

The South Carolina Historic Ships Supply Program

Introduction

In 1993, during scheduled restoration of the USS *Constitution* 'Old Ironsides,' project staff contacted the South Carolina Department of Transportation (SCDOT) and the South Carolina Institute of Archaeology and Anthropology (SCIAA) regarding the supply of live oak timbers for the effort. This request became a catalyst for the two state agencies to form a partnership to save live oak trees slated for unavoidable destruction as a result of bridge and road construction, and provide the valuable and scarce timber to an historic ship restoration project. This effort began the South Carolina Historic Ships Supply Program (SCHSSP).

Background History

This was not the first time South Carolina, or the South for that matter, provided live oak timber to frame up navy ships. It had been long recognized that the timber from live oak trees had great potential for a variety of purposes, including shipbuilding. Live oak (*Quercus virginiana*) is not a true oak, but a semi-evergreen and a member of the beech family. It is found along the coastal reaches of the continental southeastern United States from southeast Virginia to Texas, and is abundant on the west coast of Cuba. The trees grow as high as 70 ft. with crowns surpassing 150 ft. in diameter. Visually the live oaks are noted for large, horizontal limbs growing out from the trunks about five to 18 ft. above the ground, and the gnarled nature of the branches. The trees are very resistant to salt spray, and flourish in coastal regions. The wood is very dense, weighing 75 lb./ft.³. Dry, it has a specific gravity of 0.8 and is very resistant to rot (Wood 1981:3-6).

While the technical details of live oak were not known in the 16th century, its potential was recognized when Pedro Menendez de Aviles, founder of St. Augustine, wrote to King Philip II of Spain in 1565 including "green" or "live" oak in his list of the new country's wealth. When live oak was first used in shipbuilding is not known. However, live oak's suitability for shipbuilding purposes was noted by Thomas Ash in 1682 when he wrote that the "Toughness, and the Goodness of its Grain is much esteemed." Twenty-seven years later, in 1709, John Lawson, Surveyor General of North Carolina extolled the virtues of live oak for ships' frames and knees, and noted that the wood frightened sawyers due to its hardness (Wood 1981:8-11).

By the 1740s, ships in the Southeast were being advertised with an emphasis on the live oak frames used in their construction, and advertisements for transportation of southern live oak timber to northern shipbuilding ports began to occur. In South Carolina alone, between 1740 and 1760, one ship and two schooners were launched with the name, *Live Oak*, as well as the 180-ton ship, *Heart of Oak*, launched from a Charleston shipyard in 1763 (Coker 1987:52, 63).

The earliest extant evidence of live oak being used in watercraft construction in North America comes from the Brown's Ferry Vessel discovered in the Black River, South Carolina, in 1976 (Albright and Steffy 1979; Nylund 1989). The vessel, built during the 1740s, had frames, posts, and knees fashioned from live oak (Steffy 1978). In fact, the majority of 18th- and early 19th-century sailing vessel remains found in the coastal regions of South Carolina are framed with live oak, and archival shipbuilding records clearly indicate the propensity of South Carolina shipwrights to use live oak (Amer and Hocker 1995).

During the latter half of the 18th century, European nations began to show an interest in live oak. A testimonial by British shipwright Roger Fisher, sent to the British Admiralty in 1770, described the lengthening of a South Carolina-built ship, *Fair American* (Coker 1987:50). The shipwrights complained that the ten-year-old live

oak frames were as hard as iron and virtually impossible to cut, while numerous, similarly aged white oak timbers were rotten. With British timberlands largely deforested, and over 60 acres of trees needed for a 74-gun ship, the Admiralty took notice. However, before they could act, their efforts were thwarted by the Revolutionary War.

Soon after the war, the need for live oak and ships for a new American navy became acute. The war had depleted American warships, and merchant shipping, no longer under British protection, was preyed on by corsairs from West Africa. In 1794, by an act of Congress, George Washington formed a navy under the War Department with plans to build six frigates. Realizing that the average life span of a warship was 10 years, assuming it wasn't blown out of the water before the elapsed time, designers recommended live oak over the traditional white oak for framing pieces and compass timbers. A contingent of shipwrights armed with axes, cross-cut saws, ship molds, and oxen was sent south to secure suitable timber, starting on the islands of St. Simons and Hawkins in Georgia. Joshua Humphrey, the chief constructor, estimated that 55 men, working 24 hours per day for two months could cut enough timber for a frigate. These estimates proved unrealistic as rains set in and the wet, swampy terrain became increasingly difficult to negotiate (Wood 1981:23-28). Three years after passage of the Navy Act, the frigates *Constitution*, *Constellation*, and *United States* slid down the ways. Naval shipwrights resumed work on the remaining three frigates, and by April 1800, the *Congress*, *Chesapeake*, and the *President* were launched (Wood 1981:32, 162).

In 1799, during an undeclared war with France, Congress passed acts to consolidate national defense including providing funds for additional warships. The hunt for live oak freshened. Even at this early date, readily available live oak supplies were difficult to secure. Cotton planters were clearing forests to plant 'the seed,' and accessibility was still a problem, not to mention the extremely labor intensive process of reducing the cut timber to usable balks. This pro-

cess came abruptly to an end with a change of administration. The Quasi-War with France ended, and by 1801 construction of large warships was supplanted by fabrication of much smaller gunboats under Thomas Jefferson (Bass 1988:170).

The War of 1812 saw a renewed interest in large warships with the *Constitution*, *President* and *United States* winning several engagements. Congress, once again, authorized construction of large warships. Surveyors, once again, roamed the South looking for, and inventorying, suitable live oak timber. The frigates and 74-gun ships authorized by Congress required the largest quantity of live oak ever used in this country (Wood 1981:39-40).

By 1868 the public resources of live oak totaled 268,000 acres in Louisiana, Florida, Alabama and Mississippi alone. As the timber reserves increased, the main problem turned from accessibility to trespass and poaching of the naval timber. By 1826, illegal cutting had taken nearly one-half of the Florida reserves. Even with the passage of the Timber Trespass Act in 1827, the navy often ended up paying for its own trees when they were illegally cut and sold to navy yards up north (Wood 1981:48-60).

After 1840, steam-powered vessels began replacing sailing ships. This, along with the change to iron hulls that occurred during and after the Civil War, helped to hasten the demise of live oaking for the navy (Laing 1971:219; Wood 1981:63; Still 1985). However, even though live oak stocks were greatly depleted by the war effort, this timber continued to be used in merchant shipping and brought up to four times the price of white oak on the New York market.

Ship Construction

The use of Southern live oak in shipbuilding can be traced back at least 250 years. Because of the shape and nature of the trees, utilization of live oak generally was restricted to structures that required great strength and curved shapes, or 'compass timbers.' These included floor timbers

and futtocks, as well as knees, railings, and belaying structures like sheet bits.

In selecting and fashioning timbers for a ship, consideration had to be given both to the ability to work the wood and to the survivability of the timber. With live oak, this balance was especially acute. Green or unseasoned live oak is relatively soft and easy to work but will quickly rot in the damp bowels of a ship. Once dry, it literally becomes as hard as iron (hence, 'Old Ironsides').

Working live oak in the 18th and 19th centuries involved predominantly hand hewing with axes, adzes, saws, and a variety of bladed tools. After felling the trees, shipwrights inspected them for rot and fashioned them to their approximate finished shapes following ships' molds, which they brought to the site. Green live oak is heavier than water and could not be floated down rivers in rafts like many other tree types. Consequently, live oak was hauled to landings slung beneath 'big wheels,' using oxen, before being inspected again, recorded, and loaded onto waiting schooners to be shipped north (Figures pp. 113-116; Wood 1981). At the shipyard, the timbers would be seasoned by slow air drying then fashioned to their final dimensions.

While this same process is followed today, the methods are a bit different. In earlier days the blacksmith was the most important person on the crew, as he kept the tools in shape. Today it is the mechanic.

South Carolina Historic Ships Supply Program (SCHSSP)

The 1992-95 restoration of USS *Constitution* provided the impetus for the SCHSSP. Completed in 1796, 'Old Ironsides' has been on active duty ever since. During restoration of the *Constitution* between 1928-1931, the navy used hundreds of tons of live oak that had been stored underwater at Pensacola Naval Air Station since before the Civil War (Wood 1981:65-68). Since that time, the navy periodically tested the remaining live oak at Pensacola with limited success.

When the most recent restoration plans were drawn up, the navy had to search out new sources of the valuable timber.

The navy looked to the same states that had supplied live oak before, including Texas, Georgia and South Carolina, from which they previously received live oak after Hurricane Hugo. In early 1993, Robert McFee, Project Coordinator for Bridge Construction at the SCDOT, began looking for a way to save, or at least utilize, live oak trees destined to be destroyed during the construction of an expressway near Charleston, South Carolina. McFee contacted SCIAA, and with guidance from the *Constitution* shipwrights, trees of appropriate shapes and sizes for the project were selected. Two local contracting firms cut the trees to the necessary dimensions and transported the timber to Patriot's Point, in Charleston, for storage. With the assistance of the United States Marine Corps, nine tons of South Carolina live oak made its way to Massachusetts and into the fabric of the historic ship. Once at the Charlestown Navy Yard, the timbers were seasoned and finished to size before replacing old and rotted timbers in the vessel's upper works and below decks. These included fife and pin rails, hatch coamings, sheet bits and futtocks.

News of the restoration project quickly spread, and soon private citizens and companies wanted to donate trees. In response to this obvious need for South Carolina live oak, the two state agencies signed a memorandum of understanding formalizing the goals of the program and outlining the respective roles of each agency. While the majority of live oak trees used to date have come from public projects, private donations, both from residential and commercial properties, constitute a significant proportion of donated timber. In these cases, the individual on whose property the tree is located often bears the cost of cutting and transporting the timber to our storage locations.

The latest, and by far the most ambitious project utilizing live oak during modern times began three year ago at Mystic Seaport Maritime

Museum in Connecticut. SCIAA was approached by Quentin Snediker, Project Coordinator for the *Amistad* Project; he wanted to secure live oak to build a full-size working replica of the schooner *Amistad*. The dramatic *Amistad* story began in 1839 when 53 Africans — 49 men, three girls and one boy — were kidnapped from their homes in Western Africa and smuggled into Cuba where they were sold as slaves. Forced aboard the cargo ship *Amistad*, the Africans were bound for a plantation in eastern Cuba when they revolted and attempted to sail for their homeland (Mystic Seaport Museum, Inc. 1997).

After drifting in the Atlantic Ocean for two months, the ship was discovered by the U.S. Navy off Montauk Point, NY, and towed to New London, Connecticut. A federal trial followed, drawing international attention to the slaves' plight. Federal District Judge Andrew T. Judson freed the Africans, but President Martin Van Buren quickly ordered an appeal of the decision. Former U.S. President John Quincy Adams, elderly and nearly blind, successfully argued the Africans' case before the U.S. Supreme Court. The lower court decision was upheld, and the Africans were returned to their homeland near modern-day Sierra Leone (Mystic Seaport 1997).

The reproduction *Amistad* will be built and administered by Amistad America Inc., a consortium of groups including Mystic Seaport and the Connecticut Afro-American Historical Society. The mission of the project is to teach lessons of history, cooperation, and leadership illustrated by the *Amistad* incident and its legacy. Major funding for the project is being provided by a \$2.8 million bond and private donations. More than 100 tons of live oak are needed to construct the 77-ft. hand-hewn schooner (Mystic Seaport 1997).

In 1997, during clearing for a connector highway on Hilton Head, South Carolina, some 30 live oak trees were identified for removal along the right-of-way. With guidance from Quentin Snediker, SCIAA's Underwater Archaeology Division staff identified usable sections of the trees and a project sawyer cut the oaks to those speci-

fications. In July, Snediker arrived to select suitable timber. With the assistance of the project contractors, he left after two days with 12 live oak trees loaded in three, 40-ft. gondola trucks, which represented approximately 15% of the total live oak needed to complete the replica. Once at the Henry R. Point Preservation Shipyard at Mystic Seaport, the timbers were quickly fashioned to their final dimensions and then set out to season. Construction of the *Amistad* began in March 1998.

Future Considerations

The South Carolina Historic Ships Supply Program continues to identify, and stockpile, suitable live oak timber for this project, and for the next restoration of the USS *Constitution* in 2015 that will require some 500 trees to complete. The program is instrumental in helping to preserve one historic ship and in building another. Roads and highways continue to be built and land developed, processes that often sentence stately live oak trees to removal and possible destruction. Providing scarce live oak timber to projects such as *Amistad* and USS *Constitution* is a service that few would criticize. However, to be more effective, the program needs to address several concerns. These include:

- (1) Storage locations for harvested trees are open to the elements. If timbers are not transported to destination shipyards expeditiously, they become prone to infestation and rot in the humid southern climate.

- (2) More advanced coordination with all parties involved needs to be addressed. Most contractors work on the 'time is money' creed, and delays are seldom viewed with sympathy for either the timber or the ship reconstruction projects. For example, less than one-quarter of the suitable live oak identified for the *Amistad* project made it from Hilton Head to Mystic Seaport. This was due largely to the sheer volume of trees available at one time and to the logistics of handling the extremely heavy and often cumbersome timber.

Some of the larger and more suitable trees were located in swampy areas where trucks and loaders were unable to venture.

(3) Finally, funding is an ever-present problem. This program began as a cooperation between two agencies. Neither agency has a budget specifically earmarked for such a large enterprise, nor does either agency possess all the necessary specialized equipment, nor staff assigned solely to this program.

Notwithstanding, through the goodwill and dedication of the agencies involved and increased public and private support, icons of the United States like 'Old Ironsides' will survive for future generations to appreciate, and projects like the *Amistad* will provide cooperation and leadership for America's youth.

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