SEARSPORT HARBOR
SEARSPORT, MAINE
NAVIGATION IMPROVEMENT PROJECT

TECHNICAL REPORT 4

SEARSPORT HARBOR SHIPWRECK PRELIMINARY ASSESSMENT

November 2008

TECHNICAL REPORT

PRELIMINARY ASSESSMENT SEARSPORT HARBOR SHIPWRECK

Searsport, Maine

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PAL, under contract with the U.S. Army Corps of Engineers, New England District, conducted a preliminary assessment of a large wooden-hulled shipwreck identified during the 2006 remote sensing archaeological survey of the New England District's proposed navigation improvement project area in Searsport Harbor, Searsport, Maine. The preliminary assessment goals were to further interpret and define the wreck site and its boundaries and develop research contexts for future assessment of its National Register eligibility. The goals were met through additional post-processing of remote sensing data recorded at the site and supplemental archival research focused on Searsport's maritime trade during the first half of the twentieth century and the role of schooner-barges in the history of North American ship design and technology, maritime commerce, and Maine's shipbuilding industry.

Based on the results of this study and consultation with the Maine Historic Preservation Commission, a comprehensive site exam consisting of diver-based archaeological documentation, judgmental archaeological sub-surface testing, and supplemental archival research is recommended to conclusively confirm the shipwreck's identity, assess in detail the condition of its remains, and fully evaluate the wreck site's National Register eligibility.

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MANAGEMENT ABSTRACT

PAL has completed a preliminary assessment of a large wooden-hulled shipwreck identified during the 2006 remote sensing archaeological survey of the U.S. Army Corps of Engineers, New England District's (NAE's) proposed navigation improvement project area in Searsport Harbor, Maine. The preliminary assessment was authorized and completed under contract with the NAE to assist them comply with Section 106 of the National Historic Preservation Act of 1966 (16 USC 470f), as amended (1976, 1980, 1992, 1999), and the implementing regulations of the Advisory Council on Historic Preservation (36 CFR 800). The goals of the preliminary assessment were to further interpret and define the wreck site and its boundaries and develop research contexts for future assessment of its National Register eligibility. These goals were met through a combination of additional post-processing of remote sensing data recorded at the site and supplemental archival research focused on Searsport's maritime trade during the first half of the twentieth century and the role of schooner-barges in the history of North American ship design and technology, maritime commerce, and Maine's shipbuilding industry.

Based on the results of this study and consultation with the Maine Historic Preservation Commission, a comprehensive site exam consisting of diver-based archaeological documentation, judgmental archaeological subsurface testing, and supplemental archival research is recommended to conclusively confirm the shipwreck's identity, assess in detail the condition of its remains, and fully evaluate the wreck site's National Register eligibility.

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CHAPTER ONE

INTRODUCTION

This report presents the results of a preliminary marine archaeological assessment of a previously charted shipwreck tentatively identified by as the 108-year old schooner-barge, *Cullen No. 18* (Robinson 2007). The shipwreck was located during PAL's 2006 remote sensing marine archaeological survey of the U.S. Army Corps of Engineers, New England District's (NAE) proposed navigation improvement project area in Searsport Harbor, Searsport, Maine (Figures 1-1 and 1-2). The NAE is preparing to undertake the channel deepening project to provide improved access to piers located on the southeast corner of Mack Point at the mouth of Long Cove.

This preliminary assessment was conducted to further interpret and define the shipwreck site and its boundaries and to provide research contexts and recommendations for an additional phase of investigation to more fully evaluate the site's National Register eligibility. The research goals of the preliminary assessment were met through a combination of additional post-processing and analysis of remote sensing data recorded at the site, as well as through supplemental archival research focused on the developmental histories of Searsport's maritime trade and schooner-barge technology. This preliminary assessment was authorized and conducted under contract with the NAE, in accordance with the scope of Optional Task No. 9 of the survey.

Scope

As a federal undertaking, the NAE dredging project is subject to review under Section 106 of the National Historic Preservation Act (NHPA) of 1966 as amended (36 CFR 800). Section 106 requires that all federal agencies take into account the effect of their undertaking on cultural resources listed or eligible for listing in the National Register of Historic Places (National Register) (36 CFR 60). The agency must also afford the Advisory Council on Historic Preservation the opportunity to comment on the undertaking. The Section 106 process is coordinated at the state level by the State Historic Preservation Office (SHPO), which in Maine operates within the office of the Maine Historic Preservation Commission (MHPC).

The scope of the investigations performed as part of Optional Task No. 9 (Appendix A) included archival research and advanced post-processing and interpretation of magnetometer, side-scan sonar, and a sub-bottom profiler data recorded during PAL's 2006 marine archaeological remote sensing survey, reported in Robinson 2007. The preliminary assessment and report will assist NAE in complying with Section 106 of the NHPA of 1966, as amended (1976, 1980, 1992, 1999), for the proposed channel deepening project. The report will also be a scholarly document that fulfills the mandated legal requirements, and serves as a scientific reference and planning tool for future professional studies.

Figure 1-1. 1972 (rev. 1990) USGS Maine state map (1:2,500,000 scale) showing the general location of the Searsport Harbor project area in Waldo County.

Preliminary Assessment Searsport Harbor Shipwreck, Searsport Harbor, November 2008

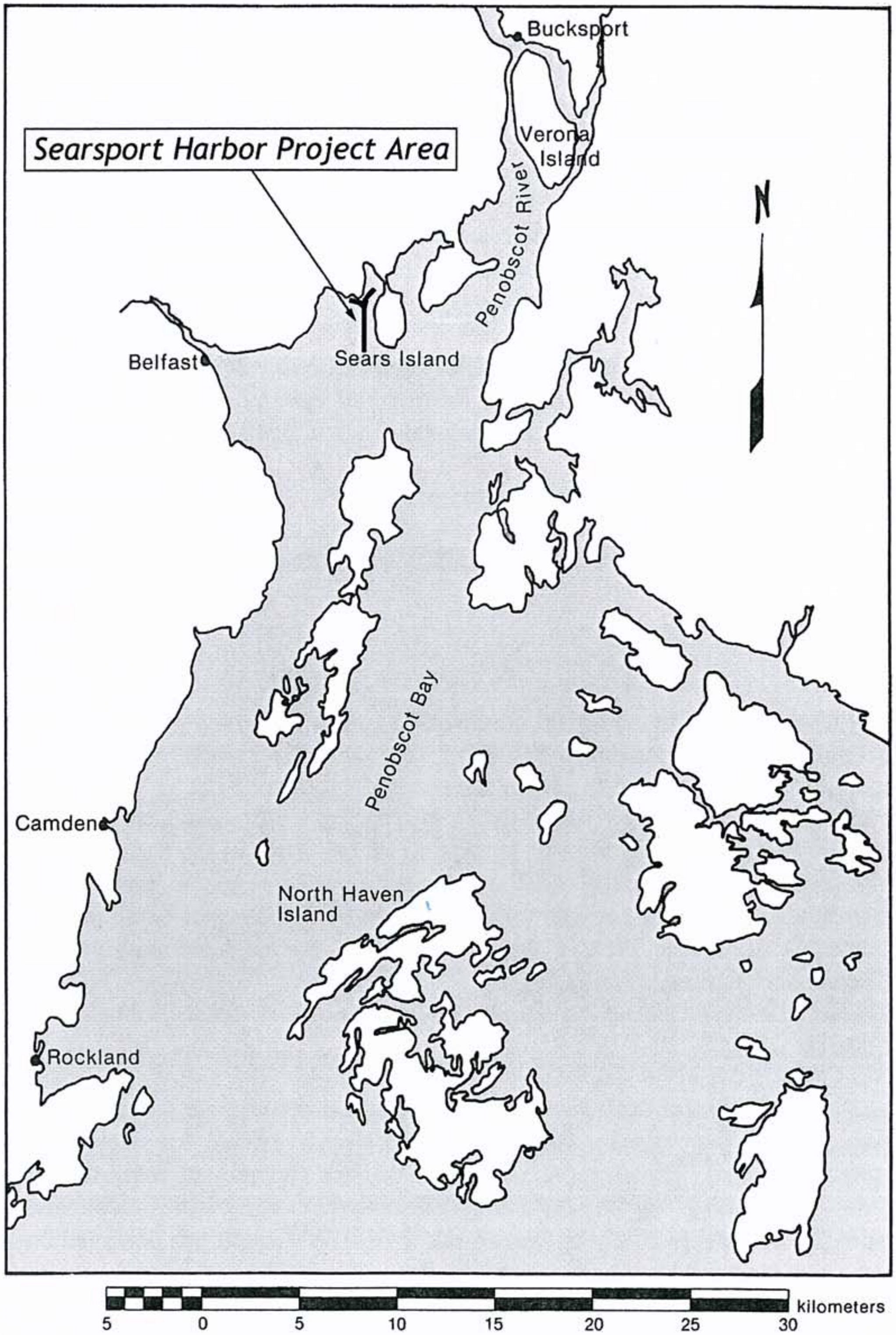


Figure 1-2. Searsport Harbor Project area within Penobscot Bay (source: Spiess and Hedden 1983:6).

Preliminary Assessment Searsport Harbor Shipwreck, Searsport Harbor, November 2008

Authority

This preliminary assessment was authorized by NAE to assist them in complying with the National Historic Preservation Act of 1966 (P.L. 89-665; 80 Stat. 915) as amended (16 U.S.C. 470 et seq.); the National Environmental Policy Act of 1969 (P.L. 91-190; 83 Stat. 852; 42 U.S.C. 4321 et seq.); the Archaeological Resources Protection Act of 1979 (P.L. 96-95; 93 Stat. 721; 16 U.S.C. 470 et seq.); the Abandoned Shipwreck Act of 1987 (P.L. 100-298; 102 Stat. 432; 43 U.S.C. 2102); the National Maritime Heritage Act of 1994 (P.L. 103-451; 108 Stat. 4769; 16 U.S.C. 5401); the Advisory Council on Historic Preservation, Protection of Historic Properties (36 CFR 800); the National Register of Historic Places, Nominations by States and Federal Agencies (36 CFR Part 60); the U.S. Army Corps of Engineers' Regulations ER 1105-2-50, Planning, Environmental Resources, Chapter 3, Historic Preservation; the Secretary of the Interior's Standards and Guidelines for Identification (1983); the MHPC's Contract Archaeology Guidelines; and the Maine Department of Educational and Cultural Services State Historic Preservation Officer's Standards for Archaeological Work in Maine (27 MRSA S.509).

The scope of the preliminary assessment was approved by the NAE district archaeologist, and performed in consultation with the state archaeologist at the MHPC. No state permit was required to conduct the non-disturbance preliminary assessment.

Project Description

Searsport is the closest U.S. port to Europe and the first port in the Northeastern U.S. Corridor. It is used by domestic and international commercial vessels throughout the year (Searsport Port Committee n.d.:3–5). The harbor's 500-foot- (ft) (152-meter [m]) wide federal navigation channel and 1,500-ft (457 m) turning basin are currently maintained at an authorized depth of 35 ft (11 m) below Mean Low Low Water (MLLW) (Barbara Blumeris, personal communication 2006; Searsport Port Committee n/d:5). This depth prevents use of the harbor by deeper drafted commercial vessels; therefore, the NAE is currently considering the feasibility of removing sediments from the harbor floor to establish a new controlling channel depth of between 40 and 42 ft (12 and 13 m) below MLLW within the study area depicted in Figure 1-3 (Barbara Blumeris, personal communication 2006).

Nature of Study

This preliminary marine archaeological shipwreck assessment was conducted as part of a larger investigation designed to assess the proposed project's effects on identified submerged archaeological deposits. The original scope-of-work for the project required any shipwreck identified by the survey to be inspected subsequently via visual reconnaissance using archaeological divers or a remotely operated vehicle (ROV). Conditions observed on-site during

the 2006 survey, however, (i.e., poor underwater visibility, entanglement hazards from abandoned fishing gear, periodic large commercial vessel traffic, and strong tidal currents) indicated that these approaches would provide little data of use for mapping the overall wreck

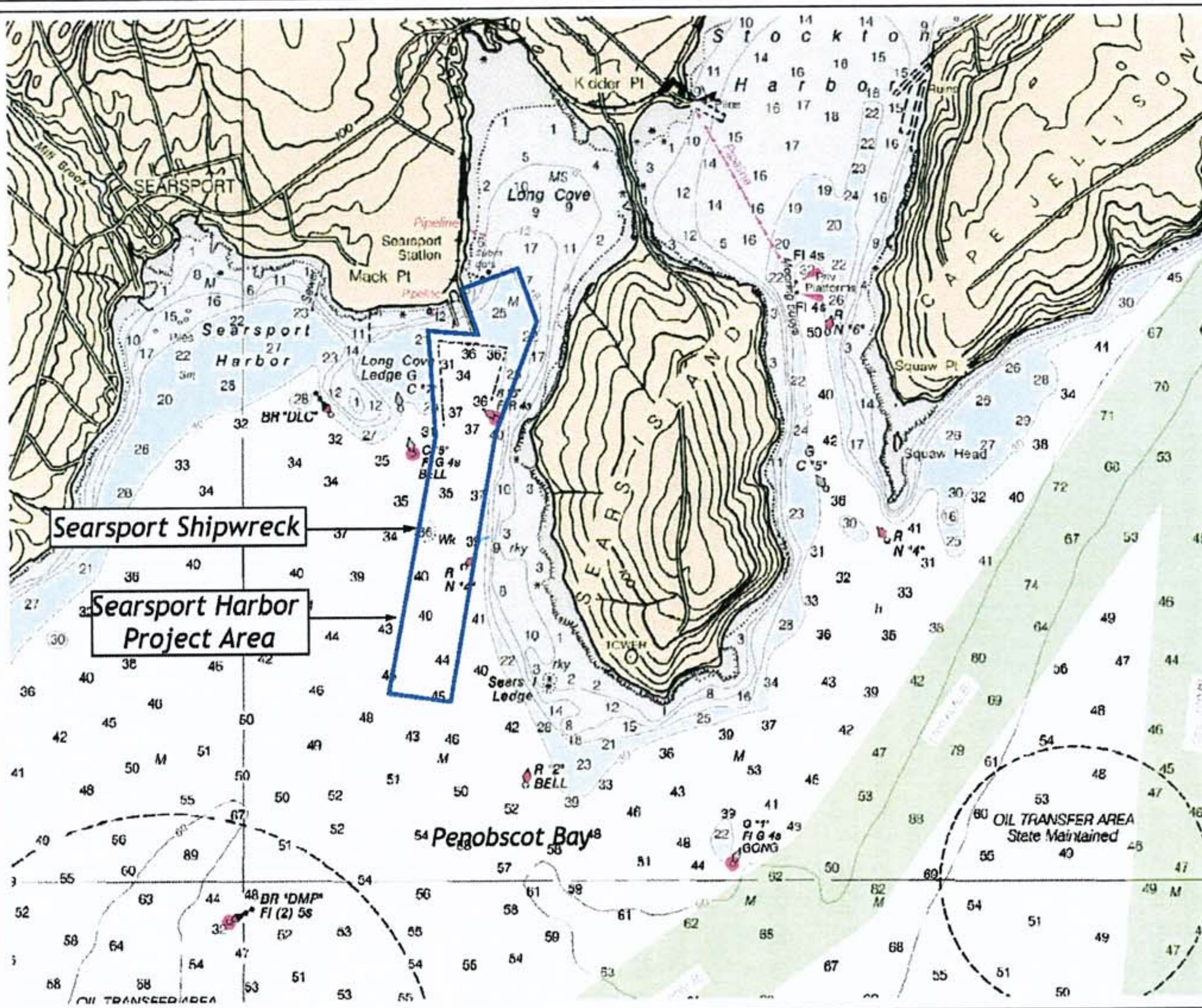


Figure 1-3. Excerpt of NOAA Chart No. 13309 showing the location of the shipwreck within the limits of the Searsport Harbor project area.

site, defining its boundaries, and assessing the overall condition of its remains, while unnecessarily exposing the project divers or ROV to potentially dangerous conditions described above. Consequently, the scope of work was revised for this study to take advantage of the extremely high-resolution side-scan sonar, magnetometer, and sub-bottom profiler remote sensing data sets that were recorded during the 2006 survey, and to use these data to their fullest capacity as a means of accurately mapping and defining the site's boundaries, interpreting the hull remains, and assessing the site's general condition and contextual integrity. In addition to the remote sensing data post-processing task, the study also included a supplemental archival research element that was intended to obtain the requisite information for preparing resource-specific research contexts for assessing the shipwreck's historical significance and National Register eligibility.

Project Personnel

PAL staff involved in the project included David S. Robinson (project manager/senior marine archaeologist/principal investigator). OSI project staff included Thaddeus A. Nowak (general manager), John D. Sullivan (geophysical surveys program manager), Jeffrey D. Gardner (senior geophysical scientist/senior project manager), Margaret H. Sano (project scientist), and Jeffrey J. Hall (project scientist).

Disposition of Project Materials

All project information is currently on file at PAL, 210 Lonsdale Avenue, Pawtucket, Rhode Island. PAL serves as a temporary curation facility for these materials until such time as the U.S. government designates a permanent repository that meets the requirements under 36 CFR 79.

CHAPTER TWO

METHODOLOGY

Systematic, interdisciplinary research methodologies associated with advanced remote sensing data processing and supplemental archival research were applied during this investigation, as stipulated in the revised NAE project scope-of-work (SOW) for Optional Task 0009 (Appendix A). Application of these research methodologies was designed to contribute to the:

1. further interpretation, assessment, and definition of the wreck site, its boundaries, integrity, density and configuration of its cultural materials and features, and age; and

2. evaluation of the wreck site's historical significance and National Register eligibility relative to historical research contexts associated with Searsport's maritime trade (especially in coal) during the first half of the twentieth century, the historical development of schooner-barges and their role in maritime trade and American ship design and technology.

Advanced Post-Processing of the Remote Sensing Survey Data

High resolution remote sensing survey data recorded throughout the NAE Project area, including the portion of the Project area encompassing the shipwreck site, was collected using state-of-the-art instrumentation that included:

- Trimble 4000 and ProBeacon Differential GPS interfaced with HYPACK MAX Navigation Software;
- Klein 3000 Dual-Frequency (100/500 kHz) Side-Scan Sonar System;
- Geometrics G-882 Marine Cesium Magnetometer, and;
- Applied Acoustics Engineering "Boomer" Seismic Reflection System.

During the survey, the sensitivity of the side-scan sonar towfish and magnetometer sensor was optimized by towing both instruments from cables attached to electric winches, the use of which allowed real-time adjustments to each sensor's height above the bay floor as the track lines were surveyed. Side-scan sonar data were collected on parallel lines spaced 150 ft (46 m) apart with the system set at a 164 ft (50 meter) sweep range to obtain high resolution data with more than 200 percent overlapping coverage of the bottom. The altitude of the side-scan sonar towfish above the bay floor was maintained at an optimal 10 to 15 percent of the range where water depth allowed.

To ensure detection of even the smallest magnetic anomalies of potential archaeological interest, magnetometer data was recorded at a 50 ft (15.25 m) survey track line interval with the altitude of the magnetometer sensor maintained at 20 ft (6 m) or less above the bay's floor. Magnetic noise during the survey was generally less than one gamma or nanotesla.

The "boomer" sub-bottom profiler's sound source (a catamaran with a boomer plate) and its receiver (a hydrophone array or "eel") were towed off the survey vessel's stern outside its propeller swash zone to minimize spurious acoustic noise. Sub-bottom profile data were recorded at the same 150 ft (46 m) survey track line interval as the side-scan sonar and at a 100 millisecond scan rate to record a total depth profile (water and stratigraphic column) of approximately 250 ft (76 m) (i.e., assuming 5,000 ft [1,524 m] per second sound velocity in sediments). The system collected raw seismic signals in the 0 to 10 kHz range, with filtered frequencies of 0.08 to 4 kHz used for final display and interpretation. Laybacks and offsets to sensors were recorded in the field for application during post-survey processing.

Initial post-processing of the remote sensing data involved reconstructing survey track lines to include adjustments for sensor layback and offset, and the plotting of the x/y horizontal position coordinates logged at each "fix" point along each track by the HYPACK MAX software package. The locations of each detected side-scan sonar and magnetometer target were plotted and profiles of each sub-bottom profiler line were produced.

For the purposes of the preliminary shipwreck assessment, advanced post-processing of the side-scan sonar data involved using the sonar manufacturer's (Klein's) SonarPro software and Triton's Isis DelphMap program. Survey track lines subjected to advanced post-processing included Primary Lines 19, 22, 25, and 28, which passed directly over and adjacent to the shipwreck, as well as several supplemental wreck inspection track lines that were surveyed immediately after the shipwreck was initially located. The Triton Isis program allowed adjustments for layback, latency, and water column removal ("ground range") to produce an accurate and precise plan-view acoustic map or mosaic of the shipwreck incorporating all the recorded sonar data. For the purposes of this particular mapping effort, the highest resolution setting possible (i.e., 0.8 inch [2 cm] horizontal) was utilized.

Magnetometer data acquired along the nine primary track lines surveyed in the area of the shipwreck (i.e., Primary Lines 20 through 28) were used to construct two types of colorized, shaded relief maps of the magnetic fluctuations observed over the shipwreck site. All magnetic data points recorded along each of these lines were used without filtering to ensure the greatest data density was available for this analysis. Magnetic intensity data collected in HYPACK were processed in HYPACK, exported as ASCII x/y/z files, and imported into QuickSurf 5.2 digital terrain TIN-modeling software. QuickSurf was utilized to display the magnetic data in two different ways: 1) as a 3-D type display with intensity values defined by a color scale and tilted with a sun illumination index; and 2) as a transparent continuous-color magnetic data layer plotted on a geo-referenced grid in Global Mapper 9, which was then brought into AutoCAD 2000 as a layer that was superimposed onto side-scan sonar mosaic and magnetic track line point plot data layers. Plots were generated using raw data files, as well as a normalized magnetic intensity data set from which the Earth's ambient magnetic field strength was removed for comparison. Screen grabs of magnetic intensity profiles displayed in HYPACK were also saved to illustrate the anomalous deflections observed over the shipwreck along individual track lines. Sections of sub-bottom profiles acquired along primary survey track lines 22, 25, and 28 were exported as .pdf files out of ReflexW seismic software to an Adobe Photoshop graphics program for labeling of features and subsequent conversion to a .jpg format for final presentation. Limited processing of the sub-bottom profile data was necessary, as the shipwreck signature (e.g., the signature visible in Line 25) was very clearly represented within the original field records.

Archival Research Methods

Archival research performed as part of PAL's 2006 marine archaeological remote sensing survey provided a foundation for the more focused supplemental research that was conducted as part of this preliminary assessment. Sources consulted as part of the initial 2006 investigation included:

- National and State Registers for any archaeological properties in the proposed Searsport Harbor project area that have been listed in, or are potentially eligible for nomination to be listed;

- National Oceanic and Atmospheric Administration's (NOAA) on-line Automated Wreck and Obstruction Information System (AWOIS);

- *Northern Maritime Research's Northern Shipwreck Database* (NSWDB) (Version 2002);

- Paul Sherman's Collection of Shipwreck Notes and Information on file at the Massachusetts Board of Underwater Archaeology;

- Environmental studies providing information about the geomorphological history of coastal Maine and the effects of the Holocene marine transgression;

- Published and unpublished primary and secondary sources held in the Special Collections section of the Belfast Public Library, the Maine State Library, and in the research library at PAL; and

- Informal informant interviews with: Maine State Archaeologist, Arthur Spiess; Penobscot Marine Museum Executive Director, Niles Parker; Penobscot Marine Museum Curator, Ben Fuller; University of Maine Darling Marine Center Research Associate Professor, Warren Riess; Dean of the Maine Maritime Academy Corning School of Ocean Sciences, John Barlow; Propeller Club-Bucksport and Searsport members William Abbot and Jon Johansen; Belfast Free Library Special Collections Librarian, Betsy Paradis; and former Massachusetts Board of Underwater Archaeological Resources Deputy Director, David Trubey.

Review of these sources and consideration of the location, size, construction, and condition of the shipwreck as recorded in the 2006 high-resolution side-scan sonar survey data, also provided the basic information that was used to tentatively identify the shipwreck as the remains of the *Cullen No. 18*, a 923-ton, 188-x-34-x-18 ft (58-x-10-x-5 m) (length/width/depth) Delaware, Lackawanna & Western Railroad-owned, coal-carrying schooner-barge (Mayhew 1963:120).

The *Cullen No. 18* was built at the New England Company's shipyard in Bath, Maine in 1900 for the Delaware, Lackawanna, & Western Coal Company of New York (Mayhew 1963:121). According to Mayhew (1963:121), the vessel had also been named at various points in its career the *Schooner Barge 783* and the *Black Diamond.* According to a contemporary newspaper report, the *Cullen No. 18* was lost to a donkey-boiler explosion-induced shipboard fire that occurred in the early morning hours of 28 May 1938 while the vessel lay at anchor in the harbor off Mack Point (Figure 2-1). Just prior to the fire, the *Cullen No. 18* had discharged a cargo of coal at the Penobscot Coal & Wharf Company's Mack Point pier that it had carried to Searsport on behalf of the Cullen Transportation Company (*The Republican Journal 1938*) (Figure 2-2).

Two other vessel casualties reported for the Searsport/Searsport Harbor area were also considered as possible candidates for the Searsport shipwreck: the 78-ft (24 m) long schooner, *Brunette*, which grounded in a gale "a few feet off the wharf" in 1889, and the 109-ft (33 m) square-ended scow or barge, *B. C. No. 2890* that foundered in 1954. The reported lengths of both of these vessels, however, are significantly less than that of the approximately 160-ft long (49 m) Searsport shipwreck as recorded with side-scan sonar. Consequently, both vessels were eliminated from further consideration as potential candidates.

Two factors bring into question the identity of the wreck as the *Cullen No. 18*: 1) the shipwreck's side-scan sonar recorded 160 ft- (49 m-) length, which is shorter than the vessel's reported 188 ft- (58 m-) length; and 2) the difference in the shipwreck's recorded distance from Mack Point from that which was reported in the contemporary account of the sinking. There are plausible explanations for both issues.

The 28-ft (8.5 m) differential in the reported and side-scan sonar recorded hull lengths of the schooner-barge can be attributed to a difference in the locations where the measurements were recorded. The reported length of a vessel was usually measured on deck, and, thus, would include the considerable additional horizontal distance created by the overhanging stern-counter feature of most sailing vessels (including schooner-barges), as well as the forward and aft rake of the stem and sternpost, respectively (Figure 2-3). In contrast, the measured length of the Searsport wreck was recorded between the preserved ends of the bottom of the hull as recorded with side-scan sonar. This dimension does not include the additional distances associated with the stern-counter and stem and sternpost rake, and is not an actual measurement recorded on the shipwreck, but rather a distance recorded from the side-scan sonar's acoustic reflection data. Distance in the side-scan sonar data is based on an average, rather than actual, speed of sound through water, which, along with slant-range error, makes it possible for there to be some nominal difference between the distance recorded by sonar and what would be recorded if the hull's length was measured by hand. There are two possible explanations for the difference between the recorded and reported locations of the wreck (i.e., about "480 yards" [439 m]) off of Mack Point, and its surveyed location (1,433 yards [1310 m]) off of the point. First, the newspaper's 480 yard (439 m) reported distance may just be a typographical error in which the numeral 1 was accidently excluded. If included, then the reported and recorded locations are nearly identical (i.e., 1,480 yards versus 1,433 yards). Second, marine archaeological research conducted over the last 40 years has repeatedly shown that vessel loss positions reported by

THE REPUBLICAN JOURNAL

BELFAST, MAINE, THURSDAY, JUNE 2, 1938

5 CENTS

JOURNAL ADS BRING BEST RESULTS

FEYLER INC., BUYS HAMILTON FISH MKT.

A Golden Wedding In Prospect

G.A.R. Bodies Attend Memorial Services Sunday

Rev. Frederick D. Hayes Deliver Address to Large Crowd In Attendance

Local Officers and Federal Men Locate Large Still in Frankfort

BACCALAUREATE AT MORSE HIGH SCHOOL

Commencement at Crosby Begins Sunday, June 5

Graduation Exercises and

FREEDOM GRAMMAR SCHOOL GRADUATION

Memorial Day Observed Here

Clark Camp in Charge of Parade and Program at Cemetery

BARGE IN SEARSPORT BURNS AND SINKS

Capt. William Bagley, his wife, Cleo, and three members of the crew, James Thompson of Dukesport, Ala., John Jensen of Norway and Charles L. Jones of Prince Edward Island, escaped with most of their personal belongings Saturday morning after fire, starting from an explosion, swept through the 1,500-ton barge Cullen No. 18 operated by the Cullen Transportation Company, while she was at anchor in Searsport.

Saturday night a Coast Guard patrol boat stood by with orders to sink her with their one-pound-ers if she did not go to the bottom within the next 24 hours.

The explosion causing the blaze occurred at 2 o'clock, in the boiler room of the donkey engine, the hose line being put out of commission. The captain and crew fought the flames as best they could until 8 o'clock, when they abandoned the craft and came ashore.

Meantime the Coast Guard at Rockland had been notified and sent the patrol boats 211 and 58 CD to the scene. The Coast Guardsmen tried to raise the anchor of the barge, so she could be towed to sea, but it stuck. She sank about 2:30.

The Cullen, which was built in 1900, was owned by the Delaware, Lackawanna and Western Railroad and she had recently unloaded a cargo of coal at the Penobscot Coal and Wharf Company plant.

Figure 2-1. Front-page headline describing the 1938 loss of the schooner-barge *Cullen No. 18* (source: *The Republican Journal* 1938).

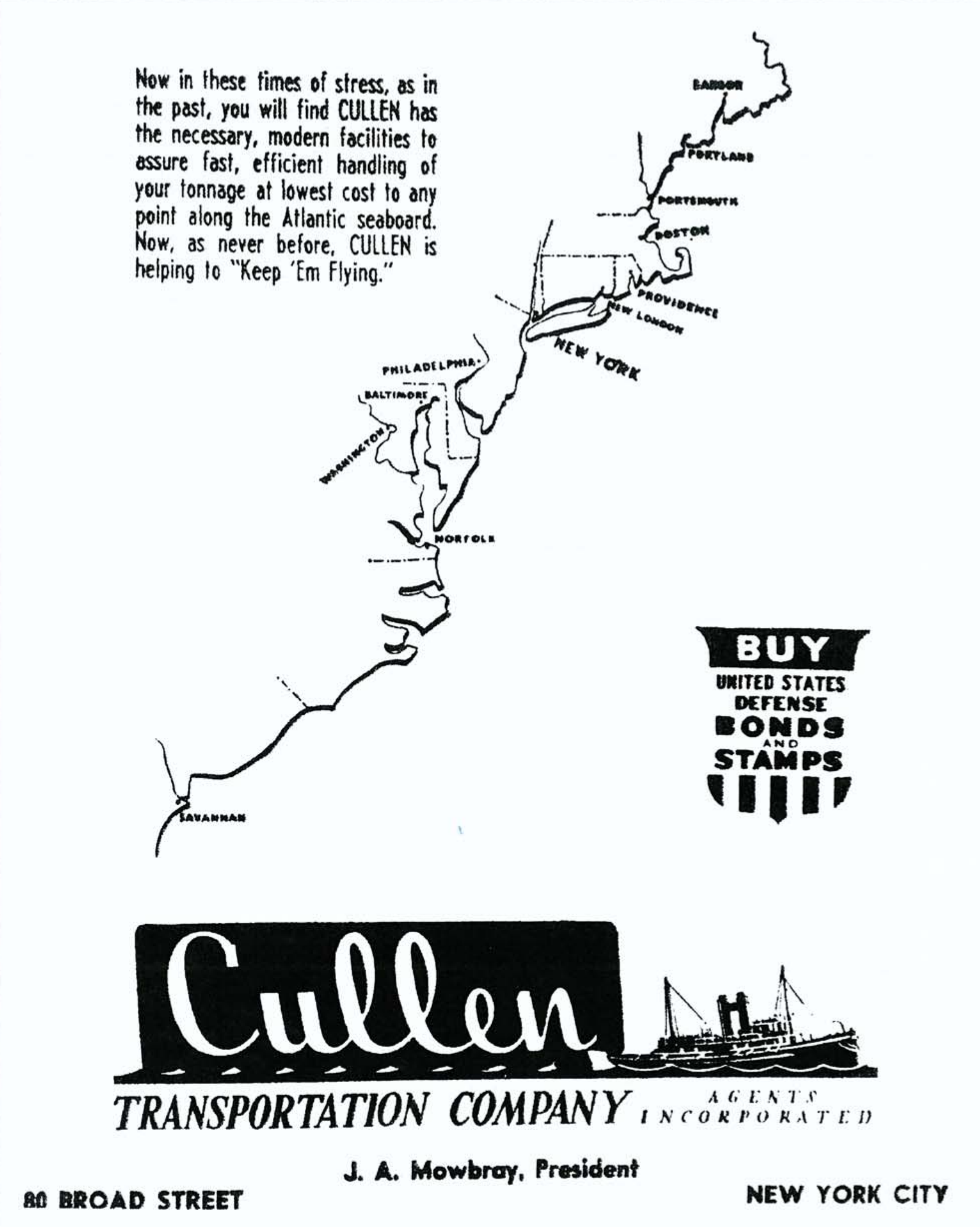


Figure 2-2. Cullen Transportation Company advertisement from 1942 (source: Mayhew 1963:41).

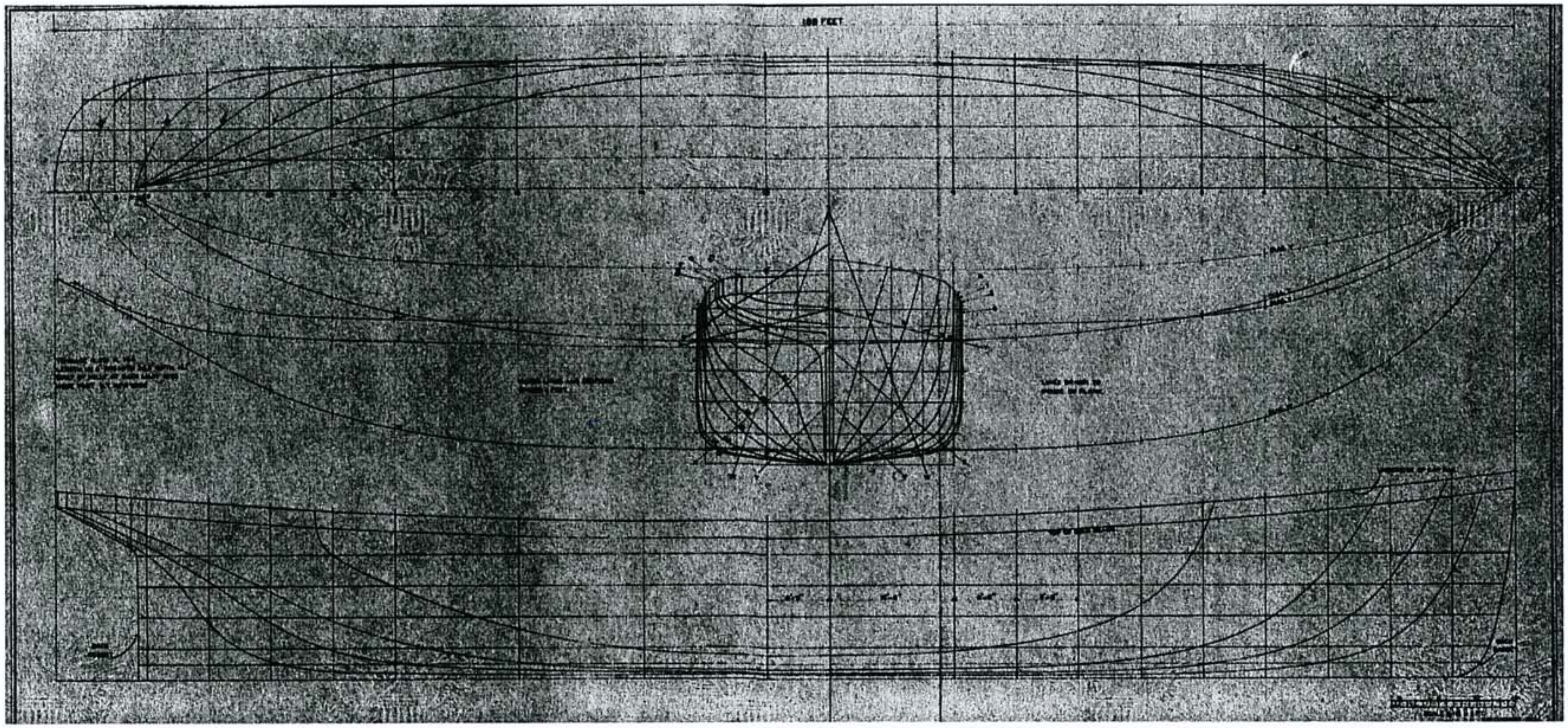


Figure 2-3. Lines plan of the 831-gross ton schooner-barge, *Rondout*, built at the Kelly, Spear & Company shipyard in Bath, Maine in 1896. (The *Rondout*'s dimensions were similar to those of the *Cullen No. 18*; note: the overhanging stern-counter and aft rake of the stem's base at the bow) (source: Morris 1984:149).

contemporary eyewitnesses of shipwrecks are often different from their recorded locations. Reasons for the inaccuracy of reported locations have been attributed to poor position fixes in the days before GPS, perceptual narrowing under stress on the part of eye-witnesses (particularly for those who were on board the sinking vessel), darkness or fog, distance from shore, and drift of the wreck during or immediately after sinking.

A final consideration regarding the identity of the Searsport shipwreck that must be considered is that it is the wreck of a vessel other than the *Cullen No. 18* whose loss simply went unreported. Given the large size and visible construction elements of the wrecked ship, its condition, and close proximity to a populated shoreline, however, this scenario seems unlikely. The large size and construction (i.e., the multiple heavy keelsons, nearly flat bottom, and tapered ends that are visible in the side-scan sonar record) are all characteristic of schooner-barges like the *Cullen No. 18*. The essentially intact exposed hull remains appear to be in good condition based on their acoustic reflectivity, which suggests that the wreck is relatively recent (i.e., late nineteenth or early twentieth century), rather than from an earlier period. Another compelling factor suggesting that the wreck is that of the *Cullen No. 18* is the total absence of hull elements from above the vessel's water-line (e.g., decking, deck beams, deck furniture, machinery, fittings, etc). This absence is what one would expect from a vessel that had burned. Finally, the likelihood that a ship of the Searsport wreck's size was lost well within visual distance of the town's populated shore without anyone taking notice and it being reported in the local newspapers seems low.

Considered together, and absent of compelling information to the contrary, the presently available archival and archaeological data indicates that the Searsport shipwreck is most likely the remains of the coal-carrying schooner-barge *Cullen No 18*. Operating under this assumption, supplemental archival research was carried out for this assessment in the Special Collections section of the University of Maine-Orono's Raymond H. Fogler Library, and at the Penobscot Marine Museum's Steven Philips Memorial Library to locate sources on the developmental histories of Searsport's maritime trade during the first half of the twentieth century and the schooner-barge vessel type. Sources reviewed at these repositories included:

- Dean R. Mayhew's unpublished Master's thesis, *The Wooden Sailing Barges of Maine, 1886 to 1945 (Maine Vessels in the Coastal Coal Trade)* (Mayhew 1963);
- Rexford B. Sherman's unpublished Master's thesis, *The Bangor and Aroostook Railroad and the Development of the Port of Searsport* (Sherman 1967);
- Offprint files on Searsport's wharves and shipyards included in the *Searsport Themes Collection* compiled by Don Garrold, and;
- "Full Ship-Modeled Towing Barges with an Auxiliary Bald-Headed Schooner Rig – The Successors of the Big Multiple-Masted Sailing Schooners in the American Coastwise Trade," and "Wood Schooner-rigged Towing Barges Built at Bath, Maine, 1895-1923,"

included in William A. Fairburn's six-volume *Merchant Sail* (Fairburn 1945–55a; Fairburn 1945–55b)

- Paul C. Morris's illustrated publication, *Schooners and Schooner Barges* (Morris 1984).

Mayhew and Sherman's unpublished master's theses, in particular, provided the bulk of the information used to develop the Searsport maritime trade and schooner-barge research contexts.

CHAPTER THREE

SEARSPORT SHIPWRECK SITE DESCRIPTION

The Searsport shipwreck is located at the head of Penobscot Bay near the mouth of the 350-mile (563-kilometer [km]) long Penobscot River, a natural transportation corridor into Maine's resource-rich interior that was navigable to ocean-going ships up to the city of Bangor. Penobscot Bay is defined by an irregular shoreline with a coast that is broken by innumerable coves and inlets. In its "Nearshore Basins" region, where the project area is located, is a transitional zone between the shore and the basins where the slope of the bay's floor is gradational and mudflats are common (Kelley and Belknap 1989:3). Searsport Harbor is a well-protected "broad bight" that opens southward into Penobscot Bay. Deepwater channels within the Bay that extend southward from the Searsport area and run along either side of Isleboro Island provide vessels using the port of Searsport with a direct outlet to the major shipping lanes of the North Atlantic Ocean, approximately 30 miles (48 km) south of the port. Searsport Harbor may be divided further into three smaller harbors:

- Long Cove (a 10 to 24 ft [3.0 to 7.3 m] deep, well-protected cove separating Kidder's and Mack Point);

- Mack Point Harbor (serves the present terminal);

- Searsport Harbor proper (its anchorages have adequate deep water that can accommodate vessels more than 45 ft [13.7 m] draft).

The Searsport shipwreck is located within Mack Point Harbor. Its approximate center-point is situated at Latitude 44° 26' 18.14119"N, Longitude 068° 54' 02.74654"W, approximately 2,800 ft (853.4 m) due west of Searsport Island, 4,300 ft (1311 m) south of the Maine Port Authority pier on Mack Point, 1,100 ft (335.3 m) northwest of channel marker and red nun buoy No. 4, and 1,650 ft (503 m) south-southeast of green nun buoy No. 5 on the west side of the channel. The longitudinal axis of the shipwreck is oriented northwest-to-southeast (285°/105° true). Mean low water depth at the shipwreck site is approximately 40 ft (12 m). Based on its acoustic reflectivity, the seafloor recorded in the side-scan sonar data appears to be generally smooth and soft, as described by Kelley and Belknap 1989:3–4. Underwater visibility observed from the water's surface during the 2006 survey operations appeared to be poor (i.e., 0 to 3 ft [(0 to 1 m]). The mean tidal range at the shipwreck site averages between 9.7 and 11.1 ft (2.9 to 3.4 m) (greater in the spring) (Sherman 1966:26). Tidal current velocities in the Belfast-Searsport area reportedly can exceed three knots in places.

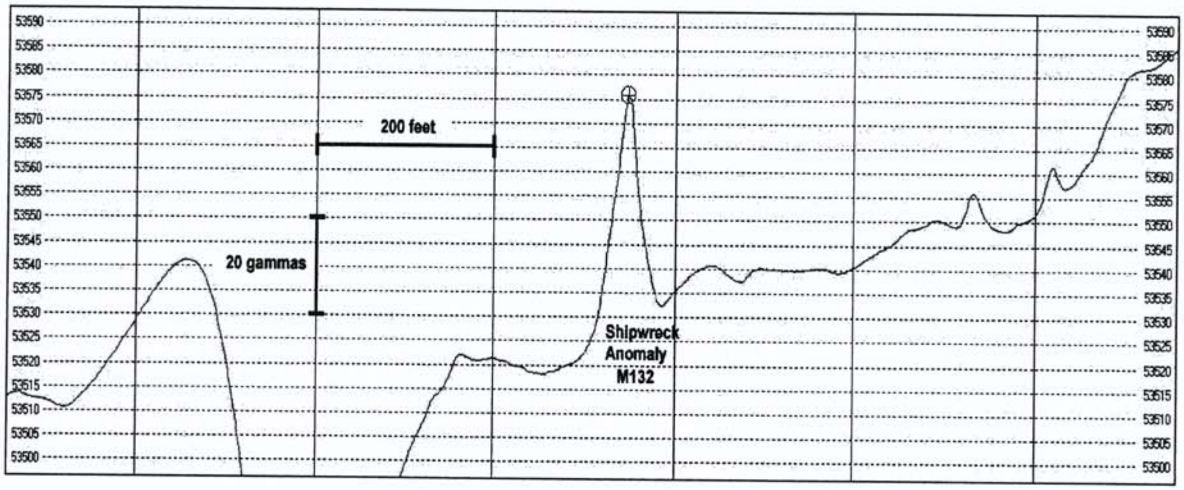
The side-scan sonar image of the Searsport shipwreck recorded by PAL and OSI provides clear documentation of the intact remains of a large, nearly flat-bottomed, wooden hull that lies upright and exposed on the harbor floor. Dimensions obtained from the side-scan sonar record indicate that the visible remains of the wreck measure approximately 160 ft (49 m) long and 30 ft

(9 m) wide, and have less than 5 ft (1.5 m) of relief above the bottom. Visible hull elements clearly discernible from the side-scan sonar record include: exterior hull planking, sections of which are scattered around the wreck; heavy longitudinal keelsons; a series of parallel rib-like floor timbers; and the remains of a vertical stem or sternpost. A slight 1 to 2 ft (30.5 to 61 cm) depression, scoured out by tidal currents on the bottom, is evident around the edges of the hull (Figure 3-1, Back Pocket).

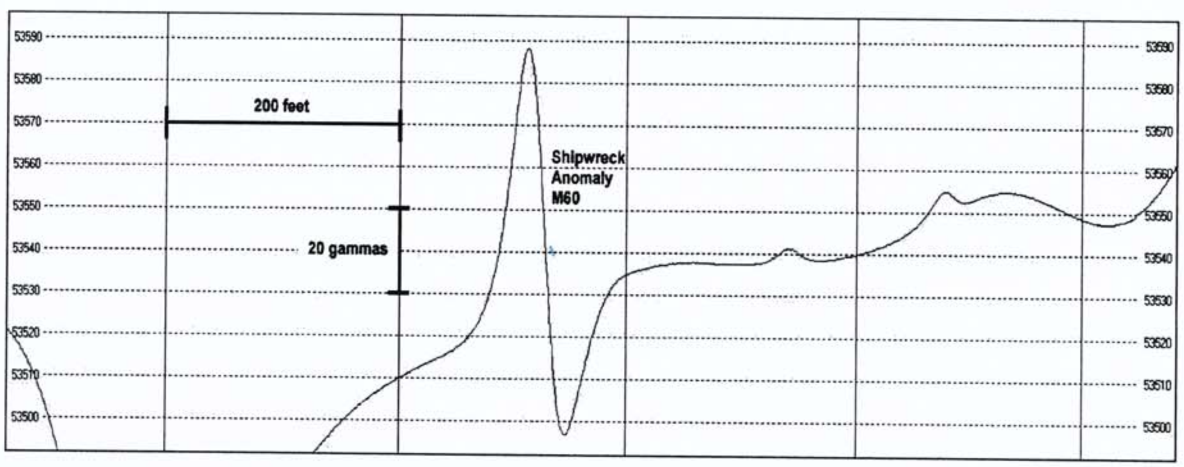
The visible extent of the wreck is concentrated within the footprint of the hull itself, although a debris field consisting primarily of elongated targets, which appear to be displaced exterior hull planking, extends outward from the wreck approximately 125 ft (38 m) in all directions. Fishing activity in the harbor could be the source of post-depositional disturbances to the wreck (i.e., scattering of some of its exterior planking). Numerous abandoned lobster traps and their associated lines are visibly entangled in the wreckage.

Analysis of contoured magnetic data collected over the wreck site indicates that the sources of the magnetic anomalies associated with the shipwreck are localized to within the wreck itself with no indications of significant wreck-related ferrous masses detected in the area surrounding the site. The largest anomaly (an 89-gamma dipole) is contained to within a 150 to 200 square foot (sq ft) (14 to 18.6 square meter [sq m]) area on the southwest corner of the wreck. A second, smaller 47-gamma monopolar magnetic deflection is also visible in the post-processed data near amidships on the wreck. The original, unfiltered magnetic intensity values recorded along two surveyed track lines passing over the shipwreck (Lines 24 and 25) have been plotted in Figure 3-2. These graphs show a cross-sectional plot of the earth's total magnetic field measurements along each track line. The relatively minor magnetic fluctuations from the wreck with the magnetic sensor towed less than 25 ft (7.6 m) above the bottom indicates that the hull is made of wood rather than steel or iron, which would have produced a much larger amplitude magnetic anomaly.

The sub-bottom profiler data collected along a track line surveyed directly over the wreck records it as a parabolic-shaped acoustic reflection. The sub-bottom record indicates that the vessel's remains extend 1 to 2 ft (30.5 to 61 cm) above the bay floor from a depression in the sediments that is of similar depth. No other significant elements of the wreck, which would have been visible in the sub-bottom profiles as smaller parabolic reflections, are discernible in the data recorded around the wreck (Figure 3-3).



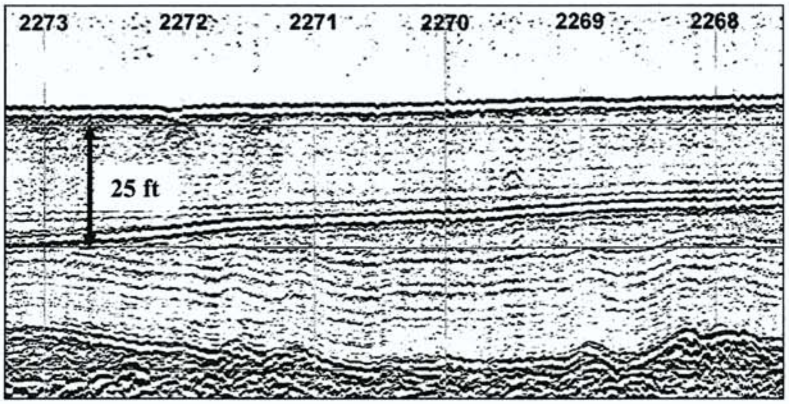
(A) Line 25 showing a 47 gamma positive monopolar anomaly (M132).



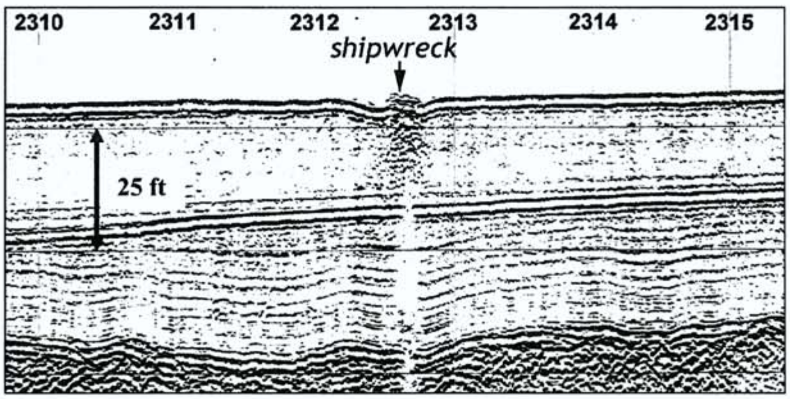
(B) Line 24 showing an 89 g dipolar anomaly (M60), the largest observed over the wreck.

Figure 3-2. Cross-sectional plots of the earth's total magnetic field values showing the local disturbance in the magnetic field due to the presence of the shipwreck. Examples of monopolar (Line 25-top) and dipolar (Line 24-lower) anomalies included (source: Ocean Surveys, Inc. 2007).

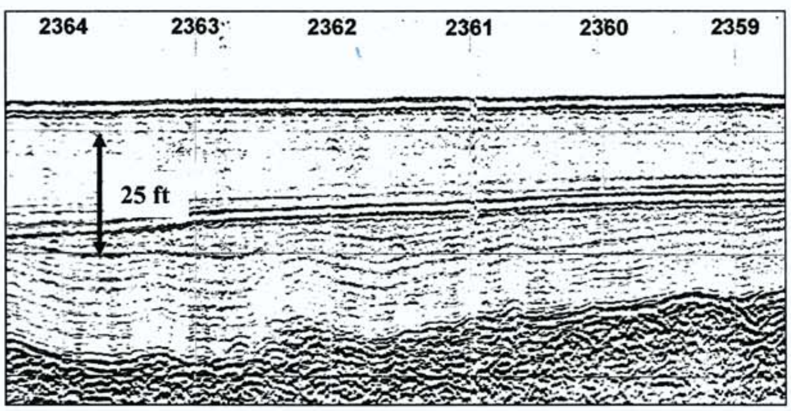
SSW **NNE**



(A) Line 28 passes ~110 feet WNW of the wreck's bow/stern at Fix #2270.2.



(B) Line 25 passes directly over the WNW end of the wreck at Fix #2312.6.



(C) Line 22 passes ~25 feet ESE of the wreck's bow/stern at Fix #2361.7.

Figure 3-3. Subbottom profiles along adjacent lines from west to east: Line 28 (A), Line 25 (B), and Line 22 (C). (Parabolic reflections generated by the shipwreck are evident on Line 25, which passes directly over the wreck; events are spaced 200 ft apart across the top of profiles) (source: Ocean Surveys, Inc. 2007).

CHAPTER FOUR

CULTURAL RESEARCH CONTEXTS

The U.S. Department of Interior, National Park Service's (NPS) Bulletin No. 20 – *Nominating Historic Vessels and Shipwrecks to the National Register of Historic Places* (1992), provides guidelines for assessing the historical significance and applying the National Register eligibility criteria to shipwrecks. According to the NPS, a vessel's historical significance is based in part on its representation of vessel type, association with significant themes in American history, and comparison with similar vessels. Topics such as these are addressed in narrative context statements that specify a vessel's place in the development of American maritime trade, naval power, recreation, government use, commerce, or various designs of waterborne craft. To assess the historical significance of the Searsport shipwreck (tentatively identified as the 1900 schooner-barge, *Cullen No. 18*), the vessel's role in Searsport's early-twentieth-century maritime trade, and the manner in which the schooner-barge vessel type fits into the developmental history, America's commercial sailing vessels were examined and the following research contexts developed.

Research Context 1: Maritime Trade in the Port of Searsport

The history of Searsport's maritime trade may be divided into two general periods that are separated by the arrival of the Bangor & Aroostook Railroad's ("the B&A") Northern Maine Seaport Railroad at Searsport in 1905. Although the pre-railroad history of the port extends back through the eighteenth and nineteenth centuries, it is Searsport's post-railroad history of the first half of the twentieth century that is most germane to the assessment of the historical significance of the *Cullen No. 18* shipwreck site. During this time, the commercial activity generated by the B&A led to the emergence of the Mack Point Terminal and its coal wharf as primary loci of the port's trade.

The area that is encompassed today by Searsport's present town boundaries was settled by Euro-American colonists in 1760. Searsport was officially incorporated as a town in 1845 when the municipalities of East Belfast and West Prospect merged. Searsport's proximity to the Penobscot River estuary and the region's rich natural resources of timber and fish initially drove the town's commercial and industrial interests. Foremost among the town's early industries was shipbuilding. At the apex of Searsport's pre-railroad era commercial development in the mid-nineteenth century, the town boasted eight shipyards that produced a variety of vessel types (e.g., schooners, sloops, brigs, barks, barkentines, and ships). In addition to its abundant natural resources and skilled shipbuilders, Searsport was also home to some 286 different vessel masters over the course of its history (Searsport Celebration Committee 1970).

An increasing demand for ships greater than 2,000 tons in the decades following the Civil War, however, exceeded the physical limitations of Searsport's waterfront, thereby limiting the size of vessel that could be built and launched there. That fact, combined with a nationwide economic depression that lasted from 1873 to 1879, led to a sharp decline in Searsport's shipbuilding activities. Although affected by the economic downturn and the loss of its primary industry (shipbuilding), Searsport's inhabitants managed to survive. This was a direct result of the town's diversified economy, which was also supported by farming, fishing, retail businesses, an iron foundry, a spool mill, a sash and blind factory, a cooper shop, and several brick factories. While Searsport's shipwrights built only five vessels between 1880 and 1899, the town retained an important role in maritime commerce. In 1885 alone the captains of one-tenth of America's full-rigged ships all hailed from Searsport (Searsport Celebration Committee 1970).

The post-railroad history of the port and its trade were shaped and dominated by the operations of the B&A railroad and the commercial traffic that it attracted to Searsport. B&A's decision in 1903 to establish an ocean terminal at Searsport by building the Northern Maine Seaport Railroad forever changed the nature of the port and ushered in its modern industrial era. It was the port's coal trade, in particular, that came to dominate the town's commercial activity and brought the *Cullen No. 18* schooner-barge, and many other vessels like it, into Searsport Harbor.

The initial impetus behind the B&A's construction of a "Seaport Railroad" was to accommodate a flood in new freight traffic that was anticipated to come out of Northern Maine, and to promote the growth of this new traffic by opening the way for the region's products to reach distant markets. The B&A had been chartered in 1891 in response to agitation in Aroostook County to establish a direct link with Bangor and the important population centers of New England and New York (Sherman 1967:34). Potatoes, lumber, and, later, pulpwood and paper, were initially the railroad's most important commodities, although the B&A also carried significant amounts of coal, grain, fertilizer, and merchandise. Despite having no direct connections with the sea and oceanic shipping interests, the B&A proved to be a small, yet successful, regional railroad.

Franklin W. Cram, the second president of the B&A, was convinced that the traditional markets for Maine's products (New England and New York) could not absorb the vast quantities of food, lumber, and other materials that he anticipated Northern Maine was capable of producing. He concluded that if the economic potential of the region was to be fully realized, it would be necessary to establish new markets in the South, in the West Indies, and even in Europe. Cram believed that "coarse tonnage," timber in particular, originating in Northern Maine, could not bear the relatively high cost of rail transportation over long distances, and, therefore, immediate access to a deep water port and lower-priced marine shipment was required. Adding a seaport route to the B&A, he argued, would provide convenient and economical access to world markets, and lead to the development of new business (Sherman 1967:36).

Bangor didn't suit Cram's purposes, because he observed that its freight terminal was already strained with traffic and, therefore, wouldn't be able to accommodate the new flood of traffic that he anticipated coming from an as-yet built "Allagash Railroad" that was to extend into the heart of Northern Maine's prime timberland. The Penobscot River at Bangor was also too shallow and narrow to be used by the largest ocean-going vessels, and was closed to navigation by ice during the winter months (Sherman 1967:38). Cram's solution was that the B&A would extend its lines to tidewater and construct its own deepwater terminal on the Maine coast.

In addition to Cram's desire to develop and capitalize on Northern Maine's untapped resources, another key factor contributing to the B&A's decision to build the Northern Maine Seaport Railroad was their constant and growing need for a steady, dependable, year-round supply of locomotive coal to fuel the railroad's ever-increasing number of engines. Successful operation of the B&A was directly affected by the cost and availability of bituminous coal. The railroad's steam engines burned thousands of tons of bituminous coal each year, and expenditures for fuel consumed more than 10 percent of the annual operating revenues of the B&A. The price of coal was always a major subject of concern, and having an adequate supply on hand at all times was absolutely necessary to ensure that the railroad's schedules could be maintained. Any delays in service would be costly and simply could not be tolerated (Sherman 1967:39–41).

Prior to extending the B&A to Searsport, most coal used by the railroad had been delivered at Bangor by water via barge or schooner and then hauled north by the Maine Central Railroad to Old Town to be turned over to the B&A. This method permitted the maximum use of cheaper water transportation and kept the relatively greater expense of transport by rail to a minimum, although the arrangement was not without its challenges. From December to April, the port of Bangor was typically closed to shipping, because of the freezing of the Penobscot River (referred to locally then as the "Ice Embargo") (Sherman 1967:40). In addition, the winter and wpring seasons coincided with the B&A's peak traffic months. The railroad had to estimate its winter coal requirements in advance and have coal delivered during the ice-free summer and fall months, or run the risk of running short on coal fuel and have to pay extra for it to be transported by rail from Portland. Shortages of coal were also inconvenient and costly for the many businesses and households that depended upon its regular supply during the colder months for heating purposes. Rail access to an ice-free port (i.e., Searsport) that could be equipped to handle and store coal was of critical importance to the B&A, because it:

- guaranteed the B&A with a year-round supply of coal at the lower water rates;
- eliminated the need to furnish storage for a six-month supply of coal;
- filled otherwise empty lumber cars on their return trips north; and
- eliminated the need and expense of shipping coal over the Maine Central Railroad (Sherman 1967:41).

Access to a deepwater port was also desirable for the B&A because it would allow the railroad to bypass the otherwise necessary connections with the region's lower roads, thereby avoiding the winter bottleneck at Bangor for direct access to the B&A's chief markets in New England and New York via water carriers in Searsport. By transporting southbound freights from Northern Maine to the docks in Searsport, and returning to the north with coal shipped to Searsport from the southern ports via water, the B&A could create an efficient "endless chain" of rail cars moving between the railroad's inland stations and the wharves at Searsport. A similar "endless chain" concept was also adopted by the coal shipping companies, who replaced their fleets of large-capacity sailing schooners with fleets of ocean-going schooner-barges that could be towed several at a time and according to fixed schedules by large steam-powered tugs (Sherman 1967:44–46).

At the time of the B&A's Seaport Railroad's construction, it was considered to be "one of the greatest railroad projects that ever came before the railroad commissioners in Maine" (Sherman 1967:50). The new rail line extended 54.13 mi (87.1 km) from B&A's railroad terminal in La Grange in Penobscot Country to a point of connection with the Maine Central Railroad near the northwest line of Belfast in Waldo County, with two spurs or branches to tidewater – one in Stockton Springs and the other in Searsport. Stockton Harbor had been selected as the location of the railroad terminal. Piers were built on Cape Jellison, Kidders Point, and Mack Point, with the Cape Jellison terminal for lumber and other heavy freight, the Kidders Point pier for passengers and light freight, and the Mack Point pier purpose-built as a coal terminal.

Mack Point was selected for the location of the coal terminal, because of its distance from Searsport's town center and residences and from Kidders Wharf. By keeping the coal terminal at a distance from these areas, the railroad hoped to prevent the "disagreeable features" of the transportation business (i.e., noise, grime, dust, smoke, etc.) from annoying the townspeople and the railroad's passengers (Sherman 1967:53). Besides the coal wharf and coal storage area, the Mack Point facility also included a freight-yard and engine-house, where steam locomotives could be serviced and fueled, as well as a station and a warehouse. The coal wharf was built and operated by the Penobscot Coal and Wharf Company, a subsidiary of C. H. Sprague and Son of Boston, who were an important distributor of industrial coals throughout New England.

Following their completion, the Cape Jellison and Kidders Docks in Stockton Harbor were hardly used, but the Mack Point terminal proved to be an "outstanding success" with the B&A playing a major role in that success (Sherman 1967:65). The impressive expansion of the Mack Point terminal's facilities and the growth of traffic in coal and fertilizer shipments coming into the terminal were both due, in particular, to the efforts of the B&A.

Sprague and Son's Mack Point coal terminal was located on land leased from the B&A. The coal terminal's wharf consisted of a trestle that extended inland from a point 660 ft (201 m) offshore to a storage area located behind the railroad tracks. Pockets built over the tracks made it possible to dump coal directly into coal cars and locomotive tenders. "Shovels" housed in towers located on the wharf hoisted the coal out of the vessels and emptied it into small cable cars, which were then hauled along the trestle to the pockets or to the storage yard. Initially there were just two hoisting towers, but a third was added in 1909, which raised the unloading capacity of the dock to 200 tons per hour.

The terminal's freight yard extended south from the coal pockets along the shore of Long Cove. Sidings were built later out across the face of Mack Point to serve the port's fertilizer plants. The engine house, located at the north end of the yard along with the water tower, passenger depot and freight house, could accommodate eight locomotives at a time. According to one study, the Mack Point terminal was "one of the largest and best equipped coal pockets and dock facilities" north of New York City (Sherman 1967:74). In addition to coal, the Mack Point coal wharf was also used for unloading other bulk commodities (e.g., phosphate rock and dry sulfur).

The nature of Searsport's maritime trade after the establishment of the B&A's Seaport Railroad could be characterized as ranging from "feast" to "famine." For ease of description, the port's post-railroad history of the first half of the twentieth century can be further divided into three sub-periods, as presented by historian, Rexford B. Sherman, in his 1967 master's thesis on the port: the Cape Jellison Period (1905–1924); the Mack Point Period (1925–1945); and the Mack Point Period (1946–1966).

The Cape Jellison Period (1905–1925)

After a promising start, Stockton Harbor's Cape Jellison and Kidders Dock terminals languished, while traffic through Searsport's Mack Point terminal thrived and expanded. Lumber, coal, potatoes, fertilizer, and granite initially moved in/out of Stockton Harbor in large volumes, but by the end of the first decade of operations, only fertilizer, coal, and paper could be considered important cargoes. Cargoes of brimstone, hay, straw, ice, oil, machinery, iron, molasses and sugar, canned goods, fish, hair, salt, grain, and starch, and railroad equipment were also handled by the port. In 1905, the inaugural year of the Seaport Railroad, only 4,000 tons of cargo was shipped at Searsport's Stockton Harbor docks. The following year, the Stockton Harbor tonnage jumped to 335,000 tons, of which 145,000 tons were coal shipped by water. In the intervening years leading up to 1914, an average of 418,000 tons of cargo was shipped through the port annually, with coal, lumber, fertilizer, and paper (mostly newsprint) accounting for 90 percent of the total. Coal alone furnished approximately 50 percent of the business of the entire port during this period (Sherman 1967:73–75).

During the same period, the coal wharf and fertilizer piers at Mack Point received an average of 1,250,605 tons of cargo per year, and the B&A carried well over two million tons of freight annually. The most important users of the port were the Great Northern Paper Company (which shipped paper and received coal and chemicals), the fertilizer plants at Searsport (for their traffic in fertilizer and fertilizer materials), and the B&A (which received coal and equipment [rails and car wheels]). Without the support of this group of users, the industrialized port of Searsport would probably have been abandoned not long after it opened (Sherman 1967:75–77).

The five principal commodities that were the staples of the port during the Cape Jellison Period were potatoes, coal, paper, fertilizer, and lumber. Only coal, and to lesser extent fertilizer and paper, appears to have done equally well on the B&A and at the port as virtually all of the coal, and most of the paper carried by the B&A passed through the port (Sherman 1967:77).

For almost 50 years coal was the most important commodity (in terms of volume) shipped through the Searsport gateway, reflecting a broader regional trend in the staggering volume of marine traffic engaged in the coal business. A marine traffic study conducted during the opening decades of the twentieth century revealed that of the 27,400,000 tons of cargo carried by 30,000 vessels transiting Nantucket Sound in one year, 9,000,000 tons were coal (Morris 1984:75). The first coal shipment was received at Cape Jellison in 1905, but thereafter, virtually all subsequent coal shipments handled by the B&A were taken in at Mack Point. Movements of coal resulted in a heavy diversion of traffic from the Maine Central and other B&A connections. Both anthracite and bituminous coals were handled at Searsport, although most of the anthracite shipped to Searsport came from Philadelphia in barges owned by the Philadelphia and Reading railroad and never amounted to very much, comparatively speaking. Bituminous coal was brought in primarily from Virginia in colliers chartered or owned by the Great Northern Paper Company or C. H. Sprague and Son, both of whom were the two principal coal buyers at Searsport. The B&A contributed to the growth of Searsport's coal traffic in three different and important ways: as a purchaser (they bought between 25 and 50 percent of the annual coal shipments); as a landlord (B&A leased the land occupied by C. H. Sprague and Son); and as a carrier (B&A handled more than 250,000 tons of coal coming into the port each year during this period) (Sherman 1967:77, 81–106).

In its operation of the port, B&A's involvement was primarily limited to maintaining its properties and piers and providing normal railroad service, which included switching service around the Mack Point coal terminal and the fertilizer plants. In addition to its freight service into Searsport, the B&A initially provided regular passenger service, which continued up until 1933 (Sherman 1967:103–106).

In 1908, a fire of mysterious origin broke out on the Cape Jellison wharves, destroying the entire paper wharf, two-thirds of the Number Two wharf, and part of the bulkhead, which was burned to the water's edge. As a result, commercial operations at the Cape essentially ceased and its traffic was transferred to Kidders wharf. The fire forced the B&A to face three choices: 1) rebuild at Cape Jellison; 2) abandon the Cape entirely and move over to Kidders, or; 3) concentrate on the development of Searsport's Mack Point facilities. After much deliberation, the B&A determined Stockton Harbor to be of inferior water depth to warrant rebuilding at Cape Jellison and further development at Kidders. Consequently, Cape Jellison and Kidder's Point were slowly abandoned during the remainder of the period, and the development and expansion of the Mack Point terminal became the B&A's priority. The viability and substantial traffic of the Mack Point terminal had demonstrated that it could be useful and profitable to the B&A, and had confirmed the soundness of Cram's idea of a seaport terminal (Sherman 1967:107–109).

Mack Point Period (1925–1945)

Port traffic at Searsport during the Mack Point Period was generally heavier than that of the preceding Cape Jellison Period and was focused entirely at Mack Point. Principal commodities shipped during this period consisted primarily of bulk cargoes of coal, dry sulfur, and fertilizer (especially phosphate rock), as well as potatoes, scrap metal, chemicals, and munitions. C. H. Sprague and Son's coal business operations at Mack Point continued through the period, although a fire at Mack Point in 1929 partially destroyed their coal trestle. Sprague responded by building the "New Pier," a 760 ft- (232 m) long and 100 ft- (30.5 m) wide timber pile, timber-decked wharf with a strengthened trestle and modernized conveyor system that increased its unloading capacity by 50 percent (Sherman 1967:127).

Between 1931 and 1945, the period when the *Cullen No. 18* was lost at Searsport, there was a substantial increase in coal traffic at Mack Point, as receipts of bituminous coal increased steadily in response to greater demands for the product, which had been fueling New England's industrial growth since the previous century (Sherman 1967:113–126). The textile industry, transportation, the manufacture of gas for lighting, and the industrial use of steam power, all were constantly calling for more and more coal. Anthracite was favored for domestic heating use, because of its comparatively smokeless qualities, whereas bituminous coal was preferred for industrial use, because of its superior steam-generating abilities (Morris 1984:73).

Expansion of the C. H. Sprague facility and the arrival of a second coal company (Boston-based distributor, H. N. Hartwell and Son) to the port in 1932 were also contributing factors to the increased coal traffic. Smaller than Sprague, Hartwell was, nonetheless, an extensive business that had additional coal terminals already in operation in Connecticut, Massachusetts, and Rhode Island when they commenced operations at Searsport. Coal delivered to the various Hartwell terminals was transported by a fleet of company-owned barges and colliers operating out of Philadelphia and the other big eastern coal ports. Situated at Sandy Point, vessels discharged their cargoes for Hartwell at the old fertilizer wharf, and coal was stored in the big warehouses pending delivery to its customers. At the time, the Sandy Point terminal was the largest covered storage plant in northern New England. Unlike Sprague and Son, Hartwell relied on truck transportation to a large extent for their operation, although some of the Hartwell's coal was handled by the B&A and transported by rail (Sherman 1967:115-116).

The B&A, and to a greater extent, the Ontario & Western, the Erie, the Delaware, Lackawanna & Western, and the Philadelphia & Reading railroads were heavily engaged in the coast-wise coal trade during this period, and shipped both anthracite and bituminous coals in schooner-barges. The three leading ports in the coal trade were Hampton Roads (Virginia), Philadelphia, and the New Jersey railroad piers in the New York Harbor area. Shipments out of Virginia were composed of bituminous coal, whereas most of the coal loading at Philadelphia and the New York Harbor ports in New Jersey was anthracite (Mayhew 1963:49–50; Sherman 1967:77).

Leading coal transportation firms in the early 1930s included: the Southern and the Sheridan transportation companies of Philadelphia; the Eastern, the P. Dougherty, and Robert P. Wathen companies in Baltimore; and the Staples Transportation Company in Fall River (Mayhew 1963:49). The chief routes for anthracite coal coming out of mines of northeastern Pennsylvania were out of Philadelphia, where they were carried by the Philadelphia and Reading railroad, and at New York Harbor, where the anthracite-carrying railroads, such as the Delaware, Lackawanna & Western, loading its vessels at Hoboken, New Jersey, ruled supreme and had their own customers and depots in the Boston and Bangor markets (Mayhew 1963:50; Sherman 1967:77).
Bituminous coal moved primarily from Hampton Roads to New York Harbor and from there into the New England area, via independently owned barges. The principal independent owners of schooner-barge fleets included: Luckenbach (New York, New York); Thomas J. Scully (Perth Amboy, New Jersey); the Neptune Barge Lines (New York, New York); the Consolidation Coal Company (Baltimore, Maryland); the Northern Transportation Company (Baltimore, Maryland); the Eastern Transportation Company (Baltimore, Maryland); the Staples Transportation Company (Fall River, Massachusetts); the Mystic Steamship Company (Boston, Massachusetts); Elmer Keeler Incorporated (New York, New York); the Seaboard Transportation Company (New

York, New York); the Durham Transportation Company (New York, New York); the Southern Transportation Company (New York, New York); Robert Wathen (Baltimore, Maryland); and the Cullen Transportation Company (New York, New York) (Mayhew 1963:28). While coal was the lifeblood for practically all of these firms, other cargoes that would turn a profit (e.g., stone, ice, lumber, iron, fertilizer) were transported by schooner-barge, as well.

Most of the tows originating in Virginia were confined to two large barges, while tows from Philadelphia and New York usually consisted of three to four smaller barges (Figure 4-1) (Morris 1984:50). The carrying capacity of each of these barges ranged from 1,000 to 4,000 tons of coal. The Lehigh Valley Railroad Company was very active in carrying coal by sea to Massachusetts and Maine, and also carried fertilizer to Searsport and stone from Penobscot Bay ports to New York and Philadelphia. Nearly 12 million tons of anthracite per year was shipped from New York at turn of twentieth century, but by the 1960s this quantity had dwindled to virtually nothing (Mayhew 1963:42).

Coal receipts into the port of Searsport increased steadily from 291,543 tons in 1931, to 332,868 tons in 1933, and to 375,833 tons in 1937 (Sherman 1967:116). The year 1938, when the schooner-barge *Cullen No. 18* delivered its final shipment of coal to the Penobscot Coal and Wharf Company's pier at Searsport, was actually an off year for coal traffic, both for the port and for the railroad. The temporary downturn may have been partially a result of increased rates on bituminous coal shipments loaded on flat cars and on anthracite coal, although relatively little anthracite continued to be received at Searsport. It is presently unknown whether the *Cullen No. 18* was carrying anthracite or bituminous coal at the time of its loss, although anthracite was the primary coal associated with the Delaware, Lackawanna & Western Railroad, from which the shipment had originated.

Coal receipts moved irregularly upward in subsequent years between 1939 and 1945, with increases offset somewhat by declines in 1940 and 1942, due in part to unfavorable conditions associated with coastal navigation during World War II. Specifically, these declines may have been attributable to the German "submarine menace" that existed off the Atlantic seaboard at the time, which created a shortage of shipping due to mounting vessel casualties and the demands of the military emergency. Coastal trade traffic was forced to be diverted to the rails, and Searsport's important 1930s trade links with Germany and Japan came to an end. In 1944, the federal government financed the dredging of a 32 ft- (10 m) deep approach channel and the enlargement of berths at the Mack Point waterfront (Sherman 1967:116–117, 128).

Services and privileges provided to vessels landing at Searsport during this period were reportedly "liberal and inexpensive," although vessels were not allowed to tie up at "New Pier" unless the B&A was to receive a full rail haul on "substantially the entire cargo." Vessels not receiving or discharging cargoes were not allowed to moor at the railroad dock for any reason. Most of the heavy work unloading cargoes at the dock was done with the aid of the vessel's booms and hoists (Sherman 1967:129).

Figure 4-1. A typical tow of three Erie Railroad schooner-barges making their way westward through Cape Cod Canal behind the tug *Albert J. Stone* in 1914 (source: Morris 1984:77).

Mack Point Period (1946–present)

Searsport's maritime trade during the most recent period of its history experienced a sharp decline in the volume of the port's coal traffic, while during the same time receipts of petroleum products rose steadily and eventually replaced coal as the port's leading import. This trend was not unique to Searsport, but instead reflected a nationwide transition toward an increased use of petroleum-based fuel oil and gasoline over coal as primary energy sources. During the course of this period, shipping services at the industrial waterfront terminal at Mack Point were expanded to also include large chemical and fertilizer processing plants, petroleum storage tanks and their associated piers, and a truck terminal (Andrews 1965:3, 4). This transition and growth led to Searsport and the Mack Point waterfront becoming one of the region's most important international shipping terminals. Searsport's connection to the sea remains as vitally important today as it was 150 years ago, because of the port's active service as the easternmost, international, year-round, deep-water port in the United States (Searsport Port Committee n.d.).

Research Context 2: Development and Role of the Schooner-Barge Vessel Type

From the late 1800s to the end of World War II, tug-towed schooner-barge "strings" were one of the principal modes of transporting bulk cargoes, particularly coal, to markets along the Atlantic Coast of North America. Use of the "tow-barge" or "consort" system of shipping appears to have developed first in the Great Lakes region during the 1860s, where it was pioneered by lumber merchant Isaac Stephenson (1829–1918). Stephenson used schooners near the ends of their active service lives as "lumber barges" that were stripped of their topmasts (and their decks too, in some cases) and towed heavily laden behind steamers either singly or in tandem from lake port to lake port (Karamanski 2000). In addition to the Great Lakes sailing vessels that were converted, many of the Lakes older steamers were also converted. Engines and superstructures were removed, so that they, like their sailing counterparts, could be fitted with the shortened masts of the "bald-headed" schooner rig. By retaining or adding shortened masts, the lumber barges could be self-propelled if necessary during an emergency (e.g., if the tow-cable parted). The inclusion of the reduced rig also was a source of auxiliary power in favorable winds for the steamers that towed them.

The principal benefit of the towed schooner-barge system was the economy of scale derived from its ability to ship larger volumes of cargo than could otherwise be carried by a single vessel, while accruing minimal increases in fuel and crew costs for the barges and their towing steamer. Operating costs were less, because the schooner-barge's reduced sail rig required a smaller crew to operate and less maintenance. At the same time that costs were reduced, cargo capacity per shipment was maximized, thus providing the vessels' owners with a greater margin of profit. The towed-barge system also enabled those engaged in the shipping trade, like Stephenson, who owned the Marinette Barge Company's three fleets of steamers and barges, to keep their fleets in constant motion while maintaining regular shipping schedules, unaffected by the vagaries of wind. The economic value of this system soon led to its adoption all along the East Coast (Karamanski 2000).

The first groups of barges towed in the Northeast appeared in the late 1870s, and were used by the Taunton-Fall River, Massachusetts-based Staples Coal Company in the coal trade carried across the protected waters of Long Island Sound between New York and Narragansett Bay. Unlike schooner-barges, these first barges (towed several at a time) were square-ended scows ill-adapted for service on the open ocean. Ocean-going, towed schooner-barges began appearing on the offshore waters of the Northeast after a world-wide economic depression developed in the 1890s that forced the lay-up of many of the United States' deep-water square rigged vessels, largely as a result of the influences of the Morses of Bath, Maine and the Luckenbachs of New York City (Mayhew 1963:vii).

The Morses were a Maine family who by the 1870s had gained a controlling interest in tow-boating on the Kenenbec River (Morris 1984:5). Through the efforts of Henry Morse, the family's shipping business began in the ice trade, which they eventually developed into a monopoly that grew into the American Ice Company with capital of $60 million before its sale in 1902. The Morses later went on to gain control of the steam shipping industry, owning both the Metropolitan Steamship Company and the Boston Eastern Steamship Corporation (Mayhew 1963:9).

Prior to the days of mechanical refrigeration, winter-frozen, northern ice was the only means of chilling the ice boxes of kitchens in most homes on the eastern seaboard. Maine ice was in great demand and became a very important part of the state's economy. The Morses bought ice on speculation from nearby ponds and from the Kennebec River, which they then shipped to New York and other southern ports in large "Down East" schooners (Morris 1984:5–6).

On their northeast-bound return trips back to Maine, the schooners carried cargoes of southern pine lumber and coal. Transporting each schooner's cargo in and out of ports and up and down rivers incurred towing charges that reduced the Morse's profits (Mayhew 1963:5). In response, they adopted a towing plan used previously on the Great Lakes, and, more locally, by the Staples Coal Company, wherein a string of three to four barges was towed by a single steam-powered tug. The difference in this case was that instead of using scows, the Morses used full-bodied, oceangoing sailing ship hulls, which were readily available and inexpensive because of the depressed economy of the period.

Use of these oceangoing vessels as tow-barges permitted cargoes to be towed on offshore waters all the way from the Chesapeake to New England and back at a fraction of the cost associated with the operation of a single, large Down East schooner (Mayhew 1963:5). The most expensive feature of the towing plan was the steam-powered tug. The cost of a tug was offset, however, by the ability to keep it in nearly continuous use between ports, dropping and picking up fully-laden barges in both south- and north-bound directions on a relatively fixed schedule. By reducing the rigs of the converted Down Easters to the bald-headed schooner configuration, the Morses also quickly realized significant savings in overhead expenses, because only about a third of the crew of a full-rigged sailing vessel was needed to operate the tow-barges.

The first of the Morse's bald-headed schooners was put into barge service in 1885, when the 1,049-ton ship, *Lizzie Moses*, built in 1859 at Bath, Maine, was towed to Bath from Hoboken, New Jersey by their steam-tug, *Knickerbocker*, fully laden with a cargo of coal (Mayhew 1963:5). The Morses continued purchasing large sailing vessels for conversion into schooner-barges up until 1888 (Mayhew 1963:6). They sold their interests in the ice and towage business around the turn-of-the-century to turn their attention to banking and the coastal passenger steamboat business.

At around the same time that the Morses were applying the towed-barge system to their shipping business, the Luckenbachs of New York City initiated coastwise coal-carrying service between ports in Norfolk, Virginia, New York, and New England using a few oceangoing steam-tugs and sailing vessels that were converted into schooner-barges. Operation of the Luckenbach's towing business was started by Captain Lewis Luckenbach and his brother, Edward, in 1850 at Rondout Creek, New York with just a single small tugboat (Mayhew 1963:28, 29; Morris 1984:9). They subsequently moved business operations to Philadelphia, where they provided local towing and salvage services. After a short time, their towing fleet was expanded with the financial support of three Philadelphia industrialists to include five small tugs for harbor service in and around Philadelphia. As the company continued to grow and prosper, their interests turned to deep-sea towing.

During the late 1880s, several ocean-going tugs and aged large sailing vessels (later converted into schooner-barges) were added to the Luckenbach's fleet. Luckenbach was among the region's pioneers in towing barges in tandem prior to it becoming an accepted practice, and was the first to introduce regular, coastwise, coal carrying service between Norfolk, Virginia and New York and New England (Morris 1984:9). Finally, Luckenbach, joined by his son, Edgar, moved the business's operations to New York City. There, they invested in ocean vessel ownership and expanded their capabilities to include the high seas salvage of stranded and wrecked vessels. Upon the elder Luckenbach's death in 1906, Edgar took over the business and expanded and improved the fleet and its field of operations. Upon the entrance of the United States into the World War I, Luckenbach made available to the United States government his entire fleet of 19 schooner-barges, five deepwater tugs, and large collection of deep water freight vessels. After the war and the return of the vessels, Edgar's son, Lewis Luckenbach, Jr., who joined the firm in 1920, sold most of the barges to the Neptune Line and discontinued the business's schooner-barge operations in the early 1930s (Mayhew 1963:30).

Initially considered too risky by insurers and their shipping peers, the successes of the Morse's and Luckenbach's open-ocean tandem towing system models led numerous coal companies, railroad companies, and independent investors to invest in and establish new tug and tow operations that employed their system to join the competition between themselves and the increasingly larger coastal schooners being built at that time (Figure 4-2) (Morris 1984:11). The increased demand for the inexpensive, old cut-down oceanic sailing vessels for use as barges eventually depleted the available inventory of the inexpensive older sailing vessels that were suitable for conversion. Consequently, a new North American vessel type emerged in the early 1890s to meet the towing industry's demand for more barges – the purpose-built schooner-barge.

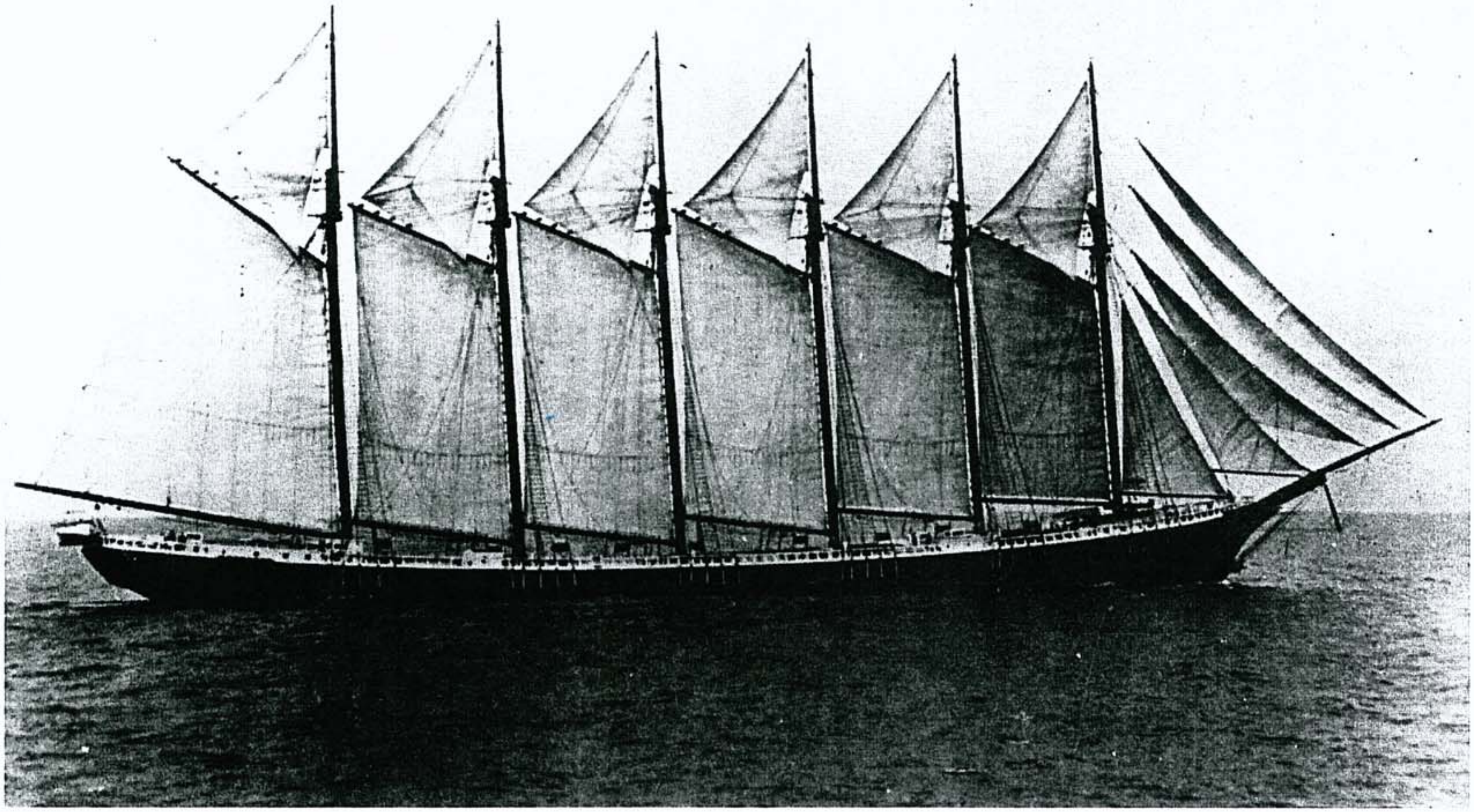


Figure 4-2. Photograph of the largest wooden sailing vessel to ever carry a cargo, the six-masted, 329 ft- (98 m-) long, 3,730-gross ton schooner *Wyoming*, built in 1909 at Bath, Maine. (In an effort to compete with string-tows of schooner-barges the sizes and rigs of schooners built at the turn of the twentieth century were pushed to their maximum limits. While transporting a northbound cargo of coal across Nantucket Sound in 1924, the *Wyoming* was lost with all hands during a spring storm) (source: Morris 1984:85).

Production of vessels originally built as schooner-barges that most typifies the style or design of such vessels was likely set by shipwrights Robert Palmer and Son, of Noank, Connecticut, when they started building schooner-barges in 1890 for the Delaware, Lackawanna & Western Railroad (Morris 1984:23). The first of the Delaware, Lackawanna & Western Railroad schooner-barges were the *Hopatcong*, the *Musconetcong*, and the *Pohatcong*, each of which had an 843-gross tonnage (Morris 1984:23). Palmer would eventually build more than 140 schooner-barges before he died in 1915. The last of them was the 1,780-gross ton *Exeter*, launched in 1914 for the Reading Company of Philadelphia (Morris 1984:23). Most of the schooner-barges built in New England had similar characteristics. These characteristics included:

- a bald-headed or pole-masted rig (masts without topmasts, regardless of number of masts) with gaff rig, triangular, or leg-of-mutton sails;
- a flush-deck (with no forecastle or quarter deck at the bow and no poop deck at the stern);
- a low rail protecting the open deck with an air course in the rail at the deck level to allow for water run-off;
- a forward chain locker and room for the donkey engine below deck that was used to power winches and raise sails;
- a continuous hatch arrangement from just aft of the foremast to a point just forward of the after house;
- an after house abaft the hatches where the galley, head, and if present, any living quarters for the captain and cook were located, and;
- a wheel house over the after house in which the crew's quarters were located in a bunk room (Morris 1984:23–28).

During an approximately 30-year period between the 1890s and the 1920s, hundreds of schooner-barges were built, many in the shipyards of Bath, Maine. The period of greatest schooner-barge building activity in Bath occurred during three consecutive years - 1898, 1899, and 1900, when 58 vessels averaging 996.3 tons per barge were built there alone, including the *Cullen No. 18* in 1900 (Mayhew 1963) (Table 4-1).

Among the most important of Bath's shipyards that produced the schooner-barge vessel type was the New England Company (NEC), established in 1866. Interests in the New England Company were reconfigured to form the New England Shipbuilding Company (NESBC) in 1884. Between

Table 4-1. Registered Tonnage of Schooner-Barges Built at Bath, Maine (1895-1923) (source: Mayhew 1963:10).

Years	Number of Vessels Built	Avg. Gross Tonnage	Avg. Net Tonnage	Comments
1895-1900*	66	1,002	899	Greatest number of schooner-barges built in one year was 25 (978 avg. gross tonnage/869 avg. net tonnage) in 1899.
1901-1908	25	1,041	928	
1911-1917	17	1,492	1,338	
1918-1923	09	1,584	1,461	*(year that *Cullen No. 18* was built at Bath, ME)

1884 and 1887, the NESBC was the most extensive yard devoted to wooden shipbuilding in the United States with the capacity to build simultaneously ten large wooden vessels. The NESBC remained the largest shipyard on the Kennebec River until the "Great 1887 Fire" destroyed much of the yard, and the Bath Ironworks was established. Following the fire, the NESBC was reorganized again under the name the New England Company (NEC) (Mayhew 1963:16).

General Thomas W. Hyde, founder of Bath Ironworks, was one of the firm's original directors, and Elijah F. Sawyer, for a short time, was a stockholder and master builder with the NESBC, prior to co-founding the Kelly, Spear and Company (1886 to 1900) shipyard. The NEC was distinct from its contemporaries, because its business was largely on contract. The firm's first barge was the *Yosemite* (built in the early 1880s) and the last was the 1,286-ton *Hattie* of 1903. Between 1884 and 1903, the combined output of the NESBC/NEC's yards was 25 vessels that amounted to 25,452 tons total, making them the second most active of Bath's builders. The NEC suspended building operations after 1906 (Mayhew 1963:18; Morris 1984:34).

The large, heavily-constructed, purpose-built schooner-barges built at Bath averaged between 1,000 and 1,500 gross tons and had full models for carrying large loads at a light draft, as well as ample hatches for facilitating the loading and offloading of bulk cargoes (Mayhew 1963:vii). The rigs of the schooner-barges were installed in the bald-headed configuration, with short pole masts, and no bowsprit or head sails. Consequently, the purpose-built schooner-barges also required a comparatively very small crew to work them.

The introduction and widespread use of the schooner-barge vessel type in North American shipping had an effect that was profound and permanent. A transitional vessel type between the large coastal sailing schooner and the steam-propeller collier, the development of the schooner-barge constitutes an extensive, albeit overlooked, chapter in the maritime history of both Maine and the United States about which very little has been written or published (Figure 4-3)

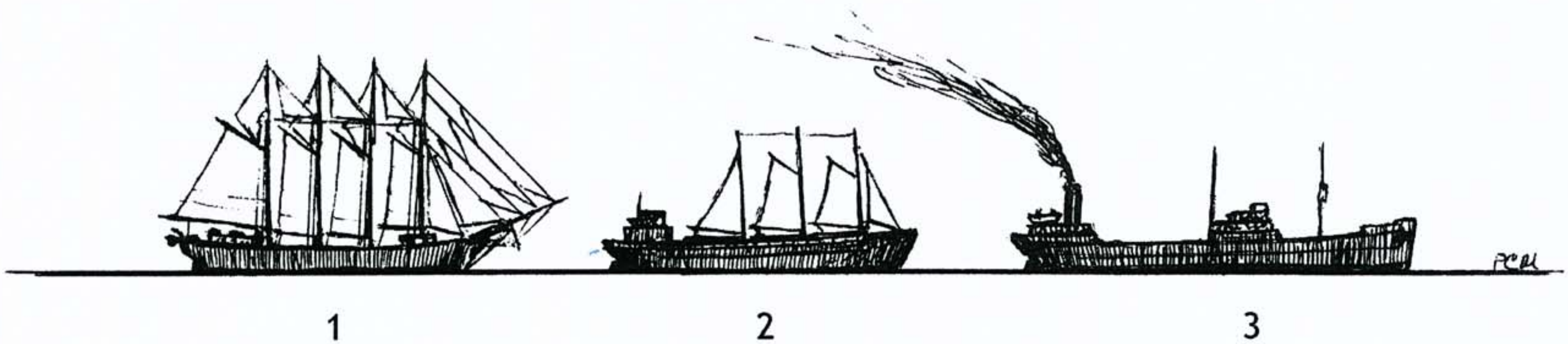


Figure 4-3. Schooner-barges (2) produced over a 30-year period between the 1890s and the 1920s represented a distinct transitional vessel type between large, bulk-cargo carrying coastwise schooners (1) and steam-colliers (3) (source: Morris 1984:81).

(Mayhew 1963: Morris 1984). The well-organized use of tow-barges suitable for open ocean conditions, particularly by shipping interests involved in the East Coast coal trade, offered reliable, regularly scheduled service direct to their patrons' waterfronts, something which the largest of sailing schooner operators could not do (Mayhew 1963:viii). The competition created by the use of towed barges gave the owners of schooners freight rates on which there was little, if any, profit. Returns soon became unattractive to investors; thus, construction of schooners ceased. Coastwise vessels in existence were forced into the offshore or distant Central and South American trades, as a result of an oversupply of tonnage at these markets and greatly depressed freight rates.

The resulting transition from individual bulk cargo carrying sailing vessels to tow-strings of multiple schooner-barges brought an end to America's merchant sailing ship era and was effectively the "death knell" of the formerly ubiquitous schooner vessel type (Mayhew 1963:ix). By 1908, numerous sizeable vessels built as sailing schooners and still in good condition were being cut down for use as barges. Many square-rigged "Down Easters" ended their days as towed barges, as well. Ultimately, it wasn't the steam, gas, or oil-propelled vessel that drove the sailing schooner from the coastwise trade of the United States. Instead, it was the system of towing strings of oceangoing barges developed in varying degrees by the Stephensons, Morses, and Luckenbachs, which once perfected by the early twentieth century, resulted in tows being operated regularly and cheaply from United States coal ports from as far south as New Orleans to markets as far north and east as Bangor (Mayhew 1963:vi).

World War I gave the schooner-barge new impetus. Bath's yards, as well as new yards at Sandy Point, South Portland, Rockland, and Machias, all built vessels for the federal government. In 1920 and 1921, however, falling ocean freights coupled with the availability of extensive new steam collier tonnage, the first of which had been put into service in 1907, led countless barges to be laid up indefinitely and then permanently, and proved to be a mortal blow to competition between schooner-barge and steam colliers (Mayhew 1963:88). Steam colliers, which could be loaded and trimmed faster than schooner-barges, were able to complete an average of 40 to 45 round trips per year, whereas schooner-barge colliers seldom completed more than 11 coal voyages per year (Mayhew 1963:77–79).

Most barges ended their days in the "boneyard" or in some special service in Florida or the West Coast, while a few managed to last into the early 1950s. The D. T. Sheridan Company of Philadelphia was one of the last schooner-barge operators on the East Coast (Morris 1984:106). By the end of World War II, increased use of fuel oil and the diesel engine had spelled doom of both the schooner-barge and steam-collier (Mayhew 1963:88).

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

Advanced post-processing of remote sensing data recorded at the Searsport shipwreck site and supplemental archival research about the developmental history of Searsport's maritime trade and the role of schooner-barges in North American ship design and maritime commerce were completed for this study. The purpose of this research was to further interpret and define the Searsport shipwreck site and its boundaries, and to develop research contexts for use in the assessment of its National Register eligibility. From this study, it is possible to draw several preliminary conclusions about the historical significance of the Searsport shipwreck site and make recommendations concerning additional research that would be required to complete a full National Register evaluation of the site.

Conclusions

Correlation of currently available archaeological and archival evidence indicate that the Searsport shipwreck is the remains of the schooner-barge *Cullen No. 18*, built in Bath, Maine in 1900 and lost in 1938 after discharging a cargo of coal at the B&A-served Penobscot Coal & Wharf Company's coal pier at Mack Point. Confirmation of the shipwreck's identification as the *Cullen No. 18* beyond any doubt, however, will require a physical inspection of the shipwreck.

The integrity of location, design, setting, feeling, and association, as well as the boundaries and general condition of the Searsport shipwreck site, all appear to be definable from existing remote sensing data recorded on site in 2006 as a result of the advanced data post-processing that was performed for this study. The vessel's remains are located where the *Cullen No. 18* sank in 1938 and are concentrated around the preserved bottom of the ship's hull. The setting of the port and harbor and the proximity of the vessel to the former location of the Penobscot Coal and Wharf Company dock strongly link the vessel to their historical significance. Enough elements of the vessel's hull are present in the archaeological record to document basic design elements and how vessels of this type were constructed. Assessment of the shipwreck's materials and workmanship will require a physical examination of the vessel's hull remains.

Presuming that the Searsport shipwreck is the schooner-barge, *Cullen No. 18*, the 108-year old vessel meets the 50-year minimum age criteria for National Register eligibility. It could be historically significant as a representative example of the final chapter in the history of the United States commercial wooden sailing-vessel era – the schooner-barge vessel type. From an engineering standpoint, the schooner-barge served as a technologically distinct, transitional vessel type between the large bulk-cargo carrying Down East coastal schooners of the last half of the nineteenth century and the steam-propeller colliers of the first half of the twentieth century during the relatively brief 30-year period that schooner-barges were produced between the 1890s and the 1920s.

The *Cullen No. 18* could also be considered historically significant for its association with broad patterns in the history of the United States within the themes of commerce, industry, and transportation. The coal trade of the early twentieth century, for which the *Cullen No. 18* was built and operated, was among the most important in the commercial and industrial developmental histories of the United States, the Northeast, and the port of Searsport. The Delaware, Lackawanna & Western Railroad Company that owned the *Cullen No. 18* was one of the nation's leading transporters of coal, and the first railroad for which purpose-built schooner-barges were built specifically for coastwise shipment of coal. The extension of the B&A railroad to Searsport and the operation of the Penobscot Coal and Wharf Company pier at Mack Point, which received the *Cullen No. 18*'s coal cargo, were the most important elements of the port of Searsport's industrialization and its early modern era of maritime commerce. Built in 1900, the last year of a three-year long apex of schooner-barge production, the *Cullen No. 18* was produced in one of the United States' most active and important shipbuilding centers – Bath, Maine, in one of its largest shipyards – The New England Company, near the end of the United States' wooden shipbuilding era.

Perhaps because of the prosaic nature of the schooner-barge vessel type, their employment as bulk cargo carriers and the relative recentness of their use, very little historical research, and virtually no marine archaeological research has been focused on them to date, despite their extensive use and important role in the technological and commercial history of the United States. Consequently, archaeological investigation of the *Cullen No. 18* has the potential to yield new and important information about this little studied aspect of American maritime history.

Recommendations

From the above conclusions and consultation with the NAE and MHPC, performance of a comprehensive site exam is recommended prior to proceeding with planned navigational improvements to Searsport Harbor. Execution of the site exam fieldwork will require detailed logistical planning and coordination with the NAE's project staff and safety officers, port officials, and the MHPC to address the significant environmental challenges (e.g., low underwater visibility, cold water temperatures, and strong tidal currents), potential hazards present on site (e.g., abandoned fishing gear entangled in the wreck and commercial vessel traffic in/out of the port), and the proposed site exam's research design. The site exam should consist of diver-based archaeological documentation, judgmental archaeological subsurface testing, and supplemental archival research to conclusively confirm the shipwreck's identity, assess in detail the condition of its remains, and fully evaluate the wreck site's National Register eligibility.

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APPENDIX A

SCOPE OF WORK

STATEMENT OF WORK
CONTRACT NUMBER DACW33-03-D-0002
MARINE GEOPHYSICS AND ARCHAEOLOGICAL SURVEY,
SEARSPORT HARBOR, SEARSPORT, MAINE
OPTIONAL TASK 9 - SEARSPORT HARBOR WRECK ASSESSMENT AND SITE EXAMINATION LEVEL INVESTIGATION
NOVEMBER 2, 2007

This Statement of Work (SOW) is for completion of an optional task (No. 9) under Contract DACW33-03-D-0002 for activities to be conducted as a follow-up to the task order for **Marine Geophysics and Archaeological Survey, Searsport Harbor, Searsport, Maine.** A copy of the original scope of work is enclosed (Attachment A) for more detailed information. This study consists of archival research and post-processing of survey data to arrive at a preliminary assessment of National Register eligibility for an identified shipwreck located within the Searsport Harbor channel.

I. GENERAL INFORMATION

A. The location of services to be performed under this contract shall be Searsport Harbor, specifically the location of the identified shipwreck in approximately 36 feet of water on NOAA chart number 13302. This wreck was also identified during the recent remote sensing archaeological survey conducted in anticipation of a navigation improvement project at Searsport Harbor by the Public Archaeology Laboratory, Inc. (PAL) (Marine Archaeological Survey, Searsport Harbor, Robinson and Gardner, July 2007). Please refer to the original Searsport Harbor Statement of Work for background and contextual information. The purpose of the wreck assessment is to assess and document the significance of the identified shipwreck for listed to the National Register of Historic Places and prepare recommendations for further study and evaluation, if required. A more detailed description is presented below.

B. The Contractor shall prepare an assessment of the wreck at Searsport Harbor based on a modified site examination level investigation for submerged cultural resources, as specified below.

Typically, a site examination investigation includes the following objectives:

a) Define the site's boundaries;
b) Determine the site's integrity;
c) Determine the density and configuration of cultural material and features;
d) Determine the complexity of the site;
e) Determine the age of the site; and
f) Evaluate the site's significance relative to an existing historical research context (e.g. Searsport's Maritime Trade and/or Schooner Barges: The Last Chapter in the History of the American Merchant Sailing Ship).

For purposes of this assessment, the investigation will meet the above objectives and should be sufficient to address the following:

1) Provide a preliminary definition of the site's size, internal composition, age, condition, and spatial arrangement of artifacts and features, and

2) Utilize the above information to arrive at a professional conclusion regarding the site's integrity, future research potential, and significance relative to larger historical context(s) of the region and the National Register criteria.

II. DESCRIPTION OF WORK AND SERVICES REQUIRED

These objectives can be met by the Contractor without the need for additional underwater investigations providing the following tasks are incorporated into the research design:

A. Additional archival research of the wreck shall be conducted with the purpose of conclusively identifying said wreck and determining its significance, if possible.

B. Additional remote sensing data post-processing:

- Side Scan Sonar Data – high-resolution mosaics presenting the best composite image of the site will be prepared to enable the determination of the areal extent of the wreck and debris field and estimated relief of individual components of the wreck where possible
- Magnetometer Data – existing data will be modeled the magnetic field intensity surface (TIN) and generate contours (at 5-10 gamma intervals, based on best presentation). The contours will be presented as an overlay (2D) to the side scan image, and, if possible and useful, a 3-D presentation of the magnetic data will also be generated

Sub Bottom Profile Data – Sub bottom data recorded over the wreck will be evaluated for evidence of any subsurface expression of the wreck and/or associated debris, which will be documented via "snap-shot" images of the seismic data

C. Interpretation of the post-processed remote sensing data shall be completed to aid in the further interpretation of the identified wreck and to preliminarily define the site's size, internal composition, age, condition, spatial arrangement, and integrity as part of the process of determining the wreck's National Register eligibility.

D. The Contractor shall provide a technical report, draft and final, detailing the research and interpretation performed and providing recommendations as discussed above.

All work to be accomplished will be in accordance with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716, September 29, 1983) and the Advisory Council on Historic Preservation's Handbook "Treatment of Archaeological Properties" (1980). The qualifications for leading an historic shipwrecks project must be met, as specified by the National Park Service in the "Abandoned Shipwreck Guidelines" published in the Federal Register, Volume 50, Number 233, on December 4, 1990.

The report will serve several functions. It will assist NAE in fulfilling legal obligations under Section 106 of the National Historic Preservation Act of 1966 as amended and related regulations. It is also a scholarly document that not only fulfills the mandated legal requirements but serves as a scientific reference for future professional studies as well.

The project area is described in detail in the original Searsport Harbor Statement of Work.

III. REVIEWS

A. Drafts. A review conference shall be held in the NAE office, for each draft submitted. The review shall be made for format, method of preparation, and compliance with applicable contract requirements. One copy of written review comments from the NAE Project Manager shall be returned to the Contractor who shall make all necessary changes or corrections and submit one (1) corrected copy within the scheduled period of twenty-one (21) days.

B. The NAE Project Manager shall provide direction to the Contractor on methods of incorporating all written review comments.

C. Results of all reviews held in the NAE office, will be furnished to the Contractor in the form of written comments and marked-up material. The Contractor will then be required to incorporate the agreed upon written comments into the report material, and any corrections due to errors or inconsistencies in the report shall be made by the Contractor at his/her own expense. If changes in criteria and/or additions are required beyond the original scope of work or services, the Contractor shall be notified, in writing by the Contracting Officer and adjustment in the fee will be made to cover the additional work required. Any such additional work executed by the Contractor without the appropriate written notice is undertaken at his/her own risk.

IV. SUBMITTALS

A. **Drafts**. The Contractor shall submit eight (8) copies of the draft assessment report by 30 days following completion of archival research and post-processing of field data. The report shall be typed, double-spaced, on 8 ½ x 11" white recycled paper with justified left margins and TBD numbered right margins. Specific type font and format instructions shall be furnished by the NAE Project Manager. The reports should be essentially complete and include a research design, and the results of field-testing and background research, and provide recommendations of National Register eligibility.

B. **Finals**. The Contractor shall submit eight (8) single-spaced final reports on recycled paper, plus one unbound camera-ready original on high quality bond paper, to the NAE Project Manager no later than 21 days from receipt of comments. Copies of contact sheets or prints for Black and White photographs, along with negatives, and copies of color slides shall be submitted with the final report, and digitally formatted photographs will be provided with the digital copy of the report (prepared in the latest MS Word format) submitted to the NAE on CD ROM.

APPENDIX B

PROEJCT CORRESPONDENCE

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

JOHN ELIAS BALDACCI
GOVERNOR

EARLE G. SHETTLEWORTH, JR.
DIRECTOR

February 28, 2008

Mr. John R. Kennelly
New England District, Corps of Engineers
696 Virginia Rd.
Concord, MA 01742-2751

Re: Searsport Harbor proposed dredging (Contract # DACW33-03-D-0002 IDIQ), MHPC #0248-08

Dear Mr. Kennelly:

Dr. Arthur Spiess and Leon Cranmer of our staff have reviewed the report entitled "Marine Archaeological Survey Searsport Harbor" by PAL (Pawtucket, R.I.) dated July 2007, and the scope-of-work dated October 29, 2007. We received both documents on February 21, 2008. We accept the report as written.

Specifically we accept both recommendations made on p83 of the report: 1) vibratory coring to explore a possible paleo-land surface in the vicinity of a paleo-channel for archaeologically sensitive paleosols, and 2) visual inspection of the shipwreck target (probably *Cullen No.* 18).

The *Cullen No. 18* shipwreck site has a Maine Historic Archaeological Sites Inventory number which is ME 385-004. It would be helpful if this site number were used in subsequent reports.

In the Statement of Work for the completion of an optional task (#9), the evaluation of the *Cullen No. 18* shipwreck, six objectives for a site examination investigation are listed. Of these six objectives, the first four would not be totally achieved if the visual inspection is replaced with an archival investigation only. We agree with the recommendations in the original report that a visual inspection either by a diver or an ROV be conducted. In addition, as with any other site, an archival investigation should also be undertaken to provide background information of a National Register eligibility determination.

Thus, we can not concur that the proposed scope of work is adequate.

Sincerely,

Kirk Mohney

Kirk Mohney
Deputy State Historic Preservation Officer

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Figure 3-1. Plots of combined post-processed magnetic and side-scan sonar data recorded in 2006 at the Searsport shipwreck site.