

To Feed, Fuel, and Build the Heartland: Underwater Archaeological Investigations from the 2014 Field Season



**State Archaeology and Maritime Preservation Technical
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**W I S C O N S I N
H I S T O R I C A L
S O C I E T Y**

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Assisted by grant funding from the University of Wisconsin Sea Grant Institute, and the National Sea Grant College Program, this report was prepared by the Wisconsin Historical Society. The statements, findings, conclusions, and recommendations are those of the authors and do not necessarily reflect the views of the University of Wisconsin Sea Grant Institute or the National Sea Grant College Program.



Note:

At the time of publication, *Hanover*, *Success*, and *Pathfinder* sites are pending listing on the State and National Registers of Historic Places. Amongst the quarry docks surveyed, Bass Island Brownstone Company is listed on the National Register of Historic Places and an amendment to the nomination to include information on the submerged dock ruins has been submitted. Hermit Island Brownstone Quarry and Stockton Island Brownstone Quarry are waiting additional terrestrial work by the National Park Service before a nomination packet can be submitted.

Cover photo: Archaeologist Caitlin Zant documents the scow schooner *Success* in Whitefish Bay, Door County, Wisconsin.

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CHAPTER ONE INTRODUCTION

Archaeological surveys conducted by the Wisconsin Historical Society are a joint effort of several organizations and many individuals. The surveys conducted in this report are the result of a cooperative effort between the Wisconsin Historical Society, and the University of Wisconsin Sea Grant Institute. Project funding was provided by grants from the University of Wisconsin Sea Grant Institute. The surveys were organized and staffed by the Society's Maritime Preservation and Archaeology program staff and volunteers and were conducted over the 2012 field season.

The Wisconsin Historical Society is the State of Wisconsin's principle historic preservation agency and charged under state statutes (44.02 and 44.30-44.31) with the research, protection, restoration, and rehabilitation of historic properties within Wisconsin. Under Wisconsin statute 44.47, the Society is also charged with the identification, evaluation, and preservation of Wisconsin's underwater archaeological resources, including submerged prehistoric sites, historic shipwrecks, and aircraft on state-owned bottomlands. Recognizing the multiple-use value of underwater archaeological sites to scientists, historians, and recreationalists, these underwater remnants of our past are broadly termed "submerged cultural resources". Submerged cultural resource management goes beyond the scope of traditional historic preservation programs, encountering diverse multiple-use concerns such as recreation and commercial salvage.

The State of Wisconsin has additional management responsibilities for submerged cultural resources under federal law, including the National Historic Preservation Act of 1966 and the Abandoned Shipwreck Act of 1987 (Public Law 100-298). State legislation (1991 Wisconsin Act 269) and modifications to state law in adherence with federal guidelines issued under the Abandoned Shipwreck Act has provided Wisconsin with a more formalized and rational framework for underwater archaeological resource management. This legislation also authorizes the Society and the Wisconsin Department of Natural Resources to designate underwater preserves for the preservation and recreational development of underwater archaeological sites.

Created in 1988, the Society's Maritime Preservation and Archaeology program works to survey, inventory, and evaluate Wisconsin's underwater archaeological resources, develop preservation strategies, administer field management practices, and enhance public appreciation and stewardship for Wisconsin's precious and fragile maritime heritage (Cooper 1992; 1993). The program is within the Society's Division of Historic Preservation – Public History, Office of State Archaeology and Maritime Preservation. To encourage preservation and visitation of these unique resources while fostering wider public appreciation for Wisconsin's maritime cultural heritage, the Society began the Wisconsin's Maritime Trails initiative in July 2001. Winding above and below the waves, the Maritime Trails encompass five stretches of Wisconsin's coastline and inland river ways and links shipwrecks, lighthouses, historic waterfronts, historic vessels, museums, shore-side historical markers, and attractions. When viewed as a metaphorical "trail", these resources illustrate the state's diverse maritime heritage and connect them within the overall context of Wisconsin's, as well as the greater Great Lakes region's, maritime heritage (Green and Green 2004).

The Maritime Trails initiative has become the Society's strategic plan for managing the state's diverse submerged cultural heritage while encouraging preservation and promoting public awareness and visitation. Initiatives aimed at identifying, managing, and interpreting Wisconsin's coastal cultural resources must consider these resources at both a local and regional level. The sheer length (approximately 860 miles), as well as the geographical, social, and cultural diversity of Wisconsin's Great Lakes coastline makes this essential. The Maritime Trails initiative encourages both divers and non-divers to consider each unique maritime property within the broader context of Wisconsin's maritime history. Through websites, interpretive materials, and public presentations, the Maritime Trails initiative integrates archaeological research and public education to encourage visitors to responsibly visit maritime cultural heritage sites. Wisconsin's Maritime Trails' major elements include:

Archaeological Research. The documentation of Wisconsin's submerged cultural resources, primarily historic shipwrecks, is the foundation of the Maritime Trails initiative. Beyond academic and resource management applications, archaeological research results form the basis of interpretation and outreach projects.

Shipwreck Moorings. With volunteer assistance, the Society maintains permanent moorings on 28 historic shipwrecks statewide. These moorings facilitate recreational access, provide a means of interpreting the wreck sites to visitors, provide a safe point of ascent and descent for divers, and eliminate anchor damage from recreational boaters anchoring into the site.

Dive Guides. Designed with divers, boaters, and kayakers in mind, these rugged, waterproof guides place each vessel within its historical context and highlights unique site features that might otherwise go unnoticed. In partnership with the University of Wisconsin Sea Grant Institute, the Society has produced guides to 25 Wisconsin shipwreck sites.

Public Presentations. Given at a variety of venues throughout the state, public presentations provide a direct, personal connection between the Society and the general public. The Society's underwater archaeologists and volunteers have reached thousands of people via public presentations since the Maritime Trails' inception.

Interpretive Signage and Kiosks. As of January 2012, the Society has installed shore-side informational markers for 34 historic shipwrecks and waterfronts. Utilizing an identical template that unifies the signs as attractions and information points within the statewide Maritime Trails program, the markers emphasize the broader connection between Wisconsin's many coastal historic resources. Five interactive touch-screen kiosks that highlight Wisconsin's historic shipwrecks are installed at the Wisconsin Maritime Museum, the Kenosha Public Museum, the Door County Maritime Museum, the Society's Madeline Island Museum, and the History Museum at the Castle. The kiosks reach an estimated 368,000 museum visitors annually and make archaeological research results available in a fun, interactive format while educating visitors on the importance of Wisconsin's coastal cultural resources.

Websites. Two websites dedicated to Wisconsin’s historic shipwrecks, underwater archaeology, and maritime history ensure the general public has access to timely and useful information. The gateway to these sites is the Wisconsin’s Maritime Trails website (www.maritimetrails.org), which serves as a unified “maritime resource” information point for Wisconsin’s residents and visitors. Unveiled in 2003, this website features a statewide database of shore-side maritime-related resources and over 700 historic Wisconsin shipwrecks. A searchable database includes contact information, Web links, and maps for historical maritime venues, as well as location and historical data for shipwrecks. An updated version of the website debuted in the summer of 2011. Wisconsin’s Great Lakes Shipwrecks (www.wisconsinshipwrecks.org) is a collaborative effort between the Society and the University of Wisconsin Sea Grant Institute that began in 1996. Making underwater archaeological research results accessible to the public, this site features detailed information on historically and recreationally significant shipwrecks in Wisconsin’s Great Lakes waters. Each shipwreck profile includes information about the ship’s archaeology, history, final voyage, sinking, and current condition.

Partnerships. The Maritime Trails program partners with federal, state, and local agencies, chambers of commerce, non-profit organizations, and individuals. With several core partners, dozens of volunteers, and a growing list of project-specific partners, this aspect of the initiative ensures that everyone with a stake in Wisconsin’s maritime heritage shares in its management and interpretation.

Research Design and Methodology

Nineteenth-century Great Lakes wooden ship construction and operation is poorly understood. Little is known about how vessels were built and operated during the nineteenth century. As a result, much of what we know about Great Lakes merchant vessels has come from the archaeological record of vessels that now lie on the Great Lakes’ bottomlands. The archaeological surveys within this report were designed to provide a better understanding of nineteenth-century Great Lakes merchant vessel construction and use.

Field survey methods included traditional baseline surveys aided by digital photo and video documentation. Archaeological documentation was conducted along guidelines established by the National Park Service for submerged cultural resource survey and evaluation in determining site eligibility for the National Register of Historic Places. Research designs were directed toward formulating site descriptions and archaeological assessments with a package of management questions, some specific to the site itself (i.e. location, environment, parameters, integrity, extant features, and artifacts), as well as more general questions that place the site within its broader historical context (i.e. historical significance, archaeological potential, recreational potential, and management requirements). Research objectives included:

1. Determine the site location, environment, and parameters through visual survey of extant elements, features, and artifacts.
2. Document and map exposed remains using trilaterated survey points and an onsite (submerged) datum.

3. Document the site using photographs, video, and measured sketches of those architectural and archaeological elements that are diagnostic of a) vessel type, b) vessel age, c) vessel construction style and method, d) vessel propulsion, e) vessel use, f) vessel identification, g) vessel cargo, and h) shipboard human activity broadly indicative of occupation, status, ethnicity, subsistence or other questions allied with the study of maritime anthropology and Great Lakes social and economic history.
4. Provide assessment of a site's environmental and cultural context for determining its historic significance and archaeological potential according to the National Register of Historic Places criteria, recreational potential, and management requirements.

Site evaluation and documentation was conducted using closed-circuit scuba technology. Documentation included digital photo mosaics, measured sketches, construction schematics, digital still and video imagery, and scaled site plans for National Register-level documentation. Analysis was conducted using comparative evidence obtained from archaeological surveys of similar sites, and augmented by historical documentation relating to individual sites and general Great Lakes maritime history. Where artifacts were encountered, material culture was interpreted in the context of its relevance to shipboard activities, shipboard hierarchy, shipboard activity/use areas, and other aspects of maritime anthropology.

This submerged cultural resource survey report serves as a source document for site description, analysis, interpretation, and management recommendations used in cultural resource management planning, recreational development, and public education. It also serves as the source document for eligibility determination and nomination for listing on the National Register of Historic Places. Inclusion of these sites on the National Register and state resources management plans is an important step in achieving long-term site preservation. Suggested plans for management include mooring buoys to facilitate recreational access (where appropriate) and alleviate damage caused by on-site boat anchoring. Other possibilities include site interpretation for visitors through self-guided site maps and Web-based pages. Site preservation ensures availability both as a future recreational resource and as an important and nonrenewable source of scientific data relating to Great Lakes underwater archaeology, maritime history, marine architecture, and maritime anthropology.

CHAPTER TWO SCHOONER *HANOVER*

The schooner *Hanover* was launched into the deep waters of Cattaraugus Creek upstream from its confluence with Lake Erie in the spring of 1853 from the hinterland shipyard of Charles Stevens in Irving, Chautauqua County, New York. She was the ninth vessel built at the C. Stevens yard, which operated from 1847 - 1856, and the second of his vessels launched in 1853 (*Buffalo Commercial Advertiser* 1857a, 1857b; *Buffalo Daily Courier* 1857d; *Democracy* 1855; *Lake Shore Mirror* 1857; *Monthly Nautical Magazine and Quarterly Review* 1855).

According to her initial enrollment document, *Hanover* was built for the trade partnership of Charles H. Lee and James Lee of Buffalo, New York, owners of one equal undivided half part. Charles Lee worked as senior partner in the firm Lee, Abell & Co., forwarding and commercial merchants in Buffalo. James Lee, Charles' younger brother, was a clerk at the city's post office. Additionally, Captain Myron Gage of Irving, New York, and William D. Talcott of Silver Creek, New York, each invested in one-fourth parts of the vessel. Captain Gage became *Hanover's* first Master. William Talcott was an early resident of the Buffalo area, emigrating to Silver Creek from Connecticut in 1832. For many years he was employed in the lumber trade in Silver Creek. The schooner was named for the Town of Hanover in Chautauqua County of which William D. Talcott served as Supervisor (Bureau of Navigation 1853; Jewett, Thomas & Co.; Young 1875).

Hanover was enrolled 31 May 1853 at the Port of Buffalo. Silver Creek, New York, was listed as her homeport. The ship carried a crew of eight men and was described as schooner-rigged with one deck and two masts, a round stern and no figurehead. She measured 108 feet 2 inches in length, 25 feet 11 inches in breadth, and 9 feet 5 inches in depth of hold with a capacity of 234 87/95 tons (Bureau of Navigation 1853; *Democracy* 1855; *Monthly Nautical Magazine and Quarterly Review* 1855).

Contemporary newsprint of the 1850s and 1860s offered a scattered and incomplete record of arrivals and clearings for *Hanover*. The following text offers a skeleton of travel records and cargos, which allow for a glimpse into *Hanover's* transportation history, and presents rudimentary patterns typical a vessel of this type from this early period of Great Lakes commerce.

Little is known of *Hanover's* first season. She cleared the Port of Buffalo under the command of the Captain Myron Gage on 20 July 1853 bound for St. Clair, Michigan (*Buffalo Daily Courier* 1853). It is likely the schooner engaged in business at other ports during the season, yet her travels remained unreported.

On 7 May 1854 *Hanover* arrived at Buffalo on her first trip of the year from Toledo, Ohio, with 22,000 feet of lumber consigned to Harrison Mixer, 43,000 feet of lumber for W.D. Talcott, 55 tons of port, 45 barrels of highwines (spirits), 144 barrels of pork for Mr. Hazzard, and 9,000 barrel staves for Mr. Dutton. There was no notice of her clearing Buffalo, but on 6 June 1854, she arrived at the port from Mount Clemens, Michigan, on Lake St. Clair with 50,000 feet of lumber consigned to Talcott & Hale (*Buffalo Daily Courier* 1854a; 1854b). *Hanover* remained in port

until 27 June, clearing for Toledo. On 19 July 1854, the schooner arrived at Buffalo from Newport, Michigan, with 199,000 feet of lumber for W.D. Talcott and cleared the same day for a return to Newport (*Buffalo Daily Courier* 1854c; 1854d). It is uncertain when she returned to Buffalo, but *Hanover* is cited clearing Buffalo for Erie, Pennsylvania, on 15 August (*Buffalo Daily Courier* 1854e). On 20 September *Hanover* arrived in Buffalo from Toledo with 94,601 feet of lumber for Talcott & Hale, and 43,580 feet of lumber for Harrison Mixer (*Buffalo Daily Courier* 1854f). Again there was no notice of the vessel clearing Buffalo, but on 15 October 1854 *Hanover* arrived in Buffalo from St. Clair with 190,000 feet of lumber for W.D. Talcott and cleared the port on 16 October for Toledo (*Buffalo Daily Courier* 1854g).

In early June 1855, William Talcott arranged the purchase of the Lee brothers' share in the vessel. On 6 June 1855 *Hanover* was reenrolled at the Port of Dunkirk, New York, listing William D. Talcott as $\frac{3}{4}$ owner and Myron Gage $\frac{1}{4}$ owner. Both Talcott and Gage were reported as residents of Silver Creek, New York, and all other information about the ship remained the same (Bureau of Navigation 1855). There were no early or mid-season trips for 1855 reported by newspapers. On 1 September 1855, *Hanover* cleared Buffalo under the command of Captain Gage bound for St. Clair, Michigan. On 3 October, she loaded barrel staves and lumber at Detroit bound for Buffalo. Her arrival at Buffalo went unreported, but she cleared the port on 6 October 1855 for Chicago, Illinois (*Buffalo Daily Courier* 1855a; 1855b; *Detroit Free Press* 1855).

Hanover was reported clearing Buffalo on 24 May and 21 June 1856 for St. Clair, Michigan (*Buffalo Daily Courier* 1856a; 1856b). *Hanover* was also reported arriving at Buffalo on 14 July with 190,000 feet of lumber from Detroit for W.D. Talcott, and again arriving on 19 September with 51,000 feet of lumber from Toledo for W.D. Talcott and 45,000 feet of lumber for Framer & Co. (*Buffalo Daily Courier* 1856c; 1856d). Arrivals were also reported on 31 October with 145,000 feet of lumber from Toledo for Talcott & Hale, and on 17 November from Erie with 72,000 feet of lumber for W.D. Talcott, 20,000 feet of lumber for Mr. Hillard, as well as 2,000 "ahooks" for J. Story. *Hanover* cleared Buffalo on 17 November for a return trip to Erie. It is uncertain how many other loads were taken later in the season, but by mid-December 1856 *Hanover* was reported overwintering in Buffalo (*Buffalo Daily Courier* 1856e; 1856f; *Detroit Free Press* 1856).

At the opening of the 1857 shipping season, Captain Myron Gage sold his $\frac{1}{4}$ share of *Hanover* to William Talcott's brother, Chauncey G. Talcott, a tanner and currier at Silver Creek. A new enrollment for the vessel was entered at the Port of Dunkirk, New York on 4 May 1857 for change in ownership. Despite selling his share of the vessel, Captain Gage remained *Hanover's* Master (Bureau of Navigation 1857; Young 1875).

Hanover cleared Buffalo on 22 June 1857 for Detroit, and arrived back into the port on 20 July with 140,000 feet of lumber from Toledo consigned to Mr. Campbell. She unloaded and cleared the same day for Erie (*Buffalo Daily Courier* 1857a; 1857b). On 13 August, *Hanover* arrived at Buffalo with 1200 feet of lumber for W.D. Talcott. Far from a full load, it is uncertain if this is a typographical error, or if the quantity of this cargo was misreported to the newspaper. She unloaded and cleared the same day for Detroit (*Buffalo Daily Courier* 1857c). On 10 September,

Hanover returned to Buffalo from Detroit with 80,000 feet of lumber for Mr. Talcott and 4,000 barrel staves for Mr. Hale. She unloaded and cleared the same day for Detroit (*Buffalo Daily Courier* 1857e; 1857f; 1857g). Her return to Buffalo went unreported, and it is unclear if any other trips occurred that season.

It is likely that *Hanover* put up in Buffalo for the 1857-58 winter because, on 16 April 1858, she was one of the earliest vessels to clear the port in the spring for a trip to Erie (*Buffalo Daily Courier* 1858a). Her arrival back at the Port of Buffalo went unreported, but she cleared on 27 April for Detroit (*Buffalo Daily Courier* 1858b). Again, her return from Detroit when unreported in the Buffalo newspapers, but on 12 May 1858, *Hanover* cleared Buffalo for Algonac, Michigan (*Buffalo Daily Courier* 1858c). Her trip upbound was swift, as *Hanover* returned to Buffalo on 23 May with 175,000 feet of lumber from Port Huron, Michigan, for Mr. Talcott (*Buffalo Daily Courier* 1858d). *Hanover* remained in port waiting on a cargo until 12 June when she cleared for Windsor, Ontario (*Buffalo Daily Courier* 1858e). On 26 June *Hanover* returned from Windsor with 175,000 feet of lumber for Mr. Talcott (*Buffalo Daily Courier* 1858f). It is uncertain when the vessel left the port next but on 2 July her arrival was reported from Dunkirk with 180,000 feet of lumber for her owner, W.D. Talcott (*Buffalo Daily Courier* 1858g). Again, it is unclear when she next cleared the Port of Buffalo, but on 23 August, *Hanover* arrived from Port Huron with 176,376 feet of lumber for Mr. Talcott. She cleared two days later for Windsor (*Buffalo Daily Courier* 1858h; *Buffalo Daily Courier* 1858i). *Hanover* arrived back in Buffalo on 7 September, from Detroit (across river from Windsor) with 97,000 feet of lumber for Mr. Armstrong (*Buffalo Daily Courier* 1858j). The vessel remained in port for much of September clearing with a cargo on 27 September for Dunkirk. *Hanover* arrived back at Buffalo with 150,600 feet of lumber from Detroit for her owner and cleared the same day for Toledo (*Buffalo Daily Courier* 1858k; 1858l).

Little is known of *Hanover's* travels for the early part of 1859, but as the season progressed it proved to be an eventful one. At 2PM, on 21 June 1859, *Hanover* was in tow of the tug *John Ely* upbound in the Detroit River when a fresh wind blew sparks from the tug onto the schooner and set her jib-topsail and flying jib on fire. Fortunately, the fire was quickly extinguished. Subsequently, *Hanover* was towed to a dock at Windsor for a full inspection before she was released to continue on her way (*Detroit Free Press* 1859a; *Buffalo Daily Courier* 1859a). On 2 July 1859, at around 2:30PM, the barque *B.A. Stanard* of Cleveland was sailing light from Buffalo to Chicago when she was struck by a gale and capsized between Port Stanley, Ontario, and the Rondeau Peninsula along the north shore of Lake Erie. *Hanover* was in the vicinity of the accident and Captain Gage rescued three sailors that were clinging to a spar floating in the lake, and retrieved three men who had climbed upon the overturned vessel. The female cook and Capt. John McKay's young son were trapped in the cabin until *Hanover's* crew pulled them from within the wreckage after they had been immersed for over an hour. Eight of the *B.A. Stanard's* crew were saved with the exception of two mates that were entangled in the rigging and drowned (*Buffalo Daily Courier* 1859b; *Cleveland Herald* 1859; *Detroit Free Press* 1859b).

Hanover disappeared from the historic record until 26 September 1859, when Captain Gage sailed his ship into Buffalo with 170,265 feet of lumber from Toledo for Mr. Armstrong. Two days later the vessel cleared for Windsor. On 7 October, *Hanover* returned to Buffalo with

another 95,000 feet of lumber for Mr. Armstrong, and an additional 25,000 feet of lumber for her owner (*Buffalo Daily Courier* 1859c; 1859d; 1859e).

As with previous years, it is likely that *Hanover* tied up to the pier in Buffalo for the 1859-60 winter. On 25 April 1860, the ship was again one of the earliest vessels of the season to depart Buffalo for a trip to Chatham, Ontario (*Buffalo Daily Courier* 1860a). It is unclear when *Hanover* returned to Buffalo, but she was reported clearing the port on 19 May for Saginaw, Michigan (*Buffalo Daily Courier* 1860b). On 7 June 1860, *Hanover* arrived at Buffalo from New River, Michigan, with 169,000 feet of lumber for A. Armstrong, unloaded and cleared two days later for Windsor (*Buffalo Daily Courier* 1860c; *Buffalo Daily Courier* 1860d). At Windsor, the vessel took on 172,261 feet of lumber for A. Armstrong and arrived at Buffalo on 19 June, unloaded, and cleared the same day for Port Huron (*Buffalo Daily Courier* 1860e). Once arriving at Port Huron, *Hanover* loaded 170,000 feet of lumber for Mr. Armstrong, and returned to Buffalo on 30 June, unloaded, and departed the same day for Port Austin, Michigan (*Buffalo Daily Courier* 1860f). It is unknown what business was conducted at Port Austin, but on 19 July, *Hanover* returned to Buffalo from New River, Michigan, with 155,000 feet of lumber for Mr. Armstrong, unloaded and cleared that afternoon for Windsor (*Buffalo Daily Courier* 1860g). On her next arrival at Buffalo, on 31 July, *Hanover* also carried a horse consigned to Mr. Armstrong, along with 170,918 feet of lumber (*Buffalo Daily Courier* 1860h). She cleared Buffalo the next day bound for Port Huron (*Buffalo Daily Courier* 1860i). *Hanover* returned to Buffalo on 13 August with 181,059 feet of lumber for Mr. Armstrong. She departed Buffalo two days later for Port Hope, Ontario (*Buffalo Daily Courier* 1860j; 1860k). At Port Hope she took aboard 155,000 feet of lumber for Mr. Armstrong and arrived at Buffalo on 3 September (*Buffalo Daily Courier* 1860l). Her departure from Buffalo went unreported, but on 29 September, *Hanover* arrived from New River, Michigan, with 167,000 feet of lumber for A. Armstrong, unloaded and cleared Buffalo two days later bound for Chicago (*Buffalo Daily Courier* 1860m; *Buffalo Daily Courier* 1860n).

At the opening of the 1861 shipping season, William Talcott ended his partnership with his brother, purchasing Chauncey Talcott's share of *Hanover* to become the schooner's sole owner. Captain Gage remained at *Hanover*'s helm. A new enrollment indicating the ownership change was entered at the Port of Dunkirk on 10 April 1861 (Bureau of Navigation 1861a). Three days later *Hanover* departed Buffalo for Milwaukee. It is uncertain when the vessel returned to Buffalo, but on 7 May *Hanover* again cleared the port for a trip to Milwaukee. On 17 May 1861, during her downbound trip to Buffalo, *Hanover* grounded on St. Helena Shoal above the Straits of Mackinac. In order to refloat the vessel, her wheat cargo was lightered off and the ship was pulled free by the tug *S.C. Ives*. The process of lightering and reloading delayed *Hanover* for two days (*Buffalo Commercial Advertiser* 1861; 1862; *Buffalo Daily Courier* 1861a; 1861b; *Detroit Tribune* 1861). The ship finally arrived into Buffalo on 19 May with 10,050 bushels of wheat for the firm, Cutter & Nims (*Buffalo Daily Courier* 1861c). She remained in port for only one day clearing for Milwaukee on 20 May (*Buffalo Daily Courier* 1861d). Again it remains unknown when *Hanover* arrived into the Port of Buffalo, but on 25 June the schooner departed for Forester, Michigan (*Buffalo Daily Courier* 1861e). Business conducted in Forester went unreported, but before turning downbound, she loaded 204,000 feet of lumber at Windsor, Ontario, consigned to

Talcott & Son. She arrived at Buffalo on 27 July. *Hanover* remained in port for three days, departing for Detroit on 30 July. *Hanover's* arrival into Buffalo went unrecorded, but on 30 August she cleared for Toledo (*Buffalo Daily Courier* 1861f; 1861g; 1861h). Business conducted in Toledo was unreported. From Toledo *Hanover* continued upbound to Milwaukee where she loaded 10,180 bushels of wheat for J.G. Stevens arriving into Buffalo on 18 September (*Buffalo Daily Courier* 1861i). She cleared two days later for another trip to Milwaukee (*Buffalo Daily Courier* 1861j).

With the end of the 1861 shipping season fast approaching on 18 October, William Talcott sold *Hanover* to James R. Smith and Harrison B. Mixer of Buffalo. Each man became equal one-half partners in the vessel. Buffalo remained *Hanover's* homeport, as did Captain Gage, her Master (Bureau of Navigation 1861b). With the ink not entirely dry on her new enrollment, *Hanover* departed the same day for Milwaukee. Her business in Milwaukee is unknown. On her downbound trip, she called at Toledo where she loaded 10,150 bushels of wheat for G.S. Hazard & Co., and arrived at Buffalo on 26 October. With the new owners anxious to complete as many trips as possible in the waning season, *Hanover* unloaded and cleared Buffalo on the same day making for Toledo. At Toledo she loaded 15,810 bushels of corn G.S. Hazard & Co. and arrived into Buffalo on 6 November. *Hanover* completed one final trip in 1861; at Detroit she took on 6,000 staves for Mr. Dutton, as well as 11,951 bushels of oats George Richardson, and arrived at Buffalo on 16 November before putting up for the winter (*Buffalo Daily Courier* 1861k; 1861l; 1861m; 1861n).

Hanover departed her winter quarters at Buffalo as one of the earliest vessels back to work for the 1862-shipping season. She took on 175,000 feet of lumber at Detroit (alternately reported as Port Huron, Michigan) on 14 April 1862 for Mixer & Smith, owners of the vessel. She arrived into Buffalo on 3 May (*Buffalo Daily Courier* 1862a; 1862b). Before her next trip, the Mixer-Smith relationship dissolved, and on 5 May 1862, James Smith bought out Harrison Mixer to become sole owner of *Hanover*; her homeport remained Buffalo and Captain Gage her Master (Bureau of Navigation 1862). After an additional fifteen days in port, on 20 May, Captain Gage steered *Hanover* clear of Buffalo harbor bound for Forester, Michigan (*Buffalo Daily Courier* 1862c). Business conducted in Forester was unknown, as was the vessel's return to Buffalo. On 4 June the schooner cleared Buffalo for Detroit (*Buffalo Daily Courier* 1862d). The vessel's business at Detroit was unreported. Before returning downbound to Buffalo, *Hanover* called on Toledo and loaded 10,000 bushels of wheat. She arrived at Buffalo on 12 June unloaded and cleared the same day for trip back to Toledo. On 20 June, the schooner arrived into Buffalo with 10,088 bushels of corn and cleared the same day for New River, Michigan (*Buffalo Daily Courier* 1862e; 1862f). Business at New River remains unknown, but on her downbound trip, *Hanover* called at Detroit where she loaded 16,151 feet of lumber and arrived into Buffalo on 5 July (*Buffalo Daily Courier* 1862g). Another trip to Detroit followed where she took on 140,000 feet of lumber and arrived at Buffalo on 21 July. *Hanover* was unloaded and cleared the next day for Port Huron (*Buffalo Daily Courier* 1862h; 1862i). Her business at Port Huron is unknown. Before returning downbound, she loaded 37,000 barrel staves at Bay City, Michigan and arrived into Buffalo on 8 August. Cargo was unloaded and the ship departed Buffalo on the next day bound for Toledo (*Buffalo Daily Courier* 1862j; 1862k). *Hanover* arrived back at Buffalo on 19 August with 10,101

bushels of wheat (*Buffalo Daily Courier* 1862l). No trips were reported for the remainder of August or September 1862, however, she likely cleared Buffalo sometime in late September, as on 4 October, *Hanover* arrived at Buffalo from St. Clair, Michigan, with 153,000 feet of lumber and 4,000 barrel staves. Her port clearing was not recorded. On 31 October, the schooner arrived into Buffalo with 10,142 bushels of wheat from Detroit. No other trips were reported in 1862 and it is plausible this was the last trip of the season before putting up for the winter (*Buffalo Daily Courier* 1862m; 1862n).

On 4 April, before the opening of the 1863-shipping season, James Smith sold *Hanover* to the partnership of Thomas Richardson and Elan Fisher of Detroit, Michigan. Each man was represented in the transaction as equal one-half partners. *Hanover* gained her first new Master since her launch as Thomas Richardson took command. The vessel departed Buffalo with a temporary enrollment document solely to transport the vessel to her new district (Bureau of Navigation 1863a). Upon arrival at Detroit on 11 April 1863, a Permanent Enrollment was issued. The paperwork defined Elan Fisher as managing owner, Thomas Richardson as owner, as well as Master, and *Hanover*'s homeport was changed to Detroit (Bureau of Navigation 1863b).

It is likely that with these changes, *Hanover*'s trips now retained her to the western Lakes where newsprint reports of vessel arrivals and clearings were less regularly recorded than in Buffalo. Only two arrivals and clearings were found in newspaper searches. *Hanover* was reported clearing Buffalo on 19 August bound for Saginaw, Michigan, with Captain Myron Gage at her helm. An arrival at Buffalo on 8 September from Bay City, Michigan, with 185,000 feet of lumber was also reported with Captain Gage in command, although Gage's continued employment aboard the *Hanover* was never expressed in her enrollment documents or addendums (*Buffalo Daily Courier* 20 August 1863a; 1863b).

On 24 November 1863, the Board of Lake Underwriters reported that *Hanover* went ashore on Point aux Barque Reef in Lake Huron, where she filled with water and sodden 600 barrels of flour. The report mistakenly identified the ship as the "brig *Hanover*". A 400-ton, brig-rigged ship named *Hanover* was built in 1862 at the Milwaukee shipyard of Ellsworth & Davidson for Otto Wermuth. This ship was designed specifically for ocean trade, went overseas in 1862, and was sold in Germany in May of 1863. The more likely suspect for the reported stranding was the schooner-rigged *Hanover*. It is not clear, however, if Richardson or Gage was in charge of the vessel at the time of the event (*Buffalo Daily Courier* 1863c; Mansfield 1899; *Milwaukee Sentinel* 1862a; 1862b; 1862c).

The 1864 season was marked by serial ownership changes, with little explanation and no available historic record of her shipping routes or trade. On 28 January 1864, H.A. Frink of Buffalo, New York, bought *Hanover* outright. The new enrollment document indicated that Frink would be the vessel's sole owner and Master. *Hanover*'s homeport in turn was changed to Buffalo (Bureau of Navigation 1864a). But before the ice had melted from the Lakes and before Frink sailed from Buffalo Harbor even once, he sold the ship to fellow Buffalo resident, John H. Montgomery. Captain Richard C. Gunning became the vessel's new Master (Bureau of Navigation 1864b). Another point of confusion comes from a listing that appeared in the oldest

surviving published ship insurance classification list for the Great Lakes, *The Register of the Ships of the Lakes and River St. Lawrence*; ownership for *Hanover* is represented as “Montgomery & Sloan”. Mr. Sloan’s involvement was never expressed in the governmental documentation of the ship. Additionally, this source describes *Hanover* as a ship in decline after eleven hard years of service. Her insurance classification had dropped to B2, an indication of some early structural problems expressing, and her lines were described as “Rather Flat”. Monetarily, she was valued at \$3,800 (Wheeler, Mathews & Warren 1864). A poor insurance rating such as this would prove detrimental to *Hanover*’s owners in continuing to transport grains and receive coverage for cargo losses or damage from water intrusion. No record of *Hanover*’s trade or routes could be located in contemporary news sources for any point during the shipping season and it is plausible that she never left the pier under her new ownership that season.

Hanover underwent major repairs and was rebuilt over the winter of 1864-65. This raised her insurance rating to B1, and valuation to \$7,000 (*Detroit Post* 1867). Because of her rebuild and also under the Act of Congress of 6 May 1864, the ship was required to be resurveyed, and a new enrollment issued. At Buffalo, Special Surveyor Sanford Halbert conducted this re-admeasure on 25 April 1865. The schooner was certified as having one deck, two masts, and measured 109 2/10 feet in length, 25 6/10 feet in breadth, and 8 9/10 feet depth of hold, with a capacity of 174 tons (Bureau of Navigation 1865). Three trips hauling lumber and barrel staves from Detroit’s Detroit and Milwaukee Dock to Buffalo were recorded in late season on 20 September, 3 October, and 10 October 1865 (*Detroit Free Press* 1865a, 1865b, 1865c).

An error in calculating the capacity of the ship’s enclosures during her 1865 resurvey was discovered and on 27 February 1866, *Hanover* was again resurveyed to document the capacity of her headroom. Her capacity was calculated at 173.98 tons capacity under tonnage deck, and 14.33 tons capacity for her enclosures on the upper deck, for a total of 188.31 tons. A new enrollment was filed listing John H. Montgomery as sole owner and Master (Bureau of Navigation 1866a). One week later, on 7 March, Montgomery sold a ¼ share in the schooner to John McElligott of Chicago, Illinois. Montgomery remained documented as Master (Bureau of Navigation 1866b).

While sailing south along Wisconsin’s coastline on Lake Michigan off Sheboygan, Wisconsin, at 2AM on 15 May 1866 *Hanover* was hit by a sudden, heavy squall that carried away her fore and main sails, her main gaff top-sail, and running rigging, a total property loss of \$250. Additionally, a crewmember was struck by the main boom and knocked unconscious during the mayhem. The accident occurred under the command of Captain John McElligott. Documentation of McElligott as Master was not expressed on her enrollment paperwork. She continued on to Chicago arriving on 16 May (*Chicago Tribune* 1866; *Buffalo Commercial Advertiser* 1867; *Detroit Free Press* 1866). Documentation was not found for the ship’s repair or subsequent trips in 1866.

It is likely *Hanover* wintered over 1866-67 in Chicago as her early 1867 travels find her on western Lake Michigan. On 17 April and again on 24 April, *Hanover* called on Kewaunee, Wisconsin, to load ties and posts for W.D. Hitchcock & Co. bound for Chicago (Kewaunee Enterprise 1867a, 1867b). Reporting of her seasonal trade remained spotty for much of 1867 season. It is likely *Hanover*’s owners kept her busy to recoup costs of her recent repairs and

misfortune, although documentation of trips for the vessel was not located in newsprint. Her next reported cargo included 150,000 board feet of circular sawed lumber for strips, as well as mixed lumber from Oconto, Wisconsin, bound for Chicago on 15 August. This cargo was repeated on 5 September (*Door County Advocate* 1867a; 1867b).

On 7 November 1867, *Hanover* was running light from Chicago to Oconto during a storm to claim another load of mixed boards and lumber strips when Captain John McElligott ran his vessel aground on the shoals off Fish Creek, Wisconsin, in Green Bay. In these early times, the waters of Green Bay southeast of Chambers' Island, including the shoals of the Strawberry Island Channel, were poorly charted. The previously unnamed reef protruding from the southeast corner of Chambers Island gained the name "Hanover Shoal" from the occurrence of the wreck (*Door County Advocate* 1867c; *Erie Daily Dispatch* 1867). The following day, the propeller *Ottawa* passed the grounded vessel and reported that the storm had already begun to break her up. Captain McElligott instructed the crew to cut away her mainmast above the deck in order to recover part of her outfit and begin the process of stripping and abandoning the ship. The ship was a total loss. *Hanover* was insured for \$5,000, although her owners claimed she was worth \$9,000 (*Chicago Tribune* 1867; *Detroit Free Press* 1867; *Detroit Post* 1867; *Door County Advocate* 1867c; *Erie Daily Dispatch* 1867; *Mansfield* 1899; *Milwaukee Sentinel* 1867a; 1867b).

On 26 November, a Warrant of Attachment was filed at the Town of Gibraltar, Door County, Wisconsin, against both captains and owners of *Hanover* to satisfy a debt of one hundred dollars owed to Mr. John Brown. It is uncertain how or when the debt was accrued, but judgment was rendered and salvage rights on the vessel sold (*Door County Advocate* 1867d; 1867e). A notorious resident of Chambers Island and locally renowned "strong-man", Allen Bradley took the job of salvaging the wreck. He removed pieces of her rigging and machinery, as well as the ship's 1,000-pound anchor, which he alone carried ashore from his workboat at Fish Creek (Holand 1943).

Site Description

On 27 June 2014, the wreck of the schooner *Hanover* was located by DNR Marine Conservation Warden Mike Neal and Warden Recruit Nick Miosky off a shoal south of the Strawberry Islands while investigating a boating accident in the vicinity. A complete video documentation of the site was collected by a VideoRay Underwater Remotely Operated Vehicle immediately following discovery. The wreck was reported to the Wisconsin Historical Society shortly thereafter and a Phase II survey of the site was conducted on 1 June 2014.

The remains of the schooner *Hanover* lie a mile off shore of Peninsula State Park, Door County, in the waters of Green Bay (45° 08.792' N, 87° 16.210' W). The vessel sits on a heading of 205 degrees, 1.75 miles northwest of the Town of Fish Creek, lying parallel to the shore just off a large rock pile southeast of Adventure Island, in the Strawberry Islands chain. The vessel rests in 20 feet of water, with her bow raising 7.0 feet from the bottom of the bay. From the turn of the bilge down, her lower hull remains intact on an even keel. Her remains are well preserved, and until the spring of 2014, were mostly buried under an estimated eight feet of sand. From the lack of mussel growth more than 2.0 to 3.0 feet below the upper extent of the wreck, it is evident that

she was uncovered recently. Though much of her upper deck works, rigging, and anchors were salvaged shortly after her grounding, major structural components of the vessel remain extant, including her centerboard trunk.

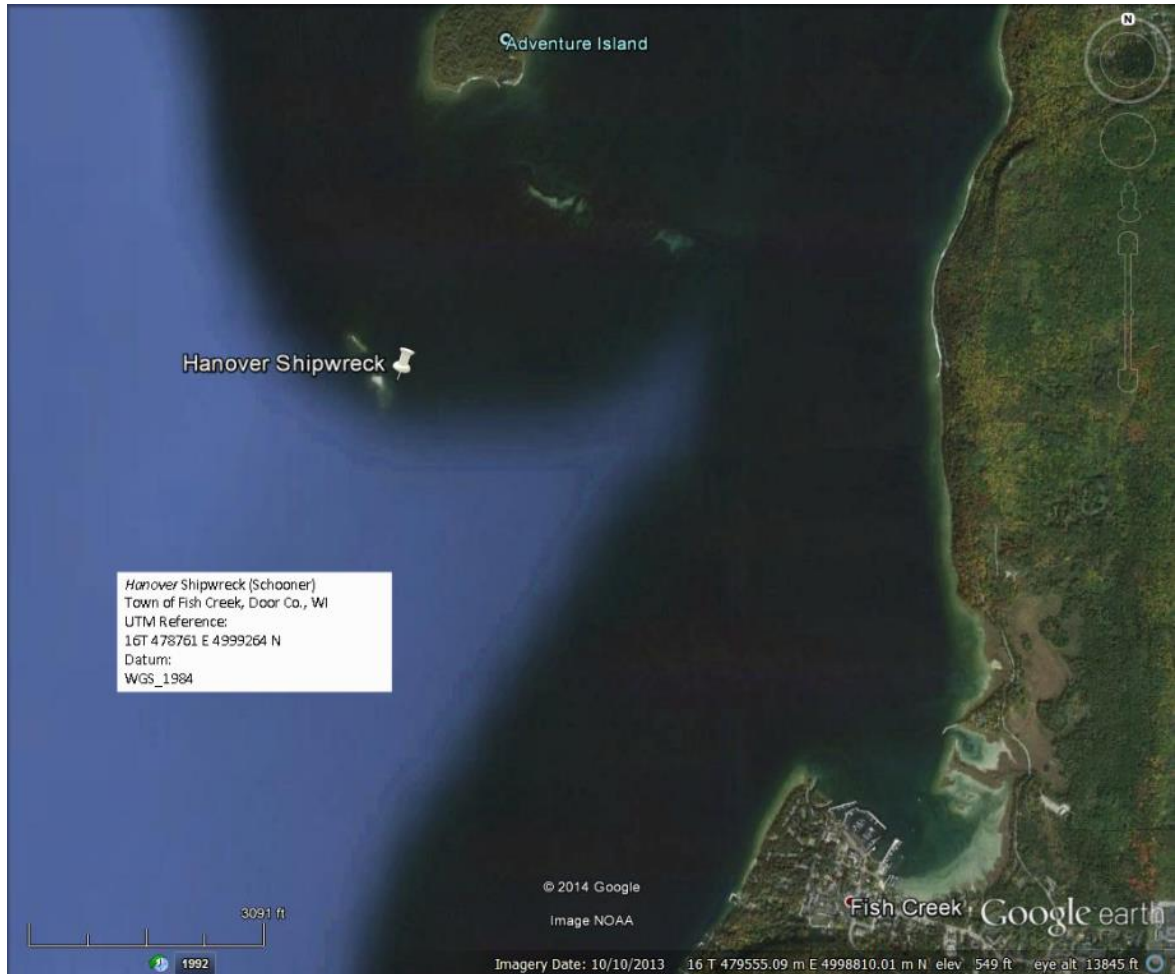


Figure 1. Location of the *Hanover* site

During the survey, a baseline was attached at the aft edge of the stempost and stretched 108.0 feet along the centerline of the vessel to the remains of the fallen sternpost. All measurements for the survey were taken from this baseline. *Hanover*'s overall length is 108.0 feet, while the vessel's beam, measured at her widest point, was 24.0 feet. Given the wreck dimensions, location, and a comparison of vessel losses in the vicinity based on historic newspaper accounts, the vessel remains were determined to belong to the schooner *Hanover*. As the site lies in a dynamic area and has been recently uncovered, no invasive zebra nor quagga mussels have colonized the interior of the bilge allowing for detailed observations.

Hanover's stempost measures 2.0 feet long by 1.0 foot wide with 7.0 feet exposed above the sand, extending to the point where it connects to the vessel's keel. Deadwood remains extant aft of the stempost, and extends to 15 feet along the baseline. A break in the ship is evident on both the port and starboard sides where the hull has separated 1.9 feet from the stempost. Though the

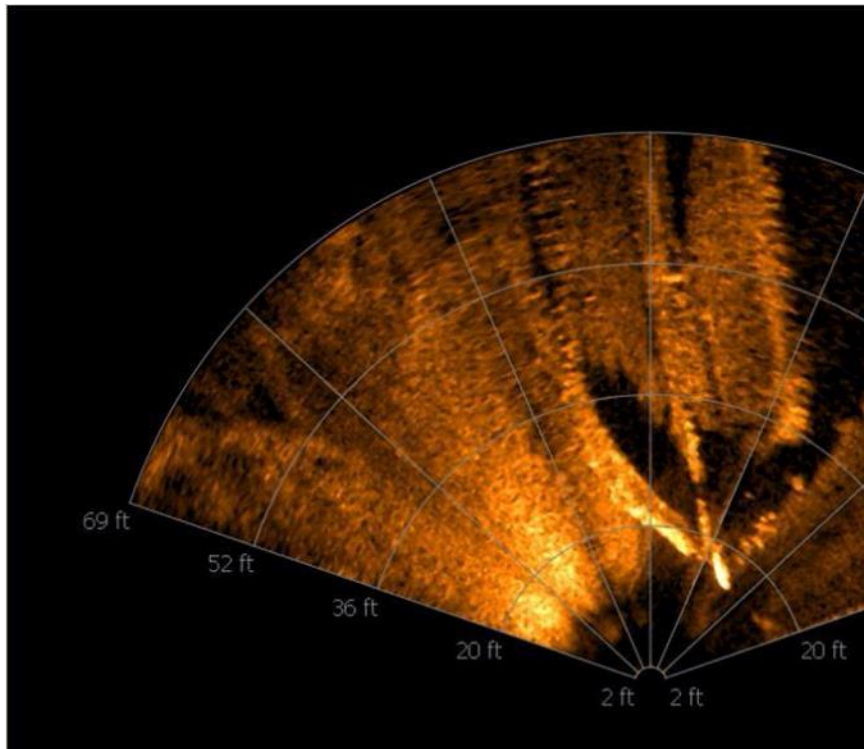


Figure 2. Side-scan sonar image of *Hanover's* bow (Wisconsin DNR)



Figure 3. Screen Capture from VideoRay (Wisconsin DNR)

Hanover Shipwreck

Town of Fish Creek, Door County, Wisconsin

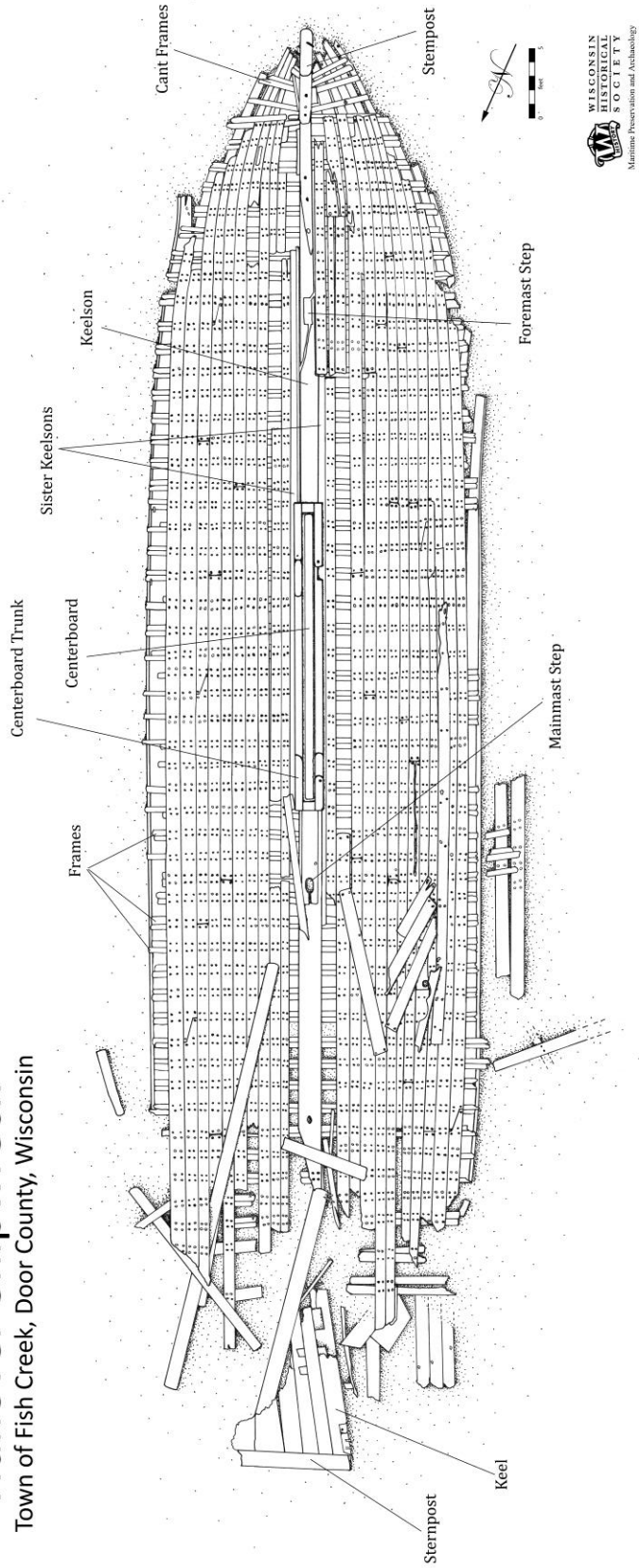


Figure 4. Hanover site plan

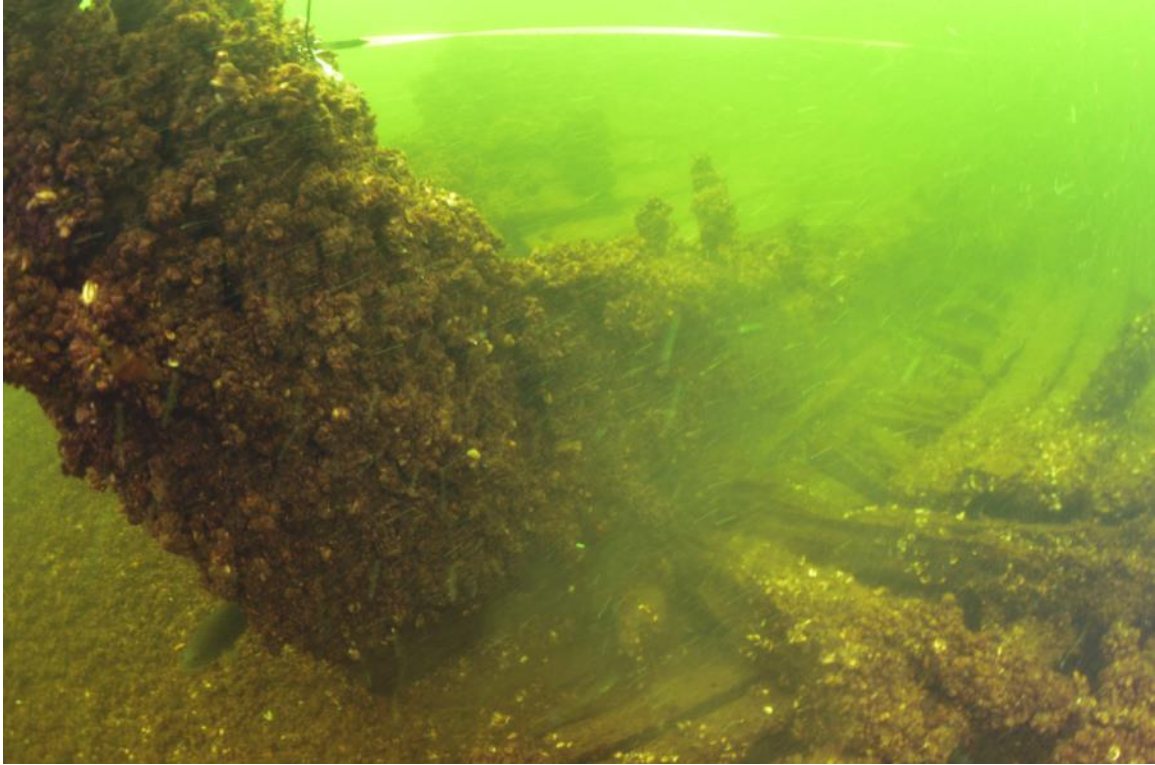


Figure 5. Portside of stempost with cant frames separated and fallen away

hull structure has separated from the stempost, the remaining lower hull structure remains intact. The outer hull planking measures an average of 0.9 feet wide by 0.3 feet thick. The ceiling planking in the bilge measures 0.6 to 0.8 feet wide by 0.2 feet thick, changing to 1.0 feet wide by 0.4 feet thick at the turn of the bilge and above. These planks are fastened using a combination of butt scarves and plain scarves. The vessel is double framed, with the frames measuring 0.7 feet wide. The individual futtocks measure 0.35 feet wide by 0.4 feet thick with 0.9 foot spacing between frame sets. Ceiling planking, futtocks, and outer hull planking are fastened together with iron drift pins, roved atop the ceiling planking and peened on the outside of the vessel. Drift pins measure 0.05 feet diameter and roves measure 0.15 feet in diameter.

Hanover's keelson measures 2.0 feet wide and runs 85.0 feet along the length of the wreck to where it has broken. The remaining 24.0 feet of the keelson is connected to the disarticulated sternpost and deadwood, lying prone near the vessel's stern. On either side of the keelson, a sister keelson measuring 0.4 feet wide, remains extant. On the port side, the sister keelson only remains from 15 to 56 feet along the baseline, while the sister keelson on the starboard side extends from 21 to 68 feet along the baseline.

Although her rigging was salvaged, evidence of *Hanover's* two masts are evident. The vessel's two mast steps can be seen in the exposed keelson. The foremast step lies at 18.5 feet along the baseline, while the mainmast step is located at 62.2 feet along the baseline. Each mast step measures 1.0 foot in length by 0.8 feet wide. At the foremast step, the keelson is broken diagonally with the fragmentation angling toward the port quarter.

The centerboard trunk is located 33 feet aft of the stempost and measures 23.0 feet long, extending 4.0 feet at its forward extent, to 6.0 feet at its aft extent, above the keelson. Forward, four planks of the trunk were exposed above the keelson, while aft, six planks remained. These boards measure 1.0 foot wide and 0.5 feet thick. Timbers on the fore and aft facing sides of the trunk measure 1.0 feet long and 0.5 feet thick. Since only the lower extent of the centerboard trunk remains, there is no trunk cover present, making it possible to examine the centerboard housed within the trunk. The centerboard measures 0.4 feet thick and 21 feet long. It is not possible to determine if the centerboard was deployed at the time of *Hanover's* grounding.



Figure 6. Aft end of the centerboard trunk, looking forward

The sternpost remains extant, lying on its port side twenty feet aft of the break in the keelson, and measures 8.6 feet tall, 0.9 feet long, and 0.6 feet wide. The deadwood timbers measure from 0.7 to 1.0 feet wide, and remain fastened to the sternpost.

It is likely that many other components of *Hanover's* hull structure remain on the site, still buried in sand. At the time of the survey, it was clear that nearly eight feet of sand had been cleared away, exposing the entirety of the lower section of the vessel's bilge. Evidence of additional frames and hull planking remain, still mostly buried in the sand of the starboard side of the vessel. Because of the dynamic nature of this area, the potential for more hull structure to become uncovered outside of the main hull section remains very high. This archaeological data would be able to provide additional information about the construction of early Great Lakes centerboard schooners. Data already gathered on the site has significantly increased our understanding of early centerboard schooner construction, and holds the potential to yield additional significant

information essential to understanding nineteenth century maritime commerce. The site remains only visited by archaeological survey divers because of the recentness of her exposure, as well as her relatively remote location.



Figure 7. *Hanover's* sternpost and deadwood

CHAPTER THREE

SCOW SCHOONER *SUCCESS*

Scow schooners were vital to many small communities around Lake Michigan, connecting them with regional markets through the lakeshoring trade. As vessel size grew throughout the nineteenth century, so too did their draft, making stops at small lakeshore communities with shallow harbors difficult or impossible. Flat-bottomed scows, however, were well-suited to shallow harbors. As an inexpensive method of transportation, the scow schooner was the lifeblood of many lakeshore communities and immigrant families, providing an entry point for many into the Great Lakes maritime trades as sailors, masters, and vessels owners.

Scows were used in great numbers throughout North America, wherever there was a need for low-cost, shoal-draft transportation. Scows saw use along the Atlantic Coast from the Maritime Provinces to Mexico, the Great Lakes, the Gulf Coast, San Francisco Bay, and on nearly every river large enough for small craft (Chapelle 1951; Merchant Vessels of the United States 1885; Merriman 1997). Despite its proliferation, or perhaps as a result of it, it is difficult to trace the scow's introduction to the New World. It is also unknown when the term "scow" came into popular usage, but it was likely derived from the Dutch term "schouw", indicating a square-ended hull possessing a flat, or nearly flat, bottom. The first recorded use of the term appears well into the eighteenth century (Chapelle 1951). Flat-bottomed craft were numerous for several reasons. One was that vessels with flat bottoms and sides were easily constructed by people with limited shipwright skills working under primitive conditions. Flat surfaces and angular corners did not require the advanced woodworking skills necessary to construct vessels with round hulls and fine lines. An equally important reason was that flat-bottomed craft easily navigated shallow water with little difficulty. If they ran aground, they were easier to refloat and less likely to sustain damage. They were also a very stable craft able to carry large cargoes relative to their size.

Little recorded information has been discovered for colonial flat-bottomed craft. Considering that planked canoes and scows were the easiest boats to build with the least skill, scows were in use throughout the New World by 1670. Nearly every community used the scow or some other form of flat-bottomed boat (Chapelle 1951). There were several variants of flat bottom boats common to the New World, but differentiation in lineage is often blurred, as there were more similarities than differences between vessel types. The scow-type hull appeared under several names, including punt, flat, radeau, periaugua, gondalow, and gondolo. Sloop-rigged scows were common as early as 1725, and by the time of the American Revolution the scow rig expanded to schooners and occasionally square-riggers (Chapelle 1951). Prior to the war of 1812, few commercial craft sailed the western Great Lakes. Following the war, the scow schooner made its appearance alongside conventional sailing craft and expanded onto the western lakes (Inches and Partlow 1964). The Great Lakes scow schooner's earliest record appears in the mid-1820s, with reports of several scows on Lake Ontario and New York's Finger Lakes, as well as the 60-ton *Bolivar* constructed at Erie, Pennsylvania in 1825. By the 1840s, scows were common throughout the Great Lakes, surviving into the twentieth century and the last days of lake sail (Labadie and Herdendorf 2004; Martin 1991).

Other North American regions mirrored the scow's Great Lakes expansion, including the Atlantic coast, Gulf coast, and San Francisco Bay. The scow expanded all the way to the Pacific Islands, and if imitation is the highest form of flattery, much can be said by the fact that New Zealand scows were descendants of those built on the Great Lakes. New Zealand's first scow was built in 1873 and named *Lake Erie*, followed by the *Lake Superior* in 1875, and the *Lake St. Claire* and *Lake Michigan* in 1876 (McGregor 1982; Hawkins 1987). Even today, the "Jon boat" is common on shallow waters throughout the United States. Built of aluminum, the Jon boat's lines are nearly identical to those of early colonial flat bottom craft.

The term "scow" refers to hull form rather than the rig type, resulting in the terms "scow schooner" or "scow-sloop" to describe these vessels. Despite a wide range of regional variation, the scow is defined as a vessel with a flat bottom, vertical sides, and a hard chine. They more closely resembled a barge than conventional sailing craft. Conventional sailing vessels had rounded bottoms and sides with a relatively gentle curve at the turn of the bilge, where the hull bottom and sides met. As in other regions, there was wide variation in Great Lakes construction techniques, and the term "scow" was used to describe variety of vessels. One of the clearest contemporary definitions is found in *Merchant Vessels of the United States* (1885):

Scows are built with flat bottoms and square bilges, but some of them have the ordinary schooner bow....The distinctive line between the scow and the regular-built schooner is, in the case of some larger vessels, quite obscure but would seem to be determined by the shape of the bilge, the scow having in all cases the angular bilge instead of the curve (futtock) bilge of the ordinary vessel.

As the above definition points out, there was occasional difficulty in distinguishing conventional craft from scows. This problem was not limited to Great Lakes vessels. A dispute arose in New Zealand's Auckland Anniversary Day scow race in 1884. Scow captains refused to race until the *Vixen*, a round-bilged vessel over which there was some dispute whether or not she was indeed a scow, withdrew from the competition (Hawkins 1987). Despite occasional confusion, several traits were characteristic of scows and used to differentiate them from conventional vessels. These traits are most easily understood when viewed in cross section. Scows are boxy vessels with a flat bottom and sides, connected by a hard chine, or a nearly ninety-degree angle where the bottom meets the side. Conventional sailing vessels, whether flat-floored or with deadrise, possessed a soft chine, or a smooth, rounded edge where the bottom and sides meet. Due to the shallow nature of many Great Lake harbors, as well as the Welland Canal locks, wooden vessels developed flat floors as they increased in size. The flat hull bottom allowed greater cargo capacity while limiting draft, but retained conventional soft hull lines.

Scow construction varied from hull to hull as well as from region to region. This variation included obvious features such as sheer lines, transoms, and bows, in addition to less obvious features like cross or diagonal planking and longitudinal framing. Several bow variations are visible in historic photographs, including the square butt-end bow with little or no forward projection of the stempost, the pointed flat-iron bow that produced a finer entry (similar to

conventional craft), and the rounded spoonbill, swim-headed, or barrel-shaped ends (Labadie and Herdendorf 2004).

Martin (1991) categorizes scows into three distinct types: (1) full scow with angular bilge along its entire length, (2) half scow with angular bilge along only part of its length with the bow and stern being similar to that of a conventional hull, and (3) a less defined category for hulls not clearly exhibiting an angular bilge, but flat-bottomed enough to be considered scows by contemporaries. Martin supports this classification with evidence from insurance registers that list both “scow” and “half scow” hulls as well as vessels with a “scow stern” or “scow bottom” (Martin 1991). This model illustrates the large variation within the scow vessel type, but may be too simplified. Problems arise when attempting to define a vessel with a bow or stern “similar” to a conventional hull. The flat-iron bow, while having a fine entry not unlike a conventional vessel, remains an obvious scow with an angular joint where the bow meets the hull side. More historical and archaeological research is needed to determine the extent of variation within the scow vessel type, and how dissimilar from conventional hulls they needed to be for consideration as a scow. This may be a daunting task, as contemporaries appear to have been as confused as modern researchers.

Scow bottoms could be longitudinally, cross, or diagonally planked, the latter two methods requiring nontraditional framing. Hull sides were also subject to variation, from the traditional frame-on-plank construction to the scow-specific “gunnel-built” sides. Gunnel-built scows were constructed with thick longitudinal hull planks edge-bolted with iron drift bolts that ran through two or more side planks (Inches and Partlow 1964). These edge bolts not only clamped the side hull planking together, but served as reinforcement against horizontal forces, eliminating or reducing the need for frames as in conventional hulls. Gunnel-built planking averaged four inches thick in vessels of sixty to ninety feet in length. Inches and Partlow (1964) suggest that gunnel-built construction, with few, if any, frames, was one characteristic common to nearly all Great Lakes scows. A second trait unique to scows, and perhaps equally as common as the gunnel-built side, was the use of a chine log at the turn of the bilge. The scow’s hard chine was a weak point in the hull, strengthened through the incorporation of a heavy longitudinal timber. These six to eight inch stringers were the principle framing members of the hull, fitted along both sides for the entire length of the bilge (Inches and Partlow 1964).

It is open to debate whether the scow’s development and popularity resulted from a need for vessels capable of transiting shallow waters or because their unsophisticated hull form was economical to build and maintain (Labadie and Herdendorf 2004; Inches and Partlow 1964). It is certain, however, that scows required the simplest construction techniques of any freight-carrying vessels. The great variation in construction and appearance is likely a combination of the builder’s shipbuilding skill, the type and quality of construction materials available, and available funding.

Variation in construction was not limited to the Great Lakes. Despite the fact that New Zealand’s scows were based on a Great Lakes model, there were many adaptations to fit local needs. For example, New Zealand’s scows carried all of their cargo above decks. While proportional in

length and beam to Great Lakes scows, New Zealand's scows carried half the depth of hold with no provisions for internal cargo. Registration documents stated that "no cargo is to be carried below deck, everything carried above; in fact, no hatchways are provided" (Hawkins 1987). There were several variations in hull framing as well. New Zealand scows utilized either a "post and rail" construction that used longitudinal stringers and stanchions, or a "solid partition" construction that utilized longitudinal bulkheads that partitioned the vessel into compartments. Centerboards were not as common as on the Great Lakes, and both the drop keel and pivoting centerboard was used (Hawkins 1987).

San Francisco's scows were more similar to Great Lakes' scows than New Zealand's, but even they exhibited an equal amount of variation in both construction and hull lines. San Francisco Bay had both longitudinal- and cross-planked hulls, but the latter was less common. Longitudinally-planked hulls were framed similarly to conventional vessels, with transverse floors scarphed into frames at the chine, precluding the need for a chine log. Ceiling planking was usually longitudinal, as was the outer planking on both the hull bottom and sides.

Cross-planked scows were of an entirely different construction, called "log built" in local vernacular. These vessels used several longitudinal floor keelsons with a heavy outer hull and ceiling planking that was edge bolted. The sides were sometimes stiffened with widely spaced frames. The most noticeable difference between longitudinal and cross-planked vessels was the angle of the bow and stern ramps. Longitudinally-planked vessels required steaming the bow and stern hull planks and resulted a more gradual upward curve of the bow and stern ramps. Cross-planked vessels did not require steamed hull planks, allowing a more abrupt angle where the bow and stern ramps met the bottom. This created a boxy hull with a nearly vertical bow and stern. Local opinion held that the boxy cross-planked hulls were less handy and slower than the finer longitudinally-planked ones. Many builders, however, opted for the cross-planked construction as it was cheaper to build and provided more cargo capacity (Olmsted 1988).

Scows were generally considered good sailors and were as fast, or faster, than conventional schooners, perhaps with the exception of sailing in heavy seas. Their shallow draft and flat bottoms created little water drag. Sailing to windward was their worst point of sail. The wide, flat bows took a beating in head seas and their shallow draft allowed considerable leeway in strong winds (Chapelle 1951; Inches and Partlow 1964; Kristiansen 1981; Olmsted 1988). Despite how seaworthy a scow may or may not have been, insurance companies held little faith in the scow's seaworthiness, and even less confidence in cross-planked bottoms and gunnel-built sides.

Construction rules for 1866 note:

Frame built scows, well-constructed and of good material, with fore-and-aft bottom planking, may be entitled to Class B1, [for] five years, but in no case will scows be entitled to the B1 grade if built with gunwale sides or athwartships bottom" (Board of Lake Underwriters 1866).

Vessels built according to underwriters' rules were given a classification rating that determined a vessel's insurance premium. Ratings of A1, A2, B1, B2, C1, C2, or "not insurable" were

assigned, A1 being the highest rating with the lowest premium - a rating scow schooners never achieved. In 1876, the Board of Lake Underwriters (1876) categorized scows with barges and even describes them as “of unseaworthy form.”

Operational History

The scow schooner *Success* was built in Manitowoc, Wisconsin, by Norwegian immigrant, Julius Johnson and launched on 3 June 1875. She measured 106 feet in length, 26 feet in breadth, with a 7-foot depth of hold. She had a capacity under her tonnage deck of 157.19 tons, and 4.30 tons capacity of enclosures on her upper deck for a total of 161.49 gross tons. The ship had one deck, two masts, a plain head, and a square stern (Bureau of Navigation 1875; Gjerset 1928).

Her builder, Julius Johnson worked as a foreman and spar maker for Danish shipbuilders Jasper Hanson and H.M. Scove in their shipyard, Hanson & Scove, in Manitowoc. Although some sources attribute the scow to shipbuilder Gunder Jorgenson and others to C. Larson, neither is substantiated with the vessel’s enrollment documents. Despite Johnson’s employment with the Hanson & Scove shipyard, chronological lists of vessels built at the well-known yard do not link *Success* to them. Johnson may have simply built *Success* privately, a feat not unheard of for a scow. The boxy lines of a scow hull would not have required the expertise of a shipyard in construction. Moreover the Panic of 1873 created hard times for the shipbuilding industry; in the wake of these tough economic times, Hanson & Scove employed Johnson, a graduate of a navigation school in Norway to sail cargos from Manitowoc to England. Johnson likely would have taken other jobs during this period, which could have included building vessels independently (Bureau of Navigation 1875; Gjerset 1928; *Manitowoc Pilot* 1881c).



Figure 8. *Success* is one of the two scows in the foreground of this image of Manitowoc Harbor taken in 1887 (Wisconsin Historical Society, Image ID 38397)

Success was enrolled at the Port of Milwaukee on 5 June 1875. Her official number was assigned as 115376. Her owners were all Norwegian immigrants and all residents of Manitowoc. Carpenter Michael Michaelson owned ½ of the vessel, and Hanson & Scove shipbuilder and shipyard superintendent Christen Olson, carpenter Jorge Olson, and Captain Ole Hanson each owned 1/6 of the vessel. Norwegian immigrant and Manitowoc resident, Abram Abrahansen served as the *Success*' first Master. Abrahansen served as a sailor on the Lakes for many years prior, but *Success* was his first command, and he later was Master of the schooner *Ben Jones* in 1877 (Bureau of Navigation 1875; Gjerset 1928; Pryor & Co. 1875).

Contemporary newsprint offers a scattered and incomplete record of arrivals and clearings for the scow *Success*. The following text offers an outline of travel records and cargos, which allow a glimpse into *Success*' transportation history, and presents rudimentary patterns typical of a vessel of this type from this period of Great Lakes intra-Lake commerce.

Little is known of *Success*' first season. It is likely the vessel engaged in business during her early season yet her travels remained unreported. On 8 September 1875, *Success* arrived at Manitowoc from Milwaukee with 2 horses and one wagon aboard. She cleared the port on 13 September for Ludington, Michigan (*Manitowoc Pilot* 1875a, 1875b). On 11 October, the scow was damaged by collision in the Chicago River. The extent of damage and the circumstances surrounding the incident remains unknown. It is likely the damage sustained was minor, because on 14 October, *Success* loaded lumber in Two Rivers, Wisconsin. While in Two Rivers a lumber scow owned by Cooper & Jones struck a piling as it was towed through the city's upper bridge; the collision shifted the scow's deck load and caused her to capsize. The *Success* was brought upriver to claim the floating lumber in the aftermath of the accident (Secretary of War 1876; *Manitowoc Pilot* 1875c).

On 10 January 1876, a new enrollment was filed in the Port of Milwaukee for *Success* due to a change in ownership. Michael Michaelson, Christen Olson, Jorge Olson and Captain Ole Hanson were joined in the partnership by carpenter Lars Olson of Manitowoc and all were equal 1/5-share owners of the vessel. Captain Ole Hanson became *Success*' new Master. After arriving in the United States from Drammen, Norway, in 1869, Hanson worked in shipyards, and sailed on the Great Lakes. Only in 1875 did he rise to the rank of Captain taking command of the schooner *Walter Taylor*. Less than one year later he took command of *Success* (Bureau of Navigation 1875, 1876; Gjerset 1928; Pryor & Co. 1875). No records were located following a thorough newspaper search regarding *Success*' 1876 shipping season.

At the opening of the 1877 season, on 7 April, the scow *Success* cleared Manitowoc, light, without a cargo, for Kewaunee, Wisconsin. It is uncertain what cargo was loaded at Kewaunee but it is likely that cargo was bound for Chicago. Captain Ole Hanson arrived at Ahnapee (now Algoma), Wisconsin, light, from Chicago on 23 April. Four hundred telegraph poles and 5,000 posts for Swaty & Son were loaded, and *Success* cleared for Chicago on 24 April (*Ahnapee Record* 1877a; *Manitowoc Pilot* 1877a; Hall 1877). On 7 May 1877, a tug ran into and damaged *Success* in the Chicago River. Little is known of the extent of damage or the circumstances surrounding the accident (Secretary of War 1879). *Success* disappeared from the historic record

until 30 June 1877, when she arrived at Ahnapee from Foscoro, Wisconsin. She was unloaded and cleared for Milwaukee on 1 July (*Ahnapee Record* 1877b). If repairs to the scow from previous accidents were made, it is likely they were made in haste to keep her sailing. On 18 September 1877, *Success* became waterlogged on Lake Michigan. She was towed to the Milwaukee shipyard of Wolf & Davidson and placed into their dry dock where an attempt was made to quell the leaks (*Oswego Palladium* 1877 Secretary of War 1879). The repairs put the vessel out of service for the month of October. On 5 November *Success* arrived light at Manitowoc from Chicago. She loaded 80 tons of hay and departed the same day for Manistee, Michigan (*Manitowoc Pilot* 1877b).

It is uncertain where *Success* was put up for the 1877-78 winter. With hints of an early spring, yet with ice still on the Lakes, on 22 March 1878 the scow *Success* arrived at Ahnapee light from Chicago. Five thousand, five hundred ties consigned to F. Swaty & Son were loaded aboard the vessel and she departed for Chicago three days later. On 19 April, *Success* arrived light again at Ahnapee, loaded 5,000 ties for Shimmel & Janda departing on 21 April for Chicago. Another trip to Ahnapee followed in May. *Success* arrived at Ahnapee on 1 May from Chicago, loaded ties and posts, and departed for a return to that city on 3 May (*Ahnapee Record* 1878a; 1878b; 1878c; 1878d). While on her next trip north from Chicago, *Success* had her foresail split by a squall. She was forced into Manitowoc for repairs (*Manitowoc Pilot* 1878a; *Ahnapee Record* 1878e). In June, *Success* hauled ties for the Conway Brothers of Chicago. She arrived into Ahnapee on 12 June, took aboard 5,500 ties and departed the next day. *Success* returned to Ahnapee on her next trip and loaded 8,000 ties departing on 26 June (*Ahnapee Record* 1878f, 1878g, 1878h). On 8 July, *Success* arrived at Ahnapee from Milwaukee, took on another cargo of 5,500 ties for the Conway Brothers and departed 10 July for Chicago. On her trip north she came into the shipyard at Manitowoc and received a fresh coat of paint. The paint apparently was much needed as her crew was described as “rejoicing” as they left port. On 6 August, *Success* arrived at Ahnapee, loaded 6,000 ties for Conway and Sam Perry and departed on 8 August (*Ahnapee Record* 1878i, 1878j; *Manitowoc Pilot* 1878b). No other arrivals or clearings were located for 1878.

Before the 1879 season opened, Michael Michaelson sold his share in *Success* to Ole Hanson. A new enrollment was entered at the Port of Milwaukee on 22 March indicating 2/5th ownership for Ole Hanson, and 1/5 share each to Lars Olson, Jorge Olson, and Christen Olson. Ole Hanson remained the ship’s Master. The *Manitowoc Pilot* erroneously printed that Ole Torrison sold his share to Hanson. It was reported that the transaction was completed for the sum of \$800 (Bureau of Navigation 1876; 1879; *Manitowoc Pilot* 1879). On 31 March 1879, *Success* arrived at Ahnapee from Milwaukee, she loaded 5,500 ties for August Froeming and departed the next day for Chicago. She arrived into Chicago on 23 April, unloaded, and departed the same day for Ahnapee. On 25 April *Success* was loaded at Ahnapee with 5,500 posts for L.J. Conway and departed the same day for Chicago (*Ahnapee Record* 1879a; 1879b; 1879c). On 4 May, *Success* arrived light at Ahnapee from Chicago. She was loaded with 5,000 ties for Sam Perry and August Froemming, and cleared for Chicago on 7 May. *Success* arrived back at Ahnapee on 23 May. Five thousand ties were loaded for F. Swaty & Son, and she departed on 27 May for Chicago. The scow then sailed to Milwaukee to pick up an unknown cargo and arrived at Ahnapee on 3 June. *Success* remained at the dock for almost two weeks waiting on her next load. On 12 June,

she departed Ahnapee for Chicago with 5,400 ties for Sam Perry. The ship arrived back into Ahnapee light on 20 June from Chicago, loaded 5,500 ties for L.J. Conway and departed the same day for a return trip (*Ahnapee Record* 1879d, 1879e, 1879f, 1879g, 1879h). On 1 July *Success* arrived at Ahnapee from Chicago light. In July and early August, four trips were made to Chicago from Ahnapee carrying ties; on 4 July she hauled 5,000 ties for Sam Perry; on 13 July, 5,000 ties for L.J. Conway; on 27 July, 5,700 ties for E. Decker & Co.; and on 4 August, 3,700 ties for E. Decker & Co. and 2,200 ties for Sam Perry (*Ahnapee Record* 1879i, 1879j, 1879k, 1879l, 1879m). On 8 September 2,500 ties and 25 cords of bark were brought aboard *Success* for F. Swaty & Son and she departed the same day for Chicago. A heavy storm swept Ahnapee Harbor on 21 September, and *Success* was among the fleet of six vessels that weathered the gale. It is unknown if additional trips were taken during the 1879 season. No records were located for late season cargos (*Ahnapee Record* 1879n; 1879o).

On 26 February 1880, the enrollment document for *Success* was surrendered at the Port of Milwaukee and new paperwork issued indicating a change in ownership. Jorge Olson sold his 1/5 share in the vessel to Jonah Richards (Bureau of Navigation 1879, 1880). As well as owning a foundry and machine shop, Richards, an immigrant from South Wales, partially owned and managed a fleet of Manitowoc vessels. The “Richards Fleet” included *H.C. Richards*, Captain Thomas Tostenson; *Alice Richards*, Captain D.W. Barnes; *A.P. Nichols*, no master listed; *Mocking Bird*, Captain Louis Larson; *Sea Gem*, Captain Henry Kane; tug *Kitty Smoke*, Captain George Bartley; tug *Willie Richards*, Captain Reuben Richards; and his newest acquisition, the scow *Success*, Captain Ole Hanson (Manitowoc Pilot 1880b, 1881d). The scow was given a new mainsail and in the waning winter months of 1880, *Success* was put to work hauling ice to Chicago. The ice was cut from the Manitowoc River by a crew of men working for Tom Windiate, known locally as the “Ice King of Wisconsin” (Manitowoc Pilot 1880a). In April, *Success* went back to hauling ties from Ahnapee to Chicago. Three trips were completed: 11 April with 5,400 ties for E.N. Anderson, 25 April with 5,600 ties for E.N. Anderson, and 5 May with 5,300 ties for F. Swaty & Son (*Ahnapee Record* 1880a, 1880b, 1880c).

Success disappeared from the historic record for June, July and August 1880. On 2 September *Success* hauled cedar ties and telegraph poles from Fish Creek, Wisconsin, to Chicago. Following this trip, three trips were completed with ties on 13 September where E. Decker & Co. shipped 5,800 ties, on 15 October and 21 October where Sam Perry shipped 5,500 ties. By 24 November, the scow was put away in Manitowoc for the winter at a berth in the Manitowoc River above the Main Street Bridge (*Door County Advocate* 1880; *Ahnapee Record* 1880d, 1880e, 1880f; *Manitowoc Pilot* 1880c, 1881a).

With ice still hampering Lake navigation, *Success* took the season’s first cargo of wood to Chicago the last week in March 1881 (*Manitowoc Pilot* 1881b). On 21 April 1881, the scow was re-admeasured at Milwaukee. Under new rules for measurements, her dimensions were 103 feet in length, and 25 feet in breadth with a 7-foot depth of hold. Her capacity was recalculated at 147.19 tons under her tonnage deck, with 4.66 tons capacity of enclosures on upper deck for a total of 151.85 gross tons. Her owners, their shares in the vessel, Master, and homeport remained unchanged (Bureau of Navigation 1880, 1881).

Throughout May and June 1881, *Success*, along with the schooner *Pierpont*, was chartered by the Chipman & Raesser Company of Milwaukee to carry ties from Baileys Harbor, Wisconsin, to Milwaukee (*Door County Advocate* 1881). Beginning on 7 June, eight shipments of between 5,500 and 6,300 ties were hauled from Ahnapee to Chicago; additional trips were made on 14 July, 21 July, 4 August, 18 August, 1 September, 8 September, and 29 September. On 6 October, *Success* cleared Ahnapee with a cargo of ties for Sam Perry, bound for Michigan City, Indiana (*Ahnapee Record* 1881a, 1881b, 1881c, 1881d, 1881e, 1881f, 1881g, 1881h, 1881i).

In mid-September 1881 Jonah Richards' son Reuben contracted typhoid fever and died, and in caring for his son, the 53-year old Jonah contracted the disease himself and died shortly thereafter on 22 September. The administrators of his estate sold his one-fifth interest of *Success* to William D. Richards of Manitowoc for \$810 (*Manitowoc Pilot* 1881d; 1882a). Her enrollment was surrendered and new paperwork issued at the Port of Milwaukee on 10 March 1882 to document the change in ownership (Bureau of Navigation 1881, 1882a; *Manitowoc Pilot* 1882a). On 20 March 1882 Ole Hanson sold one of his two shares to J. Gilbert of Manitowoc. Another new enrollment was taken out at the Port of Milwaukee defining Ole Hanson, Lars Olson, Christen Olson, W.D. Richards, and J. Gilbert as equal 1/5 owners of the scow (Bureau of Navigation 1882a; 1882b).

In mid-March 1882, *Success* was taken out of winter quarters and readied for seasonal service as soon as the weather permitted. While being towed out toward the harbor by the tug *Kitty Smoke* on 30 March 1882, the scow hit the Main Street bridge, breaking her jibboom, and tearing away much of the bridge railing (*Manitowoc Pilot* March 23, 1882b, 1882c). Repairs were made and on 4 April *Success* picked up her first load of ties from Ahnapee for the season, 5000 ties for Sam Perry bound for Chicago. Five additional trips with ties, bound for Chicago, for Sam Perry were made during April and May, departing Ahnapee on 19 April, 26 April, 3 May, 7 May, and 18 May (*Ahnapee Record* 1882a, 1882b, 1882c, 1882d, 1882e, 1882f, 1882g). On 27 May, *Success* loaded ties and posts at Ahnapee for Sam Perry bound for Milwaukee. She returned to Ahnapee on 8 June (*Ahnapee Record* 1882h, 1882i). It is uncertain if *Success* remained tied to the pier waiting on a cargo for June, July, August, and September 1882, as no records for cargos or trips could be located. On 1 October, and 12 October, *Success* loaded ties at Ahnapee for Sam Perry bound for Milwaukee (*Ahnapee Record* 1882j, 1882k). The vessel was laid up at Manitowoc for the 1882-83 winter (*Manitowoc Pilot* 1883a, 1883b).

On 3 April 1883, *Success* was admeasured under the Act of Congress of 5 August 1882, which allowed for certain deductions for tonnage. A new enrollment was not issued, however a handwritten explanation of deductions was added to her current enrollment. Her 151.85 tons as previously described, was reduced by 7.59 tons for a new net tonnage of 144.26 tons (Bureau of Navigation 1882b). During the last week in April, a huge storm blew across the lake and the scow was amongst a number of vessels that sought shelter in Milwaukee Harbor (*Toronto Mail* 1883). Record of only one trip was found for *Success* for the 1883 season. On 27 September she loaded paving posts and ties at Whitefish Bay, Wisconsin, for Mathias Cochems, of Sturgeon Bay, Wisconsin, consigned to parties in Chicago (*Door County Advocate* 1883). No records of *Success*' arrivals or departures were located for 1884.

On 9 March 1885, *Success* was re-enrolled at the Port of Milwaukee for change in ownership. Ole Hanson, W.D. Richards, and J. Gilbert sold their shares of the vessel. The new arrangement of owners consisted of Even Borresen owning 2/5, and Lars Olsen, Christen Olsen, and Otto Hermanson each owning 1/5. Price of a 1/5 share in the ship amounted to \$375. All new owners resided in Manitowoc and were Norwegian immigrants. Her homeport remained Manitowoc, and Even Borresen became the vessel's new Master (Bureau of Navigation 1882b, 1885; Gjerset 1928; *Manitowoc Pilot* 1885a). Navigation opened late in 1885, only allowing ships to begin sailing the last week in April. Even with the late start, it was reported for shipping in general that more cargo was carried before 1 May than in the two previous seasons. *Success* carried hemlock ties to Chicago from Ahnapee for Sam Perry during the season. Trips were recorded on 28 April, 10 June, 15 October, and 24 October (*Ahnapee Record* 1885a, 1885b, 1885c, 1885d). The scow was stripped for winter lay up in Manitowoc on 12 November (*Manitowoc Pilot* 1885b).

Over the winter, Otto Hermanson sold his share back to Ole Hanson. A new enrollment was registered at the Port of Milwaukee on 21 January 1886. Despite Ole Hanson returning to the owner's group, Even Borresen remained the vessel's Master (Bureau of Navigation 1885, 1886). Record of only one trip was found for the 1886 season. On 23 April, *Success* along with five other vessels, scows *Helen*, and *Sea Star*, and the schooners *Clara*, *Ole Oleson*, and *Conquest*, all loaded ties at Ahnapee for the ports of Chicago and Milwaukee (*Ahnapee Record* 1886).

On 10 April 1887, *Success* arrived at Ahnapee light, directly from winter quarters at Manitowoc. She loaded the first of two shipments of 5,000 ties to Chicago for Sam Perry. The first cleared on 13 April and the second on 28 April (*Ahnapee Record* April 14, 1887a, 1887b). On 11 June Ole Hanson sold his 1/5 interest in the vessel to William Hanson of Clintonville, Wisconsin. Borresen owned 2/5, Lars Olson, Christen Olson, and William Hanson each owned 1/5. Even Borresen remained at *Success*' helm (Bureau of Navigation 1886; 1887). No later season records for *Success* were located to indicate travel or cargos. Before the opening of the 1888 shipping season, on 20 February, William Hanson sold his interest in the *Success* to Anton Olson of Manitowoc for \$550. A new enrollment was taken out at the Port of Milwaukee indicating Even Borresen owned 2/5 interests in the vessel, and that Lars Olson, Christen Olson and Anton Olson each owned 1/5. Borresen remained *Success*' Master (Bureau of Navigation 1887, 1888; Gjerset 1928; *Manitowoc Pilot* 1888). In April and May 1888, *Success* carried ties and posts for Sam Perry from Ahnapee to Milwaukee. Trips were made on 28 April, 7 May, and 24 May (*Ahnapee Record* 1888a, 1888b, 1888c, 1888d). No records for the remainder of the season were located.

On 5 March 1889, Borresen bought out Christen Olson, and the next day, a new enrollment was entered at the Port of Milwaukee indicating that Borresen now owned 3/5 interest, and Lars Olson and Anton Olson each owned 1/5 interest in the vessel (Bureau of Navigation 1888, 1889a). Before *Success* sailed with her first cargo of the season, her ownership changed again. Even Borresen devolved his shares. Lars Olson increased his percentage of ownership, and a new owner, Ole Christenson, a Manitowoc resident and fellow Norwegian immigrant who invested in several other vessels over his career, bought into the partnership. Another new enrollment was filed at the Port of Milwaukee on 25 March indicating that Ole Christenson owned 5/10, Lars

Olson owned 3/10, and Anton Olson owned 2/10 (Bureau of Navigation 1889a, 1889b; Gjerset 1928). Anton Olson took command of *Success* and Ole Christenson served as Mate. It is uncertain if *Success* sailed during the 1889 season as no records for arrivals or clearings were located (Bergman 2004; Bureau of Navigation 1889b). Similarly little is known of *Success*' early 1890 shipping season. On 10 May 1890, while bound for Chicago with a cargo of lumber *Success* ran aground on a reef while departing Jacksonport, Wisconsin. She was freed without delay, but the incident resulted in a leaky condition for her hull. It is uncertain where *Success* went in for repair or how long she was out of service. *Success* disappeared from the historic record for the summer months. On 16 October 1890, the scow sought shelter in Manitowoc Harbor from a storm. Her points of travel are not known, nor is her business for this trip (*Door County Advocate* 1890; *Manitowoc Pilot* 1890). Over the 1890-91 winter, *Success* went into the shipyard at Manitowoc for repairs and upgrades where a third mast was added. She was enrolled at the Port of Milwaukee on 30 March 1891 because of this rig change, but ownership portions changed as well; Ole Christenson owned 5/10, Anton Olson owned 3/10, and Lars Olson owned 2/10 (Bureau of Navigation 1889b, 1891). No shipping records were found for her 1891 and much of her 1892 season. On 1 December 1892, *Success* arrived at Manitowoc with a cargo of wood before putting up in winter quarters (*Manitowoc Pilot* 1892a, 1892b).

Many trips were recorded in 1893 for the scow. On 23 May, *Success* arrived at Ahnapee to take on ties for August Froemming. She departed on 25 May for Chicago (*Ahnapee Record* 1893). The scow loaded the first cargo of bark taken from Whitefish Bay (Door County), Wisconsin, on 29 June. Dimensional lumber cut at the Reynolds' mill at Jacksonport was taken on 10 August (*Door County Advocate* 1893a; 1893b). During the latter part of the week of 22nd of October, *Success* was windbound en route for several days in Manitowoc along with a number of other vessels. Although it is unknown from where she departed, her destination was Whitefish Bay (*Manitowoc Pilot* 1893a; *Buffalo Daily Courier* 1893a). She had just completed loading hemlock ties at Whitefish Bay on 31 October when a southwest gale struck and carried the vessel and her five crewmen broadside to the beach north of the pier. The running direction of the seas prevented the crew from attempting to launch their yawl so a telephone call was made to the Sturgeon Bay Canal Life Saving Station to come to their aid. The Life Saving crew were unable to maneuver their small lifeboat in the heavy seas, so they secured the tug *Spalding*, captained by Capt. Delos McCummings, to tow the lifeboat to the scene of disaster. They covered the ten mile distance in just an hour and 30 minutes, but by the time they arrived on the scene, water was breaching over *Success*' deck sending spray as high as her crosstrees, and her crew had already been rescued by those on shore (*Buffalo Daily Courier* 1893a; *Manitowoc Pilot* 1893b; *Door County Advocate* 1893c). Ten days following the storm, the ties within her hold, which belonged to V. & C. Mashek, were removed. Then, on 13 October, Captain Anton Olson and *Success*' crew, as well as every man available in Whitefish Bay, were put to work in an eighteen-hour continual effort, working the ship's pumps and carrying away water by hand in a bucket brigade. This effort was reported to have cost the owners only \$40, less than half the cost of hiring a steam pump or tug. Finally, in the early morning hours of 14 October the scow was freed and the only damage that could be ascertained was the loss of her rudder. *Success*' sails and rigging were removed and taken aboard the tug *Goldsmith*, which was hired for \$75 to tow the scow to

Manitowoc for repairs. The vessel was overhauled during the 1893-94 winter (*Door County Advocate* 1893d, 1893e, 1894a; *Manitowoc Pilot* 1893c, 1894a; *Buffalo Daily Courier* 1893b).

While the scow *Success* was still undergoing repairs, one of her owners, Lars Olson passed away. On 2 April 1894, a new enrollment was entered at the Port of Milwaukee passing ownership of his portion of the vessel to his estate. All other information remained unchanged (Bureau of Navigation 1891, 1894). During the last week of May 1894, *Success* was forced to set her anchors off Milwaukee during a heavy blow. The anchors dragged and parted, but the vessel's crew was able to recover them (*Door County Advocate* 1894b). A clearing from Manitowoc Harbor was recorded on 26 June bound for Whitefish Bay, but no other information was located for the 1894 season (*Manitowoc Pilot* 1894b). Four trips were reported in 1895. *Success* departed Manitowoc light for Sister Bay, Wisconsin, on 16 May; she arrived at Manitowoc from Whitefish Bay with ties on 29 May; and arrived at Manitowoc from Lily Bay, Wisconsin, with wood on 2 October, unloaded and departed the same day, light, for Whitefish Bay (*Manitowoc Pilot* 1895a, 1895b, 1895c). *Success* spent the winter of 1895-96 moored in Manitowoc along thirty-six other vessels (*Manitowoc Pilot* 1896a; *Door County Advocate* 1896a).

Success arrived into Sturgeon Bay on 25 July 1896 to pick up a load of slab wood to be shipped to Manitowoc from the Pankratz lumber mill. While waiting on the cargo, a tragedy occurred - the 53-year old Mate and co-owner, Ole Christianson drowned on 30 July. His body was taken back to Manitowoc for burial at the city cemetery (*Door County Advocate* 1896b; Bergman 2004). *Success*' arrival at Manitowoc was noted from Charlevoix, Michigan, with a cargo of lumber on 2 September (*Manitowoc Pilot* 1896b).

Late in the evening on 22 November 1896, *Success* arrived at Whitefish Bay to pick up a load of lumber for Christen Olson, her former owner. A southwest gale was building, bringing large seas into the bay. *Success* untied from the pier to wait out the storm at anchor. By the morning of 24 November, the storm abated enough for the scow to continue loading and she returned to the pier. By that evening, the wind picked up again and she returned to her anchorage to ride out the storm in the bay. The wind shifted to the southeast on 25 November, which brought even larger waves into the bay. From this direction it blew into Thanksgiving Day, 26 November. *Success* began leaking so badly that by the afternoon her pumps broke and were unable to keep water out of the vessel. At 5PM, a distress signal was displayed aboard the scow. Shortly thereafter *Success* slipped her cables and was driven ashore. Many feared the ship would turtle as she came sideways to the waves. A telephone call was made to the Sturgeon Bay Life Saving Station to summon assistance, but the line was not in working order. A second call was made to the Baileys Harbor Life Saving Station, but before the crew could launch their lifeboat another call was sent informing them that the shipwreck victims had all been rescued. In a heroic effort, Fred Raatz in a pound boat, owned by Fred and Charles Raatz, Peter Peterson, and Ed Thompson, went out to the wreck and rescued all of *Success*' crew. Her cargo was later salvaged, although, the vessel, valued at \$1,000, was declared a total loss. Her documents were surrendered on 4 December at the Port of Milwaukee. Over the winter months, *Success*' hull became broken by the ice flows, covered by sand, and forgotten before much of her machinery or rigging could be salvaged

(Bureau of Navigation 1894; *Door County Advocate* 1896c, 1896d, 1897; *Manitowoc Pilot* 1896c, 1897; Mansfield 1899).

Site Description

The scow schooner *Success* lies in 8 feet of water on a heading of 212-degrees, 500 feet south of the southern edge of Whitefish Dunes State Park, Sevastopol, Wisconsin. The site has been monitored by Wisconsin Historical Society maritime archaeologists for many years, as have multiple other sites within Whitefish Bay, yet most remain covered by a thick layer of sand. In the summer of 2014, the extent of *Success*' exposure was reported to Society maritime archaeologists by Rick Hake, and the site was documented by maritime archaeologists and DNR Marine Conservation Warden Mike Neal in August 2014. The remains of *Success* rest upright on the lakebed with a large portion of the aft section still covered by sand. The sand moves about the site from year to year, covering and uncovering different hull structures, rigging, and machinery. Overall, the site exhibits excellent preservation with major hull sections intact, including the lower section of the centerboard and centerboard trunk. Scant remains of the hull structure above the bilge remain extant, though various artifacts remain beneath the sand. Due to the lack of mussel growth on most of the vessel, it is evident that *Success* has been largely covered by sand until recently. From bottles found on the site, dating to the 1950's, it is evident that *Success* was exposed to this extent only once within the last 70 years. The vessel maintains remarkable structural integrity, lying on a 2-degree list to port. The vessel's integrity, along with the presence of rigging and operational implements, offers a wealth of information for archaeologists and researchers.



Figure 9. Location of the *Success* site

Success measures 103.0 feet in overall length, and 26.0 feet in beam. A temporary baseline was established on the hull to which all hull measurements were taken. The baseline originated at the aft edge of the sternpost, passed over the top of the centerboard trunk, and extended forward where it terminated at the center of the stempost.

The lower portion of the vessel's bow remains intact and features longitudinal planking on its bow ramp that curves upward from the bottom, with each plank measuring 1.0 feet wide. This is unlike most other scow schooners of the Great Lakes, which feature cross-planked bow ramps. While it is difficult to determine why the vessel has such a varied construction technique, this type of planking was a distinctive feature of many San Francisco built scow schooners, dating back to the 1860's. In depth research of *Success*' builder, Julius Johnson, reveals no connections to San Francisco or any of the city's shipbuilders, indicating that *Success*' longitudinally-planked design developed independently in the Great Lakes just over a decade after their development in San Francisco Bay. This fact indicates that the *Success* was an experimental, transitional vessel in the Great Lakes, and its presence contradicts previous archaeological and historical information on the development of scow schooners in the region. No other known Great Lakes scow schooner has this type of longitudinally-planked bottom.



Figure 10. Archaeologists document the portside hull and bow of *Success*

Scow Schooner *Success*

Whitefish Bay, Door County, Wisconsin

N

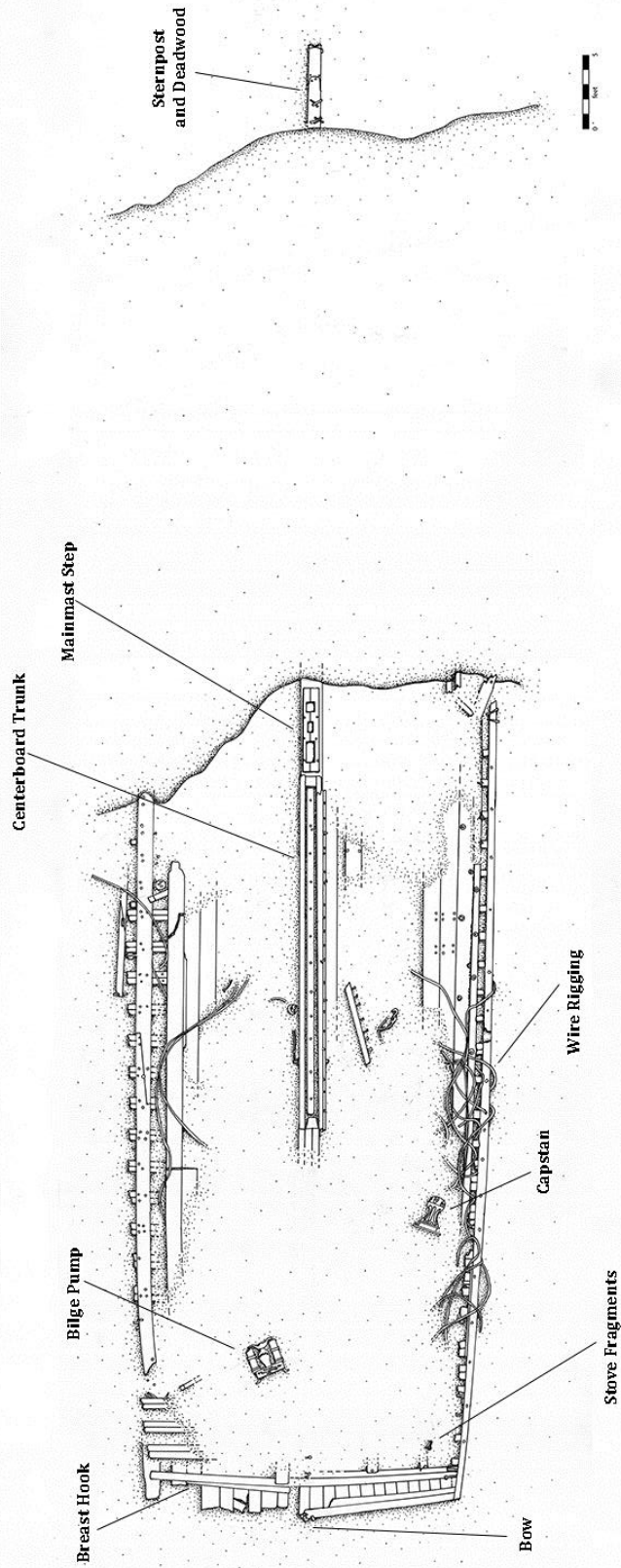


Figure 11. *Success* site plan

Although it is not known why *Success* was built with a longitudinally-planked bottom, it is possible that this was an experimental technique used to strengthen the vessel because of its length. At 103.0 feet in length, the *Success* was one of the larger scow schooners to sail on Lake Michigan, with most other scows measuring only 50.0 to 85.0 feet long. According to the Board of Lake Underwriters rules for construction in 1866, scow schooners built with longitudinal planking were considered stronger and more durable than scows with cross-planked bottoms, awarding the longitudinally-planked vessels higher insurance ratings (Board of Lake Underwriters 1866). While this may have been the case, the construction and labor costs for longitudinally-planked vessels were considerably higher than cross-planked vessels, possibly explaining the lack of other examples in the Great Lakes region.

The stempost remains extant, protruding 0.5 feet from the sand at the center of the ramp. The upper reaches of the stempost are crushed, likely a result of ice floes and the shallow nature of the wreck. The vessel is also broken at this point. The starboard and port sides of the bow are not connected to the stempost. Archaeologists were unable to determine if this break extends to the ceiling planking and frames as they were covered by sand at the time of the survey.

Four ceiling planks remain extant on the port side of the bow ramp, while on the starboard side of the bow ramp, only two remain. These measure 0.4 feet wide and 0.02 feet thick and extend toward the centerline of the vessel. The bow ramp has a slight V-shape to it, with the stempost extending 2.0 feet beyond the forward edge of the vessel's hull.

As typical in scow schooners, the vessel's keel and keelson structure lie within the bilge, allowing the vessel to draw a much shallower draft, and facilitated *Success*' work in shallow waters close to shore. Although the keel is obscured by sand, the keelson measures 1.5 feet wide and protrudes 1.0 foot out of the sand. The vessel was also equipped with a rider keelson and two sister keelsons. The sister keelsons measure 1.2 feet wide while the rider keelson is made up of two timbers measuring 0.7 feet wide each. This structure is through bolted with bolts measuring 0.1 feet in diameter. The mainmast step remains extant, cut into the rider keelson, just aft of the centerboard trunk. The step measures 1.4 feet long and 0.6 feet wide. Aft of the step, two additional rectangular notches remain extant in the rider keelson, measuring 0.3 feet wide and 0.7 feet long, and 0.6 feet square. These notches would have been associated with the vessel's deck stanchions, which are no longer visibly extant. The foremast step, located forward of the centerboard trunk, remains obscured by the shifting sand throughout the bow of the vessel.

The vessel's centerboard trunk measures 2.0 feet wide and extends 24.0 feet in length, beginning 45.0 feet forward of the sternpost. Four planks of the centerboard trunk remain extant extending from the top of the rider keelson. These planks measure 1.0 feet wide and 0.5 feet thick. The boards are attached with through bolts 0.1 feet in diameter measuring 0.75 feet apart on center, as is the centerboard fragment. Only the lower section of the centerboard remains extant within the trunk, measuring 0.4 feet thick. Due to the amount of sand cover, it is difficult to determine if the centerboard was extended at the time of the vessel's wrecking. On both the port and starboard side of the trunk, the centerboard pivot pin measures 0.4 in overall diameter, tapering to a

diameter of 0.25, and extending 0.35 out from each side. This would have allowed the deployment of the centerboard while in use.

Aft of the bow ramp, sand still covers much of the intact ceiling planking that makes up the floor. The planks measure 1.1 feet wide and cover the floor of the ship, bow to stern, beneath the sand. On the starboard side of the vessel, the side hull, and some of the ceiling planking are no longer present, revealing the vessel's floors. The floors are composed of two timbers, each measuring 0.4 feet wide and 0.4 feet thick, and are spaced 1.45 feet apart. The ceiling planking is attached to each floor timber with bolts measuring 0.1 feet in diameter. Because of the intact nature of *Success*' bilge, it is unclear how the floors were attached to the keel and keelson structure. Research on similarly built scow schooners of San Francisco reveal that the keel was likely notched for the floors, which would have run across the entire beam of the vessel, save for where the centerboard was located, in which case the floors would have been wedged into square boxes cut partway into the keel.



Figure 12. Remnants of *Success*' rigging

The lower sections of the port side hull of the vessel remain standing upright still connected to the bilge with a 90-degree chine. The sides of the vessel are comprised of longitudinal outer hull planking measuring 0.3 feet thick and 1.0 wide. The outer hull planks are edge fastened, although a few planks are joined by plain scarfs.

Unlike traditional scow schooners of the Great Lakes, the *Success* was not built with a series of king posts spaced throughout the length of the ship, but was instead constructed in a manner much closer resembling schooner construction. *Success* had double frames with futtocks measuring 0.55 feet wide and 0.45 feet wide, and measuring 0.45 feet thick. Although many of

the futtocks of each frame have been broken or damaged, evidence of their fasteners and their placement remain extant along the interior of the hull planking, where the planking remains grooved to fit the timber. The frames are spaced irregularly along the side of the hull. A 25-foot long section of the ceiling planking on the port side remains 57.0 feet from the sternpost. This planking measures 0.4 feet wide, 0.1 thicker than the outer hull planking, a method of construction common throughout the Great Lakes region. The hull structure is through-bolted and peened from the interior of the ceiling planking. The ceiling planking itself is through-bolted on end, using a series of bolts measuring 0.1 feet in diameter, and roves measuring 0.2 feet in diameter. These measure 1.8 feet apart on center.

Although difficult to discern due to the amount of accumulated sand, the frames appear to be attached to a chine log that runs the length of the vessel. These frames, as well as the floors, are likely pocketed into the chine log, a common method of construction for scow schooners. With this combination of features, *Success* appears to be somewhat of a cross between gunnel-built and traditionally framed vessels.

Just aft of the mainmast step, the exposed sections of *Success* extend beneath a layer of sand. Although most of the aft section of the vessel remains unexposed, 45.0 feet aft of the rider keelson, the vessel's deadwood and sternpost rise 4.0 feet out of the sand. The section measures 5.8 feet in overall length and 0.7 feet wide. Three timbers of the deadwood remain extant, measuring 1.0 feet thick and 0.7 feet wide. The sternpost remains intact, attached to the deadwood and measures 4.0 feet tall, 1.0 feet thick and 0.7 feet wide. Two iron preventers remain attached to the sternpost, measuring 0.65 feet wide and 0.55 feet thick. These would have been used to keep the rudder from swinging too far to port or starboard while *Success* was underway. The vessel's rudder was not located on site, though much sand has built up around the stern structure, covering many more pieces of the vessel.

Despite the fair amount of sand that remains within the vessel's hull, at the time of the survey, various artifacts and remnants of the vessel's wire rigging were present on the site. Extensive lengths of wire rigging are draped across the upright port side of the hull, revealing that much of the rigging was not salvaged at the time of the vessel's wrecking. A few lengths of the wire rigging are located on the starboard side as well. Numerous other rigging implements also remain on the site. A well-preserved iron hook, still attached to a length of rigging by an iron thimble, is located just port of the centerboard trunk. Additionally, three dead eyes, in excellent condition, remain on the starboard side of the vessel, though none remain attached to the wire rigging.

Various other artifacts associated with the vessel's operation also remain within the bow of *Success*. On the port side, near the confluence of the bow ramp and the side of the hull, a single, disarticulated leg of a cast iron stove protrudes from the sand, measuring 0.6 feet long and 0.4 feet wide. Attempts at hand fanning sand away from the leg revealed that it is no longer attached to a stove. It is unknown as to whether the stove was removed upon salvage of the vessel, or in the years since, or if it remains buried beneath the sand elsewhere on the site.



Figure 13. Embossed writing on top of the capstan on the scow *Success*

Just aft of this stove leg, 22 feet aft of the bow, the vessel's capstan is extant, lying on its side. The capstan measures 2.1 feet in diameter at its base and extends 2.6 feet in overall length. Red paint adorns parts of the capstan. The capstan drum measures 1.2 feet long and measures 0.9 feet in diameter. The drum cap measures 0.6 feet tall and 1.3 feet in diameter, while the base of the drum measures 0.3 feet thick and 1.3 feet in diameter. The lever holes in the drum cap, into which timbers would have been inserted to turn the capstan, measure 0.25 feet in diameter. This structure rests on a base measuring 1.6 feet in diameter and 0.2 feet thick. Below this, the base of the capstan measures 0.2 feet thick and has a paul rim at its base measuring 2.1 feet in diameter and 0.1 feet thick. Along this rim, eyelets measuring 0.2 feet in diameter are extant and were used to anchor the capstan to the deck of the ship. One of the bolts used to fasten the capstan to the deck remains, measuring 0.1 feet in diameter and 0.4 feet long. Embossed across the drum cap are the words: "Union Power, Patented November 21, 1881", indicating that this was not the vessel's original capstan, as the vessel was built six years earlier.

Lying just beneath the sand on the starboard side, 1.4 feet from the centerline of the vessel, the broken cast iron bilge pump remains on site lying on its side. This pump is a two-cylinder force pump with a central holding chamber. This pump measures 2.0 feet wide and would have stood 2.5 feet above the deck. The central holding chamber measures 0.8 feet wide and 1.2 feet tall, with each cylinder measuring 0.55 feet in diameter and 1.5 feet tall. Embossed across the central holding chamber is the word "BADGER". The base of the force pump is embossed with the words:



Figure 14. Cast iron stove leg

“B.W. Felthousen, Milwaukee, Wis.”. These words refer to B.W. Felthousen, a Milwaukee inventor of the late nineteenth century. Among his patents are those for boiler water feeds, steam traps, and most notably, force pumps. The word, “BADGER”, refers to Badger Iron Works, also of Milwaukee, where the pump was forged.



Figure 15. Archaeologist documents the *Success*' two-cylinder force pump

CHAPTER FOUR SCHOONER *PATHFINDER*

The schooner *Pathfinder* was built at the Campbell, Owen & Co. shipyard in Detroit, Michigan. One of the earliest shipyards in Detroit, from 1857 to 1861 the yard ran under name G. Campbell & Co., from 1861 to 1867 as Campbell & Owen, and from 1867 to 1869 as Campbell, Owen & Co. Thereafter, the company operated as the Detroit Dry Dock Company, the more well-known and prolific iteration of the yard. The Campbell, Owen & Co. firm consisted of Captain Gordon Campbell, Honorable John Owen, Elbridge G. Merrick, John N. Fowler, and Henry Esselstyn. They operated two floating dry docks, a large sawmill, and two steam shears for hoisting boilers, machinery, and masts. Located at the foot of Orleans Street on 600 feet of Detroit River frontage, the firm produced a total of twenty-two vessels through 1869. *Pathfinder* was designed and built by Master Builder, Gordon Campbell, and launched in the spring of 1869 (*Detroit Free Press* 1870a; Framer 1884; Lenard 1887; Ross and Catlin 1898).

On 19 April 1869, *Pathfinder* was registered at the Port of Detroit and assigned the official number 20290. She was described as 188 feet in length, 31.7 feet in breadth, with a 14-foot depth of hold and a capacity of 600.82 tons under the tonnage deck, and 34.06 tons above decks for a total of 634.88 gross tons. The ship had one deck, a square stern cabin, a scroll figurehead, and was schooner-rigged with three masts. Her owners were the shipyard partners, Campbell, Owen, Merrick, Fowler, and Esselstyn, individually listed, and described as joint and sole owners under the firm of Campbell, Owen & Co. Detroit was listed as *Pathfinder*'s homeport and Captain John Miner became her Master (Bureau of Navigation 1869). During her first season, *Pathfinder* worked in the grain trade making several trips carrying coal from ports on Lake Erie to the upper Lakes and returning with grain. In her first year, the vessel was involved in a collision and damaged while in the Chicago River. Little is known of the circumstances, the extent of damage or how long she remained out of service for repair (*Detroit Free Press* 1869a, 1869b, 1869c).

Pathfinder wintered over in Chicago. At the opening of the 1870 navigation season, a temporary enrollment was issued at that port, as her license had expired. The temporary enrollment was taken out by R.A. Gillmore allowing her to sail for Detroit. Gillmore listed himself as Master and owner, being an equal partner along with Campbell, Owen, Merrick, Fowler, and Esselstyn. Upon the vessel's arrival at Detroit, a permanent enrollment was issued. Gillmore was not among the owners listed but remained named as the vessel's Master, suggesting either a clerical error in the temporary enrollment or hopeful thinking by her captain (Bureau of Navigation 1870a, 1870b). After a decline in the health of Gordon Campbell, in May 1870, he sold one half of his interest in the shipyard to Captain Stephen R. Kirby, however he remained involved in *Pathfinder*'s ownership and Kirby was not added to the vessel's owner list (Framer 1884; Lenard 1887; Ross and Catlin 1898). Little is known of *Pathfinder*'s travels during the 1870-shipping season outside of one report of the ship passing Detroit downbound on 19 November (*Detroit Free Press* 1870b). No other records could be found in contemporary newsprint.

On 25 March 1871, *Pathfinder*'s enrollment was surrendered at the Port of Sandusky, Ohio, for a change in owners and districts. She was sold to Henry Kelley and William B. Guyles of Milan,

Ohio, where Kelley controlled 16/24 and Guyles 8/24 of the vessel. Her homeport was changed to Milan, Ohio, and W.W. Wells became her new Master (Bureau of Navigation 1870b, 1871). 1871 marked the first season *Pathfinder* carried "Cascade Ore", iron ore out of Escanaba; several trips were noted as the ship passed Detroit upbound or downbound in the river. During a mid-season gale on Lake Huron, *Pathfinder* damaged her outfit and lost her yawl. On 11 November *Pathfinder* departed Escanaba with another load of iron ore bound for the lower Lakes. While passing Sarnia, Ontario, on 16 November, the schooner ran into the Grand Trunk Railroad warehouse carrying away the vessel's jibboom and headgear and causing a leak in her hull. Three sections of the warehouse were ripped free from their foundations and lost into the water. *Pathfinder* was towed to Port Huron and placed in dry dock for repair (*Buffalo Commercial Advertiser* 1871; *Detroit Free Press* 1871; *Escanaba Tribune* 1871; Hall 1871).

Pathfinder's hull was repaired and strengthened during 1872 (Board of Lake Underwriters 1874). It is uncertain how long the vessel remained out of service for this overhaul. Reports of *Pathfinder* passing Detroit were located for only the months of September and October 1872 (*Detroit Free Press* 1872a, 1872b).

On 10 April 1873, *Pathfinder*'s enrollment was surrendered at the Port of Sandusky. Her licenses had expired and new owners were added. Henry Kelley (13/14) sold three of his shares to Dennis Gilmore (3/24), and William B. Guyles (4/24) sold half of his shares to J.C. Lockwood (4/24). Her homeport remained Milan, Ohio, and J. McKeighan became her new Master (Bureau of Navigation 1871, 1873). Reports of *Pathfinder* passing Detroit were recorded in May and October. No other documentation of her travels was located for the season (*Detroit Free Press* 1873a, 1873b, 1873c).

Several arrivals and clearings were noted for 1874. On 14 May 1874, *Pathfinder* arrived light at Escanaba from Cleveland. It is uncertain where the iron ore taken aboard was headed. On 10 June she loaded corn at Chicago for Buffalo and cleared the next day. On her trip North on Lake Michigan, her outfit was damaged in a storm. It is unknown the extent of damage, or if time away from service was required for repairs. The vessel was next reported passing Detroit downbound on 5 September in tow of the steamer *W.H. Barnum*, along with the schooner *Thomas W. Perry*. All three vessels were heavily laden with iron ore. Much concern was raised regarding the lower water levels in the Detroit River and whether these craft would be able to sail over the shoals below the city. These concerns were valid. Late that evening, just after the *W.H. Barnum* parted company with *Pathfinder* just beyond Bar Point, *Pathfinder* altered her course to pass Point Pelee and despite the lightship located on the shoal, went hard aground on Colchester Reef. A heavy sea was running and by morning there was much anxiety that the vessel would break up, however, she was removed within days with little effort. *Pathfinder* was inspected and returned to service. She was reported passing Detroit downbound in tow of the tug *Brady* on 12 October (*Detroit Free Press* 1874a, 1874b, 1874c, 1874d, 1874e; *Escanaba Tribune* 1874; *Oswego Daily Times* 1874).

Pathfinder carried coal and grain during April and May 1875. Due to stagnation in freight rates, by the middle of June many vessels in the Great Lakes fleet laid up holding out for more pay for

their services. *Pathfinder's* owners took advantage of the slow time to have the vessel fitted with a new rudder. By 1 July she was out of the shipyard and picked up a load of coal from Cleveland bound for Chicago. Several trips between ports on Lake Erie and Chicago were reported in July, August, and September with coal upbound, and *Pathfinder* returned downbound light on several occasions (*Detroit Free Press* 1875a, 1875b, 1875c, 1875d, 1875e, 1875f, 1875g). On 29 September while unloading grain at the Sternberg Elevator in Buffalo at 2:30AM, an employee of the elevator, Richard Dillon, fell from equipment into *Pathfinder's* hold and was killed instantly. *Pathfinder* was delayed for several days with the investigation of his death (*Buffalo Courier & Republic* 1875). On 7 October, *Pathfinder* loaded coal at Cleveland bound for Chicago; she was taken in tow of the tug *Edeall* along with the bark *Red, White, and Blue* for her trip to the upper Lakes (*Oswego Daily Times* 1875). Her trip downbound in late October was in tow of the tug *Porter* with the schooner *Heather Bell* as consort (*Detroit Free Press* 1875h).

Cargos of grain and coal occupied *Pathfinder's* hold for the 1876 season. On 16 April she loaded corn at Chicago bound for Buffalo. Her return trip to the upper lakes went unreported. Then a month later, on 16 June, while attempting to enter Cleveland Harbor under the tow of a local tug operator, she was driven up on the pier. A large hole was ripped in her starboard hull forward and just above the light water line, resulting in several broken hull planks and one broken frame. Repairs were made at Cleveland and she was back in service by mid-June. Her next trip from Cleveland to Chicago was made in record time- just short of four days and interestingly under the command of Captain McNally. The change at her helm from McKeighan to McNally does not appear in her enrollment documents (*Chicago Daily Tribune* 1876; *Buffalo Evening Republic* 1876; *Oswego Daily Times* 1876). Trips from Lake Erie to the upper Lakes were reported in August in tow of the tug *Frank Moffat* with the schooners *C.G. Mixer* and *W.H. Rounds*, and in September by the tug *Sweepstakes* with the schooners *Brightie* and *Nagaunee* (*Detroit Free Press* 1876a, 1876b).

Over the 1876-77 winter months *Pathfinder* underwent significant repairs and received a new deck. A new enrollment was entered at the Port of Sandusky on 30 April 1877. Henry Kelley sold his shares in the vessel to J.C. Lockwood. The new ownership arrangement was J.C. Lockwood with 17/24 share, William B. Guyles with 4/24 share, and Dennis Gilmore with 3/24 share. Captain L.H. Mileux became her new Master (Bureau of Navigation 1873, 1877). Trips from Lake Erie to the upper Lakes were documented as *Pathfinder* passed Detroit in June under the tow of the tug *John Martin* with the schooners *S.V.R. Watson* and *Robert Gaskin*; in July in tow of the tug *Balize*; in August in tow of *Livingstone* with the schooners *L.S. Hammond*, *Col. Cook*, *L.N. Foster*, *Charlotte Robb* and *Phoenix*; and two times in September in tow of the tugs *Hawkins*, and *Mocking Bird* (*Detroit Free Press* 1877a, 1877b, 1877c, 1877d, 1877e). On her downbound October trip loaded with grain, on 5 October 1877, *Pathfinder* was delay again by low water levels in the Detroit River. She was forced to layover at Limekiln Crossing on Grosse Ile until safe passage could be assured (*Detroit Free Press* 1877f; *The Palladium* 1877).

The schooner sailed from Buffalo to Chicago with coal in early May 1878. No records of her mid-season trips were located. On 24 October 1878, *Pathfinder* battled the early stages of a storm on Lake Erie and just made Ashtabula Harbor before the gale struck. On 31 October she was

windbound at Port Huron. The northwest gale on Lake Huron began around 10PM and forced *Pathfinder* along with ten other schooners and two steamers into port. Several of the vessels attempted to get underway only to run back into the harbor, some of them lost part of their canvas (*Ashtabula Telegraph* 1878; *Detroit Free Press* 1878; *Oswego Daily Times* 1878).

On 17 April 1879 a new enrollment was registered at the Port of Sandusky for a change in owners. J.C. Lockwood bought out his partner, Dennis Gilmore's 3 shares in the vessel; the new ownership arrangement was J.C. Lockwood with 20/24 and W.B. Guyles with 4/24. The document indicated that Guyles now resided in Cleveland. Captain Mileux remained in command of the schooner and her homeport remained Milan (Bureau of Navigation 1877; 1879). A passage downbound past Port Huron was noted on 26 June 1879 and that evening *Pathfinder* arrived at Ashtabula with ore from Escanaba for Hitchcock & Co. Her Master was recorded as Captain Andrews. The change at her helm from Mileux to Andrews does not appear in the vessel's enrollment documents. On 13 August *Pathfinder* loaded 1,100 tons of coal at Buffalo bound for the upper Lakes. She was noted passing upbound at Detroit in tow of the tug *John Martin*, but her destination remains unknown (*Ashtabula Telegraph* 1879; *Detroit Free Press* 1879a, 1879b, 1879c). On 28 August, *Pathfinder* loaded corn at Chicago destined to Buffalo. She passed Detroit on 2 September in tow of the tug *Goodnow* with the schooners *Lake Forest*, *Mary Copely*, and *D.A. Van Valkenburg*. After unloading at Buffalo, *Pathfinder* was recorded passing upbound at Detroit on 11 September (*Detroit Free Press* 1879d, 1879e, 1879f 1879g). Another load of grain was taken aboard, and *Pathfinder* passed Detroit on 30 September, arriving at Buffalo on 2 October and clearing two days later with 1,000 tons of coal (*Detroit Free Press* 1879h, 1879i). By 22 November *Pathfinder* had returned to the lower Lakes and made Cleveland Harbor for winter layover ((*Detroit Free Press* 1879j).

Pathfinder came out of winter quarters in mid-April 1880 and arrived at Escanaba on 21 April. By 24 April she had sailed into Cleveland, unloaded her ore cargo and cleared light for a return to Escanaba (*Detroit Free Press* 1880a, 1880b). Trips between Escanaba and Lake Erie ports were made in May, June and July (*Chicago Daily Tribune* 1880; *Detroit Free Press* 1880c, 1880d, 1880e, 1880f, 1880g, 1880h, 1880i). On 4 August *Pathfinder* cleared the port of Chicago, passing Detroit two days later bound for Lake Erie. *Pathfinder* returned to her Escanaba route arriving into the port on 1 September, 20 September, 7 October, and 22 October, taking out cargos of ore to Cleveland (*Detroit Free Press* 1880j, 1880k, 1880m, 1880n, 1880o, 1880p, 1880q, 1880r). On 3 November, the ship was chartered along with the schooner *David Stewart* to take coal from Black Rock, Ohio, to Milwaukee. On 7 November, she and *David Stewart*, along with the schooner *Josephine*, were towed by the tug *Goodnow* out of Lake Erie and past Detroit on their upbound voyage (*Detroit Free Press* 1880s, 1880t). After delivering her load at Milwaukee, she made for Escanaba, arriving on 18 November. Before clearing Escanaba, the bay filled with ice and froze over forcing *Pathfinder* to lay up at the port for winter (*Detroit Free Press* 1880u, 1880v).

On 31 March 1881, a new enrollment was entered at the Port of Milwaukee for change in owners and district. Henry J. and John H. Pauly, commission merchants of Milwaukee purchased the vessel, each being equal owners. *Pathfinder*'s homeport was changed to Milwaukee, and J.A. Calbick became her new Master (Bureau of Navigation 1879, 1881). Captain Calbick hired a

crew and made his way to Escanaba arriving near the end of April to begin fitting out the vessel for the season's business. On her first trip out on 6 May, *Pathfinder* stranded with a cargo of iron ore on an 11-foot shoal just off Point Peninsula coming out of Escanaba. The tugs *Kitty Smoke* and *R. Davis* steamed up from Sturgeon Bay and were able to get her off with only an hour's work. *Pathfinder* departed for Cleveland apparently uninjured (*Cleveland Herald* 1881, *Door County Advocate* 1881, *Iron Port* 1881).

Pathfinder was recorded passing Detroit upbound in tow of the tug *Castle* on 21 May 1881. She took on a cargo of corn at Chicago on 4 June bound for Buffalo and was reported downbound at Detroit towed by the tug *Burnside* with the schooners *Saveland*, and *Samians* on 12 June. On 14 June, she was chartered to bring coal from Buffalo to Milwaukee. The schooner arrived at Milwaukee with her load on 23 June. Another trip from Buffalo to Milwaukee occurred in mid-July (*Chicago Tribune* 1881; *Detroit Free Press* 1881a, 1881b, 1881c, 1881d, 1881e, 1881f). Upon *Pathfinder's* arrival at Milwaukee on 17 July she grounded in the Milwaukee River under low water conditions, just after passing the Buffalo Street Bridge. The assistance of several tugs was needed to free the ore laden vessel, which took several hours. After her release, she grounded again further upstream and was forced to remain there overnight. She finally was moved to her dock to unload on the morning of 18 July after hard pulling and much difficulty, grounding several times on the way (*Buffalo Express* 1881a). *Pathfinder* passed Detroit downbound on 3 August and on her upbound trip arrived at Sanilac, Michigan, in tow of the tug *Fred Kelley*. Her business at Sanilac is unknown. On 31 August she again passed Detroit downbound but her service history for September is unknown. On 7 October, the schooner was chartered at Buffalo to take coal to Milwaukee (*Detroit Free Press* 1881g, 1881h, 1881i, 1881j). *Pathfinder* departed Buffalo on 9 October and just off Long Point on Lake Erie was struck by a sudden gale and lost her mainsail and jib topsail (*Detroit Free Press* 1881k, 1881l; *Buffalo Courier* 1881; *Buffalo Express* 1881). The schooner continued on to Milwaukee and repairs were made there (*Oswego Morning Express* 1881). One additional trip to the lower Lakes was marked with the vessel passing Port Huron on 3 November, and by 1 December *Pathfinder* took up winter quarters at Chicago (*Detroit Free Press* 1881m, 1881n).

Pathfinder came out of winter lay up in early April. She took on a cargo of corn at Chicago bound for Buffalo arriving at the port on 15 April 1882. The schooner unloaded and cleared the same day for Milwaukee with coal (*Chicago Tribune* 1882a). A partial record of the vessel's trips between Lakes Michigan and Erie were marked by passage at Detroit downbound on 21 May, upbound on 23 June in tow of the tug *C.J. Kershaw*, and again upbound on 24 July (*Detroit Free Press* 1882a, 1882b, 1882c).

On 12 August 1882 *Pathfinder* was chartered to carry coal from Buffalo to Milwaukee, she loaded and cleared the same day. As *Pathfinder* passed Richmondville, Michigan, just before midnight on 16 August, she was struck by a heavy squall from the northeast, which carried away her jibboom, foremast, foretopmast, foresail, squaresail and maintopmast. She was picked up off Forestville, Michigan, by the tug *M.F. Merrick* the next morning and towed back to Port Huron for repairs, arriving at 5PM. The repairs were estimated at \$3,700 (*Buffalo Daily Courier* 1882; *Chicago Tribune* 1882b; *Chicago Daily Tribune* 1882; *Detroit Free Press* 1882d, 1882e 1882f;

Oswego Morning Express 1882; *The Palladium* 1882). While at the shipyard in Port Huron, *Pathfinder*'s bad luck continued. She was run into by two barges towed by the steambarge *Fred McBrier* adding an additional \$700 in damages to her repairs (*Buffalo Courier* 1882a). The steambarge *Fred McBrier* was libeled by Henry J. and John H. Pauly, the owners of the *Pathfinder*, for the collision between the boats. The owners of the *Fred McBrier* accepted service and bonded (*Buffalo Courier* 1882b).

Pathfinder's repairs were completed, and on 23 September 1882 she continued on to Chicago. While in port at Chicago the vessel was re-admeasured under a new Act of Congress passed 5 August 1882 and was given a deduction in tonnage of 31.74 tons. Her net tonnage was adjusted to 603.14 tons (Bureau of Navigation 1881; *Detroit Free Press* 1882g). Another trip was recorded in late September into early October (*Detroit Free Press* 1882h). The ship arrived at Escanaba on 22 October took on iron ore and was recorded passing Detroit on 26 October for ports unknown on Lake Erie. *Pathfinder* passed Detroit upbound on 2 November in tow of the tug *Wilcox* and arrived at Escanaba on 18 November where she took up winter quarters (*Detroit Free Press* 1882i, 1882j, 1882k, 1882l).

Pathfinder was logged passing Detroit downbound on 28 May on her first trip east for the 1883 season. She was loaded down with wheat from Chicago, but when she made Buffalo and was unloaded, the elevator determined that she was short 179 bushels. Over the months of June, July, and August *Pathfinder* brought four cargoes of grain (corn and wheat) from Chicago and Milwaukee to Buffalo, one from Milwaukee to Sandusky, and one from Toledo to Buffalo. Despite light orders for shipments of coal and coal itself being scarce, she carried five cargoes of coal from Buffalo to Milwaukee. This effort constituted a record and was celebrated in many of the regional newspapers. Shipments of coal were taken from Buffalo to Milwaukee in September and to Chicago in October. A shipment of flaxseed was hauled from Chicago to Buffalo in September, and a shipment of wheat from Milwaukee to Buffalo in early November (*Buffalo Courier* 1883; *Buffalo Daily Courier* 1883; *Chicago Daily Tribune* 1883a; *Detroit Free Press* 1883a, 1883b 1883c, 1883d, 1883e, 1883f, 1883g). On her November upbound trip with coal for Milwaukee (one source contradictorily indicated salt as her cargo), on 11 November while north of Alpena, Michigan, *Pathfinder* was caught in a heavy southerly gale and lost her mizzen sail, jib, and flying jib, and split her foresail. The vessel was forced to shelter at St. Helena Island along with the schooner *Vance*. Captain Calbick telegraphed the ship's owner, Henry Pauly from Alpena on 15 November, and orders were given to make repairs in preference to hiring a tug. It is uncertain if *Pathfinder* made Milwaukee under her own power, but by 29 November she had been stripped and put into winter quarters there after unloading (*Chicago Daily Tribune* 1883c; *Detroit Free Press* 1883j, 1883k, *Marine Record* 1883).

At the opening of the 1884 shipping season, it was discovered that *Pathfinder*'s enrollment paperwork had been lost, so a new document was taken out at the Port Milwaukee on 30 April (Bureau of Navigation 1884). On 2 May, the schooner took on a load of rye and departed for Buffalo on her first trip of the season. Three trips were made between Lake Michigan and Lake Erie ports during May and June (*Detroit Free Press* 1884a, 1884b, 1884c). On 16 July, *Pathfinder* arrived at Chicago with coal from Erie, Pennsylvania. She remained in Chicago

waiting on a cargo for a week. Finally, on 23 July she was chartered to take wheat to Buffalo; she loaded and departed early that evening. As *Pathfinder* travelled outbound on the Chicago River and crossed under the State Street Bridge, the bridge suddenly and unexpectedly closed. An upbound tug towing the schooner *J.V. Taylor* diverted to miss the span and sent *J.V. Taylor* into *Pathfinder*, causing damage to both vessels. The damage to *Pathfinder* caused no significant delay. She delivered her grain to Buffalo on 29 July and returned upbound past Detroit on 2 August. No records for the remaining months of 1884's shipping season could be located so it is conceivable that upon her return to Lake Michigan, she was sent in for repairs (*Buffalo Daily Courier* 1884; *Buffalo Express* 1884; *Buffalo Evening Republic* 1884 *Detroit Free Press* 1884d, 1884e; *Door County Advocate* 1884).

Little is known of *Pathfinder*'s 1885 shipping season. No accounts were located in contemporary newspapers for her early season and scattered records exist for her later season. On 2 August the tug *Swain* departed Escanaba towing the ore laden *Pathfinder*, and schooners *F.A. Georger*, and *Swallow*. *Pathfinder* and *F.A. Georger* were bound for Ashatbula, and *Swallow* for Sandusky. As they sailed into Lake Huron on the night of 3 August, the weather turned for the worse and *Swallow* began leaking badly. The tug was forced to drop *Pathfinder* and *F.A. Georger* in order to tow *Swallow* into Alpena for repair. The tug *Winslow* was sent on 4 August to pick up the abandoned schooners and tow them to Ashtabula (*Detroit Free Press* 1885). *Pathfinder* appeared again in newsprint on 8 October; she was chartered from Chicago with 43,009 bushels of corn for Buffalo. On 11 November, the vessel was hired to take coal from Cleveland to Milwaukee (*Buffalo Express* 1885, *Buffalo Daily Courier* 1885, *Oswego Daily Times* 1885). It is assumed that the schooner wintered over in Lake Michigan.

On 14 May 1886, a new enrollment was entered at the Port of Milwaukee for change in owners. John Pauly bought out Henry's shares to become sole owner in the vessel. Captain Calbick remained on as Master (Bureau of Navigation 1886). On 26 May, *Pathfinder* cleared Chicago for Escanaba on her first trip out for the year. In June, *Pathfinder* began taking iron ore out of Marquette, Michigan, on Lake Superior and became a regular tow of the steambarge *Jim Sheriffs* (*Chicago Tribune* 1886 a; *Detroit Free Press* 1886a, 1886b). On the night of 17 November, *Pathfinder* was in tow of *Jim Sheriffs* north of Twin Rivers Point (now Rawley Point) when they encountered an enormous gale with a running sea. *Pathfinder* broke her towline around 10PM. Captain Chamberlain, of *Jim Sheriffs* made several attempts to pick her up, but the sea conditions prevented him from getting near her. At about 4AM *Pathfinder* went ashore. At daylight, *Pathfinder*'s crew sighted *Jim Sheriffs* at anchor and pulled out to her in their yawl with great difficulty. *Jim Sheriffs* took aboard all the shipwreck victims; no lives were lost. They departed the wreck site at 7AM the following day for Milwaukee. At the time of their departure, *Pathfinder* had settled far into the soft sand (described as "quicksand") reducing the probability of her release. The storm claimed upwards of twenty other vessels and many lives across the Lakes (*Albany Times* 1886; *Chicago Tribune* 1886b; *Detroit Free Press* 1886c; *New York Herald* 1886).

Captain Calbick remained at Two Rivers to look after the wreck for John Pauly. Within days after the storm, *Pathfinder*, high aground with her heavy ore cargo, started breaking up in the surf. Reports came in that she was broken in two amidships and a little less than a week later, she was

declared a total loss. *Pathfinder* had an insurance rating of A2 ½ and a valuation of \$15,000 in the Inland Lloyds. She was insured for \$13,000, aside from the cargo of 1,200 tons of iron ore. Estimates brought the value of the vessel and cargo at over \$26,000 (*Albany Times* 1886; *Buffalo Evening News* 1886; *Detroit Free Press* 1886c; *Door County Advocate* 1886a).

On 29 November 1886, the steambarge *John H. Pauly* was sent from Milwaukee by the underwriters to remove her anchor, canvas, and rigging. A copy of *Pathfinder*'s enrollment was surrendered on 30 June 1887 at the Port of Milwaukee indicating that the vessel was a total loss (Bureau of Navigation 1886; *Door County Advocate* 1886b; U.S. Merchant Vessel List 1886).

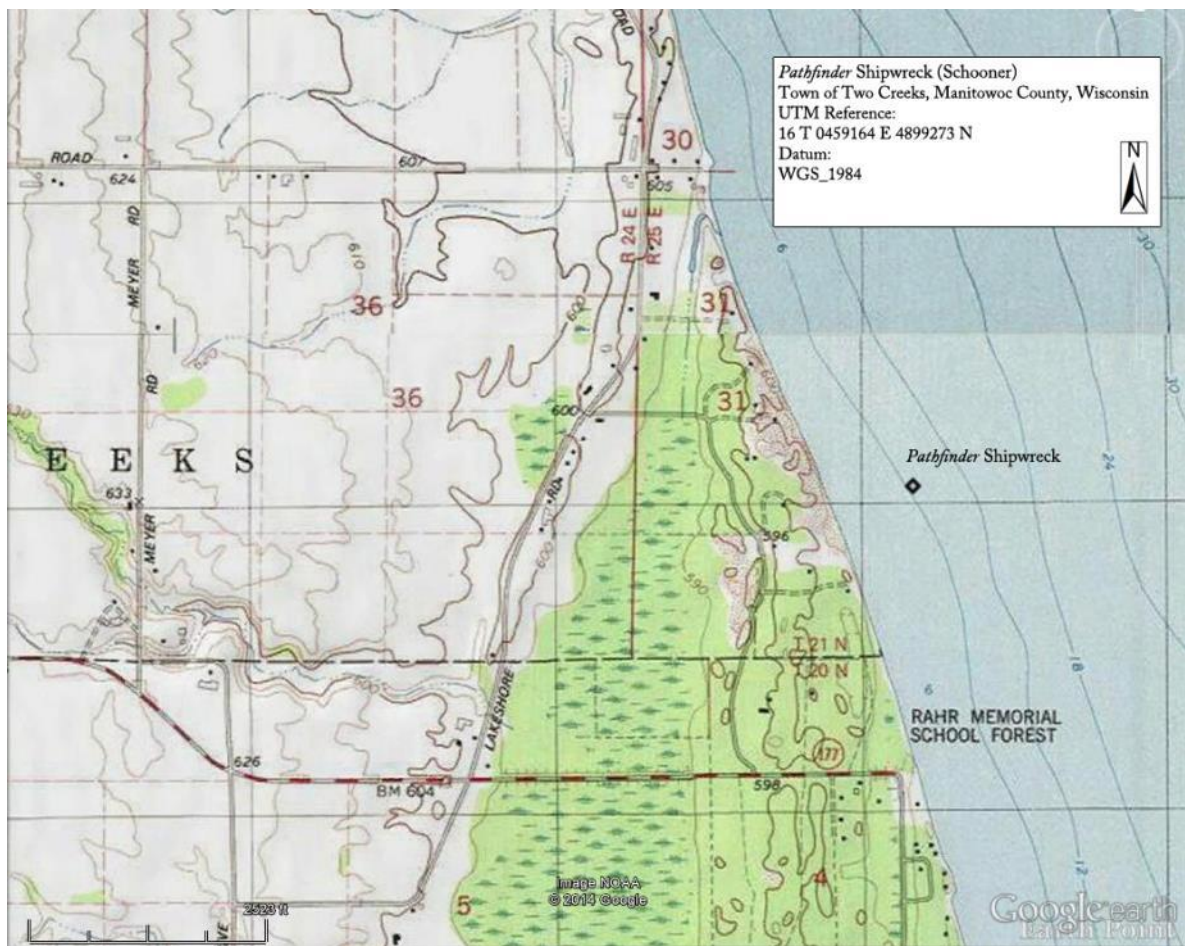


Figure 16. Location of the *Pathfinder* site

Site Description

The remains of the schooner *Pathfinder* lie 0.2 miles off shore of Two Creeks, Manitowoc County, in the waters of Lake Michigan. The site was reported as uncovered from the sand by Suzze Johnson, while flying in a powered parachute in the fall of 2013. The vessel sits on a heading of 270 degrees, 2.6 miles north of Rawley Point, lying perpendicular to the shore, in a bed of fine sand. *Pathfinder* rests in 15 feet of water, with her bow raising 4.0 feet from the bottom of the lakebed. From the turn of the bilge down, her lower hull remains intact on an even

keel, forward of 105.0 feet along the baseline. The aft 84.9 feet of the vessel lies on a slight list to starboard. Her remains are well preserved, and until the summer of 2013, were mostly buried under a layer of shifting sand. From the lack of mussel growth on areas of the vessel's aft section, it is evident that she remained largely covered until recently. Though much of her upper deck works, rigging, and anchors were salvaged shortly after her grounding, major structural components of the vessel remain preserved, including her centerboard trunk, keelson structure, and cargo of iron ore.

A Phase II archaeological survey was conducted on *Pathfinder* in August of 2014 by maritime archaeologists at the Wisconsin Historical Society. A temporary baseline was attached to the stempost and stretched 189.9 feet along the centerline of the vessel to the remains of the vessel's sternpost. All measurements for the survey were taken from this baseline. The overall length of the *Pathfinder* wreck site is 189.9 feet, while the vessel's beam, measured at her widest point is 32.8 feet. Given the wreck dimensions, location, and a comparison of vessel losses in the vicinity based on historic newspaper accounts, the vessel remains were determined to belong to the schooner *Pathfinder*. As the site lies in a dynamic area, with her stern recently uncovered, invasive zebra and quagga mussels have not colonized the interior of the bilge near the vessel's stern allowing for detailed observations.



Figure 48. Bow of *Pathfinder*

Pathfinder's stempost measures 1.0 feet long by 1.0 feet wide, with 4.0 feet exposed above the sand and gravel that has accumulated within the vessel's bow, extending to the point where it connects to the vessel's keel. The outer hull planking measures 0.6 feet wide by 0.25 feet thick.

The ceiling planking in the bilge are of various measurements, with widths ranging from 0.8 to 1.2 feet wide in an irregular pattern, though each plank measures 0.3 feet thick. The vessel's outer hull and ceiling planks are fastened using a series of butt scarves.

A break in the ship is evident on the port side of the vessel 110.0 feet along the baseline, where the side of the hull forward of this has fallen outward and remains buried by sand. Aft of this break, 7.0 feet of the port hull remains extant and upright. One of the vessel's hanging knees remains attached to the ceiling planking at 125.0 feet along the baseline. The knee measures 0.6 feet wide, 3.0 feet tall, and extends 1.1 feet out from the ceiling planking. Although the forward 110.0 feet of the vessel rest on an even keel, aft of the break, the vessel has torqued slightly and lies on a slight list to starboard. A sand scour, measuring 5.0 feet deep, has occurred at the break in the hull. Though the hull structure has split and twisted, the remaining lower hull structure remains intact.

Evidence remains that the vessel's framing structure was originally double framed with space measuring 1.0 feet wide. Forward of 23.0 feet along the baseline, the vessel remains double framed with a space of 1.0 feet and room of 1.6 feet, changing to a room of 1.0 aft at 23.0 feet along the baseline. Aft of this, the framing structure becomes more irregular, with three to five futtocks per frame. After the 1872 "strengthening", and multiple rebuilds following collisions, it is evident that the original framing structure was supplemented with these additional futtocks. The individual futtocks measure 0.45 feet wide by 1.0 feet thick with irregular spacing, ranging from 0.5 feet (starboard aft quarter) to 1.1 feet (midships). Evidence of this framing pattern is only found on the exposed starboard side of the vessel where the ceiling planking no longer remains. While it is possible that this irregular framing pattern is extant on the port side of the vessel, none could be seen due to the remaining cargo and ceiling planking. Aft of 136.5 feet along the baseline, *Pathfinder's* framing structure returns to two futtocks per frame, measuring 1.0 feet wide overall. The ceiling planking, futtocks, and outer hull planking are fastened together with iron drift pins, roved atop the ceiling planking and peened on the outside of the vessel. The drift pins measure 0.05 feet in diameter with the roves measuring 0.15 feet in diameter.

Pathfinder's keelson is obscured by the rider and sister rider keelsons attached atop the main keelson. This massive keelson structure is made up of multiple timbers and measures 4.4 feet in overall width. The sister keelsons measure 1.0 feet wide and 1.0 feet thick, with the sister rider keelsons measuring 1.0 feet wide and 1.0 feet thick as well. Two rider keelsons are located atop the keelson, each measuring 1.2 feet wide and 1.0 feet thick. From these measurements, and measurements taken near the stern, it is possible to determine that the keelson itself measures 2.4 feet wide, running from the bow to 166.0 feet along the baseline. The remaining 21.0 feet of the keelson is no longer connected to disarticulated sternpost and deadwood, lying prone near the vessel's stern, and measures 1.1 feet wide. At 171.5 feet along the baseline, a plain scarf connects two timbers of the keelson. This indicates a possible repair to the original keelson following one of *Pathfinder's* many collisions and groundings.

Although much of her rigging is no longer extant, a small piece of wire rigging remains in *Pathfinder's* bow. It is likely that additional wire rigging remains on the site, beneath layers of sand. Evidence of *Pathfinder's* three masts remain. The vessel's three mast steps can be seen in

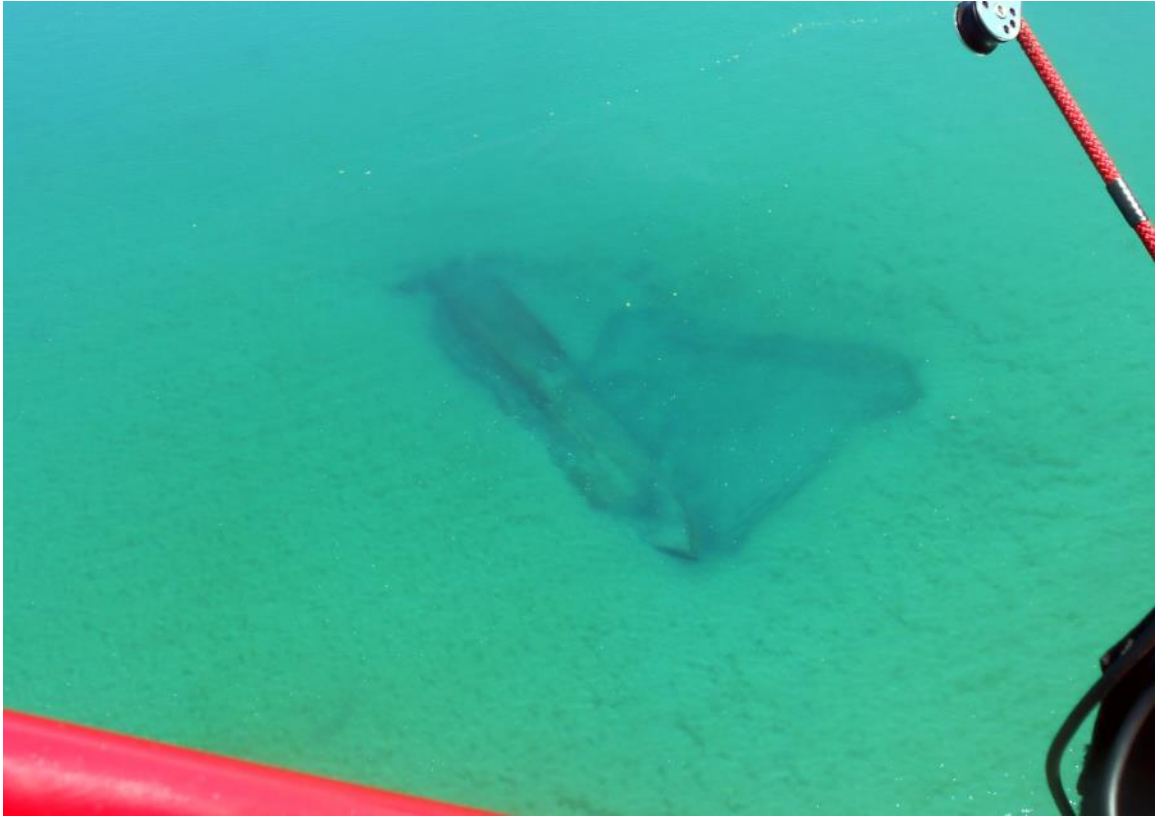


Figure 18. Aerial photo of *Pathfinder* site taken by pilot, Suzze Johnson



Figure 19. Aerial photo of *Pathfinder* site taken by pilot, Suzze Johnson



Figure 20. Keelson assembly and starboard side hull with reinforced framing

the exposed keelson structure. The foremast step lies at 39.0 feet along the baseline, measuring 1.3 feet long and 1.5 feet wide; the mainmast step is located at 94.8 feet along the baseline, measuring 2.2 feet long and 0.7 feet wide; and the mizzenmast step is located at 151.8 feet along the baseline, measuring 1.5 feet long and 0.7 feet wide. Deck stanchion steps remain extant cut into the twin rider keelsons along the length of the vessel. These measure 0.6 feet square.

Additionally, the keelson structure has a set of unique additions not usually seen in schooner construction. Six planks run athwartship on top of the keelson structure, just forward of the centerboard trunk. The forward most three planks measure 1.0 feet wide, while the aft three planks measure only 0.6 feet wide. Due to the lack of any other associated materials extant on the site, it is not possible to discern for what these planks were used, although it is possible they were an additional means of fastening the multiple timbers of the keelson structure together. Aft of the mainmast step, a rectangular block measuring 2.4 feet long, 1.0 feet wide, and 1.0 feet thick, is fastened to the top of the twin rider keelsons. This block has six bolts extending 0.6 feet out of its top, with no indication as to what was fastened there. While difficult to discern, it is likely that this was a component of support for the mainmast.

The centerboard trunk is located 60.0 feet aft of the stempost and measures 33.0 feet long, remaining broken off level with the keelson structure. Because of this, no planks making up the trunk were extant above the keelson. The centerboard rests between two timbers measuring 0.7 feet thick, which sit atop the vessel's keelson as twin rider keelsons. Since only the lower extent of the centerboard trunk remains, there is no trunk cover extant, and it is possible to determine that the centerboard remains housed within the trunk. The centerboard measures 1.0 feet thick and

26.0 feet long, and extends 1.5 feet above the extant centerboard trunk. The centerboard has a diagonal break 19.0 feet from its forward-most edge. Because of the angle of this break, it is possible to determine that the centerboard was deployed at the time of *Pathfinder's* grounding.



Figure 21. Gudgeon aft of keelson assembly

The sternpost remains exposed, lying on its starboard side 181.2 feet aft of the stempost, and measures 8.3 feet tall, 1.5 feet thick, and 1.5 feet wide. The deadwood timbers measure from 1.0 feet wide, and remain fastened to the sternpost. The vessel's brass gudgeon remains on the site, connected to the stern end of the keelson, measuring 2.2 feet in length and 0.6 feet in width.

Beyond the large deposits of *Pathfinder's* cargo of iron ore still found on the site, multiple other artifacts remain, including an iron scupper grate measuring 1.2 feet in diameter. This grate would have been used to cover a scupper hole and to act as ventilation to the lower deck. Additionally, a disarticulated piece of the centerboard trunk is extant on the site, lying 28.0 feet off the vessel's forward starboard quarter. The piece measures 28.0 feet before it extends into the sand, and rests on a bearing of 120 degrees. The timbers and boards were identified as part of the centerboard trunk from the existence of the centerboard pivot pin. This pin measures 0.5 feet in overall diameter, and extends 0.5 feet out from the side of the board. Here, the pin measures only 0.2 feet in diameter. The board to which the pivot pin is attached measures 7.5 feet long and 0.6 feet wide, and is attached to two timbers measuring 0.6 feet and 0.8 feet wide. The timber measuring 0.8 feet wide runs the length of the piece, and is made up of two timbers, the first measuring 13.0 feet long, and the second measuring 15.0 feet long, each rising 0.3 feet out of the sand. At 7.0 feet and 14.5 feet along the trunk two notches are cut out of the timbers, measuring 0.3 feet deep and 1.0 feet wide and containing one bolt, 0.1 feet in diameter.



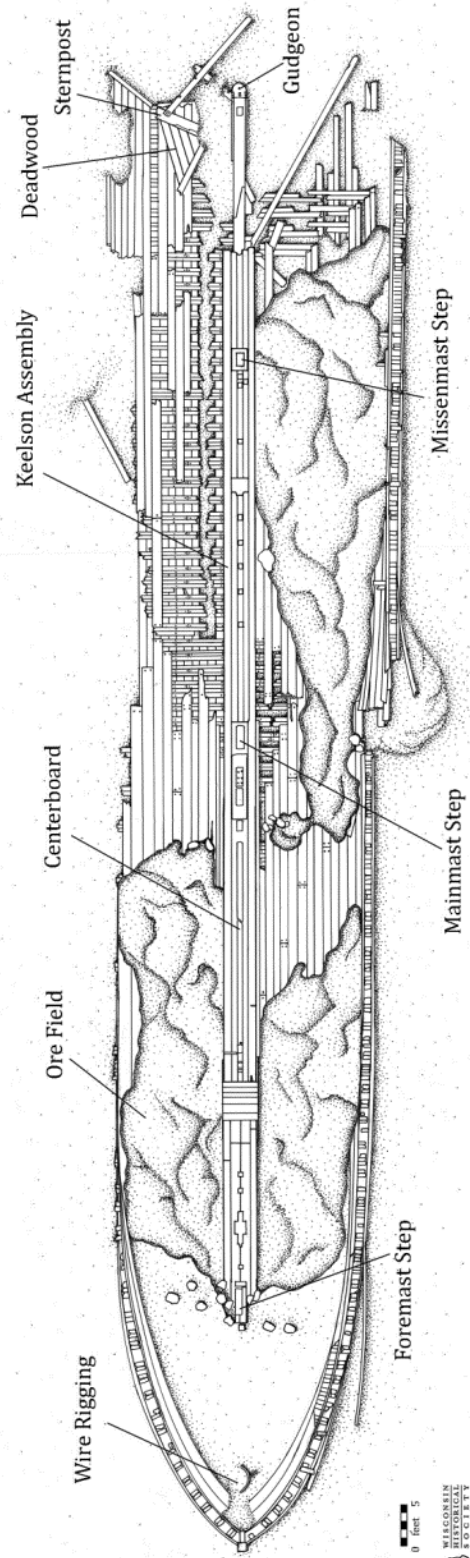
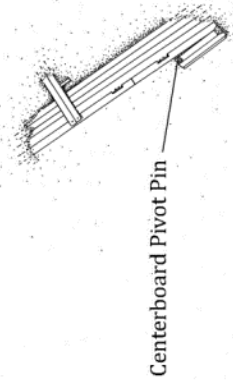
Figure 22. Fragment of the Centerboard trunk with pivot pin

The trunk itself is made up of four planks, measuring 0.6 feet and 0.8 feet wide. More of these planks likely remain beneath the sand. At 21.4 feet from the southernmost edge of the trunk, two planks are attached to the main timber, running perpendicular to the boards of the trunk itself. These measure 0.7 feet and 0.8 feet wide, 0.15 feet thick, and measure 5.5 feet long before extending beneath the sand. These are attached to the rest of the trunk by two to three nails in each board. An additional eight nails are located on the timber, though no other planks remain extant.

It is likely that many other components of the *Pathfinder*'s hull structure remain on the site. At the time of the survey, it was clear that at least four feet of sand had been cleared away, exposing the entirety of the lower section of the vessel's bilge. The vessel lies in a bed of fine sand, or quicksand, which measures over 3.0 feet deep. Additional remnants of *Pathfinder* likely remain covered by the thick layer of quicksand. Because of the dynamic nature of this area, the potential for more hull structure to become uncovered outside of the main hull section remains very high. This archaeological data would be able to provide additional information about the construction of Great Lakes centerboard schooners. Data already gathered on the site has significantly increased our understanding of centerboard schooner construction, and holds the potential to yield additional significant information essential to understanding nineteenth century maritime commerce. The site remains lightly visited by divers because of the recentness of her exposure, as well as her relatively unknown location.

Schooner *Pathfinder*

Town of Two Creeks, Manitowoc County, Wisconsin



0 feet 5



Figure 23. *Pathfinder* site plan

CHAPTER FIVE APOSTLE ISLANDS BROWNSTONE QUARRY DOCK SURVEYS

History of the Brownstone Quarries on the Apostle Islands

Spanning the era marked by the end of the Civil War until the beginning of the twentieth century, brownstone quarrying around Chequamegon Bay and on the Apostle Islands became one of the most important industries in the region. Used to build massive stone buildings in Chicago, Minneapolis, St. Paul, Detroit, and Milwaukee, the stone quarries of Chequamegon Bay became a staple of architectural building styles in the late nineteenth century, transforming Ashland and Bayfield into thriving hinterland communities. Although many brownstone quarries developed on the Bayfield Peninsula, Apostle Island brownstone was consistently rated among the most beautiful and pure grades of brownstone in the country. The quarries' close proximity to the waters of Lake Superior made transportation of the massive blocks relatively easy and inexpensive (Eckert 2000).

Although brownstone quarrying on the Apostle Islands was a booming industry, it was dictated by economic trends throughout the country. By 1893, the popularity of brownstone began a steady decline. The great economic downturn in that year made the construction of brownstone buildings too expensive for many builders. Despite this, quarrying operations on the islands maintained until 1897 when the last island quarry, on Presque Isle - today's Stockton Island - halted operations (Apostle Islands National Lakeshore 2004).

Brownstone

The stone found throughout the region is known as Northern Potsdam Sandstone, or more commonly, Lake Superior Brownstone. The stone is found beneath several feet of topsoil under the Apostle Islands and extends six to eight miles inland from the Lake. Known for its durability and imperviousness to fracture and decay when exposed to the elements, brownstone was sought after as a strong and beautiful building material. The extent of the stone stretches between the western edges of Lake Superior to the Montreal River. Throughout this region, brownstone cliffs rise abruptly along the water's edge, which allowed many opportunities for quarry development (Buckley 1896).

Geological reports from the 1890's indicate that brownstone typically occurs in beds 4,000 feet in thickness. One of the factors that made it so desirable was the ease of quarrying the stone into ready-to-ship blocks. The stone split parallel to the bed at any depth, allowing blocks of any size to be chiseled easily (Buckley 1896). Although the stone was known for its durability, when first quarried, the stone remained ductile until it hardened, making it easier to work into smaller blocks by the builders. Once exposed to the air, the stone would harden, allowing it to withstand even the harshest of weather conditions (*Bayfield Press* 1871g). The stone's unique brown color was a sought after characteristic for many buildings of the era. Stone quarried from this region was known for being of uniform color, containing few of the white streaks or imperfections found in other types of Potsdam sandstone (Buckley 1896; Eckert 2000). As quarrying operations began to extend further away from the water's edge, the brownstone was said to be of a deeper brown

color and contained almost no imperfections, only adding to the stone's popularity (*Bayfield Press* 1872).

The Beginnings of the Brownstone Industry

The period after the Civil War was marked by an era of rapid expansion throughout the Midwest. Cities in this rapidly expanding region created a strong market for durable building materials. As major Midwestern cities developed into industrial centers, architectural tastes began to develop to reflect the city's prosperity (Apostle Islands National Lakeshore 2004). Larger, more substantial buildings with rich architectural embellishments became popular for many buildings. This type of construction was meant to invoke the Medieval Romanesque style, thus beginning the "Romanesque Revival" architectural movement. Brownstone buildings built in this style became immensely popular in the Midwest for durability under harsh conditions, and were thought to harmonize with the region's natural surroundings (*Bayfield County Press* 1885; Eckert 2000).



Figure 24. Brownstone Quarrying in the Apostle Islands (Bayfield Historical Society Image 1980_1_515)

Likewise, the outbreak of the Chicago Fire in 1871 spurred this development even further. The lightly constructed wooden structures of Chicago were quick to light aflame, and in the aftermath of the disaster, stronger, more substantial stone buildings were in high demand. It was discovered that buildings made of Lake Superior brownstone were of the few to withstand the heat of the fire without buckling, cracking, or crumbling (*Bayfield Press* 1971i; Apostle Islands National

Lakeshore 2004). Because of this, the demand for brownstone construction, in Chicago and in cities throughout the Midwest, exploded.

Despite the general boom in demand for brownstone, its durability was still contested during the early years of production. To dispel any doubts, early quarry owners allowed their stone to be analyzed and tested for durability and strength. Each test conducted found the stone to be of the strongest, most durable quality, and by the fall of 1871, the desire for additional brownstone quarries on the Apostle Islands was already well known (*Bayfield Press* 1871i; Buckley 1896).

Apostle Islands Quarry Operations

Four quarries operated on the Apostle Islands in the late nineteenth century, run by seven different companies between 1868 and 1897. The four quarries were located on Basswood, Hermit, and Stockton Islands, with Basswood Island containing two different quarry sites. While brownstone on the mainland was in high demand, the stone from the Apostle Islands was reported to be of superior quality that could not be matched on the mainland, or anywhere in the United States (Eckert 2000). The development of the brownstone industry in the region began with Alanson Sweet of Milwaukee and the Bass Island Brownstone Company when the Milwaukee Board of Supervisors chose Basswood Island brownstone for the construction of the Milwaukee County Courthouse (Buckley 1896).

The proximity of the islands' brownstone cliffs to the water made the transport of stone quick, relatively easy, and inexpensive. Once railways reached Bayfield and Ashland, the stone could be transported by boat to docks on the mainland and loaded into waiting railcars (Eckert 1985). The stone on the islands was also said to be of exemplary quality due to its dark brown color, durability, and parallel fracturing when quarried. To quarry the stone successfully, channelers would cut the stone in two directions along the bed's plane, eight to ten feet deep. At that point, sawing machines could cut the stone to desired dimensions. The stones were then transferred to the quarry docks by steam derrick and narrow gauge rail carts, where it awaited loading onto a schooner (*Bayfield Press* 1871g; Buckley 1896). Despite early attempts to blast the brownstone from its beds, it was found that that method of removal only produced small bits of rubble, which were not suitable for the building stones desired for construction (Buckley 1896).

While quarry operations on the mainland extended into the 1920's, quarries on the Apostle Islands completely stopped by 1897. The resources of brownstone on the islands remained plentiful, however, a combination of the nationwide economic downturn and a change in architectural tastes had all but obliterated the industry by 1893. Although one quarry, located on Presque Isle - today's Stockton Island - stayed in operation for a few additional years, all quarry operations on the Apostle Islands ceased by 1897 (Apostle Islands National Lakeshore 2004).

End of the Brownstone Era

Periods of economic downturn slowed production demands throughout the nearly fifty years of quarrying operations in the Apostle Islands, but the Crisis of 1893 marked the end of the brownstone industry. Once the economy picked up again, architectural tastes had changed. The dark, heavily constructed brownstone architecture of the late nineteenth century was no longer

popular or economical. Following the 1893 World’s Fair and the popularity of the “White City”, lighter limestone became the preferred stone building material. At the same time, builders and architects began using concrete in buildings as a lighter and less expensive alternative to stone.

During the 1893 World’s Fair, the Wisconsin Minerals Pavilion was slated to highlight Bayfield, Ashland, and Apostle Islands brownstone. The building’s façade and four, 25-foot tall obelisks, were made out of Lake Superior brownstone. Though the building was successfully completed, most of the buildings featured displayed much lighter and brighter façades. Although the ‘White City’ was primarily built of lightly constructed frames, wiring, and plaster, the lighter colored construction appealed to many of the region’s architects, ushering in a new era of architectural style. By the time the economic crisis had ended, this lighter stone construction had risen in popularity, effectively ending the demand for brownstone (Apostle Islands National Lakeshore 2004). It was at this time innovations in building materials allowed much lighter construction for buildings; the development of steel frames and concrete allowed buildings to be constructed larger and taller, and at a much larger cost (Eckert 2000).

By 1897, the last brownstone quarry on the Apostle Islands shut down operations. Although quarries on the mainland were able to maintain operations until the early 1920’s, the high demand for brownstone seen in the 1880’s never returned. Today, the remains of these quarry operations still exist, and serve as tangible bits of local history for visitors, and offer exceptional information for historians and archaeologists alike.

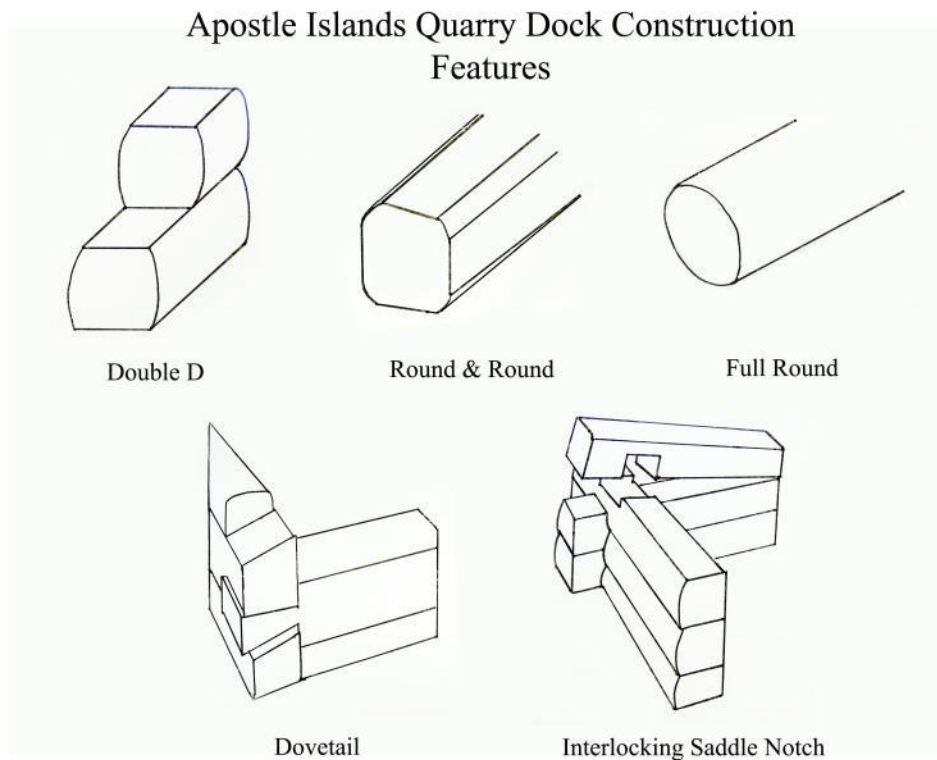


Figure 26. Apostle Islands Quarry Dock Construction Features

Basswood Island

The Bass Island Brownstone Quarry, otherwise known as the Basswood Island Quarry, is located at the southeast end of Basswood Island. In 1854, a group of investors; George Becker from St. Paul, Minnesota, and Beriah Magioffin, Paul Rankin, and John C. Breckenridge from Kentucky originally purchased the land on which the quarry eventually opened. Each of the four original investors owned $\frac{1}{4}$ of the land. In 1868, Rankin sold his holding to Breckenridge, and Becker and Magioffin sold their interests to Alanson Sweet, a stonemason from Milwaukee. Sweet established the Bass Island Brownstone Company and quarrying operations began in 1868 in response to a request for a reliable building material to construct the Milwaukee County Courthouse (Eckert 1985). In that first year, Sweet, and the Bass Island Brownstone Company, built docks and installed machinery at the site in preparation for extraction of the stone. Because brownstone was not a common building material prior to 1868, Sweet sent samples of stone to the Smithsonian Institution for analysis and strength testing. Finding the stone to be of superior quality, the Milwaukee Board of Supervisors chose Basswood Island brownstone as the building material for the courthouse (Buckley 1896).

Sweet and the Bass Island Brownstone Company maintained ownership of the quarry and its operations until 1870. It was in this year that Alanson Sweet sold his share of the land to a group of investors from Chicago and Milwaukee; Robert H. Strong, Edwin C. French, Daniel L. Wells, and George P. Lee. From 1870 until 1873, the quarry was operated as Strong, French & Company. Over the course of 1870, fifteen to forty workers cleared top soil, felled trees, built additional quarry docks, installed machinery, including steam drills with the capacity to drill holes 3-inches in diameter and six feet deep in five minutes. They removed nearly 2,000 tons of stone for the Milwaukee County Courthouse (Eckert 1895).

During the spring of 1871, several additional houses were constructed on the island to accommodate the nearly 100 workers, and their families, expected to work the quarry that season (*Bayfield Press* 1871a). Over the winter months of 1870 – 1871, two additional horse-powered derricks were installed on the island, adding to the two hand-powered derricks already installed. Rails were laid to the main derrick from all sections of the quarry as well, and it was expected that the output of the coming summer would far exceed that of the past year to successfully complete the contract for the Milwaukee County Courthouse (*Bayfield Press* 1871b). In April, the quarry first began operations for the year, and by May, the steam drill was in working condition after being damaged in the months prior. The quarry was operating at a rapid pace, turning out 50 tons of stone per day (*Bayfield Press* 1871c, 1871d, 1871e).

Throughout the summer, work continued rapidly, with the schooner *Starlight* carrying between 500 to 600 tons of stone with each trip from the island (*Bayfield Press* 1871f, 1871g). This trend continued throughout the rest of 1871. Following the outbreak of the Chicago Fire that fall, Strong, French & Company called for keeping the quarry open throughout the winter months to quarry stone to be shipped to Chicago for its rebuild. The brownstone from the Basswood Island Quarry was noted to have withstood the fire ‘splendidly’. Where the intense heat of the fire had caused fractures and melting of many other types of stone, brownstone was said to have maintained integrity, increasing the popularity of the stone exponentially. By November of 1871,

the popularity of the region's brownstone was fully realized as a market to be capitalized upon. Investors began to look at other islands in the Apostle Islands chain as potential brownstone quarrying sites (*Bayfield Press* 1871h, 1871i).

Strong, French & Company operated the Basswood Island Quarry for another two seasons, and during that time, the company shipped brownstone to Chicago exclusively, for the rebuilding of the city. Some of the rubble from the quarry was shipped to Bayfield to aid in the building of numerous foundations throughout the city, including foundation of the Bayfield School. By 1873, however, the demand for brownstone had significantly dropped due to a nationwide economic downturn. With lightened demand for brownstone, the Basswood Island Quarry shut down its major operations in October of 1873 (Eckert 1985). For the next decade, the quarry operated with a limited crew of workers, with scant reports of the bark *D. A. Van Valkenburg*, which the company had purchased in 1873, making trips from the island. The bark carried only one full load of stone from the quarry in 1874 and again in 1875 (*Bayfield Press* 1873, 1874, 1875). Quarrying operations on Basswood Island would not occur en masse again for another decade.

In the summer of 1882, Edward Townsend Mix and Edwin Hyde, a cut-stone merchant and contractor, finished plans for St. Paul's Episcopal Church in Milwaukee, and plans were finalized to ship Basswood Island Quarry brownstone to Milwaukee for the church's construction. This marked the beginning of a new era in brownstone construction that would last until the mid-1890's. The early 1880s was marked by an economic upturn that created a high demand for stately brownstone structures. The Cook & Hyde Company operated the Bass Island Brownstone Company quarry from 1883 until 1888. As two of the largest contractors and builders using Lake Superior sandstone in the region, Cook & Hyde used their quarrying operation on Basswood Island to supply their stone yards in Milwaukee and Minneapolis (Eckert 1985).

The season of 1883 was highly successful for the Cook & Hyde Company, with shipments of stone bound by schooner to the ports of Washburn and Milwaukee (*Bayfield County Press* 1883b, 1883c). By May of 1883, the Basswood Island Quarry opened operations for the season, and it was reported that the quarry would be operated with a full force of workers in the summer months, run by F.C. Bailey of Milwaukee (*Ashland Press* 1883). In June, Cook & Hyde began looking for property on the mainland to expand their quarrying operations. With land acquired on the mainland, the company planned to build a dock to easily unload cargos of stone from Basswood Island. That same year, the Chicago, St. Paul, Minneapolis, and Omaha Railroad made a connection to Bayfield, making it possible for shipments of stone to be made by rail as well as water, greatly increasing the company's reach and profits (*Bayfield Press* 1883; Eckert 1985). It was also reported that the stone quarried out during the 1883 season was far superior to the stone quarried the previous year, and that it would be used for the construction of the Bayfield County Courthouse (*Bayfield County Press* 1883a). In November, blocks of Basswood Island stone were sent to St. Paul to be placed on exhibition (*Bayfield County Press* 1883d).

Throughout the 1884 season, in addition to shipping its largest tonnage of brownstone to Milwaukee, and St. Paul for the Germania National Bank, several improvements were made to the quarry to increase efficiency. These improvements included extending the quarry dock to accommodate vessels with 12-foot drafts when taking on full loads of cargo, as well as the

installation of two new steam derricks. Additionally, a new log boarding house and steam drill were implemented at the quarry at the close of the 1883 season (*Bayfield County Press* 1884a, 1884b).

In addition to furnishing stone for the Bayfield County Courthouse, St. Paul's Episcopal Church, and the Germania National Bank, stone from the Cook & Hyde Company's quarry was used to construct two well-known Milwaukee landmarks: T.A. Chapman's Dry Goods Store in 1885, and the Plankinton Building in 1887 (Eckert 1985). The only vessel known to have been built in the Apostle Islands, the *Annie R*, was built on Basswood Island in 1896. The two-masted scow schooner, built by C.L. Rudd, was used specifically to haul brownstone from the Cook & Hyde Company quarry to Washburn (Eckert 1985).



Figure 26. Bass Island Brownstone Quarry (Bayfield Historical Society Image 1983_8_003)

In 1889, Cook & Hyde sold the quarry, equipment, and machinery to Frederick Prentice of the Prentice Brownstone Company. Prentice operated the quarry from 1889 to 1891. When Prentice purchased the quarry, he did not maintain large quarrying operations on the island. The quarry's productivity decreased to only 5,000 cubic feet of stone each season. He instead, moved much of the machinery from Basswood Island, to his mainland quarry, and to furnish his newly opened quarry on Hermit Island (*Bayfield County Press* 1889; Eckert 1985).

In 1881, Superior Brownstone Company was incorporated by James H. Rogers, Freeborn C. Bailey, and George K. Barr with the intention to purchase tracts of land for logging or quarrying purposes. The company leased the land on Basswood Island beginning in 1891, and started

quarrying operations later that year, shipping stone to their docks in Ashland, West Superior, and Duluth (Eckert 1985). Once in possession of the quarry, the Superior Brownstone Company made major improvements to the operations on the island, including the installation of a self-revolving steam derrick on the company's dock (*Bayfield County Press* 1891). This machinery allowed the company to load a vessel in half the time as with traditional, hand and steam-powered derricks. With their own tug, *Mariel*, the Superior Brownstone Company was poised to export a larger tonnage of stone than the quarry had produced in years past, exporting 100,000 cubic feet of stone in 1891, and 310,000 cubic feet in 1892 (*Bayfield County Press* 1891; *Ashland Daily Press* 1891, 1892).

Superior Brownstone Company maintained quarry operations on Basswood Island until the financial crisis of 1893 led to a decline in the demand for brownstone. Prior to the economic decline, quarry production was up, and in the fall of 1892, the quarry's dock received repairs from George Wilkinson (*Bayfield County Press* 1892). In June of 1893 though, the stock market crashed, beginning the largest economic downturn of the century. Although a few quarries around Chequamegon Bay were able to remain in operation through the crisis, the Superior Brownstone Company reduced its working crew to 15 men at the beginning of August, but by the end of the 1893 season, had shut down operations for good (*Bayfield County Press* 1893; Eckert 1985).

One other brownstone quarry operated on Basswood Island in 1892, but operations were shut down within a year. In 1892, on land about 0.25 miles north of the main quarry operations on the island, the Breckenridge Quarry was opened. Instead of using steam drills and saws, the stone was blasted out with charges. Quarry operations were shut down after one season because this method of removing stone merely created rubble, and not the large stone blocks desired by builders. Additionally, a lack of supplies and good machinery forced investors to abandon work at the quarry (Buckley 1896; Eckert 1985).

Site Description

The terrestrial portion of the quarry site remains largely the same as it was described in the National Register of Historic Places nomination, written in 1976 – irregularly shaped with high walls, overgrown, and partially water filled. The National Park Service has since added interpretive signage along the hiking trail past this resource.

The remains of the dock structures have not previously been described. The dock extends nearly 186.5 feet to the southeast into Lake Superior from the southeast shore of Basswood Island on a heading of 250 degrees. Overall, the site is located in 1 to 20 feet of water and consists of three crib structures and one stone pier. Measuring 102.5 feet in overall length and 26.0 feet in width, the main crib is made of a combination of full “round timbers” and “round and round” timbers with a non-tapered dovetail corner system. A total station was set up on shore and a datum created at the coordinates, 46° 49.911 W 090° 45.343 N to be able to gather point data for the edges of the cribs and accurately map in the shoreline. Three baselines were installed during the course of this survey from which all measurements were taken. One baseline each was installed on the main crib and the near-shore north crib along their lengths, while the third baseline extended from the main crib to the near-shore crib along the stone pier.

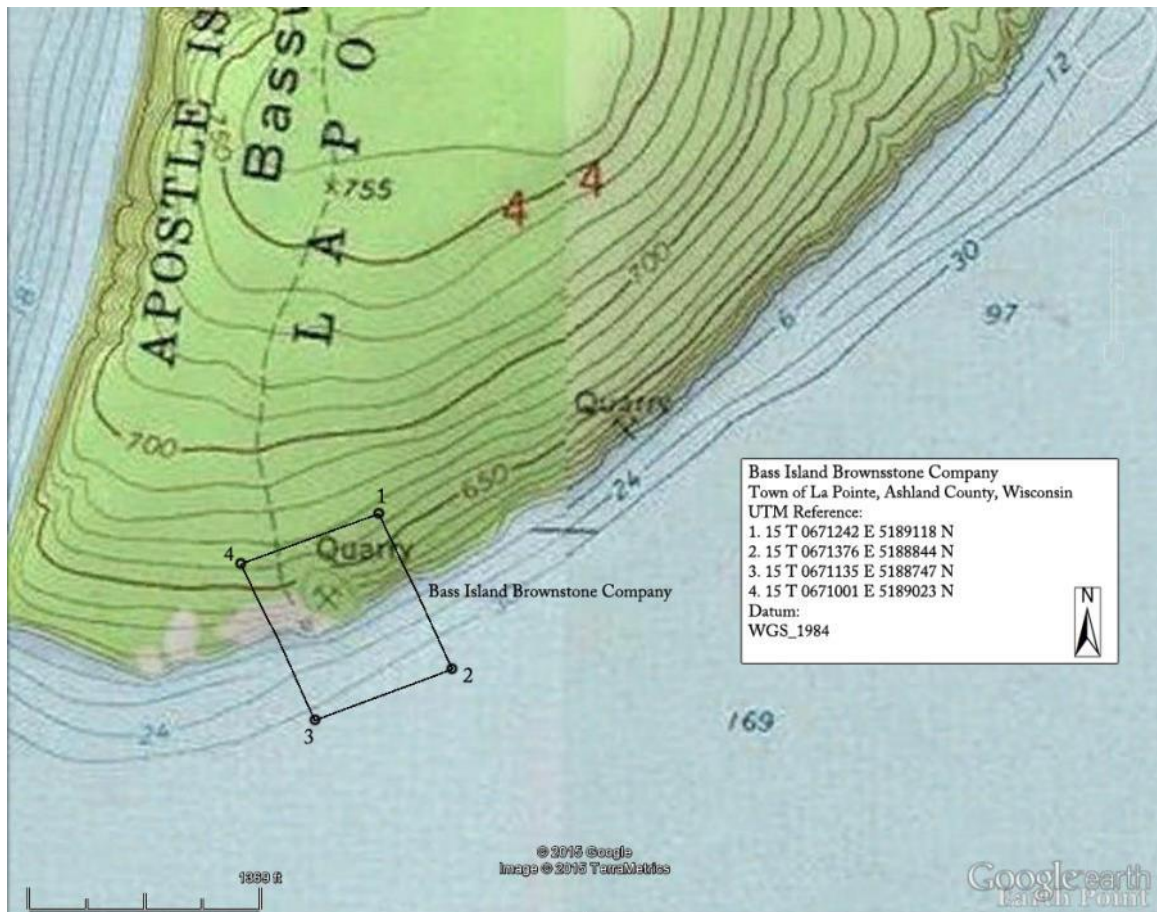


Figure 27. Location of the Basswood Island Quarry site

At the time of the survey, the main crib rose 15.0 feet from the sand, and was made up of ten stacked timbers. The timbers themselves are various widths while all measure 1.0 foot in thickness. The timbers making up the west end and the inshore side of the crib measure 1.75 feet wide, while the lakeside timbers measure 1.5 feet wide. The timbers making up the east end of the crib, as well as the cross-timbers, measure 1.0 foot wide. Additional timbers remain extant on the sand to the southwest of the crib near a portion of rail track and numerous iron rods used for fastening the timbers of the crib together. The rail track would have been a part of the narrow gauge railway used throughout the quarry. Two interlocked timbers are located on the sand, 5.0 feet north of the northeast corner of the crib. The interior of the crib is filled with medium to large sized rocks. Evidence of the upper structure of the crib can be seen on the lakeside edge, with rock fall extending up to 7.0 feet away from the crib.



Figure 28. Bass Island Quarry's main crib corner system

The main crib is connected to the island by a stone pier that now remains completely submerged. The rocks making up the stone pier have fallen outward in the years since the quarry's abandonment, and the top of the pier now lies in 4 to 7 feet of water. The rock fall from the stone pier measures 50.0 feet wide at 95.0 feet from shore, its widest point; and 41.5 feet wide at 130.0 feet from shore, its narrowest point. The pier extends 158.0 feet from shore to the southeast side of the main crib on a heading of 355 degrees. At the main crib, the pier widens to 60.1 feet wide. The majority of the pier is made up of medium to large rocks, and features numerous cut stones ranging from 2.0 feet by 4.0 feet, to 4.5 feet by 4.5 feet in size. The stone pier widens and flattens along the shoreline, and consists of small rocks and pebbles. No evidence of timbers or cribbing structure were extant along the stone pier, but various tools and other implements were found, including stone splitting wedges, and rods, along with a section of narrow gauge rail track measuring 16.7 feet in length on the southwest edge of the rock fall of the stone pier. Near shore, additional wedges and an iron turnbuckle were located, as well as two porcelain shards found near the near-shore cribbing.



Figure 29. An archaeologist swims over Basswood Island Quarry's main crib

The near-shore crib is one to two timbers in height. The length of crib runs 62.0 feet parallel to shore, and four extant cross-timbers measure 2.0 to 8.0 feet in length before extending beneath an overburden of small rocks. The crib is built around a small point located at the northern end of the crib, which is made up of large rocks, boulders and tree roots. An additional timber runs perpendicular to shore around this point, and measures 28.2 feet in length. All of the timbers measure 1.0 foot in width. It is possible that this crib shored up the natural point located at this part of the island. The small size of the rocks covering much of this crib indicates that they are remains of the point that have collapsed into the lake over time. The corner system of the near shore crib is the same construction as the main crib, though a 1.0-foot diameter upright timber is located in the southeast corner of the crib, near the edge of the point. It is unclear what use this timber had, but it is possible it was part of the corner construction system.

Located 95.5 feet to the northeast of the main crib, on a heading on 305 degrees, are the remains of the near-shore north crib, lying in 2 to 9 feet of water. This crib raises one to three feet from the sand and rock overburden, with one timber on the near-shore side, and three on the lake facing side. The crib measures 113.5 feet in overall length, with a width of 18.5 feet. The timbers themselves have various measurements. The timbers creating the near shore side of the crib measure 1.25 feet in width, while the timbers of the lake facing side of the crib measure 1.75 feet in width. The cross-timbers measure 1.0 to 1.5 feet in width. Small to medium rocks act as

overburden and fill inside the crib on the southwestern end of the crib, while sand fills the northeastern edge of the crib. A large rock fall is located at 33.5 feet along the baseline, extending 12.7 feet out into deeper water, which includes numerous cut stones measuring 2.0 feet by 3.5 feet, to 6.0 feet by 6.5 feet. Additional rock fall on the lake-side of the crib measures an average of 8.0 feet wide.



Figure 30. Interior of the main crib at Basswood Island Quarry

Additional timbers were located extending 24.25 feet from shore to the edge of the near-shore north crib. At 8.0 feet from shore, overburden of small rocks covers the timbers, extending 18.0 feet from shore. This crib measures 20.0 feet in overall width and consists of two stacked timbers measuring 1.0 foot wide, and 1.0 foot thick. The corner system of the near-shore north crib is the same construction as the other two cribs on the site. An additional 1.0-foot diameter upright timber remains extant in the southwest corner of the crib beneath a tree, near shore.



Figure 31. Rail located on the stone walkway leading from the main crib



Figure 32. A stone splitting wedge



Figure 33. Cut stone block with saw marks

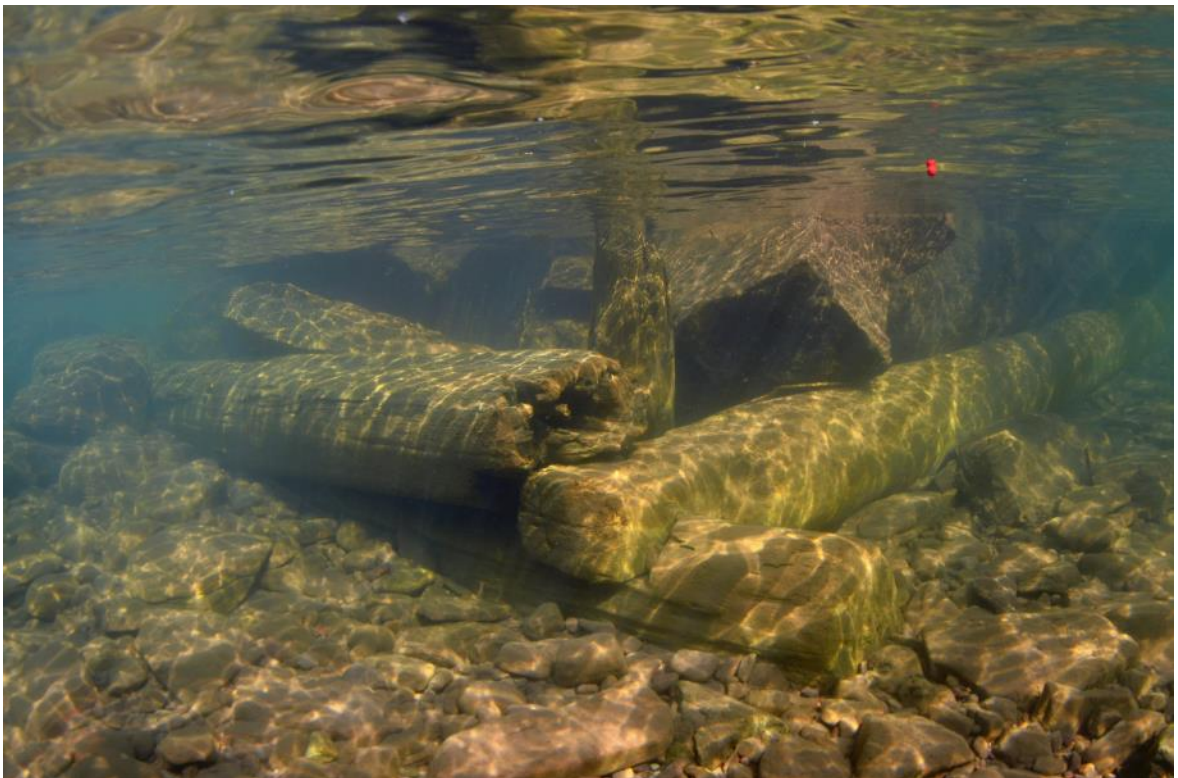


Figure 34. Southwest corner of the near shore crib

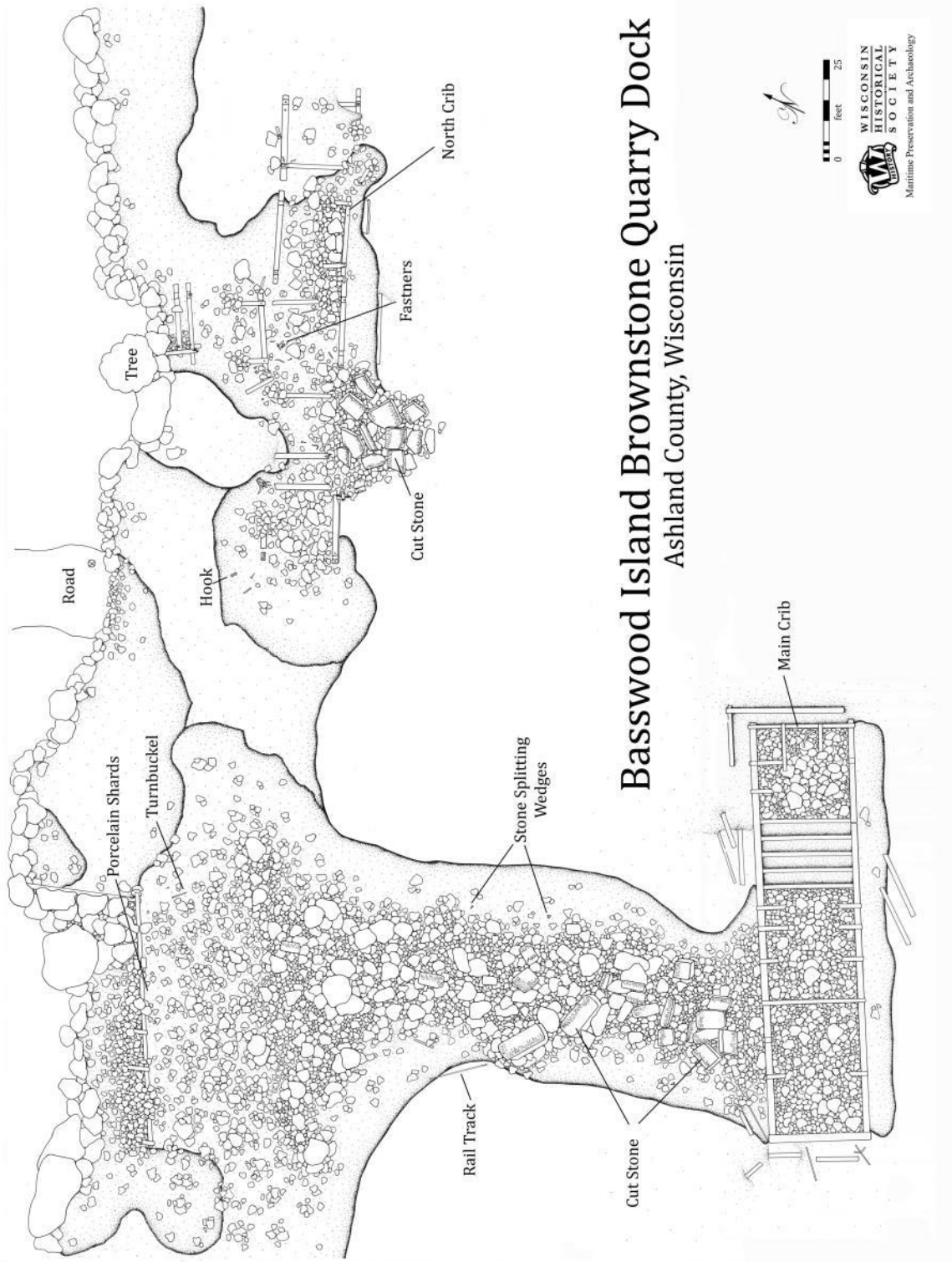


Figure 35. Basswood Island Brownstone Quarry Dock site plan

Hermit Island

The Excelsior Brownstone Quarry operated on Wilson's Island, today Hermit Island, from 1891 to 1897. The remains of the quarry are located on the northeast side of the island. In the 1850's, a trader with the Hudson Bay Company working for the American Fur Company in La Pointe, John Wilson, moved to the island. Known for being a recluse, Wilson built four log buildings on the uninhabited island and monitored visitors very closely. With the increased popularity of Lake Superior brownstone, following Wilson's death in 1865, investors began to look at the island for the development of a brownstone quarry (*Bayfield County Press* 1892a).

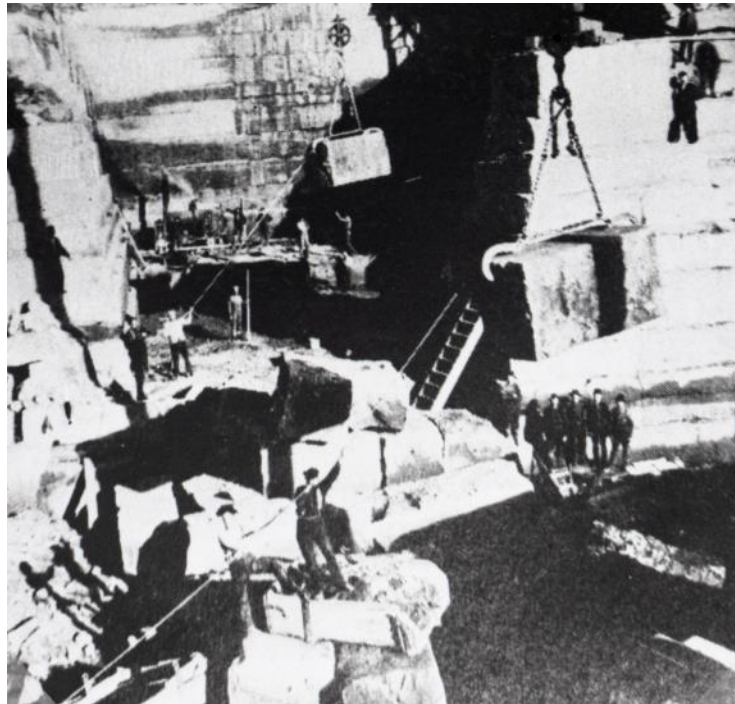


Figure 36. Excelsior Brownstone Quarry (Bayfield Historical Society Image 1980_1_514)

In 1884, while operating the Basswood Island quarry, the Cook & Hyde Company purchased 96 acres of land on the northeast side of Hermit Island, which had been placed for sale by H.M. Rice in June of 1883 (*Bayfield County Press* 1883b). Prior to this, the island was owned by Julius Austrian of St. Paul, Minnesota (*Bayfield Press* 1872a). Finding the stone on the island to be of superior quality, the Cook & Hyde Company began making plans to build a quarry on the site. Two weeks later, however, the venture was abandoned because the stone was not “developing as was expected” (*Bayfield County Press* 1885a, 1885b). In 1889, the Cook & Hyde Company sold all of their holdings, including lands on the Apostle Islands and the mainland, to Fredrick Prentice of the Prentice Brownstone Company. As one of the most successful producers of brownstone on the Bayfield Peninsula, Prentice had been looking for additional lands on which to build another quarry, and purchased additional land on the island from Julius Austrian of St. Paul. By the 1892 season, Prentice owned 874 acres of Wilson Island (*Ashland Daily Press* 1892a; Eckert 1985).

In August of 1890, E.E. Davis of Ashland traveled to Wilson's Island to look for a good location on which to build Prentice's new quarry. Choosing a location near the water on the northeastern edge of the island, Prentice began shipping machinery to the site to begin construction for the Excelsior Brownstone Company to be opened in the spring of the following year (*Bayfield County Press* 1890b). By May, operations had begun on Wilson's Island. With the installation of \$80,000 worth of machinery and equipment at the site, the first shipment of 7,000 cubic feet of stone was transported in June of 1891. By the end of the quarry's second season in 1892, Prentice had spent \$150,000 on improvements and machinery, including another steam engine, and multiple new channelers and steam derricks. That year, three vessels and five barges of stone, totaling 150,000 cubic feet, were shipped from the island (*Bayfield County Press* 1891a, 1953; *Ashland Daily Press* 1893; Eckert 1985).

In addition to the Excelsior Quarry, Prentice built Cedar Bark Lodge as a home for himself and his family on a point across a small bay overlooking the quarry site. The cottage was three stories tall, made entirely out of materials from the island, and had an observation tower overlooking the lake. The fireplace and chimney were made out of brownstone quarried from the Excelsior Quarry as well (*Bayfield County Press* 1953). The fireplace is now preserved at the Wisconsin Historical Society's Madeline Island Museum in La Pointe.

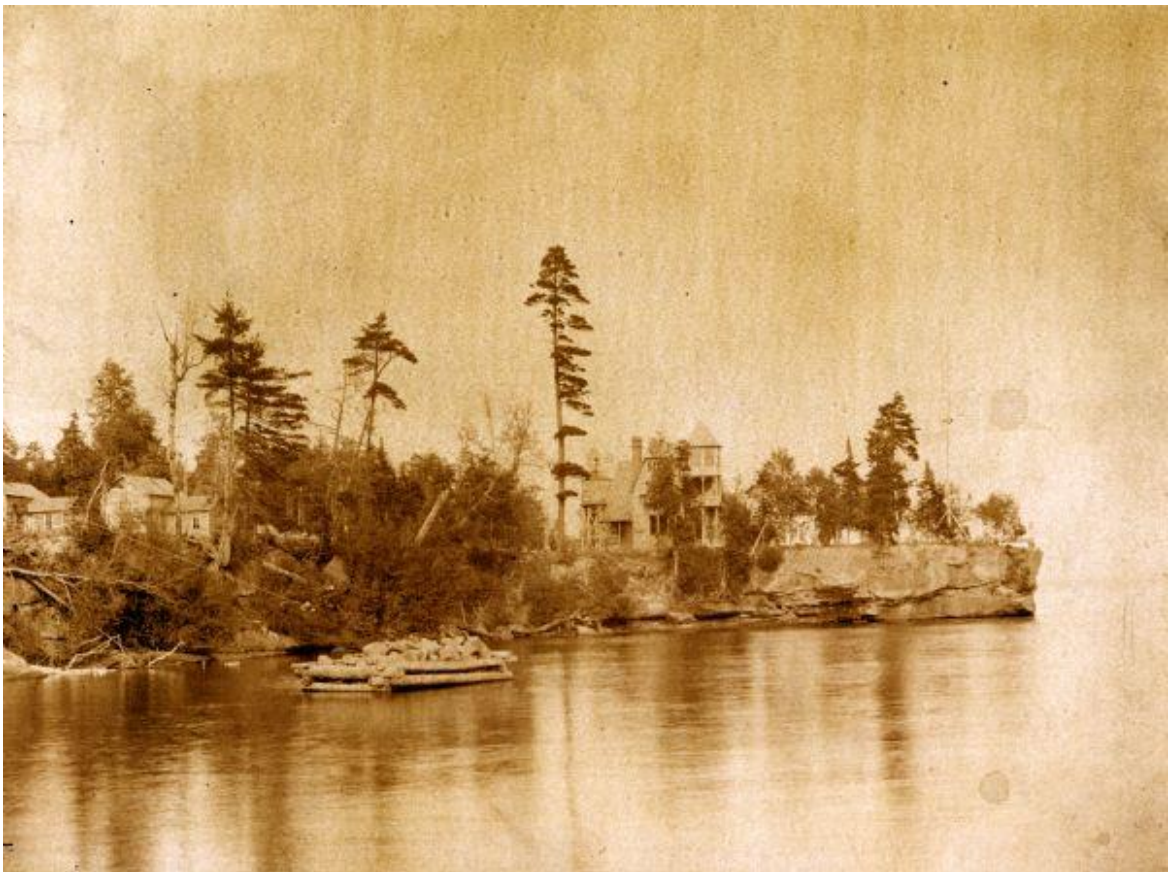


Figure 37. Cedar Bark Lodge and crib (Eckert 1985)

In the spring of 1892, the Excelsior Quarry was chosen to provide stone for the massive brownstone monolith that was planned to be featured at the 1893 World's Colombian Exposition in Chicago. Work began on the monolith in mid-June. The monolith was to be over 110 feet tall, 9.2 feet wide at the base, and 4.2 feet wide at the top. Located 200 feet from the water's edge, it was thought that removal of the monolith could be conducted easily by raising the stone with jack-screws and placing it on rollers for transportation to an awaiting schooner (*Bayfield County Press* 1892a). Despite the plans, the monolith was never harvested from Wilson's Island. After two different attempts to remove the stone from its bed, the work was abandoned, and the monolith was cut at Prentice's mainland quarry on Houghton Point. On 1 August 1892, thirty-five men and five steam channelers completed cutting the stone while onlookers watched as it was pulled from its bed. Unfortunately, Exposition officials felt it was too late in the season and too expensive to transport the monolith to Chicago in time for the opening of the World's Fair. Instead, the obelisk was cut up and used for building stone (Huber 1979). Four smaller brownstone monoliths, measuring only 25 feet in height, were completed though and placed on display at the World's Fair. It is unknown from which brownstone quarry these were cut (*Ashland Daily Press* 1892c).

In the fall of 1892, the quarry's dock facilities were improved by E.E. Davis, in preparation for a full crew working the Excelsior Quarry over the winter. Quarry operations were set to resume as soon as the ice in Chequamegon Bay had frozen enough to allow over ice transportation to and from the island (*Bayfield County Press* 1892b, 1892e, 1892f). In March of 1893, E.E. Davis requested that the quarry be opened early that year due to the lack of ice on the bay. Quarrying operations continued throughout the spring and into the summer, but by August the brownstone market had fallen drastically, and the quarry was shut down in the middle of the month, forcing twenty men out of work (*Bayfield County Press* 1893a, 1893c).

By 1893, a series of factors led the Prentice Brownstone Company into bankruptcy. To recoup some of his losses, Prentice sold all of his holdings on the Apostle Islands and the mainland to the Excelsior Brownstone Company investors. This sale included the quarry and all of the remaining brownstone on Wilson's Island, all tools, engines, derricks and machinery associated with quarrying, the scow schooner *Napoleon I*, and the steam tug *Minnie Karl*. The Excelsior Brownstone Company remained in operation on Wilson's Island for another five years, continuing to produce 220,000 cubic feet of stone each year, but by 1897, the company was no longer able to remain in business with the low demands for brownstone. In the fall of 1897, operations on the island ceased, and all land and the title to the island was sold to the estate of Elias Drake for \$10,000, and quarrying on the island was concluded for good. Hermit Island, and the old Excelsior Brownstone Company quarry remained in receivership for the next ten years, until it was purchased by W.G. Maginnes of New York for \$7,250 (Eckert 1985).

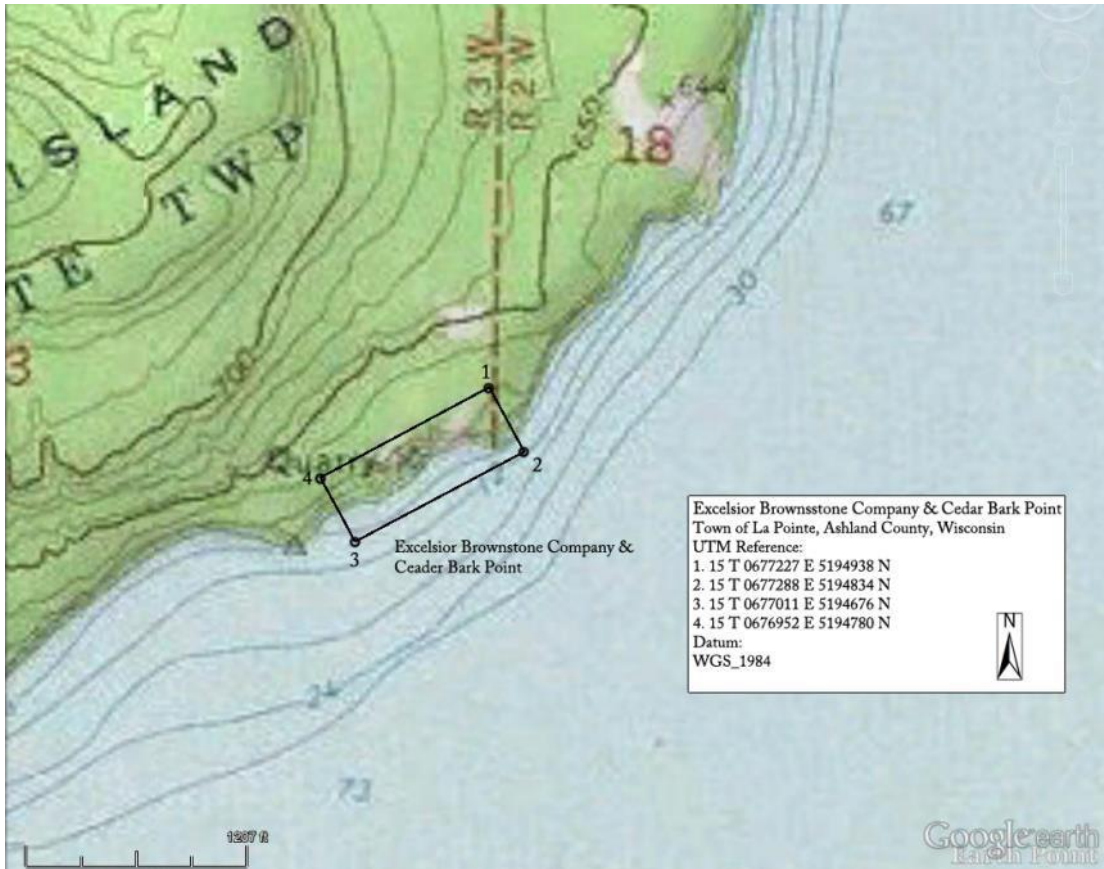


Figure 38. Location of the Excelsior Brownstone Quarry site

Site Description

The remains of the Excelsior Brownstone Company Quarry were recorded in a two-day field project by National Park Service archaeologists in 1981. The information gathered contains sketches and maps not drawn to scale, and brief descriptions of the extent of the terrestrial remains. This information remains within the archives of the Apostle Islands National Lakeshore. Additional documentation on the terrestrial components of the quarry is still needed.

The remains of the Hermit Island Quarry Dock extend nearly 156.6 feet into Lake Superior from the southern side of Hermit Island on a heading of 250-degrees. Overall, the site is located in 1 to 21 feet of water and consists of three crib structures. Measuring 228.8 feet in overall length, the main crib is made of a combination of “full round” and “double D” shaped timbers with a non-tapered dovetail corner system. The main crib’s width varied along its length, with a width of 22.0 feet up to 127.0 feet along the baseline, and 18.0 feet from 127.0 feet to its extent at 228.8 feet. A total station was set up on shore and a datum created at the coordinates, $46^{\circ} 52.969' W$, $090^{\circ} 40.574' N$, to gather point data for the edges of the cribs and accurately map in shoreline features. Four baselines were installed during the course of this survey from which all measurements were taken. One baseline was installed on each the main crib, the cribbing

gangway to shore, and the north crib along their lengths, while the fourth baseline extended along the finger pier.



Figure 39. Hermit Island Brownstone Quarry Dock shoreline survey. Cut brownstone stacked on the shoreline.

At the time of the survey, the main crib, made up of 8 timbers, rose 10.4 feet from the sand. The timbers themselves are various widths while all measure 1.0 feet in thickness. The timbers making up the inshore side of the crib measure 1.5 feet wide, while the lakeside timbers and cross-timbers measure 1.0 feet wide. An additional timber remains extant extending 10.7 feet from the rock fall interlocked to an extended cross-timber to the southeast of the crib, and measures 2.5 feet in width. The interior of the crib consists of medium to large sized rocks. Cut stones are extant among the uncut rocks throughout the crib, measuring 2.0 feet by 2.0 feet to 4.0 feet by 5.5 feet. Evidence of the upper structure of the crib can be seen on the lakeside face of the crib, with rock fall extending up to 5.6 feet away from the crib, extending along the face until 151.5 feet along the baseline. Additional cribbing is extant, extending 46.0 feet toward shore at the southern end of the main crib, beginning at 214.8 feet along the baseline and extending to the end. The cribbing measures 14.0 feet wide, and consists of timbers 1.0-foot wide extending to shore, and cross-timbers 0.7 feet in width. A post extends from the rocks 40.7 feet inshore of the main crib at 192.0 feet along the baseline.

The main crib connects to the island with a cribbing gangway, two timbers in height, which extends 54.5 feet from the inshore side of the crib to shore. This cribbing measures 16.5 feet wide

and extends from 133.5 feet to 150.0 feet along the baseline. The west side of the crib is constructed of timbers measuring 1.5 feet wide, while the timbers of the east side of the crib measure 1.0 feet wide. The crib also has two cross beams, one at shore, and one 10.1 feet inshore of the main crib, each measuring 1.0 feet wide. One additional crossbeam is located in the center of the main crib in line with the gangway, which measures 1.0 feet wide, and 16.5 feet long. Ten longitudinal timbers extending up to 24.0 feet from shore also remain extant. The shortest of these timbers measures 14.1 feet long. Two additional timbers remain extant on the east side of the crib, measuring 8.1 and 10.0 feet in length. Near shore, a length of cable, 1.0 diameter thick, remains loosely coiled, half-submerged and half-extending out of the water onto the shore.



Figure 40. Hermit Island main dock construction detail



Figure 41. Hermit Island north crib construction detail

Hermit Island Brownstone Quarry Dock Ashland County, Wisconsin

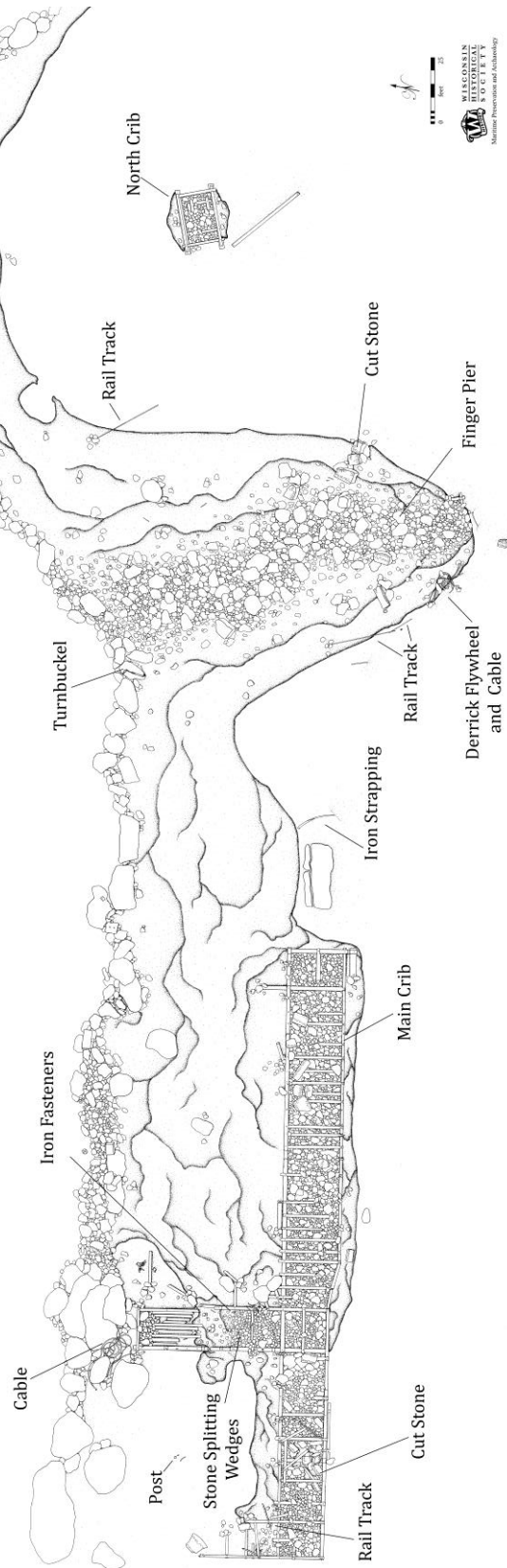


Figure 42. Hermit Island Brownstone Quarry Dock site plan

Approximately 164.0 feet to the northeast of the main crib, measured on a heading of 225 degrees, are the remains of a finger pier crib, now completely submerged, extending 147.5 feet from shore on a heading of 308-degrees. At its widest point, the rock fall from the finder pier measures 75.6 feet wide. Although the finger pier seems to be made up of mostly stones, evidence of cribbing remains near the end of the structure. Two interlocked timbers extend from the southeast corner of the finger pier, with the longitudinal timber measuring 1.0 feet wide and extending 5.1 feet from the rock fall, and the crossbeam measuring 0.7 feet wide and extending 4.2 feet from the rock fall. One additional timber remains extending 2.1 feet from the middle of the southernmost reach of the rock fall. This timber measures 1.0 feet wide. From the remains of these timbers, it is possible to discern that this finger pier was originally constructed with timber supports, much as the other cribs found on the site.



Figure 43. Derrick pulley on finger pier cribbing

The pier functioned as a working pier, as numerous artifacts were found along its length, including two narrow gauge rails measuring 24.9 feet and 9.1 feet in length, located 33.5 feet to the west and 37.0 feet along the baseline. A segment of narrow gauge rail, measuring 26.0 feet in length, remains located 56.6 feet to the east and 115.5 feet along the baseline. Additionally, a derrick flywheel, measuring 1.3 feet in diameter, remains extant near the southern end of the breakwater. Located 18.5 feet to the west of the baseline, and 11.5 feet from the end of the breakwater, the derrick wheel is surrounded by coils of cable, some still threaded through the wheel itself. Three cable ties are extant on the cable as well. Scattered through the rest of the remains of the breakwater are fasteners, rods, and stone splitting wedges, along with numerous cut stones measuring 2.0 by 3.0 feet to 4.5 feet by 7.0 feet. One additional cut stone is extant in the sand to the south of the finger pier. The stone itself measures 2.5 feet by 3.5 feet, and is located 9.1 feet from the rest of the rock fall. A segment of 0.1-foot diameter cable remains extant 1.1 feet from the edge of the rock fall near the cut stone, extending 4.1 feet before extending beneath the sand. On shore, remnants of an iron turnbuckle remain embedded in a rock, just above the waterline. The turnbuckle measures 4.7 feet in length and 0.7 feet in overall width. A section of cable remains threaded through the iron loop on the northern end of the turnbuckle, extending beneath the water.



Figure 44. Rail track segments

Located 158.5 feet to the northeast, of the turnbuckle, on a heading of 50-degrees, are the remains of the North crib, lying in 2 to 5 feet of water. The inshore side of the crib is 91.1 feet from shore. This crib raises 4.0 feet from the sand and rock overburden, and is constructed of three timbers on all sides. The crib features an interlocking saddle-notch corner system with “double D” and “full

round” timbers. The crib measures 20.1 feet in overall length, with a width of 14.3 feet. The timbers themselves have various measurements. The lower timbers of the crib measure 2.0 feet in width, while the upper timbers measure 1.0 in width. The cross-timbers and inner longitudinal timbers measure 1.0 feet in width. Medium to large rocks act as overburden and fill inside the crib, covering much of the internal timbers. Large rock falls are located on the northwestern and southeastern sides of the crib, with the northern rock fall extending 2.2 feet toward shore, while the southern rock fall extends 4.1 feet into deeper water. An additional timber was located to the southwest of the crib, measuring 32.0 feet long and 1.0 feet wide. Due to the length of this timber, it is likely that it was originally part of the finger pier support structure, since the nearby crib does not measure more than 20.0 feet in length.



Figure 45. The State Archaeologist examines a turnbuckle on shore

Stockton Island

Quarrying operations took place on Presque Isle, now Stockton Island, in 1871, and then again from 1886 until the fall of the brownstone industry in 1897. The Ashland Brownstone Company operated the main quarry on the island from the spring of 1886 through the end of 1897. The remains of the quarry are located on the southwest side of the Stockton Island, along the lakeshore. The earliest quarrying operations on Presque Isle took place in what is today known as Quarry Bay. Willard, Mercer & Company were contracted to quarry 300 cords of stone for the repair of the breakwater at Ontonagon, Michigan (*Bayfield Press* 1870, 1871g). The schooner *Chaska* carried the quarried stone from Presque Isle to Ontonagon throughout the season (Bayfield Press 1871f).

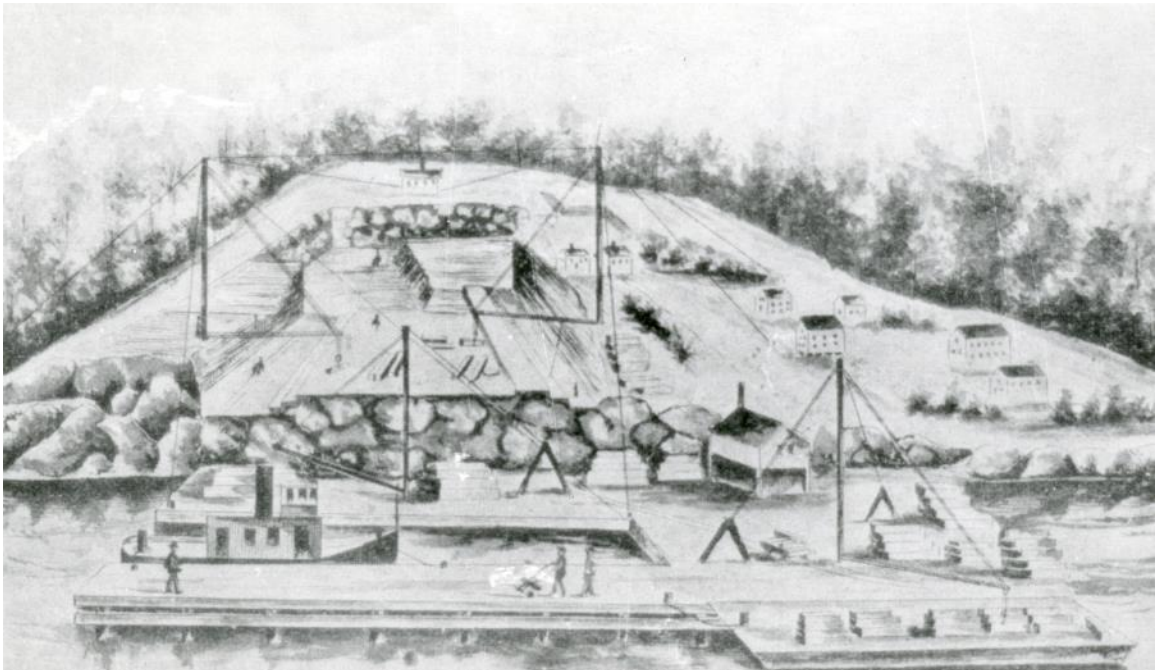


Figure 46. Stockton Island Quarry dock (Bayfield Heritage Association Image 1980_1_549)

Quarrying operations only continued in Quarry Bay until 1872, when the Ontonagon Breakwater repairs were completed. It was not until 1886 that brownstone quarrying again took place on the island. In March of 1885, the *Bayfield County Press* reported that despite the failure of the Cook & Hyde's brownstone quarry on Wilson Island, the probability of quarry operations opening on Presque Isle remained very high (*Bayfield County Press* 1885b). Joining the brownstone trade at its height in June of 1886, John F. Knight, a lumberman and lawyer from Ashland, and William F. Vilas, a lawyer, U.S. Senator, and cabinet member, from Madison, Wisconsin, purchased land on Presque Isle, to the southwest of Quarry Bay (Eckert 1985). In May, the tug *Favorite* towed a scow to the island with men and supplies to begin operations on the island (*Bayfield County Press* 1886).

By July, two steam derricks, a boiler with hoisting apparatus, a steam engine, and a Wardwell channeling machine were installed on the island and quarrying operations had begun in earnest

(Eckert 1985). It was not until October of 1886 that John H. Knight, D.S. Kennedy, and William Knight filed articles of incorporation for a new company headquartered in Ashland, Wisconsin, with a capital stock of \$50,000, the Ashland Brownstone Company (*Bayfield County Press* 1886). With newly installed equipment and access close to the lake's edge, the Ashland Brownstone Company was exporting 25,000 cubic feet of brownstone by midway through the 1887 season (Eckert 1985).

Due to the company's success, the Ashland Brownstone Company, along with two scows, the tug *Favorite*, and all quarrying machinery and tools, was bought for \$40,000 by two Chicago stone merchants, G.A. and J.G. Bodenschatz at the beginning of the 1890 season (*Ashland Weekly Press* 1890a). Shortly after purchasing the Ashland Brownstone Company, the Bodenschatz brothers began to implement large-scale changes to the quarry to increase productivity and profitability. In June, one new dock was built at Bayfield for the company, and one leased from the Western Central Railway, to easily transport stone to awaiting trains. With this new addition, the company could remain in operation 30 to 90 days longer at the end of the season due to patterns of ice development in Chequamegon Bay. Additionally, the company proposed to build cottages by the end of the 1890 season to accommodate a population of over 1,300 people on the island (*Bayfield County Press* 1890a; Eckert 1985).

In August of 1890, a schooner carried 800 tons of stone from the Presque Isle quarry for building the Cathedral of the Servite Fathers in Chicago. With the multiple quarry improvements and the addition of company docks on the mainland, the Bodenschatz brothers would push the quarry to produce 127,542 cubic feet of stone during the 1890 season, an increase from the 115,000 cubic feet transported in 1889 (*Ashland Weekly Press* 1890b; *Ashland Daily Press* 1892a). In November, pilings were driven into the company's mainland docks in preparation for the installation of new derricks for unloading stone in the spring (*Bayfield County Press* 1890b).

At the start of the 1891 season, the Ashland Brownstone Company made additional improvements to the quarry on Presque Isle. In March, the quarry docks were improved by an additional 400 feet of frontage for loading vessels. This 400 foot long dock extended further out into the lake so vessels drawing up to 22 feet when fully loaded, could tie up to the dock. Additionally, the new dock addition created a slip between wings of the dock for vessels to moor in inclement weather. The company also cut a new opening to the quarry that was located slightly to the south of the original opening. This allowed them closer access to the docks and to the water for easier transport of materials. By the start of quarrying operations in the spring of 1891, the Ashland Brownstone Company quarry had a total of four steam channelers, five 30-ton steam derricks, a newly built tug, *J.W. Ward* to carry additional stone more quickly. Predicted to lead the industry with the largest tonnage of brownstone shipped that season, the Ashland Brownstone Company's capital stock was raised from \$50,000 to \$100,000 (*Bayfield County Press* 1891a; *Ashland Daily Press* 1892a).

Shipping nearly 250,000 tons by the end of the 1891 season, the Ashland Brownstone Company quarry was only closely rivaled by the Prentice Brownstone Company quarries, and the Excelsior Company Quarry for that year. This amount continued to increase. Throughout the 1892 season,

the quarry on Presque Isle was turning out 900 cubic feet of No. 1 quality brownstone per day on average. The company ended the season having shipped over 680,000 cubic feet of stone in total. This was in comparison to the Superior Brownstone Company's quarry on Basswood Island producing 310,000 cubic feet of stone, and the Excelsior Brownstone Company only producing 150,000 cubic feet that year (*Bayfield County Press* 1892c; *Ashland Daily Press* 1892a, 1893).

Following this period of significant boom for the Ashland Brownstone Company, production rates began to fall off with the start of the 1893 season. As with other brownstone quarries in the region, a decline in popularity of brownstone as a construction material, reduced demand, lowering Presque Isle's production rates. This decline was due in part to the 1893 economic downturn as well as the 1893 World's Columbian Exposition. Despite this downturn, the Ashland Brownstone Company continued to operate their Presque Isle quarry until 1897, producing over 200,000 cubic feet of stone each year; notably the most successful of the Apostle Islands brownstone quarries following the economic crash. In 1897 though, the company could not maintain operating costs and the quarry suspended operation at the close of the season.

Though the Presque Isle quarry was operated for the shortest number of years of any of the Apostle Island's quarries, the Ashland Brownstone Company quarry had some of the highest production rates in the region, and produced stone for a number of notable buildings throughout the Midwest. A sample of those buildings include the Telephone Building and the Joseph L. Hudson Company Department Store in 1891, and the Schmidt Block in 1894 in Detroit, and the Duluth Breakwall in 1895 (*Ashland Daily Press* 1893; Eckert 1985).

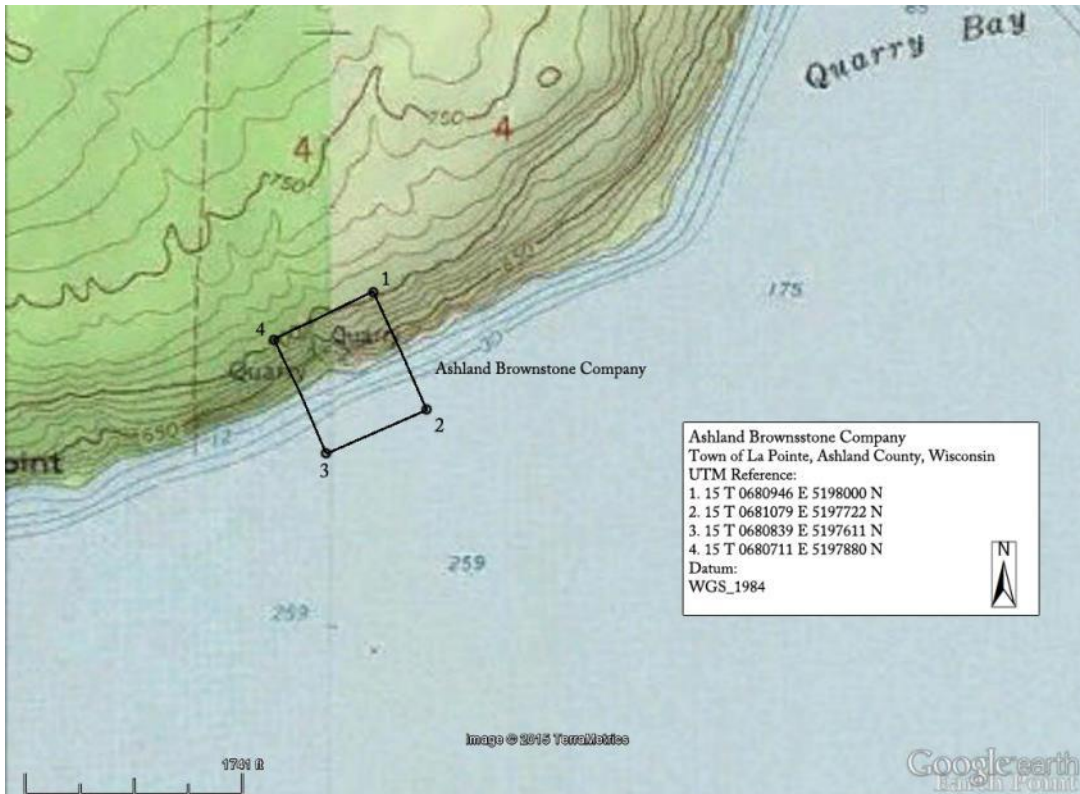


Figure 47. Location of the Ashland Brownstone Quarry site

Stockton Island Quarry Dock Site Description

The remains of the Ashland Brownstone Company Quarry were recorded in a two-day field project by National Park Service archaeologists in 1981. The information gathered contains sketches and maps not drawn to scale, and brief descriptions of the extent of the terrestrial remains. This information remains within the archives of the Apostle Islands National Lakeshore. Additional documentation on the terrestrial components of the quarry is still needed.

The remains of the Stockton Island Quarry Dock extend into Lake Superior from the southern side of Stockton Island on a heading of 250-degrees. Overall, the site is located in 7 to 23 feet of water and consists of six crib structures. Measuring 287.1 feet in overall length, the main crib consists of two spokes extending to the southwest from shore, with a 50.0-foot wide berth between the two spokes, and one cross-crib, connecting the two spokes. The lakeside spoke extends the full length of the crib and measures 18.5 feet in width, while the shore side spoke measures only 150.5 feet in length and only 18.0 feet in width. The entire crib structure is made of a combination of “full round” and “double D” shaped timbers with non-tapered dovetail, and interlocking saddle-notch corner systems. A total station was set up on shore and a datum created at the coordinates, 46° 54.567' W, 090° 37.490' N, to be able to gather point data for the edges of the cribs and accurately map in the shoreline. Three baselines were installed during the course of this survey from which all measurements were taken. One baseline was installed on each spoke of the main crib, while the third baseline extended from the cross-crib between the two spokes, to the northeastern extent of the site.

At the time of the survey, the main crib rose 15.1 feet from the sand, made up of 10 timbers, all measuring 1.0 feet thick and 1.0 feet wide, save for a cross timber, measuring 1.5 feet wide, located 187.5 feet along the baseline. Additional timbers and sections of interconnected timbers remain extant in the sand surrounding the crib, each featuring the same measurements of the timbers still attached to the main crib. A cross crib remains extant connecting the two spokes of the main crib. This crib begins at 150.0 feet along the shore side spoke baseline and 147.5 feet along the lakeside spoke baseline. All timbers of the cross crib are “full round” shaped timbers and measure 1.0 feet in width and thickness.



Figure 48. An archaeologist locates an axe head on Stockton Island Quarry's main crib

The interior of the crib consists of medium to large sized rocks. Cut stones are extant amongst the uncut rocks throughout the crib, measuring 2.5 feet by 4.5 feet to 4.5 feet by 5.0 feet. Three additional cut stones are extant at 215.6 feet along the lakeside spoke baseline in a rock fall extending into deeper water. Two of these stones measure 3.0 feet by 6.0 feet, with the other stone measuring 3.5 feet by 6.0 feet. Evidence of the upper structure of the crib is defined by a rock fall on all faces of the crib spokes. The rock fall extends from 4.0 feet to 8.1 feet from the shore side spoke. The rock fall extends 8.0 feet to 10.2 feet from the inshore side of the lakeside spoke and 13.5 feet to 19.0 feet into deeper water on the lake facing side of the crib. A large rock fall remains off the northeastern end of the lakeside spoke, extending 33.4 feet to the northeast. This rock fall contains 10 additional large, cut stones, measuring 6.0 feet by 6.5 feet to 3.0 feet by 8.5 feet in size.



Figure 49. Corner of interior crib

Numerous artifacts were located throughout the crib structure, including an iron axe head, found at 161.1 feet along the baseline of the lakeside spoke of the crib. Additionally, 57.6 feet, on a 60-degree heading, from the southeastern corner of the lakeside spoke of the crib, are the remains of one intact leather boot, and two leather soles. Although exact dating could not be concluded, the style of these boots and their location near other artifacts signify that these are likely associated with the quarry and dock structure. Additionally, the remains of a wagon or cart axle and leaf spike remain extant 55.9 feet to the southeastern edge of the lakeside spoke, half buried in the sand, sitting upright. The leaf spike measures 5.5 feet in diameter, and the axel shaft extends 4.5 feet from where it is attached to the lead spike.



Figure 50. Pulley



Figure 51. Wagon or cart axle and leaf spike

Stockton Island Brownstone Quarry Dock

Ashland County, Wisconsin

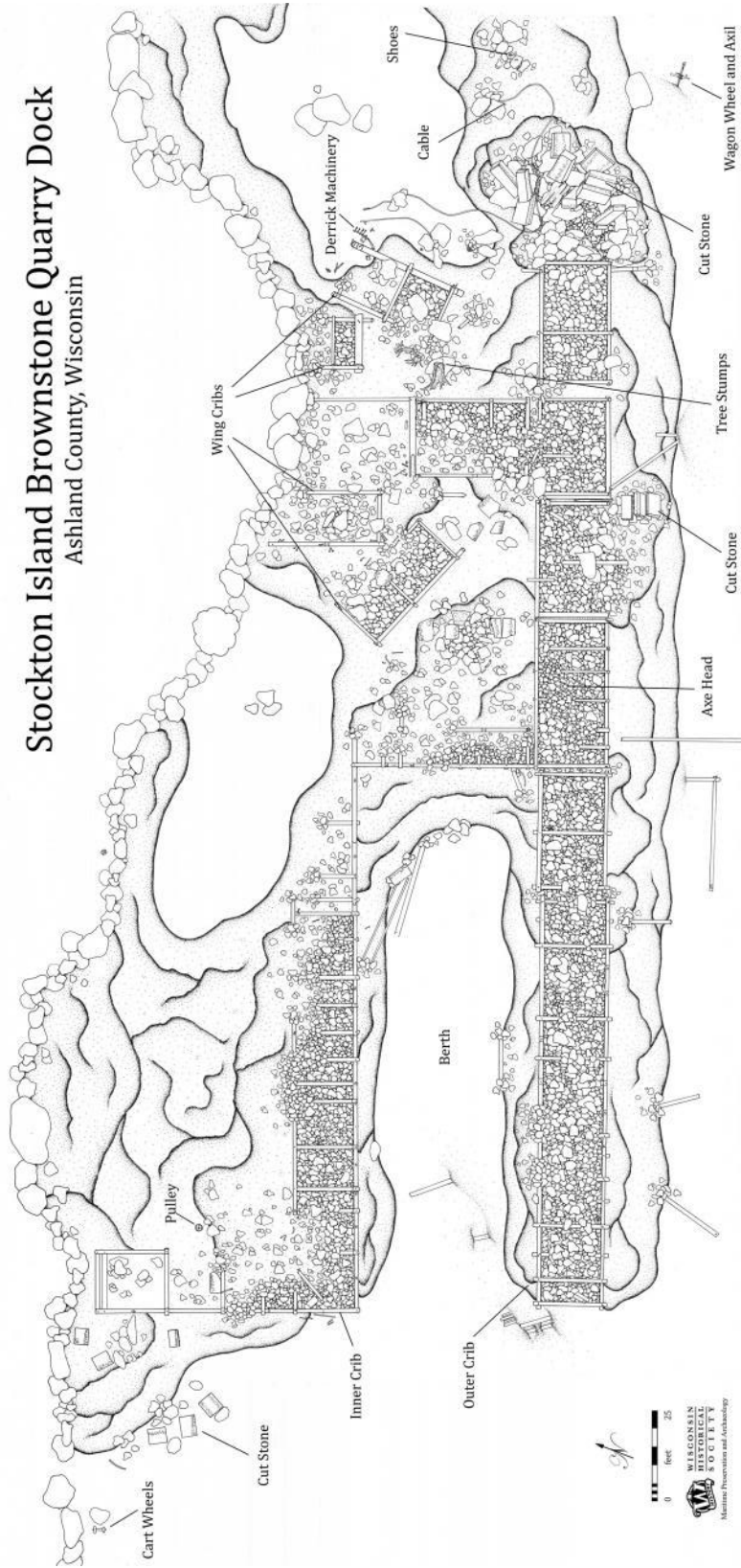


Figure 52. Stockton Island Brownstone Quarry Dock site plan

Additional cribbing extends 72.5 feet toward shore at the southwestern end of the inshore spoke, beginning at 18.0 feet along the baseline and extending to the end of the spoke. The cribbing measures 18.0 feet wide, and consists of timbers 1.0 feet wide extending to shore, and cross-timbers 1.0 feet in width, fastened together with 0.1 to 0.15-foot diameter through bolts and drift bolts. Extending 18.0 feet from shore, the timbers remain beneath an overburden of small to medium sized rocks, and do not reappear until it connects to the shore side spoke. Just to the west of this cribbing, six additional cut stones remain extant, measuring 2.5 feet by 4.5 feet square to 4.5 feet by 5.0 feet square. Other artifacts remain to the west of these stone blocks as well, including a short segment of narrow gauge rail track and a set of narrow gauge wheels from a cart. Further artifacts were located near the datum point, including the remains of thin iron strapping just on shore.

The rest of the crib is composed of five separate crib structures, three extending from the edge of a large point, and the other two wing cribs extending diagonally between these. The main crib extending from shore connects the main crib to the island, and at the time of the survey, stood one to two timbers in height in 1 to 7 feet of water. The crib extends 61.2 feet in length, stretching from shore, to 2.5 feet inshore of the main crib. This cribbing measures 21.5 feet wide and is composed of longitudinal timbers measuring 1.0 feet wide, and cross timbers measuring 1.0 feet to 1.5 feet in width. The crib is filled with small to medium sized rocks, with corner systems similar to the main crib, fastened with round and square fasteners. Additionally, stone spitting wedges remain extant scattered amongst the rocks. On either side of this main cribbing, two additional cribs, standing one timber in height each, extend from shore. The western crib extends 24.0 feet from shore and is 15.5 feet in width, remaining in 1 to 2 feet of water. The longitudinal timber on the western facing side of the crib measures 1.5 feet wide while the cross-timbers and the longitudinal timber on the eastern facing side measures 1.0 feet wide. The eastern crib is slightly smaller, extending only 16.0 feet from shore, and measures 14.0 feet in width. Both longitudinal timbers measure 1.0 feet in width, while the cross-timbers vary in widths. The timber constructing the southern end of the crib measures 2.0 feet in width, while the single cross timber only measures 0.6 feet in width. Just to the southwest of this crib, between it and the main crib extending from shore are three large petrified stumps. Though it is possible wind and wave action moved these stumps to this location, the largest stump has a 0.1 feet squared, square bolt embedded in its side.

The two wing cribs extend in front of the two short cribs that extend from shore, one on either side of the main crib running perpendicular to shore. The western wing crib measures 32.5 feet in length and 15.5 feet wide, with its longitudinal timbers measuring 1.0 feet wide and cross-timbers measuring 0.7 feet wide. The eastern wing crib has similar measurements, running 31.0 feet in length, and measuring 16.0 feet wide. The southeastern facing longitudinal timber measures 1.5 feet wide, while the northwestern facing longitudinal timber and both cross-timbers measure 1.0 feet wide. Additional stone spitting wedges were found scattered throughout this area. Though it is not known why there are so many small cribs in this location, it is possible these cribs made up the support structure for a wide storage dock when the quarry was in operation. A historic painting from the time of the quarry's operation depicts a large, flat, open space on which cut stones and tools were stored before being loaded onto awaiting ships.

Various artifacts, associated with a derrick and other loading machinery, were located to the east of the eastern wing crib. These include a piece of derrick machinery consisting of a box, and two iron straps with bolts still attached. The straps extend 7.0 feet in total, while the box measured 1.2 feet square. The bolts range in length from 1.1 feet long to 1.5 feet long and all are 0.1 feet in diameter. Additionally, a length of cable remains extant extending from near this derrick machinery to the large rock fall off the northern end of the lakeside spoke of the main crib, until terminating beneath rocks near the disarticulated boot remains. A 19.0-foot long narrow gauge rail section remains extant 10.5 feet from the eastern wing crib, as well as a derrick wheel, measuring 1.5 feet in diameter. Other small iron machinery parts were found to be scattered throughout this area as well.



Figure 53. Leather boots and sole

CONCLUSIONS AND RECOMMENDATIONS

This field report is a component of the ongoing research to document Wisconsin's collections of historic shipwreck and submerged cultural sites. Combined with earlier fieldwork conducted by the Wisconsin Historical Society, this document adds to the ever-increasing body of knowledge on Wisconsin's historical Great Lakes vessels and maritime heritage sites. Archaeological surveys conducted by the Wisconsin Historical Society are designed to document sites according to the standards and guidelines established by the National Park Service for submerged cultural resources. A primary goal of the surveys is to evaluate a site to determine its eligibility for listing on the National Register of Historic Places. A National Register of Historic Places nomination has been submitted and is under review at the state level for all three shipwreck sites.

As one of the earliest documented schooners in Wisconsin waters, the *Hanover* survey was designed to document early Great Lakes schooner construction and to provide positive vessel identification through identifying marks or artifacts. The first objective was achieved, and *Hanover* is under review for listing on the State Register of Historic Places. Its nomination will then be forwarded to the National Park Service for consideration for listing on the National Register of Historic Places.

The second objective, to provide positive vessel identification through identifying marks or artifacts, was not achieved. A complete archaeological documentation of the *Hanover* site will be a continued process for years to come. Much of *Hanover*'s remaining hull structure is believed to be buried in sand near the site. With the removal of an estimated eight feet of filled sand from the interior of the hull, it is evident that a large quantity of sand moves through the area with each passing storm. As the sand continues to move, there is potential for previously undocumented hull structure and artifacts to be uncovered and exposed. For this reason the site should be monitored and any newly exposed structure or artifacts should be documented and added to the site plan. The vessel's size, location and construction details, all support the identification as *Hanover*.

The *Hanover* site is easily accessible via boat, and is located 1.75 miles northwest of Fish Creek Harbor, just south of the Strawberry Islands. Due to its shallow nature and cladophora blooms in Green Bay, visibility at the site is oftentimes poor. Only recently uncovered from the sands and reported in the spring of 2014, she remains lightly visited. Because of the site's location near a shoal south of the Strawberry Islands and the changing nature of the site, it is not recommended for a State-sponsored mooring buoy. Information gathered during the survey will be used to for website updates, public outreach, and educational materials for Door County and the surrounding community.

Success represents a unique site, as it is one of only six documented scow schooners in Wisconsin waters, and remains the only documented scow schooner in the Great Lakes featuring fore-and-aft hull planking. The *Success* survey was designed to document Great Lakes scow schooner construction and to provide positive vessel identification through identifying marks or artifacts. The first objective was achieved, and *Success* is under review for listing on the State Register of Historic Places. Its nomination will then be forwarded to the National Park Service for consideration for listing on the National Register of Historic Places.

The second objective, to provide positive vessel identification through identifying marks or artifacts, was not achieved. A complete archaeological documentation of the *Success* site will be an ongoing process for years to come. Although remarkably intact for such a shallow wreck site, much of *Success*' remaining hull structure is buried beneath two to three feet of sand. Due to the site's shallow nature, a large quantity of sand moves through the area on a yearly basis. As the sand moves previously undocumented hull structure and artifacts will continue to be uncovered and exposed. For this reason the site will be closely monitored and any newly exposed structure or artifacts will be documented and added to the site plan. Although no name board was located, the vessel's size, location, construction, and description of her loss all support the identification as *Success*.

The *Success* site is easily accessible via boat or kayak, and is located less than a hundred feet from the shoreline south of Whitefish Dunes State Park in Whitefish Bay. Despite its shallow nature, visibility at the site usually remains good. The site is best explored during prolonged periods of calm weather. Because of the site's proximity to shore and the shallow and changing nature of the site, it is not suggested for a State-sponsored mooring buoy. Likewise, the local residents and landowners along the shore are very protective of the *Success* site. During field investigations by the Wisconsin Historical Society, local residents came out to inquire as to what was occurring on the site. With this connection to and pride for the wreck site, a State-sponsored mooring buoy is not recommended. Information gathered during the survey will be used to for website updates, public outreach, and educational materials for Whitefish Dunes State Park and the surrounding community.

Like *Hanover* and *Success*, the *Pathfinder* survey was designed to document early Great Lakes schooner construction and to provide positive vessel identification through identifying marks or artifacts. The first objective was achieved, and a National Register of Historic Places nomination *Pathfinder* is under review for listing on the State Register of Historic Places. Its nomination will then be forwarded to the National Park Service for consideration for listing on the National Register of Historic Places.

The second objective, to provide positive vessel identification through identifying marks or artifacts, was not achieved. Despite achieving the first objective, many opportunities remain for further research that could significantly add to our understanding of Great Lakes sailing vessels in general, and to schooners specifically. A complete archaeological documentation of the *Pathfinder* site will be an ongoing process. Much of *Pathfinder*'s remaining hull structure is believed to be buried in sand near the site. While schooners were commonly used throughout the Lakes, little comparative work has been conducted on the many variances in Great Lakes schooner construction. Additionally, *Pathfinder* offers a unique opportunity to study wooden vessel construction as vessels reached nearly 200 feet in length. Without the use of metal structural supports, as is found in many contemporary schooners of this length, *Pathfinder*'s unique keelson structure represents an opportunity to study construction techniques underrepresented in the archaeological record. Although no name board was located, the vessel's size, location, construction, and description of her loss all support the identification as *Pathfinder*.

Pathfinder is an excellent location to study and observe the construction techniques used to build goliath nineteenth-century Great Lakes schooners. Although the hull is broken up, nearly all of the *Pathfinder*'s hull components and rigging are extant, both above and below the sand. To many divers, a broken hull such as *Pathfinder* holds less appeal compared to more intact vessels, as the vessel was entirely stripped of rigging, gear, and artifacts during salvage attempts following the wrecking. To an analytical eye, however, the *Pathfinder* site presents a prime opportunity to study and learn about wooden vessel construction. The advantage of broken hulls like *Pathfinder*'s is that they offer a view of many construction details that are hidden in more intact vessels. For this reason the *Pathfinder* site is the best of both worlds – she is intact enough to have nearly all hull sections represented, but allows a thorough examination of the many intricate details that would be hidden were the vessel intact.

The *Pathfinder* site is easily accessible via boat or kayak, and is located only 0.2 miles from shore north of Two Creeks. Due to its shallow nature, visibility at the site is poor at times. Likewise, the site sits in an area covered by a very fine sand and cladophora, which can cloud visibility on days of heavy weather. The site is best explored during prolonged periods of calm weather, and can easily be seen from the surface. Because of the shallow and changing nature of the site, it is not recommended for a State-sponsored mooring buoy. Information gathered during the survey will be used to for website updates, public outreach, and educational materials for the surrounding community.

The survey of the Apostle Islands Brownstone Quarry Dock sites on Basswood, Hermit, and Stockton Islands were designed to document the existing underwater structures and artifacts associated with late nineteenth century brownstone quarrying to update information gathered by the National Park Service, and to evaluate each site for listing on the National Register of Historic Places. The first objective was achieved for all three sites, and a detailed site description and historical documentation was completed for each. The information gathered will be shared with the Apostle Islands National Lakeshore for their records and to update their interpretive materials.

The second objective, to evaluate each site for listing on the National Register of Historic Places, was also achieved. With thorough documentation of the submerged resources at each site, and an examination of the existing archaeological documentation of the terrestrial components of the quarries completed by the Apostle Islands National Lakeshore in the 1980's, an evaluation of the eligibility of the three quarries was completed. A National Register of Historic Places nomination for the Bass Island Brownstone Company, located on Basswood Island, was completed in 1976 and the site was listed on the National Register. Detailed historical information and a detailed documentation of the submerged resources were not included in the original National Register documentation. Following archaeological investigations, these components were completed and included in an update to the original National Register of Historical Places nomination, which will be under review in August of 2015.

The archaeological remains of the Excelsior Brownstone Company on Hermit Island were evaluated and found to be ineligible for nomination to the National Register of Historic Places at this time. Although archaeological investigations of the quarry site were conducted on the island

in 1981, the information gathered is not sufficient for the completion of a National Register of Historic Places nomination. A more detailed site description of the terrestrial remains of the quarry is needed. A thorough documentation of the submerged archaeological remains was completed, along with detailed historical documentation, which will be submitted to the Apostle Islands National Lakeshore for their use, should more terrestrial work be completed in the future. With more documentation of the terrestrial component of the site, a National Register of Historic Places nomination could be completed and submitted by the Apostle Islands National Lakeshore.

Much like the Excelsior Brownstone Company quarry, the remains of the Ashland Brownstone Company on Stockton Island were evaluated and found to be ineligible for nomination to the National Register of Historic Places at this time. Similarly to the site on Hermit Island, preliminary archaeological investigations were conducted at the Stockton Island quarry site in 1981, but the information gathered was collected for management purposes and does not encompass the detailed information necessary for a National Register of Historic Places nomination. A more detailed site description of the terrestrial remains is still needed. Detailed historical research and a thorough documentation of the submerged cribbing and artifacts were completed, which will be submitted to the Apostle Islands National Lakeshore for their use. Should additional terrestrial archaeological investigations be completed at the Ashland Brownstone Company site, the information gathered on the submerged resources can be used to supplement the site description for a National Register of Historic Places nomination completed by the Apostle Islands National Lakeshore.

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