Missisquoi Bay Barges Underwater Archaeological Survey

by Scott A. McLaughlin

Project Description

The Vermont Agency of Transportation (AOT) proposes to rehabilitate the Missisquoi Bay Bridge between East Alburg and West Swanton (Hog Island) (Figure 1). The present bridge and causeway were constructed between 1936 and 1938 to carry Vermont Route 78. The proposed bridge work will consist of the replacement or the repair of the existing abutments and the rehabilitation of the existing drawbridge, with little, if any, effect to the causeway. The waters to the north and south sides of the causeway needed to be studied for potential underwater archaeological sites as work barges and other watercraft will be moored in the construction area. A previous study (Thomas and Cohn 1991) covered a portion of the potential impact area, but supplemental work was needed due to changes in the construction design and the Vermont Division for Historic Preservation’s (DHP) standards of archaeological studies (Wilkie 1995:1).

The current project was conducted by the Lake Champlain Maritime Museum with the support of the Archaeology Research Center, University of Maine at Farmington. The project area covered the entire length of the causeway-bridge complex, which is about 1235 m (4050 ft) long across the narrow outlet of Missisquoi Bay. A wide area needed to be considered on either side of the causeway given that construction barges will be moved along and ultimately anchored next to the causeway-bridge complex. The impact area, determined by AOT, was established as a 91.5 m (300 ft) wide area on each side of the causeway (Wilkie 1995:1). The project area was expanded to approximately 300 m (1000 ft) north and 600 m (2000 ft) south of the Missisquoi Bay Bridge.

During the earlier survey of the project area, the only significant submerged cultural resources that were identified were four historic wooden barges near the north side of the causeway on the Alburg end (Thomas and Cohn 1991:26) (Figure 2). The current archaeological study was undertaken between September 25 and 29, 1995. During the project six wooden scow barges, a large wooden tub, an iron boiler and a large wooden rudder were located. It is assumed that all of these features are related to the construction of the Missisquoi Bay Bridge.

Survey Results

A side-scan sonar unit, free swimming divers, and towed divers were used to collect data on the lake bottom. No significant targets were located during the sonar survey (Figure 3). Most of the targets were geologic features or what was probably debris such as logs, parts of docks, and fishing shanties.

Over five days, divers surveyed the waters on the north side of the causeway and between the piers supporting the Missisquoi Bay Bridge (Figure 4). Divers scanned the lake bottom for significant historic cultural features and isolated finds. They used both their hands and eyes to inspect the lake bottom.

A wooden rudder attached to a rudder post was found on the west side of the causeway (Figures 5 and 6). The rudder post is 3.20 m long (10 ft 6 in), and the rudder blade is 1.59 m tall (5 ft 2.5 in), 1.83 m long (6 ft), and 15.2 cm thick (6 in). The rudder post is elliptical in shape. The blade is made of two sets of horizontal boards. Each set of boards is drift bolted together. The head of the rudder post is reinforced with iron strapping and mortised for a wooden tiller. There was no evidence of pintles or gudgeons on the rudder post.

The construction of the rudder is very similar to that of the barges inspected during the earlier survey at the west end of the causeway. The barges exhibited no evidence of sailing features or the attachment of a rudder, but the size of the rudder is appropriate for the barges. It is uncertain if the rudder is from one of the barges. Barges do not usually have rudders, as their directional control is usually furnished by the vessel providing the tow.
Figure 1. General location of the project area.

--- Vermont Route 78 --- Central Vermont Railroad Lamoille --- Valley Extension Railroad

Figure 2. Underwater archaeological survey area covered in 1987-1988 (drawn by Scott A. McLaughlin, 1996).
Northwest of the rudder, divers located a 4.27 m (14 ft) long wooden tub. The tub is constructed of vertical stays held together by a metal band around the bottom of the tub. The tub’s bottom is constructed of thick planks running across the width of the tub. The tub’s height and width could not be accurately determined because the tub is upside down, and much of it is buried. The minimum each dimension could be is 1.2 m (4 ft). Leading to the southeast corner of the tub is a small iron pipe. The pipe enters the lake bottom approximately 4.5 m (15 ft) from the southeast side of the tub. It is assumed the two features are related.

Another feature that may be related is a 40 cm (16 in) diameter timber that leads out from the riprap slope into the lake bottom approximately 6 m (20 ft) northwest of the tub. No clues could be found as to the use or date of when this object sank into the bay. An investigation of the construction of the tub and other features may help to answer some questions.

Six late-nineteenth or early-twentieth century scow barges, designated VT-GI-22, were located north of the western end of the causeway, two of which are outside the proposed impact area (Figure 7). Three of the barges within the project area are visible from the shoreline, while one is below water. The three visible barges were identified and photographed during the 1987-1988 underwater archaeological reconnaissance survey of the area. The barges are heavily constructed with flat bottoms, transverse bottom planking, a large chine log, three stringers, and steeply raked ends. The hull’s sides are supported by posts mortised into a
chine log that runs the length of the vessel at the junction of the vessel’s side and bottom. The side planks are edge-fastened by long iron drift bolts. The only measurements that were taken of the vessels were their bottom dimensions (Table 1). These were the only dimensions that were easily accessible and useful at this point of the survey.

The above water portions of the barges are badly deteriorated. Only barge E still had identifiable upper works during the 1987-1988 survey; but it has subsequently collapsed into the interior of the vessel (Thomas and Cohn 1991:22). The deck of this vessel was attached to the hull using hanging knees. The deck was also supported by a series of stanchions placed on top of the keelson that are capped by a longitudinal timber running fore and aft under the deck beams. The only artifacts that were visible inside of these barges were wire cable and a hand truck in barge C.

Between barges E and F, a cast iron boiler was located. The boiler measures 2.6 m (8 ft 6 in) in height and 1.2 m (4 ft) in diameter. Located 30 cm (12 in) from the top of the

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**Table 1. Bottom Dimensions of Barges**

<table>
<thead>
<tr>
<th>Barge</th>
<th>Beam</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>9.14 m</td>
<td>25.60 m</td>
</tr>
<tr>
<td>B</td>
<td>10.05 m</td>
<td>26.21 m</td>
</tr>
<tr>
<td>C</td>
<td>9.75 m</td>
<td>21.79 m</td>
</tr>
<tr>
<td>D</td>
<td>9.91 m</td>
<td>24.38 m</td>
</tr>
<tr>
<td>E</td>
<td>8.99 m</td>
<td>27.74 m</td>
</tr>
<tr>
<td>F</td>
<td>8.84 m</td>
<td>19.81 m</td>
</tr>
</tbody>
</table>

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*Figure 4. The 1995 scuba diver survey area along the northern side of the causeway (drawn by Scott A. McLaughlin, 1995).*
boiler is a rectangular opening 23 cm by 46 cm (9 in by 1 ft 6 in). A metal plate was bolted over this opening containing the hardware to regulate the boiler. The top of the boiler has also been removed, exposing the ends of the 9 cm (3.5 in) thick boiler walls. This boiler was originally located aboard barge F, but was accidentally dropped into the lake during the 1940s (Oscar and Anna Bohannon, personal communication 1995).

Two additional barges were located 320 and 425 m (1050 and 1400 ft) north from the west end of the causeway. They apparently have been a nuisance to boaters, as they have been marked by small buoys tied to their outer limits. Numerous buoys were also found sunk in the same area but still tied to the vessel. These vessels were built using the same construction techniques as the other four. A cast iron capstan was found in barge A. The capstan is approximately 76 cm (30 in) in diameter and 92 cm (3 ft) tall. There is no evidence of upper works of either of these barges. Only one side is intact on barge A, but the ends still stand on both barges A and B.

The Bohannons remember as many as seven barges working during the construction of the causeway (personal communication 1995). The six barges located during this survey are among the seven. An attempt was made to locate the seventh barge by towing a diver at a slow speed behind an inflatable boat. Two survey runs were made between the wooden tub and barge B, but nothing was located. A circle search was also made around barge A and B with no success.

Missisquoi Bay Bridge and Barges

The States of Vermont and New York authorized the construction of the Missisquoi Bay Bridge and the Rouses Point Bridge simultaneously. This was done to create a direct highway connection between U.S. Route 9 in New York and U.S. Route 7 in Vermont (Figure 8). These were the primary north-south routes through the Champlain Valley. The Lake Champlain Bridge Commission, established in 1927 and staffed jointly by appointees from both New York and Vermont, was charged with the task of constructing the Rouses Point Bridge (Vermont General Assembly 1935:220). The Missisquoi Bay Bridge, being entirely within Vermont, required the state to create a new
The bill, Act No. 212, was passed on February 27, 1935, creating the Missisquoi Bay Bridge Commission and authorizing the construction of the bridge. On March 9, 1935, Governor Charles M. Smith appointed Dr. George E. King of Alburg, P. E. Sullivan of St. Albans, and E. T. Bradley of Swanton as members to the Commission. The Federal Public Works Administration awarded the Commission a grant on January 18, 1936. Bids were called for, and the Paul Caputo Construction Company, Inc. of Brighton, Massachusetts, was awarded the contract on May 15, 1936. The contract called for completion of the project on July 1, 1937 (Stratton 1986:180).

According to the contract, Caputo Construction was to "furnish sufficient barges, tug boats, boats, equipment, labor, etc. in order to perform properly the work undertaken" (Sylvester and Ready 1936:1). On November 11, 1936, a contract was made between Florence D. Goodsell, of Burlington, Vermont, and the Paul Caputo Construction Company (Webster 1936b:Exhibit A:1-4). Florence was the spouse of Elisha N. Goodsell, a Lake Champlain mariner. Goodsell promised to furnish two tugs, the Elsie B and the Admiral, mastered by her husband, Elisha N. Goodsell, to assist in the construction of the Missisquoi Bay Bridge. Caputo promised to pay Goodsell the sum of sixty dollars per day and give her the ownership of four barges and two lighters upon the completion of the bridge. Payments were to be made weekly to Goodsell for services and rental of equipment (Webster 1936b:Exhibit A:2-3).

Caputo accumulated a debt to Goodsell of about ten thousand dollars by early December 1936. Florence Goodsell, on December 3, 1936, filed a suit against Caputo Construction for the sum of ten thousand dollars (Sherman, Hawthorne, and Collins 1936:1). When the Chittenden County Deputy Sheriff seized Caputo Construction's equipment in December of 1936, he made a list of the vessels and the machinery aboard each vessel located near the Missisquoi Bay Bridge. The sheriff listed four barges, named Simpson, Comet 1, Comet 2, and Comet 3; and two lighters, named Simpson and No. 17 (Webster 1936a:1). These names match those listed in the contract between Goodsell and Caputo. These vessels are believed to be those located during the 1995 underwater archaeological survey.

According to the engineer's records, one barge was used to carry a crane with a clamshell bucket, one carried a derrick, one was a work platform for carpenters, and two barges

Figure 6. Large wooden rudder located during the 1995 scuba diving survey. The drift bolts are shown as dashed lines (drawn by Scott A. McLaughlin, 1995).
were moored at all times on each side of the fill slope to protect it from excessive waves and wind. Some of the barges carried bulk materials in their interiors (Missisquoi Bay Bridge Engineers 1936-37). There is no evidence to suggest that these barges were converted sailing scows. The Bohannons remember no vestiges of centerboards, chain plates, rudders, or other sailing hardware. The barges are described as ordinary wooden scow barges that were painted black with no numbers or names (personal communication 1995).

Caputo Construction was unable to fulfill the contract to construct the highway bridge. On September 1, 1937, two months after the required completion date, Caputo Construction declared bankruptcy. Caputo Construction had vastly underestimated the amount of fill required to create the causeway. On September 9, 1937, the contract was annulladed (Stratton 1986:180).

The bonding agency for the project, American Surety Company of New York, replaced Caputo Construction with the Coogan Brothers of New York City as the contractor. Under the terms of the contract, the bonding agency took over Caputo Construction’s equipment on the site and used it to complete the bridge. On December 1, 1937, Elisha Goodsell claimed that the American Surety Company of New York was using his barges and equipment without his permission (Crosby 1941:1-2). The two parties attempted to make an arrangement, but it apparently failed. On February 7, 1938, the barges were beached on the Alburg shore. The bridge was open for traffic on April 10, 1938; but the official dedication of the bridge was not held until August 18, 1938 (Stratton 1986:180-181).

During the spring of 1940, ice flows broke the cable attaching two of the barges to shore and moved them several hundred feet north. These two barges, A and B, became grounded on the shale bedrock (Peterson 1942:1). The two barges split further apart in subsequent years. In October 1940, Florence Goodsell filed suit against the American

Figure 7. Location of the six Missisquoi Bay barges, steam boiler and wooden tub (drawn by Scott A. McLaughlin, 1995).
Surety Company of New York at the U.S. District Court in Burlington, Vermont. Goodsell alleged that the American Surety Company used the barges without her permission and did not return them to her when the bridge was completed (Leddy 1940). The case never went to trial and was later discontinued in February 1946 for unknown reasons.

The barges set on the lake bottom in shallow water for years before they became so badly deteriorated that a person could not walk on them. The Bohannons, located just north of the Alburg end of the Missisquoi Bay Bridge, ran a boat and tackle rental shop from their farm throughout the 1950s and 1960s. They used the abandoned Missisquoi Bay barges as a wind break, creating a protected harbor for their small pleasure boats. Children from the area played on the barges for almost twenty years, using them as a platform to fish and dive from. The barges became a part of the local architecture (Anna Bohannon, personal communication 1996).

Missisquoi Bay Barges

Six or Seven Barges?

There is some uncertainty whether there were six or seven barges abandoned on the Alburg shore. Many sources suggest that seven barges were abandoned, but only six were located during the survey and mentioned in the court records. What happened to the seventh barge is a mystery. A 1939 lake chart of the project area illustrates seven vessels located along the Alburg end of the causeway, labeled "Scows Aground" (DePagter and Kirshner 1939:6) (Figure 8).

Figure 8. The Missisquoi Bay Bridge and the Rouses Point Bridge create a highway route across the northern end of the Champlain Valley (from Northern Cartographic, Inc. 1980).
Figure 9. A map of the study area drawn in 1939, showing the location of seven scows aground and other features (from DePagter and Kirshner 1939).

In an aerial photograph of the area taken in September 1941, there appears to be seven vessels (State of Vermont 1941) (Figure 10). Oscar and Anna Bohannon remember as many as seven barges being used at one time or another in the construction of thecauseway. The Bohannons believed that portions of five barges still exist immediately adjacent to the north side of the causeway; but only four were located during the archaeological survey (personal communication 1995).

There are some indications that there were at least a few attempts to have the barges and their contents removed. The Vermont State Highway Department in 1941 wanted to have the barges removed. The barges were said to be an eyesore. The Highway Department was even considering to pay to have them removed. Seven barges are mentioned in Highway Department letters concerning their proposed removal (Corry 1941:1). At this date, the barges apparently could no longer float or be floated as the discussion of their removal involved sawing them into sections. Arthur Colomb of Swanton had given the Highway Department a price of two hundred dollars to remove each barge, but apparently no further action was ever taken (Chase 1941a:1).

When the barges were abandoned, the land that they were beached on belonged to the estate of John Hazen. The property was managed by Warren Austin, Jr., a Burlington attorney, and rented to the Bohannons from 1939 until they purchased the property in 1942. By 1941, even Austin was pressing the Goodsellts to remove the barges (Chase 1941b:1 and Anna Bohannon, personal communication 1996).

During the scrap iron drives of World War II, C. H. Peterson, a Grand Isle County Representative, attempted to salvage the barges for their scrap iron. The barges were claimed to be dangerous, unsightly, and of no value except for the scrap that they contained. Mr. Goodsell was willing to relinquish his claim to the barges and their contents if they were to go for scrap (Peterson 1942:1). For some unknown reason, the barges were never broken down and all their contents removed. The Bohannons remember an attempt to remove a donkey boiler and steam engine from barge F. This effort may have been related to the scrap iron drive. When attempting to remove the boiler from the barge, two gentlemen lost control of the boiler, and it fell into the water. No attempt was made to recover the boiler from the muddy lake bottom. The Bohannons said that the side plate and top were removed before the gentlemen attempted to recover the boiler (personal communication 1995). The boiler was located during this survey between barges E and F.

Origin of the Missisquoi Bay Barges

It seems likely that these barges were not built locally. The shipyard at Champlain, New York, would have been one of the last operating yards equipped to build such craft. J. Adolphus Poissant, whose father was the chief boat builder
Missisquoi Bay Barges

Commercial vessels working or abandoned in U.S. waters. The Missisquoi Bay barges were probably not registered.

Why Were the Barges Abandoned?

Before the Abandoned Barge Act of 1992, it was common practice to dispose of a vessel by simply abandoning it on a shoreline or sinking it in deep water (Committee on Merchant Marine and Fisheries 1992a). During the 1930s, there were no federal or Vermont laws prohibiting boat owners from abandoning vessels in Lake Champlain. However, the River and Harbors Act of 1899 made it unlawful to abandon a vessel that could obstruct, impede, or endanger navigation of federally maintained channels. Since the barges are not obstructing the Missisquoi Bay entrance, they have been left in place since their abandonment. Owners often abandoned vessels instead of selling them for scrap metal because the cost of scrapping the vessel was greater than the scrap value (Anderson 1992:4-5). This was probably the case with the Missisquoi Bay barges.

Conclusions

Lake Champlain has a rich and varied nautical archaeological record (Bellico 1992; Crisman 1986; Crisman and Cohn 1994) (Figure 11). The six barges located along the Alburg shore are examples of the nautical resources in Lake Champlain. Wooden scow barges were a very common vessel type once found throughout the Champlain Valley. Today, very few of these vessels remain in such good preservation as the Missisquoi Bay barges. The remains of the vessels are capable of yielding significant information about the design and construction of barges used upon Lake Champlain.

The design and materials used in the construction of the barges is believed to be typical of United States shipbuilding during the late nineteenth and early twentieth century. Barges, such as the Missisquoi Bay barges, were the last style of wooden commercial vessel constructed in the United States. In the late 1920s, wooden shipbuilding gave way to welded iron vessels.

Background research indicates that the wooden scow barges and steam boiler were last used during construction of the Route 78 causeway in 1938. Probably dating to the late nineteenth or early twentieth century, the barge wrecks provide a tangible link to an important aspect of Lake Champlain’s maritime history. Although the construction of the barges cannot be directly tied to a specific boatyard on Lake Champlain, they are closely linked to the maritime
activity that dominated the lake for more than 100 years. Commercial construction of breakwaters, railroad crossings, docks, wharves, and rock-filled cribs all required the services of similar wooden barges to hold machinery and transport necessary materials.

The Missisquoi Bay barges are eligible for the Vermont State Register of Historic Places and the National Register of Historic Places. The barges retain significant integrity within a local and state context. The association of the barges with the bridge is significant because the bridge is one of just a few drawbridges in the state. A large quantity of documents concerning the bridge and barges still remain. These documents include the original architectural plans of the bridge, the engineers’ logs, court records, and five boxes of documents. These records add a measure of significance to the barges and offer an opportunity to observe the barges’ function in the construction of the bridge and their role within the community after their abandonment.

Figure 11. Some of the historic underwater features of Lake Champlain and their locations (from Crisman and Cohn 1994:Figure 1).

References


Bohannon, A. 1996 Personal Interview with S. A. McLaughlin. February 22.


Chief Lock Operator #12 1936-37 Chief Lock Operator’s Logs for Champlain Barge Canal Lock Number 12. Ms. on file, Champlain Barge Canal Lock no. 12, Whitehall, New York.


Corry, W. F.

Crisman, K. J.
1986 Of Sailing Ships and Sidewheelers: The History and Nautical Archaeology of Lake Champlain. Vermont Division for Historic Preservation, Montpelier, Vermont.


Crosby, G. R.

DePagter, I. and L. D. Krishner (cartographers)

Ledy, B. J.

Missisquoi Bay Bridge Commission

Missisquoi Bay Bridge Engineers

Peterson, C. H.

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Sherman, A. L., H. G. Hawthorne, and J. Collins

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Stratton, A. L. (compiler)

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Thomas, P. A. and A. B. Cohn

U.S. Geological Survey (cartographer)

U.S. Lake Survey, U.S. Army Corps of Engineers

Vermont General Assembly
Webster, J. H.


Wilkie, D. C.