THE DEVEREAUX COVE VESSEL AND THE PENOBSCOT EXPEDITION OF 1779: AN HISTORICAL AND ARCHAEOLOGICAL INTERPRETATION OF VESSEL REMAINS AT DEVEREAUX COVE, STOCKTON SPRINGS, MAINE

A Thesis

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Chapter 7
Archaeological Investigation of the Devereaux Cove Vessel

Previous Investigations in the Penobscot River

Over the last 30 years, several efforts have been made to locate, document, and develop management plans for Penobscot Expedition shipwrecks. In one sense, expedition shipwrecks can be considered a single archaeological site; their association with a single historical event dictates that they be considered for their relationship to one another geographically, archaeologically, and historically. As individual archaeological sites, some of which may never be conclusively linked to the Penobscot Expedition, each shipwreck and its associated material culture also represent rare opportunities to gain a better understanding of eighteenth-century life, seafaring, ship construction, and design. For these reasons, the several projects outlined here, as well as the Devereaux Cove project, should be considered for their combined value as well as individual findings.

In the summer of 1972, the first Penobscot Expedition site was discovered when a team of students and faculty from the Massachusetts Institute of Technology and the Maine Maritime Academy (MMA) found the remains of the privateer *Defence* in Stockton Harbor, Maine.[1] Led by W. F. Searle, the team located the 170-ton brig using an experimental side-scan sonar unit developed by participants in an engineering field

[1] David Switzer, "*Defence* Project Symposium, Introduction", *The Proceedings of the 13th Conference on Underwater Archaeology*, edited by Donald Keith (San Marino, California, 1984), 67. For more historical and archaeological information on the *Defence* see this paper's bibliography for works by Barbara Ford, Shelley O. Smith, David C. Switzer, and David B. Wyman.

school at the MMA. The site's significance was realized immediately, and an archaeological task force consisting of the Maine State Museum (MSM), the MMA, and the Institute of Nautical Archaeology (INA) was subsequently assembled. In 1973 and 1974, a student team recovered two cannon and other artifacts from the site. Between 1975 and 1980 systematic excavations, led by Plymouth State College's Professor David Switzer, were carried out with funding from the National Endowment for the Humanities, the MSM, and the Maine Historic Preservation Commission (MHPC).[2] During the five-year project, hundreds of artifacts were recovered, revealing much about life aboard an eighteenth-century American privateer. Additionally, the vessel's remarkable state of preservation (roughly 40 percent of the hull is intact) allowed retrieval of substantial ship construction and design data (see chapter 8).

In 1975, Martin Meylach, of Meylach Magnetic Search Systems, conducted a Phase I survey along the Penobscot River using a magnetometer, side-scan sonar, and sub-bottom profiler.[3] Unfortunately, the results of Meylach's five-day investigation are unpublished. Further remote sensing and ground truthing carried out by Klein Associates, Inc. the following summer resulted in the discovery of a 6-foot Admiralty anchor and several ship timbers near Oak Point. The three-week project also obtained a magnetic profile of the *Defence* and attempted to locate remains of Penobscot Expedition transports around Sandy Point.[4]

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[2] Robert Neyland, et al., *The Penobscot Expedition of 1779: an Archaeological Survey and Site Investigation of ME 054-004 Penobscot River, Penobscot County, Maine* (Washington, DC, 2001), 3.
[3] *Ibid.*
[4] *Ibid.*

Commensurate with the Abandoned Shipwreck Act, the Maine Department of Transportation contracted the University of Maine's Dr. Warren Riess and the Maritime Archaeological and Historical Research Institute (MAHRI) to conduct remote sensing at two bridge construction sites between Bangor and Brewer, Maine. The project concluded with negative findings.[5]

Between 1994 and 1997, the University of Maine conducted additional remote sensing and shore inspection in selected portions of the Penobscot River. With funding from the Department of Defense Legacy Resource Management Program and smaller grants from MAHRI, the university initiated the Penobscot Expedition II Project. Under the direction of Dr. Warren Riess, the endeavor produced site assessments and management plans for the Continental frigate *Warren*, artillery brig *Samuel*, and coal barge *Hampden*, and continued research to detect other Penobscot Expedition sites.[6]

To determine if the final reburying of the *Defence* was sufficiently protecting the vessel's structure, the University of Maine returned to the site in 1996 and retrieved wood samples. At that time it became clear that the upper hull and mainmast protruding from the sediment were deteriorating rapidly. Those areas exposed during excavation were extensively degraded by microorganisms.[7]

Recent archaeological work in the Penobscot River includes the ongoing investigation of an eighteenth-century shipwreck in Brewer, Maine, by the Naval Historical Center's (NHC) Underwater Archaeology Branch (see chapter 8). A Phase II

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[5] *Ibid.*
[6] *Ibid.*, 4.
[7] *Ibid.*

survey was conducted in 1999, and although initial data did not conclusively link the vessel to the Penobscot Expedition, historical research and local lore suggest a possible association. Remote sensing in the immediate area using side scan sonar did not produce any other reliable targets. The NHC conducted further fieldwork in 2000 and 2001, the results of which are pending publication.[8]

Project Objectives

The primary aim of the 2000 Devereaux Cove project was to conduct a Phase II archaeological survey of wooden vessel remains located along Devereaux Cove's northeastern shoreline and to document visible remains using mapping and photographic techniques. Archaeological data generated by this reconnaissance level survey determined the extent of intact hull structure and established the shipwreck's current state of preservation. Secondary goals were to determine the site's potential for further archaeological investigation, develop a management plan, begin the process of nominating the shipwreck to the National Register of Historic Places, and, through archaeological and historical research, determine the shipwreck's association with the Penobscot Expedition of 1779.

Site Location and Description

Named for the tidal cove within which it rests, the Devereaux Cove vessel is located in Stockton Springs, Waldo County, Maine (Figure 6). Situated at the

[8] *Ibid.*, 18-25.

approximate center of the Maine coastline, Waldo County is bordered to the east by the Penobscot River and includes several Penobscot Bay islands. The county seat of Belfast is approximately 30 miles south of Bangor, 40 miles east of the state capital of Augusta, and 85 miles northeast of Portland.[9]

Devereaux Cove is one of five small coves located along the north-northwestern shoreline of Fort Point Cove, on the west side of Penobscot Bay at the mouth of the Penobscot River. Approximately one quarter of a mile wide at its entrance, Devereaux Cove is a shallow tidal flat, roughly 3 feet deep at mean low tide.[10] The immediate shoreline is comprised of coarse sand and small stones, with rocky outcroppings at the outer edges of the cove. The high water mark quickly gives way to larger stones, rocks, marsh grass, underbrush, and finally stands of hemlock, white pine, and mixed hardwoods. The northeastern portion of the cove, immediately beyond the high water mark, rises dramatically to a height of 50 feet and provides a panoramic view of both Devereaux Cove and Fort Point Cove. Several private dwellings skirt the higher ground along Devereaux Cove, resulting in protective barrier of private property that reduces recreational traffic at the wreck site.

The Devereaux Cove wreck lies in the northeast portion of the cove, approximately 50 feet from the high water mark, and is completely exposed at low tide (Figure 15). Positioned with a northwest to southeast orientation, the visible remains cover a 52 foot by 12 foot area, and to the casual observer are hardly discernable as the remains of a wooden vessel. While interviewing local residents, it was interesting to note

[9] Goodman, Kenneth, *Soil Survey of Waldo County, Maine*, series 1940 (Washington, D.C., 1955), 3.

that at least one family was completely unaware that the "drift wood" within the cove is actually the remains of a wooden ship. The visible remains are comprised of floors and first futtocks, none of which are preserved in their entirety. The timbers are embedded in thick mud and protrude roughly 2 inches above the mud line. The sided (exposed) surfaces of the timbers are eroded significantly, resulting in a fragile archaeological surface riddled with channels worn into the timbers over years of tidal exchange and harsh weather. The inboard ends of treenails, used to attach the outer hull planking to the frames, are clearly evident. The dynamic site environment has resulted in the exposed (inboard) ends of many treenails becoming pointed, with a circular depression surrounding the treenail itself.

Because the Devereaux Cove Wreck is located in a tidal flat, the visible remains are left dry at low tide and completely submerged at high tide. Consequently, the vessel's exposed timbers become waterlogged during high tide, only to partially dry out when exposed at low tide. This circumstance accelerates decomposition of the exposed timbers.

The region's average year round temperature is 45º Fahrenheit (F), with winter temperatures averaging 20º F. [11] The resultant ice formation, and repeated expansion and contraction of the waterlogged timbers further compromises their structural integrity. Ice formation also produces "rafting," a condition where loose timbers may be worked free of the site as the ice they are attached to shifts with the tide. The exposed timbers are

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[10] National Oceanic and Atmospheric Administration Chart No.13309.
[11] National Oceanic and Atmospheric Administration, *Climate of Maine* (Asheville, North Carolina, 1982), 4.

also perpetually eroded by the daily tidal exchange and the constant movement of water over the timber's sided surfaces. Those timbers not firmly ensconced in the mud bottom or attached to a more substantial part of the wreck are subject to being dislodged and carried away with the tide. Notably, the shoreward portion of the vessel is considerably less intact than the open water side, suggesting that the wreck initially listed toward open water, leaving shoreward frames more exposed to the elements and tide. Extant outer hull planking on the vessel's shoreward side, now free of frame timbers, suggests that when the wreck came to rest in Devereaux Cove, more frame timbers were present.

The wrecking event, contemporary salvage, and modern artifact collecting must also be considered for their impact on the site formation process. If the Devereaux Cove vessel is a Penobscot Expedition transport, run aground and burned to prevent capture, it likely burned well below the waterline after the tide ran out. Moreover, should the remains at Devereaux Cove be the carcass of a transport burned at a nearby location only to drift to the present site, that process too would have further compromised the wreck's structure.

Like other beached expedition transports, the Devereaux Cove vessel likely represented a windfall of iron, and depending on the extent of its initial destruction, building timber for local inhabitants. That locals may even have re-burned the wreck to claim every valuable iron fastener, is not inconceivable. Finally, because of the wreck's close proximity to shore, modern human impact on the site, in the form of souvenir hunting or mere curiosity, likely ensured the loss of easily portable timbers, planks, or artifacts. Clearly, much of the vessel has been lost via all, or a combination of, the

environmental and human impacts described above. It should be noted, however, that anaerobic conditions well below the mud line appear to have slowed deterioration of some buried hull structure.

Methodology and Fieldwork

Designed as a Phase II predisturbance survey, the field investigation of the Devereaux Cove Wreck called for documentation and archaeological assessment of the site as it lies. The research design did, however, allow for removal of three wood samples, whose taxonomic identifications were confirmed by the Center for Archaeological Investigations at Southern Illinois University-Carbondale. Additionally, selected diagnostic features of the vessel were minimally cleared of sediment. These areas were ultimately reburied, an effort aided by daily tidal exchange over the site. Throughout the project care was taken to minimize archaeological impact to the wreck.

Fieldwork was carried out over a four day period in July 2001 by a team of five graduate students from East Carolina University's Program in Maritime Studies. Funding was obtained from the National Park Service in the form of an American Battlefield Protection Program grant, and housing provided by the University of Maine's Darling Marine Center, in Walpole, Maine. Prior to the team's arrival on site, arrangements were made with Chip and Sandra Bradsteet, whose property is adjacent to Devereaux Cove, to gain access to the site. The Bradstreets also graciously allowed their property to serve as a staging area for field equipment.

Actual fieldwork began on 10 July with crew members familiarizing themselves with the site. All fieldwork was coordinated with the daily tide schedule, and mapping was done at low tide when the wreck was relatively dry and exposed. High tide found the wreck site covered by approximately two feet of zero visibility water, making accurate documentation time consuming. Since the limited remains are completely exposed at low tide, and the research design called only for a reconnaissance level survey, it was deemed more efficient to record the site during tidal lows.

A standard baseline system was used to document the site, with a baseline established along the vessel's apparent centerline, indicated by several extant full floor timbers. Careful probing revealed that more of the wreck lay beneath the extreme ends of the visible remains. Consequently, the 0'0" end of the baseline was established five feet beyond the visible remains at the northeast end of the site, in an area free of buried hull structure. The baseline was anchored with a 6-foot long, 2-inch diameter length of PVC pipe driven into the mud bottom and reinforced with a 10-foot long ¾ inch diameter length of rebar. A plastic coated, ⅛ inch diameter steel cable, graduated in feet and inches, served as the baseline and terminated at the southwest end of the site at 58 feet 10 inches. Here too, the baseline was anchored in an area determined to be free of buried remains by probing.

Crosslines positioned every ten feet extended beyond the edges of the wreck, with the largest grid measuring 10 feet by 7 feet. A carpenter's square ensured that each crossline lay perpendicular to the baseline, and crossline ends were trilaterated to the baseline to guarantee accuracy. Because of the site's minimal relief, and the level,

uniform nature of the exposed features, the baseline/crossline system was positioned a minimal distance of 8 inches above the wreck. This helped facilitate accurate measurements, since it reduced the distance crew members were required to drop a plumb bob.

The level nature of the wreck also enabled crew members to use a 10-foot length of 3-inch PVC pipe, with measuring tape attached, as a sliding measuring bar in each grid. Resting on the floors and futtocks, the ends of the "sliding bar" were accurately positioned under each crossline using a plumbob, and the bar was subsequently leveled. After first taking measurements directly under the baseline, crew members slid the bar at 6-inch intervals (or less depending on the features in their grid) toward the crossline ends. The field crew simply recorded measurements along the graduated PVC pipe and plotted them on mylar backed with graph paper. Akin to a fixed grid system, this method proved to be an accurate and efficient means of documenting the site.

Offset and trilateration measurements supplemented data obtained from the "sliding bar" method, and crew members ultimately produced scaled drawings of the timbers in each grid. When completed, the individual mylar field drawings were transferred onto individual sheets of graph paper where inconsistencies were resolved and accuracy checked. The individual graph paper drawings were then brought to the drafting table, joined together, and a plan view of the wreck eventually emerged (Figure 14).

Due to its close proximity to shore, the Devereaux Cove wreck also required delineation within its larger geographical context (Figure 15). The vessel's orientation to

the shoreline, for example, may reveal something about how and why it came to rest as it did. Determining the site's exact position within the tidal zone also makes observations about environmental impact more accurate. Additionally, future, and possibly unplanned, archaeological finds in and around the cove may enhance the present site's interpretation, and their spatial relationship to the Deveraux Cove wreck will need to be considered.

With the above in mind, the site's main datum was established just above the high water mark atop a large flat rock that provided an unobstructed view of Devereaux Cove. Serving as a central reference point, the datum allowed the field crew to orient accurately the wreck site within the cove and plot the cove's shoreline and high and low water contours. This was accomplished using standard surveying equipment (transit, electronic distancing meter, and stadia rod) to record the distance and angle of features relative to the main datum. The result was an accurate representation of the Devereaux Cove Wreck's relationship to its larger geographical setting.

Finally, interviews with local residents provided insight into the more modern history of the Devereaux Cove Wreck. Two residents revealed that over the years "pegs" (likely treenails) had washed up on shore from time to time, and another long time resident probably collected various artifacts from the site. It was further intimated that these artifacts may have been subsequently destroyed in a fire, though neither the existence of the artifacts nor their possible loss has yet been confirmed. Long time resident Nancy Wilkens, whose family once owned most of the property adjacent to Devereaux Cove, recalled that as a young girl she could jump along the timbers of the Devereaux Cove wreck. That the shipwreck was once an attractive place for children

Figure 14. Devereaux Cove Vessel site plan.

(click here)

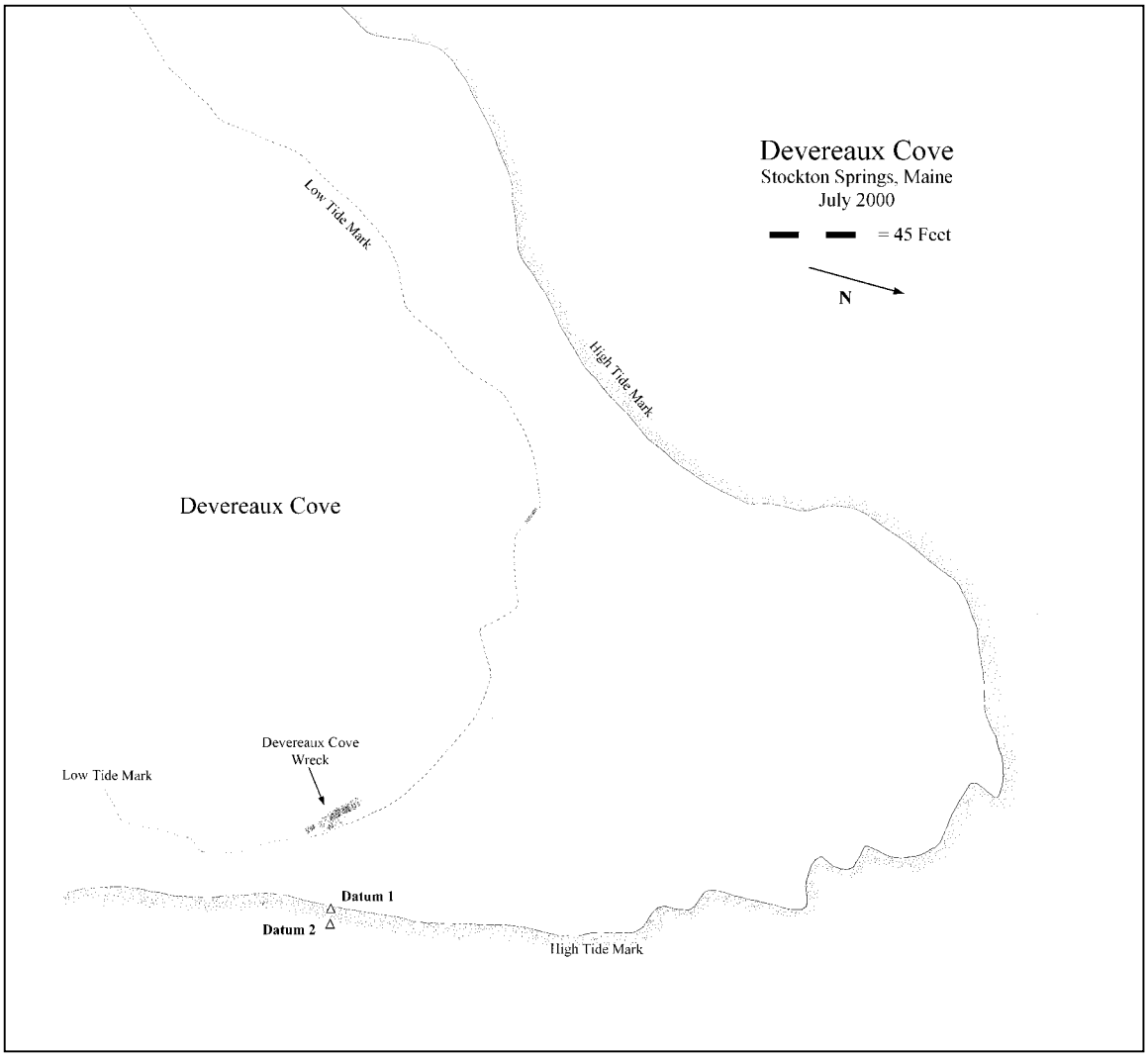

Figure 15. Devereaux Cove overall site plan. Drawing by Russell T. Green.

to play suggests that within the last 50 years the site possessed considerably more relief. Ms. Wilkens also recalled that planks were visible during her childhood. Considering that playing atop (along the sided surface) of the frame timbers was a vivid memory for Ms. Wilkens, the planks she recalled may have been ceiling planking. That the site has apparently deteriorated significantly over the last generation is well illustrated by the family, mentioned previously, who when interviewed in July 2000 had no idea that the timbers in the cove were that of a wooden vessel.

Findings

Floors

Forty-seven frame timbers constitute the exposed remains of the Devereaux Cove Wreck. Although none of the timbers are preserved in their entirety, the relative position of extant timbers indicates a possible framing pattern. Six floors clearly cross the keel, 5 others, though deteriorated, strongly appear to have once crossed the keel, and the remaining 10 can only be identified as floors due to their position within the overall framing pattern. Due to limited preservation, total lengths for floors vary considerably. Of those timbers that are clearly floors, the longest is 9 feet 11 inches. The longest single arm is 6 feet, the shortest 4 feet 7 inches; the opposing arms of both these floors, located on the wreck's shoreward side, are deteriorated. Sided dimensions for the 11 most intact floors range from 10 ½ inches to 11 ½ inches, averaging 11 ¼ inches. Floors are spaced on approximate 22-inch centers.

Obtaining an accurate molded measurement was precluded by the tight space, or lack of space, between most floors and futtocks. Since clearing any space of the thick

mud between floors and futtocks could have potentially dislodged timbers not securely fastened to the outer hull planking, molded floor dimensions were taken sparingly. The greatest molded dimension obtained was 5 inches, though it should be noted that the sided surfaces of all frame timbers are significantly eroded, producing an unusually small molded measurement. Indeed, the inboard ends of treenails used to fasten outer hull planking to the frames are clearly evident, suggesting that the treenails were either driven into through holes, rather than blind holes, or that a significant portion of the frame timbers' sided faces have eroded. The sided surfaces do not preserve tool marks; determining if the timbers were sawn or hewn, for example, is presently impossible. That the floors have significantly deteriorated is corroborated by the observation that, of the 6 floors crossing the vessel's centerline, the portion of each directly over the keel is thin and fragile, where once it had to be thick enough to hold the fastener that presumably secured the floor to the keel.

The exposed floors are separated from the keel. Limited preservation along the vessel's centerline precluded cursory observations about the floors' limber holes, or determining if the floors were notched to fit over the keel. Additionally, in most areas the sided surface of the keel is significantly eroded, making observations about its dimensions and fastening method impracticable. In several locations, just below the mud surface (where the top of the keel should presumably be detectable) only small, badly decomposed wood fragments were found. Probing along the vessel's centerline did, however, indicate that deeper buried portions of the keel may be intact. Probing at

baseline (BL) 45.5 feet, revealed a fore and aft running timber with notches that accept two consecutive floors. The piece is possibly a fragment of rising wood or a notched portion of the keel.

A single piece of evidence for the type of fasteners used to secure either floors to the keel, or the keelson to the floors, is an iron drift bolt found at baseline 39 feet (Figure 16). Found lying at the heel of a first futtock, the drift bolt is 1 foot 7 ⅜ inches long, ⅞ inches in diameter at its mid point, and has a slightly flared 1 ¼ inch head. The fastener was probably not long enough to pass through the keelson, floor, and into the keel. More likely, it was used to secure a floor to the keel. Notably, the concretion around the drift pin's mid section has wood striations in it, suggesting that the bolt was driven into wood. That the fastener is intrusive, or perhaps used on another part of the vessel (i.e. deadwood or stem assembly) is entirely possible.

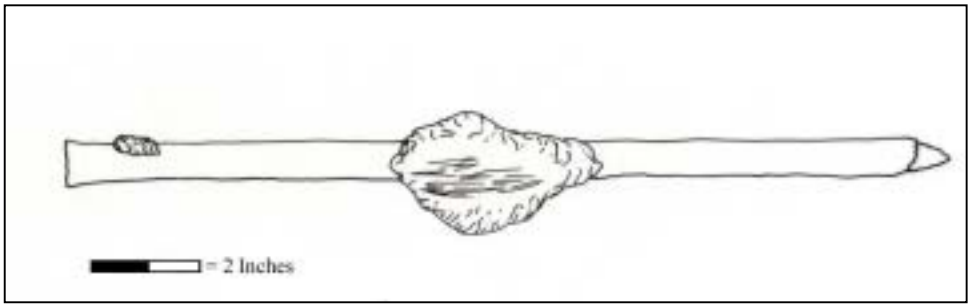

Figure 16. Iron drift bolt at BL 39 feet. Drawing by Russell T. Green

First Futtocks

The remainder of the exposed portion of the vessel consists of 25 first futtocks. A wood specimen from a frame timber (probably a first futtock) at BL 5.5 feet proved to

be red oak (*Quercus rubra*.). The many growth rings are quite narrow, indicating that the timber was fashioned from slow growth timber.[12]

Nearly identical to the floors, the best preserved first futtocks range between 10 inches and 11 ¾ inches sided, averaging 10 ¾ inches. As with floors, discerning molded dimensions for first futtocks proved difficult without excavation. Of the few futtocks that produced a molded dimension, a measurement of 5 ½ inches was obtained, albeit with the same caveat as the floors. The relatively uniform heels of first futtocks averaged 7 ¼ inches from the baseline (theoretical center of the vessel), suggesting that if they met the keel/keelson assembly's outboard face, the keelson was sided at over 14 inches. If the keelson were that large is impossible to know, but by subtracting from this theoretical extreme, one can develop scenarios for potentially determining how far the futtock heels were from the keelson.

All first futtocks are fastened to the outer hull planking with treenails. A loose futtock at BL 5.5 feet (Figure 17) was removed to gain access to an intact treenail, and one semi-intact, white oak (*Quercus* sp.) octagonal treenail was recovered. Taxonomic identification suggests that the treenail is very likely American white oak (*Quercus alba*).[13] A second, disarticulated, treenail produced an identical identification.

[12] Lee Newsome to Russell Green, 9 August 2001. Wood sample analysis conducted by Lee Newsome, Associate Scientist, Southern Illinois University Carbondale, Center for Archaeological Investigations.
[13] *Ibid.*

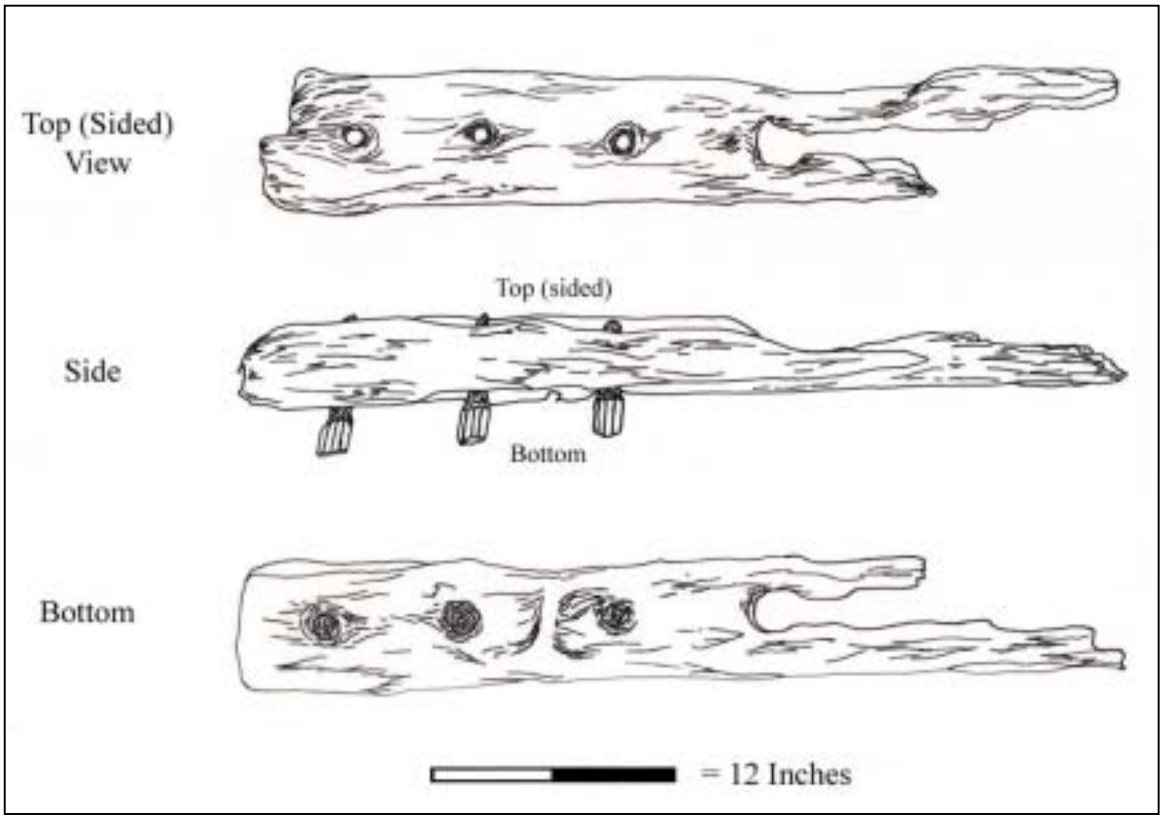

Figure 17. Futtock at BL 5.5 feet. Drawing by Catherine M. Green.

Space between floors and first futtocks ranges from none to 4 ¾ inches. Here too, archaeological surfaces may have produced skewed measurements. Nevertheless, it is clear that very little, if any, space exists between the floors and first futtocks best preserved. Since the average sided dimension of first futtocks is nearly identical to those of the floors, and no space exists between most floors and futtocks, the Devereaux Cove vessel appears to have room equal to the space.

It is not clear how, or if, the floors and first futtocks are sistered into complete frames, or mold frames. However, possible evidence of a fastener hole exists between a floor and first futtock at BL 16 feet. With much of the sided surface of these two timbers eroded, the remnant of a possible horizontal fastener hole is visible. The extant hole, now more of a trough, is approximately 1 ¼ inches wide and passes completely through both frame timbers. Since the sided faces of all frame timbers appear to have eroded somewhat uniformly, it is curious that only at this single potential frame set did such a feature become exposed. That this "trough" is simply an errantly drilled fastener hole or was produced through erosion are possible alternative explanations.

Notably, a tapered wood piece was found between the first futtock and outer hull planking at BL 11 feet (Figure 18). The smooth piece, tapered at one end and along one edge, appears to be worked, rather than eroded, into a wedge shape. The wedge measures 9 ⅞ inches long by 1 ½ inches wide by ⅞ inches thick, and was driven between the futtock and planking with its untapered face against the planking and its tapered end pointing obliquely toward the vessel's centerline. The piece was possibly used to shore up unwanted space between the futtock and planking.

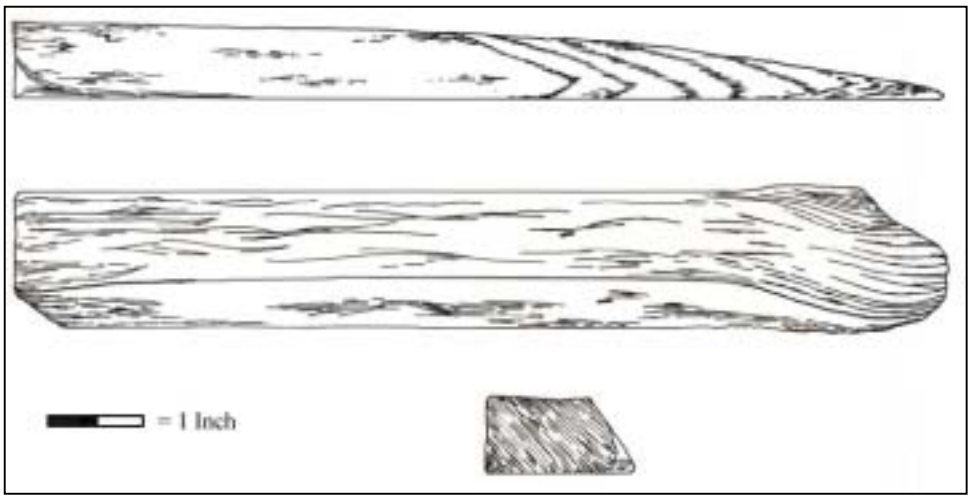

Figure 18. Wedge at BL 11 feet. Drawing by Catherine M. Green

Outer Hull Planking

Careful probing around the site's exposed timbers revealed extant portions of outer hull planking. A small, transverse section (approximately 1 foot by 7 feet) of planking was uncovered between BL 11 feet and BL 12 feet, in order to obtain a wood sample and discern the planking's dimensions and fastener pattern. The planking was covered by roughly 4 inches of sediment. Other portions of outer hull planking were documented by simply feeling below the sediment at regular intervals.

The outer hull plank proved to be red oak (*Quercus rubra*), with growth rings similar enough in morphology to suggest that the plank derived from the same original tree as a futtock sampled from the same area.[14] The six planks in this section vary from 11 inches to 13 ¼ inches in width, and are between 2 ½ and 3 inches thick. No scarphs or sacrificial planks were visible. The outer hull planking is fastened to the frames with 1 ¼

[14] Lee Newsome to Russell Green, 9 August 2001.

inch diameter treenails. Treenails are closer to the edges of the hull planking than the middle, and generally spaced more than 7 inches apart. Treenails are spaced uniformly on 11-to 12-inch fore and aft centers, substantiating that floors and futtocks are sided relatively uniformly as well. Randomly sided frame timbers, employed in a vessel with no space between those timbers, would have necessitated unevenly fore and aft spaced treenails, assuming that treenails were driven through the middle of each frame timber. Curiously, treenails used to secure the Devereaux Cove vessel's outer hull planking are not staggered along the futtocks and floors (top to bottom), but rather, are in a straight line. Staggering the fasteners would have helped avoid splitting the frame timbers.

With archaeological knowledge of the Devereaux Cove vessel's construction in hand, one can next turn to the interpretation of data. Coupled with insight relating to Penobscot Expedition transports, and historical evidence for the construction, use, and prevalence of eighteenth-century New England-built sloops presented in chapter 6, archaeological findings begin to suggest that the limited Devereaux Cove vessel remains are an eighteenth-century shipwreck. Comparing the Devereaux Cove vessel with known eighteenth-century shipwrecks, particularly New England-built merchantmen, provides additional evidence. Constituting the substance of the following chapter, it is these comparisons, in fact, that are most helpful in interpreting the Devereaux Cove vessel's construction.