the flukes, flippers, viscera and remaining head were generally discarded. Interviews conducted between 1986 and 1988 suggested that between 70 and 100 dugongs were sold at that time at the Abu Dhabi fish market per year³¹. For more than two decades now dugongs in UAE waters are protected by Federal Environment Law no.23 and Article

28/2000 Amiri Decree which prohibits the exploitation of dugongs in the UAE.

Dugongs and Ritual Deposits

An important recent discovery by French archaeologists at the previously known Neolithic site on Akab Island in the Emirate of Umm Al-Quwain was a man-made

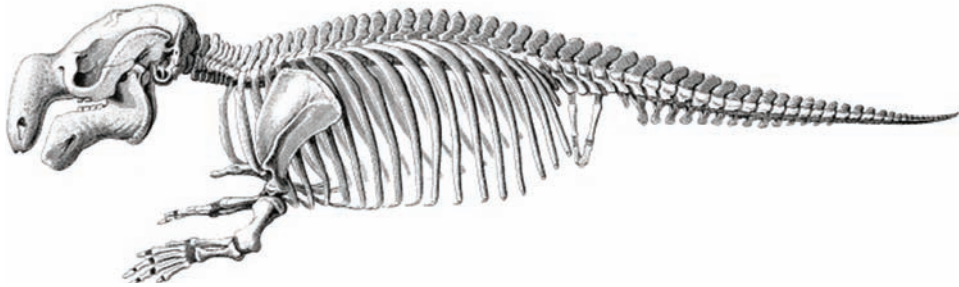


FIGURE 5. Female Skeleton of a Dugong (after Home 1821).

structured platform of dugong bones³². This contained skulls laid in parallel with ribs in sets, together with other carefully placed artefacts (Figure 5).

The Akab dugong bone mound is very similar to comparable monuments established much later (14th-20th c.AD) by aboriginal communities on the Australian coasts of the Torres Straits. These Australian dugong bone mounds were mostly part of totemic ceremonial sites, known as ‘kod’ sites, which were sacred sanctuaries usually reserved for men³³. They were constructions containing tens to several thousand dugong bones, amongst which were placed other objects such as ornaments, tools, ochre, as well as terrestrial and marine fauna. These mounds were associated with hunting magic rituals³⁴. In Australia, Madagascar as well as a number of other places such as the Trobriand Islands, for example, the dugong is an animal of special status, which was and still is today subject to particular rites concerning its capture, transportation, dismemberment and consumption³⁵.

Graves of the Dugong Hunters?

Islamic burial tradition is generally noted by its simplicity. The burial rituals should normally take place as soon as possible and include bathing the dead body, enshrouding the dead body in a white cotton or linen cloth, funeral prayer, burial of the dead body in a grave and positioning of the deceased so that the head is faced towards Mecca. The body is placed directly into an open grave without a casket. Gravediggers then fully

bury the corpse, stamping or patting down the grave to shape, typically supervised by the eldest male. After the burial, the Muslims who have gathered to pay their respects to the dead, collectively pray for the forgiveness of the dead. This collective prayer is the last formal collective prayer for the dead. Any grave markers used are very simple and are generally used to indicate the head end of the grave.

An archaeological survey of the Ghubba village Islamic cemetery on Marawah Island in 1992 by the Abu Dhabi Islands Archaeological Survey first noted some interesting local variations in Islamic burial practice during the historical period along the coast of Abu Dhabi³⁶. This Islamic graveyard measured about 20m x 40m and had about 100 burials, of which around 20 were of children. The graves were large measuring c.2.5 x 1.2m, with kerb and head and foot stones rising to a maximum of 70cm height. The orientation of the graves was an average of 246-254 degrees. Three of the headstone had holes in them, suggesting that they may have been previously used as boat anchors. Many of the graves had an enamel teapot at their headstones, or on the grave itself. Occasionally there was an enamel jug or basin instead. Two graves had ceramics scattered over them. One particular grave had an inverted painted Julfar style vessel with a smashed based at its head end³⁷.

In actual fact, similar grave deposits have been noted for a historical cemetery in the Sultanate of Oman³⁸, although no dugong remains were found in the Omani case. Ceramic remains were deliberately placed on the graves, local informants reporting that the daughter of the deceased chose one of her best pieces to be left at the head of the tomb after it was deliberately broken on the spot to discourage theft.

Besides some of the Ghubba village graves having pottery associated with them, two graves from the Late Islamic period cemetery at Ghubba village on the south coast of Marawah Island have interesting deposits of dugong bones associated with them (Figure 6a). These comprised fragments of skull and jaws from juvenile individuals. In each case the remains were placed at the head end of the grave mound. We were told by local Al-Rumaithi informants on the island that these were graves of successful dugong hunters.

On the shore of Ghubba village a midden of dugong bones was also discovered during the archaeological survey of Marawah Island (Figure 6b). The site designated as MR4 consisted of an assortment of dugong bones (mostly skull, jaw and rib fragments) together with marine turtle bones, with a handful of Julfar pottery sherds being found adjacent, indicating its historical period date.

Concluding Remarks

Marine resources were being extensively traded to the interior of the Arabian peninsula by the Iron Age period, probably as a direct result of the domestication of the camel opening up new caravan trade routes³⁹. It may well be that the use of dugong hide was more widespread in the past than was previously realised. Simply it may not have

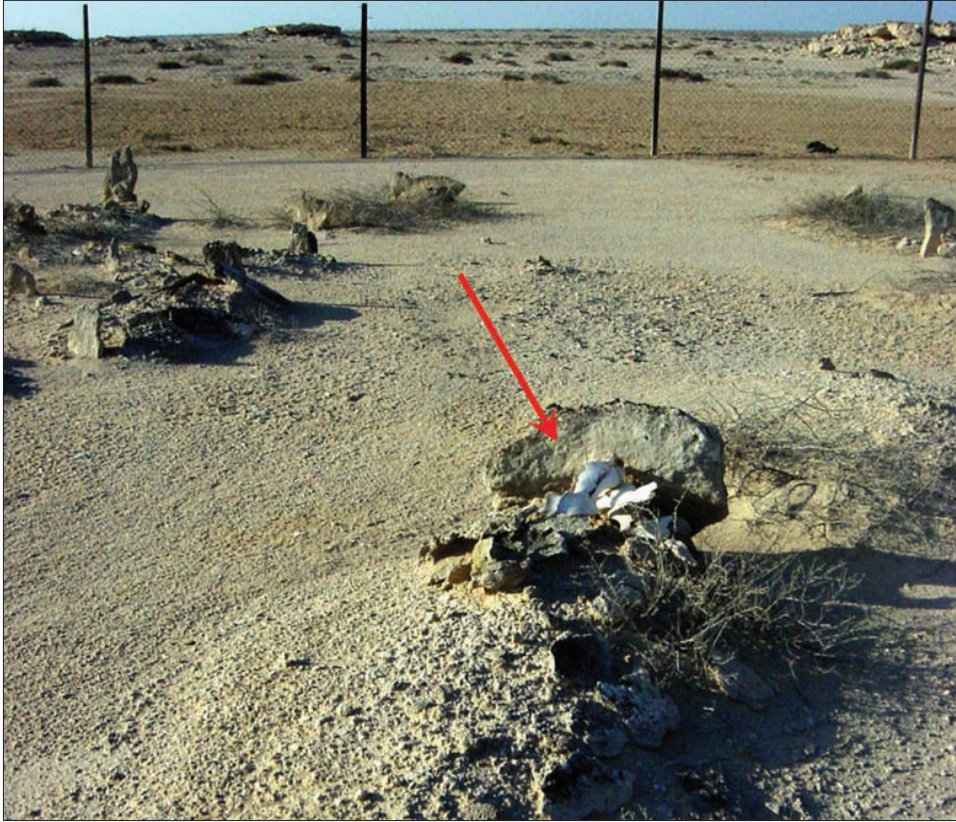


FIGURE 6. Dugong bones placed on Islamic graves (top) and a Late Islamic period dugong bone midden, site MR4 (bottom) at Ghubbah village, Marawah Island (Photographs: Dr Mark Beech).

been recognised as ethnographic items are not often subject to stringent analysis and testing.

Marine resources have always played a vital role in the survival of early populations inhabiting the coasts of south-east Arabia⁴⁰. Previous studies have largely concentrated on the important role of fisheries and the exploitation of marine shellfish. The important role of dugong can now be added to our existing knowledge and awareness of significant human-marine interactions. Clearly the early coastal populations of the Gulf had a special and indeed magical relationship with the dugong which provided not only basic economic products but may have also played an interesting symbolic role in their daily lives.

Acknowledgements

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In addition, a number of archaeozoologists kindly shared details of dugong records from various archaeological assemblages in the region, including: Sheila Hamilton-Dyer, Dr. Marjan Mashkour, Dr. Ian McNiven, Dr. Phil Piper, Dr. Ruth Young, and Dr. Melinda Zeder.

This paper is dedicated to the Mermaids of the Gulf. Long may they flourish, and be protected from man's insatiable appetite for destroying our precious oceans.

Notes

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- p. 176; and in: Paz, Victor, and Wilhelm G. Solheim. 2004. *Southeast Asian Archaeology: Wilhelm G. Solheim II Festschrift*. Diliman, Quezon City: Univ. of the Philippines Press, p.276-288; and thanks to Phil Piper, personal communication.
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