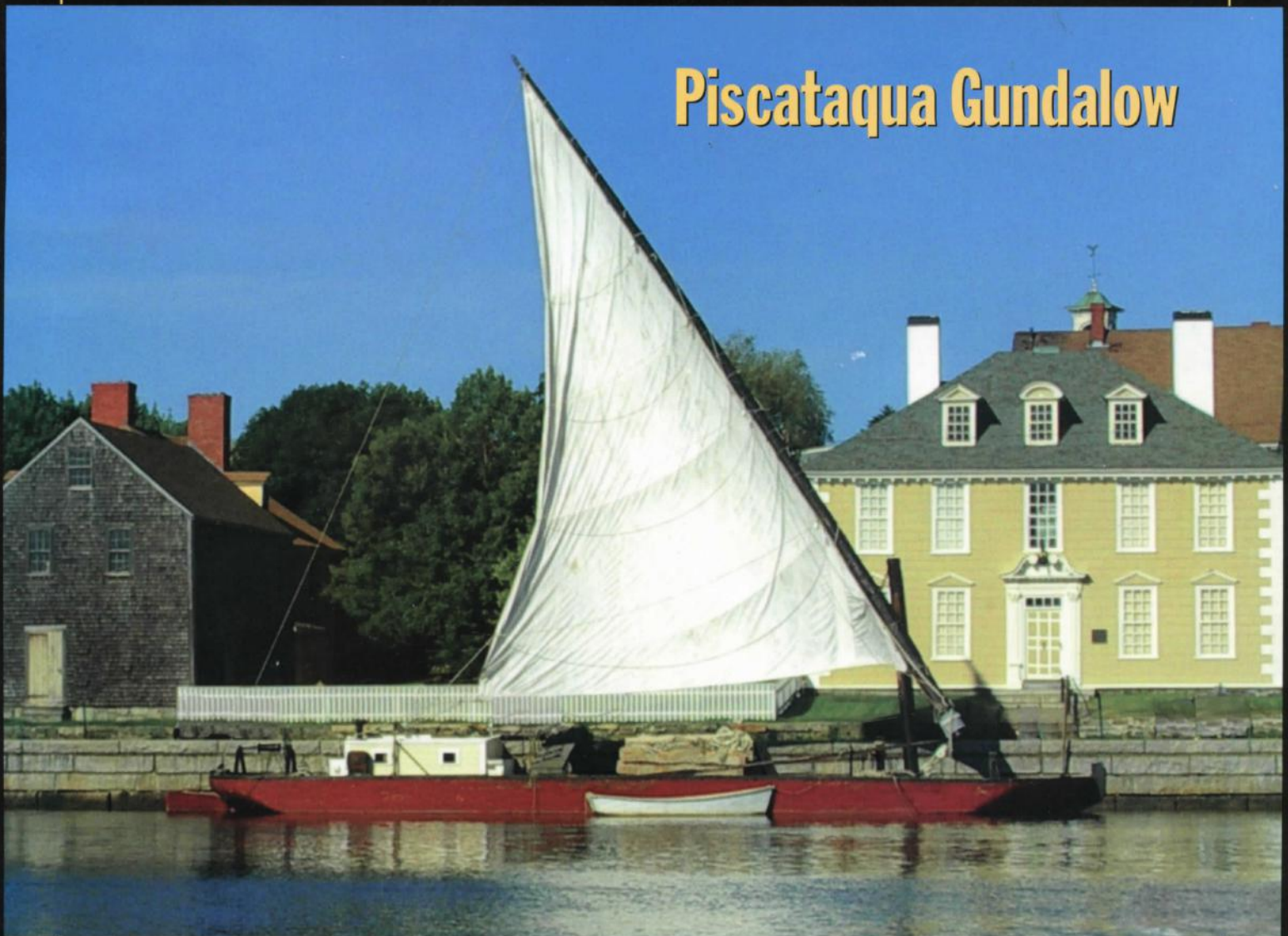


Maritime

Life and Traditions Spring 2006 No. 30

Piscataqua Gundalow



James Watt • John Gardner and the Small Craft Revival
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The Piscataqua Gundalow

by Courtney MacLachlan

A unique working boat, developed and evolved for multiple conditions, the Piscataqua gundalow served a specific region of northern New England for more than two centuries; today it has faded into almost total obscurity.



Few would have called it a beautiful craft but, in its perfect suitability to the environment it served, it surely did have an innate beauty. The humble gundalow was a river barge, a freight carrier, an indispensable cog in the economy of the New Hampshire-Maine seacoast for about 250 years. It was also an oddity. Indigenous to the region, it was designed to carry heavy loads, not only in a deep river with swift currents, but also in tidal shallows that dried to mudflat at low tide. The men who built and sailed the gundalows were often local farmers who knew the special demands of the river basin, and they deserve credit for developing this unique form of rivercraft.

The Piscataqua River basin on the New Hampshire-Maine border is 1,000 square miles of intricate waterways, which include six shallow rivers: the Squamscott, Lamprey, Oyster, Bellamy, Cocheco, and Salmon Falls; along with numerous tributaries they flow into the inland tidal lakes of Great Bay and Little Bay. All then funnel into the Piscataqua River, with its dangerous currents and eddies, which in turn flow into the Gulf of Maine at Portsmouth, New Hampshire. From Portsmouth, local goods and products were shipped to the outside world; into the port came luxuries, West Indian goods, and raw materials.

Today Portsmouth is best known for the ships and submarines of the Portsmouth Naval Shipyard. But it is remembered for the sailing vessels launched by private yards: ships like *Ranger*, *Raleigh*, and *America* in the

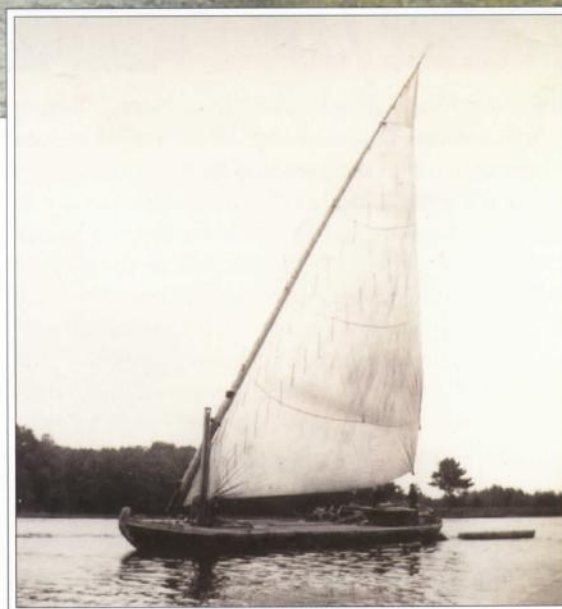
American Revolution; *Typhoon* and *Dashing Wave* in the 1840s. But the indispensable workhorse of this close-knit regional economy was the now-nearly-forgotten, strange-looking, 40–60' barge with a stump mast – the Piscataqua gundalow.



Unique Craft

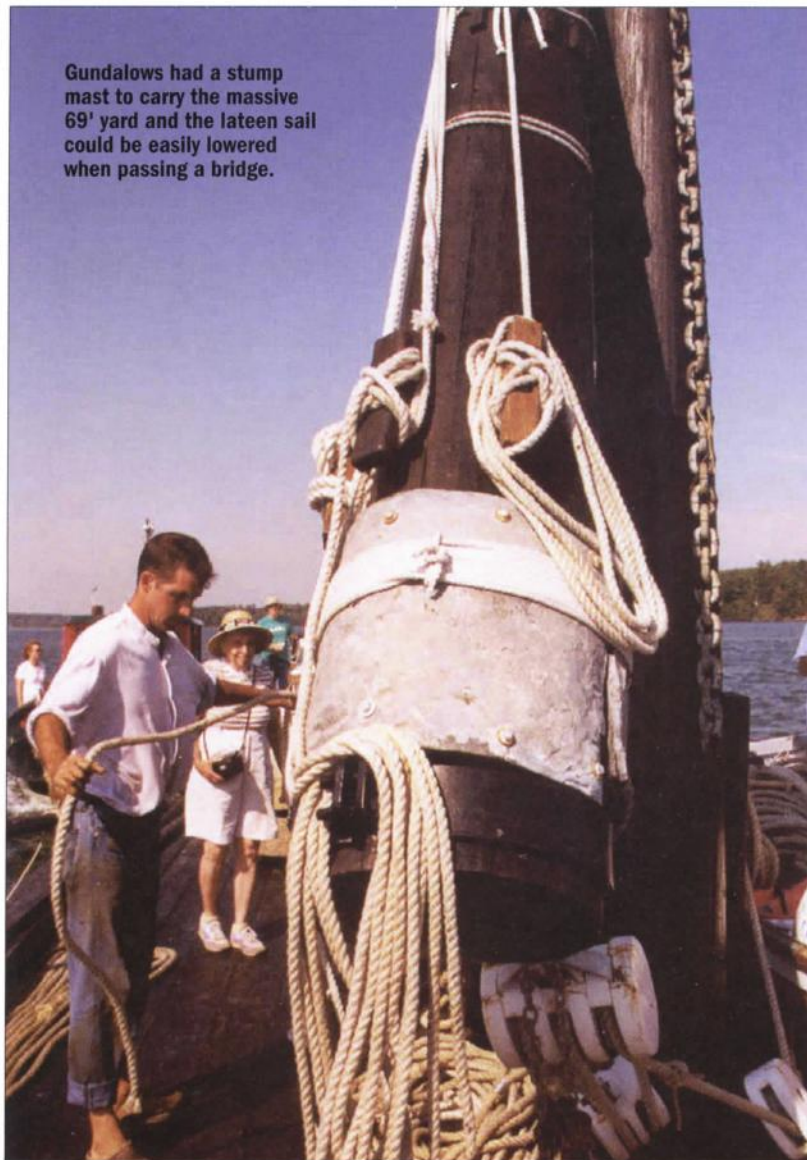
Gundalows plied the rivers and harbours of northern New England from the 1630s working as lighters in ports and salt hay carriers from the marshes to local farms. Theirs was an ancient and primitive form that had remained unchanged through the ages. Gundalows of the marshes of the Merrimac River in Massachusetts, for example, were commonplace, but their design barely changed over time. The same is true for those on the south shore of Massachusetts, in towns such as Duxbury and Marshfield. Here, as in other places in New England, they were square-ended, flat-bottomed scows without an attached rudder, deck, or transom, propelled only by poles and oars. By the mid nineteenth century a few carried a square sail hung on a removable mast. The Piscataqua region, however, presented a special set of circumstances, which led its inhabitants to adapt their gundalows in special ways.

The first factor was the strong tidal and cross currents of the river itself. Gundalows were built for flat water, but the Piscataqua is considered the second fastest-running navigable tidal river in



The gundalows are fully decked flat-bottomed cargo carriers with a 'lateen' sail that could be lowered to shoot bridges. The sail acted as an 'auxiliary engine' since gundalows depended on the tides to take them upriver on the flow and downriver on the ebb.

Gundalows had a stump mast to carry the massive 69' yard and the lateen sail could be easily lowered when passing a bridge.



With such an arrangement gundalows made good speed, frequently out-sailing larger vessels of twice their draught.

Further inland, where the brackish waters became very shallow and intricate, gundalowmen equipped their boats with poles to propel them in the narrows where sails or sweeps were unusable. In some places they used warping stakes along the riverbanks. A spoon bow, developed in about 1850, enabled the gundalow to travel the narrows more smoothly. The fact that these vessels drew only 12–18" of water when empty, and no more than 48" when fully laden, meant they could travel far into the shallows. If the tide – whose range averaged 6' in Great Bay – ebbed while the craft was being loaded or unloaded, she could simply rest on the mudflat, or 'take the ground' until the water rose again. Over time the rivermen developed the habit of completely decking-over the craft, while barges in other parts of New England remained open. The below-decks was used as a cabin for living, sleeping, and awaiting the tide.

A major factor to influence the development of the Piscataqua gundalow was the presence of low bridges. From the earliest days of European settlement until the mid nineteenth century, residents of the Piscataqua region were extremely dependent on the water for travel; numerous creeks, acres of marshland, eelgrass, mud, and sand – as well as the large bodies of tidal water – presented almost impassable barriers to land travel. What roads there were had to circumvent

the continental United States. Names like 'Horse Races', 'Boiling Rock', and 'Pull-and-be-damned Point' illustrate what local mariners thought of some of the locations along the river. The hazards notwithstanding, the strong ebbs and flows offered great advantages to the gundalowmen. They could use them as an auxiliary engine by sailing downriver to Portsmouth on the ebb, and upriver to the inland towns on the flow. To speed themselves along they supplemented their oars or sweeps with a large lateen sail rather than the small square sails used on most gundalows elsewhere. Since the gundalow had no keel, skippers added a huge retractable leeboard to enable their vessels to sail to windward, and they hung a permanent rudder off the stern, rigged to a wheel via drums and tackle. With such an arrangement gundalows made good speed, frequently out-sailing larger vessels of twice their draught.

If the wind failed when the rivermen needed to cross the open water of Great Bay or Little Bay they depended on the 40' sweeps to propel the gundalow. When the vessels were laden with up to 50 tons of brick or cordwood – as they often were – skippers added iron extenders to the sweeps, stood atop the deck load, and rowed from there.

myriad bays and inlets. By the early nineteenth century, however, as populations and road-building increased, low bridges were erected across some of the larger waterways. Gundalows now needed to have a maximum beam of 15' so that they could fit between the spans of the bridges.

The clearance of bridges posed another challenge – when faced with bridges too low for a gundalow mast, the bargemen responded by devising a way to swiftly and conveniently lower the sail to pass under, or 'shoot the bridge', and quickly raise it again on the far side before losing momentum in the swift current. They did this by constructing a stump mast of about 12' (the maximum height that could be guaranteed passage under any Piscataqua bridge at any tide), and attaching a 60' yard – roughly the length of the gundalow – with a chain and swivel. The yard carried a large lateen sail, rigged so that it could be quickly brailled up. If needed, the yard was counterbalanced by weights so that the skipper could lower and raise it single-handedly. More than any other element – spoon bow, retractable leeboard, wheel-operated rudder, covered deck, extendable sweeps – this unique rig set the Piscataqua gundalow apart from all others and marked its highest development.

The Cargoes

Gundalows not only carried freight downriver to Portsmouth and upriver to the inland towns, but they also crisscrossed the basin, carrying goods and people between the ports of the Piscataqua: Durham, Dover, Exeter, Berwick, Eliot, Newfields, Newmarket, Stratham, and Greenland. These small up-river ports—originally built as lumber towns—developed into very busy places. Sawmills



These flat-bottomed barges were built to carry cargo such as timber, cordwood (as seen here), bricks, cotton, salt marsh hay, granite, etc. between Portsmouth and all the towns on the rivers connected to the Piscataqua River.

Between the sixteenth and nineteenth centuries, hundreds of gundalows were built and used in the Piscataqua region. They have been replaced by trains and trucks.



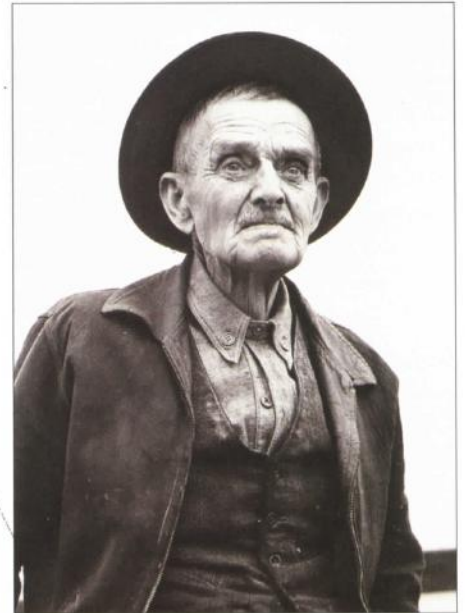
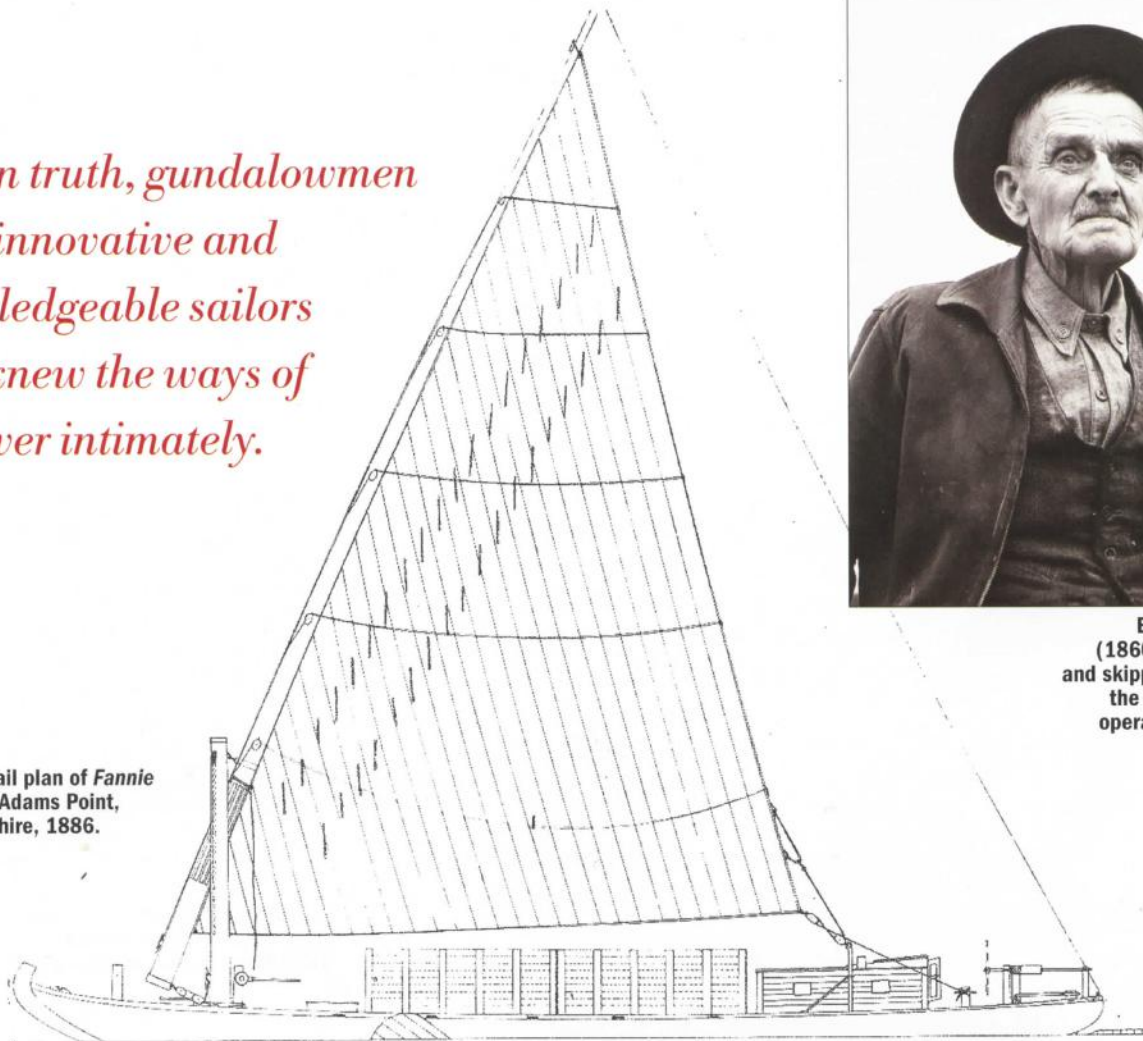
produced long and short lumber, staves, shingles, and other wood products for shipbuilding and export from Portsmouth. Gundalows took it all, as well as cordwood for burning in brick-mills and other factories. Indeed, cordwood was such a common freight that it came to be used for calculating the size and carrying capacity of a gundalow. Rivermen often referred to a 'ten-cord' or a 'twenty-cord' gundalow, and between them the barges carried thousands of cords to fuel the thirty brickyards along the river.

They also handled all manner of farm products, including cattle and other livestock. They carried salt hay upstream to the farms, as well as fish, flour, salt, corn, butter, and cheese for inhabitants who were not farmers. Imported goods were transported to stock the shelves of local shops. From the time when the cotton mills and brickyards were built in the 1820s, gundalows hauled raw cotton, sand, and coal, as well as finished textiles and brick—much of the brick went on coasting schooners to Boston, where it was used in the construction of Back Bay homes.

In Portsmouth harbour gundalows were used to service an extensive blue-water economy. Along with timber and lumber, they carried stone for ballast, and supplies for the construction of iron ships at the Naval Shipyard. Berwick in particular had a large gundalow fleet delivering timbers to the Naval Shipyard, and all the local yards used gundalows to pick up the ramp wedges that floated away after a launching. With their picturesque appearance, the gundalows provided a real contrast to the large square-rigged vessels in Portsmouth

But, in truth, gundalowmen were innovative and knowledgeable sailors who knew the ways of the river intimately.

Lines and sail plan of *Fannie M.*, built at Adams Point, New Hampshire, 1886.



Edward H. Adams (1860-1950), builder and skipper of *Fannie M.*, the last gundalow to operate commercially.

harbour. When a number were under sail at the mouth of the river, they gave the harbour a vaguely middle-Eastern look – under sail they were reminiscent of Arab dhows.

Trade in the Piscataqua region was so tied to the gundalow that the warehouses lining the waterfronts were custom-designed to serve them. Two-storeyed, the buildings had an overhang on the second floor that leaned out over the water, allowing gundalows – like their predecessors, the packets – to pull up close to the warehouse without getting masts or rigging caught up in the buildings. Men could then load and unload the barges by means of hoists from a trapdoor in the overhang. Today, the only remaining example of this once-common gundalow warehouse is the Sheafe Warehouse in Prescott Park, Portsmouth.

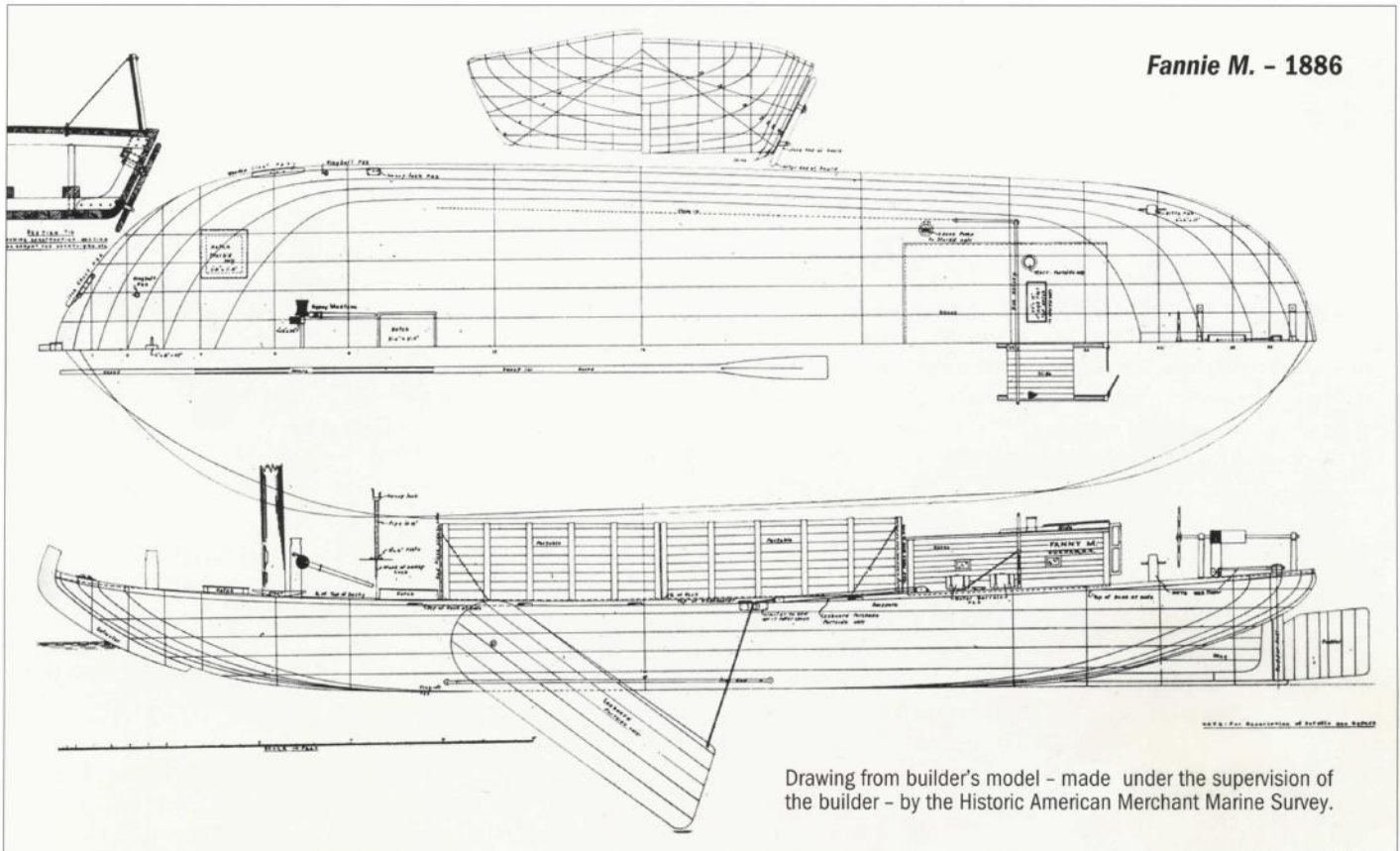
Varied Roles

Gundalows were so integral to the local culture that they were put to multifarious uses. In 1774, for example, just before the American Revolution, local colonials used gundalows to transport munitions from Fort William and Mary at the mouth of Portsmouth harbour to the upriver towns, where they would be out of reach of the British. The gundalows were perfect for such work... deep-hulled British vessels were unable to chase them upriver. The facilitation of social activities was also a common –

but often overlooked – function of gundalows. In summer, parties of young people went out on ‘sunset cruises’, complete with music provided by a local fiddler. ‘In the evening we had another party up the pond in the gondola – about 25 or 30 ladies and gentlemen. I walked up to Mr Sprague’s for Henrietta and Fanny. We had a fine time; returned about eleven o’clock,’ wrote Hezekiah Prince Jr in 1825. Gundalowmen even earned extra money ferrying Sunday School picnickers out to the beaches. One episode involved a group of church-school students who went by gundalow to a picnic on Plum Island, about 20 miles south of Portsmouth. Pranksters pulled the drain plugs on the barge, allowing it to fill with water so that they had to extend their stay until the next low tide, when the water could be drained out.

Gundalowmen

Blue-water captains of Portsmouth and the seacoast scorned upcountry gundalow skippers who supplied the sweat and muscle along the Piscataqua. One deep-sea skipper claimed that gundalowmen were the type who would steal from a churchyard. But, in truth, gundalowmen were innovative and knowledgeable sailors who knew the ways of the river intimately; there is no arguing that great skill and practice was required to handle a gundalow successfully in the Piscataqua.



Drawing from builder's model - made under the supervision of the builder - by the Historic American Merchant Marine Survey.



In keeping with tradition, most of this gundalow is fastened with 5,000 trunnels. Note the spoon bow.

In early days gundalow skippers were often part watermen, part farmers or mechanics who built a vessel over the winter to transport their own products to market the following spring. As the nineteenth century progressed and business grew they often became full-time skippers, with a crew of either local or French Canadian men. Although few diaries or journals of such rivermen exist, their colourful reputation is still alive through stories and anecdotes. They had a reputation for strong drink and strong language. Crews habitually took a dram of whisky at certain points along the river - especially when they passed the famous 'Barn Door' in Eliot, which marked the end of Long Reach on the Piscataqua River, and Half-Tide Rock in the Oyster River near Dover. Superstitious, they never

failed to tip their hats to 'The Pulpit', an outcropping of granite that marked an entrance to Great Bay. They took great pride in their individuality and their boating abilities; always competitive, they loved to brag of their skills at shooting bridges. These proud men were a law unto themselves along the river and liked to do things their own way. One riverman said wryly, 'A compass isn't much good. I'd rather have a potato. A compass can't tell you where you are, but a potato can be eaten if you're hungry.' Although they were from the humbler walks of life, they had great self-confidence and flair. They performed an important service, hauling heavy freight without romance or much reward.

Gundalow Construction

The boatmen built their own vessels without plans, although they sometimes used models to guide construction. They were not interested in beauty, but in creating the best possible answer to the requirements of providing cheap transportation of bulky freight. Their boats were economical to build and cost practically nothing to maintain.

The builder found the timber and knees in the local forests and cut it in winter. He then either shaped it by hand or had it sawn at the local sawmill. He generally left the topsides unpainted; bottoms did not require painting because they were scraped clean by the sand and mud of the shallows. Builders often left gundalows uncaulked. Nor did they bother to supply them with pumps; instead, they bored two drain-holes in the corner pieces of the hull. To empty the gundalow of water, the skipper put it over a sandbar when the tide was ebbing, and pulled the plugs. The water drained out as the tide dropped; the crew then replaced the plugs and moved off with the rising tide. In winter, most gundalowmen simply pulled up their barge and left it unprotected on the shore.

But even though gundalows were economical to build and practically maintenance-free, they were not easy to build. Much hard work went into the construction of these heavy-hulled barges of between 30 and 60 tons burden. Oak beams were hand-hewn and everything was trunnelled with hundreds of locust or oak pegs driven into a corresponding number of 1 1/4" hand-drilled holes.

Shaping the spoon-bow and corner pieces was the most crucial part of gundalow construction. Usually ten to twelve logs were required. The corner pieces – port and starboard – united the floor and sides, and gave shape to the whole hull. Once in place, the floor planks of 6" spruce were positioned between them. Then came the knees, or frames, and oak floor timbers. Side planking was of 4" spruce. Deck beams were oak, and the decking was 3 x 6" pine or spruce planks. The 'flats' – a wide rail amidships where crew members stood when plying the sweeps or poles – were made of white pine, less slippery than other woods when wet. The 5'-wide, 16'-long, retractable leeboard was of 3" oak planks held together with long iron drift bolts.

The barge was completely decked and cargo was carried above deck. The cargo space – about 25' long – was covered with a thick coat of tar and sand. Sideboards, about 5' high and 15' long, were set up to hold loose cargo like coal or sand piled high on deck. The lower edge of the sideboards was held in place against the inboard edge of the 'flats' by the weight of the cargo itself.

The 12'-tall mast was of thick oak, which turned in its bearing at its base to facilitate the swing of the sail. The mast head was sheaved and reinforced with an iron band. Attached to this, by a chain on the starboard side, was a yard about 60' long, which carried the 1,000-square-foot sail of cotton duck. It was raised and lowered by hauling on a 'tipping line' made fast to its upper extremity. Iron counterweights were attached to the bottom of the yard if needed.

Decline and Resurrection

Even as the Piscataqua gundalow was reaching the apex of its design in the 1870s, events were conspiring to make it obsolete. The road system was being consistently improved during the nineteenth century. Railroads arrived before the Civil War; ship-building and deepwater trade fell off after war was over. Gundalows continued to ply the Piscataqua with cargoes of coal and wood, but the old bustle was gone. More and more, the economy was shifting from regional to national; goods were moved by rail, and finally, road. By the dawn of the twentieth century many of the remaining gundalows had been dismantled and were being used as coal-carriers for the inland towns. Economic needs had changed, and the gundalow no longer met the demands of the Piscataqua basin.

The last of the type to operate commercially was launched in Durham, New Hampshire, in 1886. Edward Adams (1860–1950), a lifelong riverman, built his final working gundalow, the *Fannie M.*, and launched her from his own land at Adams Point. He carried primarily coal, lumber, brick, and gravel. When the *Fannie M.* 'died a natural death' – she was hauled up on shore and broke up in the winter storms in 1925 – the gundalow era was over. Worse, it was in danger of being forgotten.

Captain Adams, then already in his seventies, saw the need to advocate for recent history before it was totally lost. 'We



After three long years of dedicated labour, the replica was launched with the help of oxen on 13 June 1982.

Captain Edward H. Adams at Wagon Hill Farm, Durham, New Hampshire.



were concentrating on the distant past... doing research on the seventeenth century while the last hundred years were being ignored,' he pointed out. To help remedy the situation, he and his son, Cass Adams, set about creating a traditionally built gundalow – down to the last wooden peg and hand-hewn beam. The result was *Driftwood*, launched 22 October 1950 – Edward Adams's ninetieth birthday – from the same location where the *Fannie M.* had been launched. His models for this beautifully crafted boat are now in the Watercraft Collection of the Smithsonian Institution. More than anyone else, Edward Adams promoted the age he felt people were ignoring, and bridged the gap between the gundalow era and today.

Current efforts to educate the public about the Piscataqua gundalow are implemented by a non-profit organization – the Gundalow Company of Portsmouth, New Hampshire – that seeks to be a connecting force and collaborative leader of a shared maritime heritage of the Piscataqua watershed.

Driftwood was destroyed by vandals in the 1960s so the Gundalow Company (then called the Gundalow Project) set about building a replica using Captain Adams's lines and models. They worked for three years using only traditional materials and building techniques and ranged for some distance to find the materials they needed: the keelson logs came from Fremont, New Hampshire, hackmatack knees came from Cherryfield, Maine, the stump mast from Dover, New Hampshire. The 69' spar was a purpose-felled Maine white spruce. The gundalow was built in the grounds of Strawberry Banke Museum in Portsmouth, New Hampshire. Named the *Captain Edward H. Adams*, in honour of the last of the rivermen, she was launched with the help of oxen on 13 June 1982.

The region's only remaining Piscataqua gundalow – the *Captain Edward H. Adams* – is today a working classroom, visiting ports along the Piscataqua River, and serving as a platform for maritime, historical, and environmental education for school groups and the public. Programmes on board the gundalow are designed to help students appreciate local maritime history, and see the relationships between economic development, natural resources, and contemporary coastal issues in the Piscataqua basin. The sailing gundalows of the Piscataqua and the men who built and worked them may have disappeared, but their unique relationship with the environment and the resources of the area is being commemorated by the Gundalow Company. □

Courtney MacLachlan is a librarian at Strawberry Banke Museum, Portsmouth, New Hampshire, and author of The Amanda Letters: Civil War Days on the Coast of Maine.

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