5. ARCHAEOLOGICAL AND CULTURAL SITES

Through even the most casual observations, we readily see the region's maritime heritage in the form of ship captains' homes, lighthouses, fortifications, wharves, and boatyards. While these terrestrial resources reflect the seaward nature of this heritage, a maritime legacy can be found in the submerged reaches of this region as ancient Native American sites, historic and modern shipwrecks, disposal areas, and aircraft. Given Massachusetts' long maritime heritage and its leadership in maritime activities, there exists a high probability that many of these shipwrecks may be historically important.

The management of cultural resources, including those submerged resources such as shipwrecks, involves a sequence of tasks (GAO 1987):

1. inventory (discovery and recording)
2. evaluation (scientific and public importance)
3. planning (determine appropriate use)
4. protection (safeguarding resources)
5. utilization (accommodating proper use)

While this sequence of tasks is fairly straightforward, protection and utilization are controversial when involving shipwreck sites. The state of knowledge remains in the very basic stages of task one, inventory, with only limited progress with respect to tasks two and three, evaluation and planning. However, it is possible to construct the necessary contexts through which we can begin to model the potential for site occurrence and potential importance of resources.

Within the Massachusetts ocean planning area, and throughout state waters, underwater archeological sites are managed by the Commonwealth's Board of Underwater Archaeological Resources. Under state law (312 CMR 2.03), "any person who has located a shipwreck or other underwater archaeological resource within inland or coastal waters of the Commonwealth or the lands beneath such waters shall secure a permit from the Board of Underwater Archaeological Resources prior to conducting any activities that may disturb the site or resource." Similarly, under federal law (36 CFR 800), projects that require any federal licensing, funding, or permitting must consult with the State Historic Preservation Office, which is the Massachusetts Historical Commission (MHC), to take into account adverse effects to significant historic and archaeological resources. Any projects or activities in the ocean planning area must anticipate the existence of underwater archeological resources and if they are found, must take steps to avoid them.

NATIVE AMERICAN SITES

Prior to the last marine transgression of the Holocene epoch, the now submerged bottomlands off the coast of Massachusetts were once uplands and coastal plain. During periods of lower sea level, terrestrial and coastal environments extended seaward occupying those areas formerly covered by the oceans (Emery and Edwards 1966). Similar to today, these bottomlands turned terrestrial landscapes would have been characterized by uplands and river valleys, sand dunes, springs, and lakes. The more seaward reaches of these exposed bottomlands were likely characterized as lagoon and barrier island, which extended out into deeper water marine environments. The varied topography, fresh and

saltwater resources, and abundant floral and faunal species together comprised a wide range of onshore ecozones that, when they were exposed, would have been an attractive landscape for occupation by early Native Americans and for exploitation of an abundance of plant and animal species.

There were two periods when this offshore area was not completely submerged and could support habitation and land use by ancient Native Americans. Between 12,000 and 9,000 before the present (BP), the area was a series of shoals and small islands. Seal and bird hunting, shellfish collecting, and fishing could have been major subsistence activities. Between 9,000 and 6,000 BP, areas such as Stellwagen Bank appear to have been one large continuous island able to support small Native American habitation sites with associated shell middens similar to the nearby Provincetown area (Barber 1979).

Ancient Native Americans may have hunted large marine mammals and birds, or fished at sea prior to European contact. Early explorers observed porpoises and seals being hunted in the open ocean. However, the exploitation of these mammals may have favored utilizing beached whales or hunting seals and birds, or shellfishing along the shore, rather than hunting in the open ocean. Archaeologists continue to debate the extent of deep ocean fishing and hunting by ancient Native Americans. There is little likelihood for Native American site remains more recent than 6000 BP far away from the present shoreline. Closer to shore and in tidal rivers, the inundation process continued, so Native American site remains may be found in those now submerged areas.

While only a few ancient Native American artifacts have been discovered in the region's coastal waters, the potential for more extensive preserved, ancient archaeological sites underwater must be considered. Occasionally, Native American artifacts are recovered by scallopers in deep water in the Gulf of Maine region, and some have been found in mudflats by clam diggers and even underneath peat deposits along tidal rivers and in estuarine wetlands in Massachusetts. In 1990, a mastodon or mammoth tooth was recovered by commercial fishermen several miles off of Provincetown. The occasional recovery of such remains suggests environmental conditions were present to support Paleo-Indian populations. Recently, an intact drowned forest with a freshwater marsh and pond dating *circa* 10,000 to 5,500 BP was found during the archaeological survey associated with the Cape Wind Project in Nantucket Sound (Robinson *et al.* 2004). In general, the preservation of organic materials, items made of wood, bone, and natural fibers and hides, may be better preserved in now-submerged sites than at terrestrial sites. The highest density of terrestrial archaeological sites, from both ancient and early historical periods, in Massachusetts is found in our coastal communities. It can be reasonably expected that the lands now submerged also contain evidence for settlement and land use prior to inundation (Mastone 2002, Bell 2008)

SHIPWRECKS AND OTHER HISTORIC RESOURCES

The Age of European Exploration ushered in over four centuries of vessel traffic engaged in the exploitation of the marine environment and its resources. The lands and waters of the western North Atlantic were explored and colonized for their abundant resources, particularly cod and whales. The detailed depictions of Cape Ann, Cape Cod, and the rest of our shoreline on historic maps and charts are statements to the importance of Massachusetts and her waters. This exploration and exploitation of Massachusetts' waters was accompanied by the inevitable loss of vessels at sea that now have protection

under the federal Abandoned Shipwreck Act of 1987 (43 U.S. C. 2101 *et seq.*) as well as state Underwater Archaeology Act (Acts of 1973, Chapter 989, as amended).

Looking seaward, the area bordered by the two Capes is the gateway to Massachusetts' maritime commerce. Historically, as today, the main shipping lanes crossed Stellwagen Bank. Oil tankers, colliers, container barges, trawlers, and pleasure boats replaced the coastal schooners, clipper ships, packets, and fishing schooners. Until the opening of the Cape Cod Canal, the expanse of ocean between the capes was the only access to the ports inside Massachusetts Bay, such as Boston, Plymouth, Salem, Gloucester, and Provincetown. Once the canal opened, vessel traffic crossed the area in greater frequency. Similarly, the area of Nantucket Sound was the main safe route for vessel traffic rather than south of Nantucket and Martha's Vineyard Islands, with many of the nearby ports being designated officially as "safe harbors." The late 19th century/early 20th century saw the highest level of coastal shipping in the northeast.

The fisheries activities in this region are well established. Early whaling activity from long boats would have encompassed large portions off Cape Cod. The shift from small boats to larger schooners moved the majority of fisheries further out to sea to Georges Bank, South Channel, and Grand Bank. Until the Civil War, near shore fisheries were undertaken in a few small open boats engaged in market fisheries mainly in the winter months. Local banks and shoals were not initially heavily exploited by the schooner fisheries because Georges Bank fisheries were more lucrative. The growth of the 20th century trawler and dragger industries turned attention back to the nearer shore waters.

The records of the Massachusetts Board of Underwater Archaeological Resources indicate there are well over 3,000 shipwrecks off of the Massachusetts coast. The earliest known and recovered shipwreck, Sparrowhawk (*circa* 1626), is now on display at the Cape Cod Maritime Museum in Hyannis. The primary causes of shipwrecks fall into four broad classes:

1. acts of war - naval engagements, piracy, law enforcement
2. natural forces - storms (gales/hurricanes)
3. human error - seamanship, fire, collision
4. abandonment - above, plus vessel condition, economic

There is a strong relationship between high shipwreck frequency and major storms. By contrast, collisions and founderings are the major cause for loss during periods of low shipwreck frequency. Further, a strong seasonal distribution of shipwrecks within the peak period of November/December is exhibited off of Massachusetts (Fish 1989). Interestingly, these months are typified by lower traffic volume, except fishing activities.

Adverse and unpredictable weather conditions (severe gales and hurricanes) have been identified as the major cause of vessel loss. Table 5.1 depicts over 20 recorded major storm events with significant impact on shipping.

Table 5.1 Historic major storm events (adapted from Luther 1958, Mastone 2002).

August 15, 1635	April 14, 1851 (Minots Ledge Lighthouse destroyed)
September 1676	January 19, 1857
February 22, 1723	September 8, 1869
December 1786	December 25, 1873
October 9, 1804	December 1886
September 23, 1815	November 25, 1888
December 14-15, 1839 *	September 9, 1896
December 17, 1839* (the "Triple Hurricanes of 1839")	November 26, 1898 (the "Portland Gale")
December 22, 1839 *	September 21, 1938
December 27, 1839 *	September 14-15, 1944
October 2, 1841	October 30, 1991 (the "Perfect Storm")

The Triple Hurricanes of December 1839 and the Portland Gale of November 1898 were particularly devastating. The 1839 storms inspired Longfellow's poem "The Wreck of the Hesperus." Contemporary accounts noted over 200 vessels sunk in Boston Harbor alone, but with comparable losses in the ports of Gloucester and Provincetown. By comparison, roughly 400 vessels were lost during the Portland Gale. The greatest number of shipwrecks to occur in one year for New England happened during 1898, with 90% of those shipwrecks taking place in just three days, November 25-27, 1898 (Fish 1989)

While research strongly indicates more than 3,000 shipwrecks in Massachusetts' waters, the quality of descriptive information and precision of locational data is severely lacking. A strong bias may exist in the historical and documentary record to selectively not record locational or other information on shipwreck sites which do not pose a hazard to navigation, involve human tragedy, or carry valuable cargo. Government data is aimed at identifying and locating man-made and natural objects that are hazards to navigation but not all shipwrecks are important for reasons other than navigation. In many instances for deepwater shipwrecks, the reported locations are approximate and not verified because they do not pose a hazard to navigation. Further, reliable locational information is in private hands (*e.g.*, sport divers, researchers, fishermen) whose varying purposes and needs generally preclude sharing this information (Mastone 1990, 2002).

Most available published sources of shipwreck information concentrate on romance of the sea and/or major calamities and disasters. Their audience is typically popular and not scholarly. Many of these works are laundry lists of shipwrecks often published without sources or evaluation of sources. Further, many works reflect a certain selective presentation of facts such as including only larger vessels or those carrying "valuable" cargo. Thus, vessel loss is under-recorded (Mastone 1990, 2002).

Unfortunately, the ambiguity of location given in documentary sources for most maritime disasters generally precludes establishing statements of impacts to specific resources. Ambiguity exists over the reported location of a shipwreck, particularly at sea and the types of vessel losses that are reported. Typically, the presumed nearest landfall is used when the shipwreck does not occur at a recognized

landmark - on shore, on rocks, near a buoy marker or lightship. References such as "off Provincetown," "off Cape Ann," "off Massachusetts Coast," "off New England," or "left port never to be heard of again," are frequently the only description. Further, the place of loss was far less important to record than "who and what was lost" for most colonial period writers. The precision of location that we require today was historically not as important to the recording of vessel losses (Mastone 1990, 2002).

Among the other historic resources on Massachusetts ocean bottomlands are: dumping grounds, communication cables (*e.g.*, the trans-Atlantic telegraph cable at Marconi Beach), aids to navigation (*e.g.*, the remains of the 1851 Minots Ledge Lighthouse), and aircraft. While several aircraft crash sites have been positively identified in Massachusetts waters (locations undisclosed), many others can be anticipated due to the numerous training bases in the region, as well as private and commercial flights.

Over the past decade, a number of major offshore development projects ranging from dredging to submerged cables and pipelines to alternative energy proposals have conducted archaeological sensitivity and preliminary site identification activities. For example, the Hubline, Northeast Gateway, and Neptune projects in Massachusetts Bay together located approximately 30 shipwreck sites along their main routes. Re-routing flexibility allowed the proponents to avoid impacts to these sites. Unfortunately, the need to determine the identity or assess the archaeological importance of these sites was mitigated by avoiding impact. As a result, little qualitative information was collected from these site locations (*i.e.*, the site location is known, but the identity of the archeological resource at that site is unknown).

Often overlooked is the multiple usage value of submerged cultural resources. Beyond their heritage value is a recreational opportunity and economic value associated with recreational use (*e.g.*, heritage tourism). Massachusetts maintains a list of shipwreck sites specifically preserved for the continued enjoyment of the recreational diving community. Known as "exempted sites," 40 shipwreck sites have been designated since 1985 (Figure 5.1). Additionally, and possibly equally important, are the natural resource characteristics of cultural resources. Through the processes of structural deterioration and plant/animal colonization, shipwrecks and other resources are transformed from their original function into habitats. Their value no longer manifests itself in the cargoes carried or the functioning of the vessel, but rather in their ability to serve as habitat and thereby support the food web. Thus historic shipwrecks achieve dual historical/archaeological and biological values.

Finally, knowing precisely where submerged cultural resources are located may not fully address the management task of site inventory. The problems associated with this task are compounded by insufficiently detailed historical and spatial information on these sites. Similarly, the lack of qualitative site-specific information severely limits discussion of their potential historical importance. Advances in technology have made locating submerged resources easier, particularly for historical period shipwreck sites. Once identified, site-specific research and evaluation is required to evaluate significance and to develop site-specific management recommendations to consider their planning, protection, and appropriate utilization.

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Figures

Figure 5.1. Mapped locations of the 40 "exempted" shipwreck sites in Massachusetts that are specifically preserved for recreational diving.