POSSIBLE SHIPWRECK AND ABORIGINAL SITES ON SUBMERGED LAND

GLOUCESTER, MASSACHUSETTS

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ABSTRACT

A proposed dredging of Gloucester Harbor could adversely affect significant underwater archaeological sites unless those sites are located and avoided or mitigated. Prehistoric sites may be present, but almost impossible to detect. Historical research indicates, because of centuries of intense maritime activity in the bay and harbor, there were at least 302 historically significant small and large vessels lost in the general area that includes the proposed disposal sites. Any dredging or disposal in the area might disturb one or more of the shipwreck sites.

Therefore, any dredging in Gloucester should be preceded by an archaeological remote sensing survey, to locate and identify by type, any significant sites within the proposed disturbance areas. Once any detectable cultural resources have been located and identified by type, decisions can be made to avoid or mitigate them.

INTRODUCTION

The State of Massachusetts is currently planning to dredge the Gloucester Harbor shipping channel. As part of the project planning, local and federal statutes and regulations require the identification of significant cultural resources within the possible impact zone and either avoidance or mitigation of impacts to such resources, if identified. As this channel was dredged in the past, the impact zones will be areas chosen for dredge material disposal.

Massachusetts therefore contracted with the Maguire Group to 1) conduct preliminary background research to determine if undetected remains of prehistoric sites and shipwrecks may be in the project's possible disposal areas and, 2) recommend any necessary further research to meet local and federal cultural resource requirements. The Maguire Group conducted the study, in association with Dr.Warren Riess as maritime archaeologist.

PROJECT DESCRIPTION

Area Description

The project area is located in Gloucester Harbor and upper Massachusetts Bay. For millennia this part of the Atlantic Ocean has been a thoroughfare for numerous interests, including assumed prehistoric fishing, European exploration, general and military shipping, commercial fishing, and recreation.

Site Description

The disposal sites being considered are generally two types. One is the area directly adjacent to both sides of the existing shipping channel. The other consists of discreet sites in

northern Massachusetts Bay. Each possible site has a different size and shape (Figure 1).

BACKGROUND ANALYSIS

Methods

In order to determine the probability of sites, the location of any known remains, and information about previously investigated sites, the research team conducted interviews and inspected secondary and some primary archival material. To research all available primary material would take many months of time without any guarantee of added information. Therefore, extensive primary research was not required for this study.

The research team interviewed staff at the Massachusetts Board of Underwater Archaeological Resources, the local dive shop operator, a local avocational shipwreck diver, and the Gloucester Harbor Master. They also conducted limited primary and secondary research at the Cape Ann Historical Association Library.

Histories of the New England region, Massachusetts, the North Shore, and the individual municipalities were studied for background historical information, and published material on the prehistory of the area was read for pertinent information. In addition, eleven published and unpublished lists of shipwrecks were inspected to determine how many ships were lost in the study area. The references included an "encyclopedia" of shipwrecks with many inaccuracies, excerpts from a federal Bureau of Land Management study of some primary sources, and three lists compiled by amateur shipwreck historians from Massachusetts. Little primary research was conducted, except for the study of historic charts of the area at the Mystic Seaport Museum chart archives and the interviews mentioned above.

Since most shipwreck locations cited in contemporary newspapers were quite general, such as "lost off Gloucester," and other sources gave exact locations, the team designated each

reported shipwreck as being at a specific location, "off" a municipality, or in the general area.

To determine significance for each site we used the Department of the Interior's definition for eligibility to the National Register of Historic Places -- generally sites over fifty years old. However, most of the shipwrecks were over one hundred years old. We have accepted the recorded locations and dates of the shipwrecks, without enough time to research each shipwreck in depth, therefore the information for any particular site might be inaccurate. However, the approximate number of significant shipwreck sites in the Gloucester study area is accurate enough to allow the determination of recommendations for predredging planning.

HISTORICAL BACKGROUND

The history of the survey area is rich in maritime activities. Prehistoric Indians used the shore as a summer dwelling area to get away from the heat and bugs in the interior and to collect the bountiful food offered by the sea. Regionally, Indians were known to collect many types of shell fish which were smoked, dried, stored and traded for winter food. They used small dugout and bark canoes for fishing and hunting mammals, and for transportation along the shore and to nearby islands.

In most areas of New England, seasonal Indian dwelling sites are typically found near a beach and a fresh water source with a southeast exposure to the sea. In addition, shell middens, created by Indians processing bivalves, are often found in similar areas without the need of running fresh water (Bourque, 1980, IV-45-49 & Riess, 1989, 12). Since the last ice age, the net sea level change has placed the coastline of 6,000 BP under approximately 25 feet of water in the Cape Ann area (Bourque, 1980, IV-229). Some of the islands now close to shore near Gloucester would have been small hills connected to the mainland by low strips of land as recently as 2,000 years ago. If they were close to a beach, which might have been part of the

connecting strips, they would have been prime areas for prehistoric residential use.

When Europeans settled in the study area in the 1620s, they established fishing and timber businesses for regional and transatlantic commerce. The collection of natural harbors provided havens for inshore and offshore fishing vessels. The crews would fish for cod, mackerel, haddock and other species and bring their catch to port for processing. They would split and store the cod on salt in the ship or salt-dry the cod on stages and flakes set up on the slopes at the villages' shores (Lawson, 111-115 and Reynolds, 1856). Many types of historic vessels were used for fishing in the study area, including 1600s and 1700s shallops, ketches, pinkies, and schooners, plus 1800s schooners, Chebacco boats, and jiggers (Lawson, 1895; Reynolds, 1856). In the early 1800s, Jefferson's Embargo, the War of 1812, and other economic factors hurt the area's fishing industry. Gloucester remains a major fishing port to this day, while Manchester, Beverly, Salem and Marblehead continue some commercial fishing.

Gloucester

Fishing in Gloucester probably began when the first group of humans settled in the area. Gloucester is a well-protected harbor on Cape Ann, a small peninsula which extends out into the Gulf of Maine. Local, near shore, waters contained many edible species in quantities to sustain thousands of people, even with primitive fishing techniques. Early European explorers at Gloucester counted approximately 200 adult Agawams farming and fishing to produce both fresh and preserved winter food.

When English settlers came to Gloucester in 1623 they found few Agawams had survived the plagues which had decimated the local peoples. The colonists started a typical New England settlement based on agriculture and fishing along the banks of the Annisquam River, close to, but not in Gloucester Harbor. An armed confrontation in 1624 over the ownership of the local fishing stage (processing pier) indicates the early importance of fishing in the area.

During the seventeenth century most Gloucester fishermen worked the near shore waters

as far east as the settlers of New France (present day Canada) would let them. As markets and available capital expanded they used larger boats to fish the Grand Banks, owning approximately 70 of Massachusetts's 400 Grand Bank schooners. During the colonial period and well into the twentieth century Gloucester was an important fishing port of Massachusetts. Its share of fish varied from approximately 10 to 30 % of Massachusetts's market catch.

Gloucester has been more important than most fishing towns because it has a large safe harbor, accessible to large sailing vessels and proximate to important fishing grounds. Fishermen from Gloucester and other ports often preferred to land their catch at Gloucester, rather than sail against the typical westerly wind to the greater market of Boston. As the local fish market developed in the eighteenth century, so did the maritime services available to fishermen at Gloucester, increasing the benefits of landing one's catch there. Fishing captains could be relatively sure of finding a ready buyer for the fish, supplies for subsequent voyages, replacements for broken hardware, and people to repair the ship.

Gloucester rose to international prominence in the mid-nineteenth century as various factors led to a concentration of fish landings and fish processing at the port. The development and expansion of the railroad system throughout New England was a key factor in the changes. In 1846 a track connected Gloucester to Boston, New England's largest potential market for fresh fish. Generally the most efficient means of moving fish, from the various fishing banks off the Gulf of Maine to Boston, was by sailing vessel to Gloucester and then by rail to Boston. In the 1840s sailing smacks, boats with live wells, often carried live fish into Gloucester, but much of the fish were still landing salted from the larger Banks fishing vessels.

To take advantage of the fresh fish market, Gloucester fisherman began taking ice to nearby Georges Bank in the 1850s to return with fresh haddock and halibut. Although close by and highly productive, Georges Bank is a treacherous area of shoals and shifting tides where thousands of Gloucester fishermen have lost their lives. In 1852 Boston began transporting fresh iced fish to New York by rail, further enlarging Gloucester's potential market. Gloucester fishermen then extended their halibut fishing grounds eastward to Labrador and the Grand

Banks. By 1880 there were 50 Gloucester ships fishing mostly for halibut on the Grand Banks alone.

Fresh fish did not supplant salted fish in Gloucester, it added to the already major landings. In the 1870s and 1880s, Gloucester was the fishing center of North America. Gloucester shipped more fish than any other port and therefore set the prices for the rest of the region's fish. While the port was home to a large fleet, fishermen from many ports landed their catches in Gloucester to get better prices and services. In 1833 John Mason recorded 443 vessels at anchor and more at wharfs in the harbor. In the 1880s, when American tariffs against Canadian fish left many Canadians out of work, hundreds of fishermen and fish processors moved from the maritime provinces to the Gloucester fish industry. The city's economy boomed as thousands of people were employed directly in the fishing industry and in many support industries such as sail making, ship building and repairs, clamming for bait, and victualing.

Steam and internal combustion powered vessels ended Gloucester's supremacy in New England fisheries. Boston, always the major New England market for fresh fish, was growing rapidly. Its fishing industry had been at a distinct disadvantage to Gloucester because Boston was generally upwind of the fishing grounds and the port has a difficult entrance when fighting the typical westerlies with a sailing vessel. It had been faster to sail fresh fish to Gloucester and move it by rail to Boston than to try to sail directly into Boston Harbor. Power boats, however, could move quickly from the fishing grounds directly into the winds and through the Boston Channels to land their fish quickly at the center of the best market. With the construction of a major fish pier in Boston, "The Hub" drew the fishing industry from Gloucester and other ports. The change was slower than might be expected because most of the fishing industry was slow to change over to powered vessels and Gloucester had the inertia of decades of fish processing and marketing, especially with preserved fish.

As Gloucester lost much of the fresh fish market, the processed mackerel fishery developed to replace some of the loss. Local businessmen also developed a national market for canned fish in various forms, such as fish chowder, *finnin haddie*, dog and cat food, and even rat

poison. In the 1930s and 1940s Gloucester again changed with technology to produce much of the fast-frozen fish to be shipped throughout North America to the new electric freezers in restaurants and homes. The development of paved roads and trucks also allowed Gloucester to again provide fresh fish directly to much of New England. Today Gloucester remains an important, though not the most productive, fishing port in New England. Much of the fish processed in the port is imported in cargo vessels because its plants outpace its fishing fleet. The cargo ships often dominate the harbor's large quays. Meanwhile, recreational vessels fill much of the mooring areas and marinas grow along the waterfront.

Manchester, Beverly, and Salem

Manchester produced wood products since its early years, but in the 1800s cabinet making became a major industry for the town. With the use of water power and the development of John P. Allen's veneering mills, Manchester was able to import logs and export a greater quantity of furniture and a high volume of furniture veneer relative to the size of the town. This industry was serviced by ships and later the railroad.

Early Beverly and Salem focused most of their maritime interests on trade, especially to the West Indies. The majority of colonial Massachusetts' cross-atlantic trade funneled through Boston. However, the smaller ketches, schooners, and brigs of the North Shore towns continued a brisk trade with the Caribbean, sending lumber and salted fish for sugar, molasses, and rum. When independence from the British Empire allowed trading with other countries, Beverly and Salem quickly engaged in the lucrative Orient trade. This trade required larger, three-masted cargo ships. However, it should be noted that the American terminus for North Shore-owned ships was often New York or Boston because of the nature of the American domestic merchandising.

In the mid-1800s, the North Shore towns were discovered by the well-to-do of Massachusetts and other states. Along with the industrial revolution came the wealth and time for many to enjoy vacations at summer homes along the North Shore. With the new, faster

steamboats and trains, year-round living in the area was also feasible for some who worked in the greater Boston area. The new popularity and population of the area brought many passenger steamboats and summer pleasure boats to the harbors, and brought boating activity in the bay. With pleasure boating, the continued commercial uses of fishing, and the transportation of general cargo, the study area has remained active through the present day.

POTENTIAL FOR ARCHAEOLOGICAL SITES

Since little is known of the prehistoric Indians of the study area, any remains, whether a village, fish processing site, or sunken canoe, would be of great importance. However, previous sub bottom profiling data indicate that the area has an irregular bed rock which is typically covered by 0-30 feet of glacially deposited medium sand and some organic and clay sediment. Remains of any sites would be extremely hard to locate under the sediment in the survey area. Remote sensing surveys will generally not indicate a prehistoric site in this type of topography. Locating prehistoric Indian sites would require archaeological trenching of each proposed impact area. Spot inspection by archaeological divers, while investigating remote sensing targets of possible historic remains, would be useful, but probably not productive.

In contrast, historic shipwreck sites are known to exist in the study area and are easier to detect. The number of vessel losses found in this study is smaller than the total losses that would be located with a complete study, but the results found are indicative of a large number of probable shipwreck sites in the study area. The lack of complete recorded evidence is typical for any locality along the New England shores. Until recently the loss of a vessel, even with the loss of life, was not considered newsworthy enough for the ubiquitous 4-page weekly newspaper in the 1700s and 1800s. State and federal government compilations of vessel losses, which are incomplete, date only from the very late 1800s. In addition, the parameters of this study only included some primary research with mostly the inspection of secondary compilations of data from the primary sources. The data located in this study indicate that there is a probability of

encountering the remains of an historic vessel in most sections of the project area.

The survey-level historical research located a total of 349 shipwrecks in the Gloucester study area, including vessels listed lost in Gloucester Harbor, or "off" Gloucester, Manchester, Beverly, Salem, or Marblehead. Eliminating those vessels known to be outside of the disposal sites presently considered, we are left with 5 shipwreck sites known to be in, or close to, one of the possible disposal sites and 317 at some unknown spot in the general study area. Of the latter two groups, 302 would fit the Department of the Interior's eligibility for the National Register of Historic Places. Located wrecks are shown in Table 1 and Figure 2.

Table of Shipwrecks with Known Locations Within the Study Area

(Locations are approximate)

Vessel Name	Date	UTM Northing	UTM Easting
AVALON	1899	4,613,760	352,460
CHESTER POLING	1977	4,714,470	362,770
CITY OF ROCKLAND	1924	4,711,750	352,360
GLANCE	1834	7,706,750	354,200
MAY QUEEN	1877	4,709,640	349,500
MARGUERITE	1897	4,712,560	350,720
NANCY	1813	4,712,220	349,380
NINA T.	1990?	4,714,440	362,660
NORTHERN LIGHT	1867	4,707,100	354,200
PEIRCE	1876	4,710,100	349,020
R.B. PITTS	1866	4,709,400	349,400
SAMUEL	1835	4,706,900	354,200
TWO BROTHERS	1831	4,711,820	351,900
USS NEW HAMPSHIRE	1922	4,714,300	356,800
VESPER	1827	4,712,140	349,140

In addition to those vessels found in the historical records, we must assume many others were lost in the study area and not recorded. Before radios and radar, vessels were surely lost with all hands on the numerous ledges in the area during storms and fogs. Others could only record them as missing at sea, whether they had just left the harbor, were returning after a long voyage, or were blown in while trying to sail past the shore. No one would know what happened to them. They would include small and large fishing boats, coasters, and transoceanic merchantmen and warships.

Besides those vessels lost while underway, a number would have been lost at their moorings or abandoned in shallow water, such as the abandoned 1800s fishing vessel seen at low tide on the western shore of Manchester Harbor and the 1690s Hart's Cove shallop in Newcastle, New Hampshire. Some of the shipwrecks would have been salvaged shortly after wrecking or more recently.

Since we know so little of the early vessels, the onboard fishing processes, and life aboard the early merchant vessels, the remains of any historic ship or boat would be archaeologically and historically significant on a local, regional, and national level. Locating remains of these vessels with remote sensing will require a precise survey because of their peaceful utilization. Warships, and larger merchantmen sailing to dangerous places, carried many iron guns and a large quantity of iron shot. The iron disturbs the earth's magnetic field and can usually be detected with a magnetometer survey. Most of the vessels which might have been lost in the study area would have had few, if any, large guns or ammunition. However, they had iron anchors and sometimes small iron guns which produce a smaller magnetic anomaly. Therefore, they can only be detected with a careful and precise magnetometer survey.

RECOMMENDATIONS

The number of historic shipwrecks "found" by historical research indicates that there is a strong possibility that dredge disposal will impact historic shipwreck sites unless the planned site(s) is cleared by survey or avoidance is practiced after a survey. Depending on the planned method of anchoring the dredge and disposal vessels, disturbances from large anchors can be 500 to 1,000 ft. away from a barge. To clear the proposed disposal sites we recommend the following tasks be completed:

1. A remote sensing survey, including precise navigation, magnetometer, side scan sonar, and subbottom profiler of all possible impact areas.
2. Analysis of the gathered data to determine the location of possible sites.
3. Visual inspection of possible sites, suggested by the remote sensing, that might be impacted if not avoided.
4. A report on the above.

More specifically:

1. Remote Sensing Survey

A precise archaeological remote sensing survey of the proposed disposal sites, including any peripheral impact zones, should extend beyond any planned disturbance. Otherwise, last minute, small location changes might require a new survey at an inconvenient time. A series of 50 ft.
(15 m) tracklines should be planned. The marine magnetometer and side scan sonar should be used on each track line, while the subbottom profiler should be used on at least every other trackline. The archaeologist should plan and supervise the field work, analysis, and report.

The marine magnetometer should be capable of reading 1 gamma differences in the magnetic field. Magnetic data should include date, time, navigation events, heading, depth of sensor, and strength of field.

A 600 KHz side scan sonar survey of the sites should be conducted to locate possible cultural resources which do not have a significant amount of iron in them, and which are near the water/sediment interface. Presently, maximum resolution is gained with a range of 67 ft. (20 m). Therefore, gathering data on every 50-ft. trackline will provide 200 % coverage, enabling a "view" of any target from two sides.

High resolution subbottom profilers, such as CHIRP systems, provide detailed information about the sediment and bedrock on the sea bottom. This information is helpful when analyzing the side scan and magnetometer data. Occasionally they can indicate possible vessel timbers buried in the sediment.

For any formerly dredged channel areas, there is much less chance of finding an undisturbed site in the dredged channel, but a number of sites have been located and held up dredging in other "dredged" channels. Since it is not a large area, and the survey vessel must go near the channel anyway if disposal sites on the sides of the channel are being considered, we suggest that the survey include any such areas.

In order to tie all of this data together, a precise DGPS navigation system should be used and the magnetometer, side scan sonar, and subbottom profiler synchronized with it in the field.

2. Processing of the survey data should be handled by the survey company, who provide post plot track lines, a magnetic contour chart(s), and all original data, so that their geophysicist and archaeologist can systematically inspect and analyze the data for possible cultural resources. In small areas, with fewer than six track lines, a magnetic contour chart may not be appropriate.

3. Archaeological inspection of any possible sites usually can be accomplished at three per day

in 0-to-60 feet of water, two per day in 60-to-100 ft, and one per day in water over 100 ft. (30 m). Inspection would include dropping an anchored buoy on each possible cultural resource and diving down to do a systematic search and recording of the target. If the target can not be located on the sea bottom surface, archaeologists should be able to find any target with a hand-held metal detector. Targets in water over 130 ft. deep are usually inspected with a remote operated vehicle (ROV).

Targets not located visually or with a metal detector should be few, if any. To core down to them or excavate to identify them is usually not justified. However, if there is such a target(s), a decision on the proper mitigation can be made at that time after consultation with state authorities.

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