Ryan Winterberg-Lipp
Planning for Historical Preservation
10 April 2008

Dredging the Past: Restoring the Historic Chowan County Courthouse

The dense forests of towering trees that blanketed the country in a deep wilderness remained unbroken for thousands of years before European colonists ever landed upon the New World's coast. When the Spanish explorer Don Tristán de Luna y Arellano first set foot on the scrubby shores of what is now the Florida Gulf Coast in 1559, the timber industry in the United States set down its first roots. It was not until the 1600's, however, with subsequent large settlements along the Atlantic coast that logging's great influence began to shape the American landscape. With the arrival of settlers in Jamestown in 1607, lumber was essential to the growing North American colonial economy. Shipbuilding fueled the need for lumber, the pristine forests of virgin trees supplying the emerging market with ample supply to continue its expansion ("History of Logging").

As the Industrial Revolution filled America's cities with factories and drew massive population increases, the demand for lumber increased exponentially with new steam-based technologies churning trillions of processed wood board feet. Steam power opened up new opportunities for the Eastern logging industry as mills could be built farther inland, supplied with raw materials by a complex system of channels and rivers that floated logs to processing. "The conquest of the forest" drove settlers farther westward with promises of land under the Homestead Act as swaths of barren stumps marked paths of settlement. With such continued deforestation, early logging operations moved farther inland where log flumes combined with animal power and rudimentary railroads to supply lumber mills with the inputs that would shape the building industry and city formation in the United States for hundreds of years ("History of Logging").

By 1900, the largest sawmill in the world was operated by the Atlantic Lumber Company in Georgetown, South Carolina, using logs floated down the Pee Dee River from as far as the edge of the Appalachian Mountains of North Carolina. Mill operations like the Atlantic Lumber Company paved the way for the growth of the log driving culture, the exceedingly dangerous occupation of guiding the buoyant logs to processing down flumes and rivers. These log drivers ensured that the timber floated freely down current by standing on the moving logs, running from one to another, and freeing obstacles as jams occurred. Such drives often hindered river navigation and had to be timed with spring floods as thousands of logs cut during the winter months were sent downriver. With rushes of seasonal driving, each timber firm would mark its logs with a brand that identified ownership as hoards were captured in log booms before sorting and processing. Yet such massive tides of floating trees were not completely immune to losses as inevitable jams caused some timbers to become saturated and sink to the bottom of the water body. Technologies available to early loggers did not allow for the salvage of these gigantic pieces of virgin timber as they collected along muddy river and lake bottoms (Donaldson 150-152). The dangerous practice of log driving became unnecessary and obsolete as railroads expanded and public roads stretched nationwide, submerged logs sinking deeper into murky riverbeds as the remnants of a lost trade.

Though the timber industry has had a history rooted in the very formation of American history and economy, logging today is a huge, complex industry. The World Bank estimates that forest products are a $270-billion-a-year business globally and the worldwide appetite for everything from paper to building materials shows no signs of slowing ("History of Logging"). In the United States alone, the logging industry generates $14.4 billion a year in revenue, with a domestic demand of $13.2 billion annually. As a considerable proportion of the logs felled are used for building or building-related purposes, the level of activity in the construction sector along with consumer preferences are important determiners of demand. The level of demand for timber flooring is often noted in increased logging industry-wide ("Logging in the US" 5). On a large scale, rapid growth in industrializing countries indicates that global wood consumption is expected to rise by 20 percent by 2010 and by over 50 percent by 2050, according to the Resource Conservation Alliance, highlighting both the importance of timber in the global economy and the necessity for study into its effects on the earth from which it grows ("History of Logging").

With 95 percent of the original forests in the United States destroyed within the last 500 years, modern timber harvesting has shifted to practices that produce lumber outputs more rapidly than ever before ("The Destruction of America's Last Wild Forests"). Such finished lumber is supplied primarily to the construction industry from coniferous softwood species including pine, cedar, and hemlock. These trees are planted in large-scale operations and harvested as soon as they reach maturity to fuel the wood-related industry, typically only after 20 to 30 years. Fast-growing species, with thinner cell walls and lighter color, are generally less dense than their slow-growing and old-growth counterparts and produce weaker finished wood products. From data collected by the United States Forestry Service, such fast-growing pines are given "moderate" to "poor" durability ratings based on density, shrinkage, hardness, resistance to decay, and maximum load (Wood Handbook: Wood as Engineering Material). It is therefore of great concern that the booming construction industry is literally being built by inferior quality wood products that are often grown in unsustainable practices that damage the natural environment.

With increasing demand on forest resources and a greater understanding of the timber industry's environmental impact, non-forest sources of wood have grown in importance. Reclaimed wood, one source of non-new-growth lumber, is wood that is usually salvaged from buildings slated for demolition, abandoned railroad trestles, and sinker logs that have been submerged for years in river-based log drives. As an aspect of the larger green building movement, the *deconstruction* technique generally used to collect such timber places an emphasis on disassembly and salvage for reuse—in contact to *demolition* which places emphasis on building removal, and usually landfill consumption ("Deconstruction: Back to the Future for Buildings?"). While the deconstruction movement has faced controversy and criticism as an incentive to dismantle a historic building rather than preserve it, interest in the use of reclaimed wood lends insight into the quality and possible uses in new construction and renovation projects.

Supporters of the reclaimed wood movement outline several benefits of salvaging lumber that is currently in use or idle in riverbeds or lakes. The Reclaimed Wood Council asserts that "such timber is available in species, coloration, and wood quality that is no longer available in newly harvested timber." Many of the old-growth tree species the RWC refers to no longer exist, such

as old-growth cypress, or are of such diminished quality due to growing practices, including pine, that their true potential is never realized. The deep coloration of dense old-growth heart wood cannot be found in the grown-for-profit lumber practices seen today that produce light-colored wood with little variation (Reclaimed Wood Council).

Beyond the issue of supply and physical attractiveness, reclaimed wood is touted as a component of the "Reduce, Reuse, Recycle" movement that seeks to mitigate the effects of human consumption on the environment. As a component of the Leadership in Energy and Environmental Design (LEED) Green Building Rating System, the use of reclaimed wood can earn credits towards LEED certification under both "recycled content" and "certified wood" categories" (U.S. Green Building Council). Reducing the demand on new-growth timber by incorporating reused products in flooring, roofing, furniture-making, and other building practices is one aspect of a larger mission to decrease the land devoted to and energy consumed by the lumber industry. The air and water pollution generated by mechanized harvesting practices can be reduced as part of such a movement away from large timber cutting. Beyond the conservation of natural resources, existing ecosystems and biodiversity can be protected from further expansion of clear-cut techniques that obliterate huge tracts of land as the building industry demands more wood products (Reclaimed Wood Council). Specialized demand for high-cost, rare wood products in luxury markets place pressure upon foreign countries to harvest rainforests and old-growth lands for export products. These demands compelled companies like Home Depot, Inc. and IKEA AB to ban the purchase of wood from endangered, ancient forests in protest of foreign woodland depletion (McKenna).

A large component of the attractiveness of reclaimed wood is its economic benefit, both in individual projects and on a larger scale. Due it its unsurpassed quality, products made of salvaged wood are more durable and have usable lifetimes that are many times greater than those made from modern lumber. The actual trees that such timbers were cut from are several hundreds of years old, having been preserved in dry roof areas, building interiors, or in cold water environments. Wood cut from fast-growing trees may deteriorate and rot in mere years with huge implications on today's building industry. Canada's Federal Heritage Buildings Review Office Code of Practice asserts that "Life expectancies for many contemporary buildings are 30 to 40 years, considerably less than the life expectancy for the average restored or rehabilitated building" (Rypkema 50). Though this statement refers specifically to building life, generalizations can be made regarding the quality of building materials available in previous construction eras, especially in the wood framing techniques of older structures. Beyond the vastly longer life span and therefore reduced need for replacement, wood salvaging adds value to local economies that the mechanized timber industry is unable to achieve. Reclaiming lumber is a labor-intensive process that employs skilled workers, adding value to a local economy. The processing and finishing of the salvaged wood that can include skilled handwork, often remains in the region of its harvest to further infuse local economies with capital (Reclaimed Wood Council).

Reclaimed timber can be differentiated by its source: salvaged from an existing site such as a bridge, barn, or railroad, or recovery from a body of water. The discussion that will follow is centered around this second type of reclaimed timber, sinker logs that have been dredged from bodies of water after laying dormant for years. Attention was first brought to the opportunity of

sinker log retrieval in a 1996 article in the Washington Post cleverly titled “30,000 Logs under the Sea.” The article described the recovery efforts of the Superior Lumber Company in Checaumegon Bay, Wisconsin in raising approximately one million sunken logs to the surface. Sitting for approximately 100 years under roughly 60 feet of cold water, the logs originally cut in the 1800’s were preserved almost to perfection (“Lake Superior Sunken Logs”). The phenomenon described in the article is not unique to Lake Superior and can be found in varying degrees in areas throughout the country where the logging industry was influential. Subsequent articles in major newspapers and industry sources sparked attention in the recovery of sunken logs and led to the foundation of numerous companies specializing in the retrieval and finishing of such rare lumber. Preserved in cold, anaerobic environments for multiple decades, such sinker logs are actually denser than their above-surface counterparts and strengthen further as they dry (Smith, Jim). Prized for its beauty and quality, these products are used in both new construction and in historical renovation projects; one such example of the use of refurbished submerged wood in a restoration project is the showcase Chowan County Courthouse in Edenton, North Carolina.

Edenton was selected as the colonial capital of North Carolina in 1722 and soon became its cultural and economic capital, as well, as hundreds of ships made the town a regular port of call. A thriving plantation economy rose from the shipping industry, many of the original historic structures meticulously restored today to comprise the 25-building North Carolina State Historic Site (A Guide to Edenton, NC). The centerpiece of the town is arguably the historic courthouse constructed in 1767 and designated as a Registered National Historic Landmark in 1970. The courthouse is not only the oldest public building in North Carolina, but boasts the title of the least altered of all remaining British colonial courthouses in America (Willers 1). When Chowan County’s court facilities moved to a new building in 1979, the future of the colonial courthouse came into question. Numerous surveys, studies, proposals, and individual restoration projects had been carried out when in 1993, a Plan for the Restoration of the 1767 Chowan County Courthouse was drafted and the Courthouse Study Commission set the comprehensive plan into action. The Commission emphasized two key values in the courthouse’s restoration: that the building should remain a functioning piece of

Edenton's civic culture, and that architectural and historical integrity should be preserved back to its state prior to 1850 when substantial renovations were carried out (A Report on the 1767 Chowan County Courthouse 10). With these two goals in mind, a restoration plan was developed and a team of specialists was assembled including HagerSmith Design, PA; George Fore, Architectural Conservator; Lysaght and Associates; and Rooftop Systems Engineers, PC to restore the courthouse to its original splendor (Willers 2).

One of the aspects of the courthouse renovation that received the greatest attention was the replacement of the cypress shingled roof due to its vast importance in integrity, both structural and historical, and complexity. Historical records indicated that an unsuccessful attempt was made in 1835 to replace the original wood shingle roof with a more modern standing seam metal roof. Subsequently, several wood shingle roofs were installed, the most recent in 1979 when the courthouse functions moved from the colonial site (Plan for the Restoration of the 1767 Chowan County Courthouse 5). The comprehensive plan written in 1993 calls for the roof replacement as an urgent need as leakage and signs of failure threatened the building. "Portions of the timber structure had been damaged by water entry, specifically the lower portion of the base of the valleys and various locations at the cornice. Defects in the swept valley construction were the primary cause of the damage to the timber structure" explains a brief prepared by Rooftop Systems Engineers regarding the structural damage the building sustained (Willers 2). The Plan therefore recommends that, "A new wood shingle roof, made of local cypress, could be expected to last longer than the current roof. Alternatively, a standing-seam or 'tin' roof could be installed. Although technically not accurate to the proposed restoration period, tin roofs were used on other public buildings in North Carolina at the time, and such a roof is undoubtedly what was intended in the unsuccessful re-roofing in 1835" (6). Though the material for the roof restoration was undecided at the time of the Plan's publication, over $156,000 was budgeted for its immediate replacement as a first step in the long-term projected renovation of the courthouse exterior and interior (14).

In order to maintain the historical integrity of the courthouse, investigation into the most appropriate roof material began. During inspection of the structure, original shingles from the 1767 construction were found in the clock tower and in the crawl space under the main floor. They were identified as 18" long, cypress shingles that had been split and dressed, and each corner of the butt had been rounded (Willers 3). The 230-year-old shakes found in the building were evidence enough to convince the preservation team that similar old-growth cypress shakes would be the most appropriate material to complete the roof renovation (Willers, John). Further investigation into finishes used during the era of the courthouse's construction yielded records that detailed George Washington's use of cypress roofing at his Mount Vernon estate. Accounts stated that he even acquired personal lands to mine the lumber, prized for its durability and aesthetics (Thomas, Reid).

Beyond the issue of historical continuity, cypress was chosen as the roof material for its resilience and hardiness. As previously noted, however, local cypress was originally specified for the roof renovation. Yet the desire for old-growth wood dictated that the preservation team seek a nontraditional source of lumber due to the near depletion of such cypress. At the time of the roof replacement in the late 1990s, the use of reclaimed sinker logs was coming to the forefront of industry attention with such large-scale projects as the Lake Superior salvages drawing notice.

Reid Thomas of the North Carolina State Historic Preservation Office detailed that such water salvaged cypress could have an expected lifespan of three to four times that of a new wood roof, leading the team to select such a product for the courthouse renovation. Though the reclaimed cypress roof cost substantially more than originally anticipated, as described below, the team felt that such an increase in cost was a wise investment when the cost of multiple replacements over the chosen roof's possible lifespan was calculated.

Though the roof replacement was bid at approximately $290,000 in 1997, a drastic increase from the original $156,000 budgeted in 1993, Jim Smith of HagerSmith explained that though sunken cypress was more expensive than new growth due to the difficulty in retrieval and labor-intensive processing, the vast majority of the cost increase was actually a factor of the extensive damage and intensity of skilled labor required to repair the roof to its former standards. Unanticipated water damage was discovered in the building's cupola, requiring special attention and adding to the project's expected costs (Thomas, Reid). The most substantial increase in project costs, however, was attributed to the labor costs of crafting every shingle by hand. Such a labor-intensive process was necessary to maintain the historical continuity of the roof and also achieve the desired quality with a consistent grain pattern and orientation (Smith, Jim).

Figure 1 (Photo by Progressive Contractors, Inc.)

As is often noted in reclaimed wood processing, value is added to the local economy through the use of skilled labor. Though the logs used in the restoration of the Edenton courthouse were salvaged from the murky waters of the Florida and Louisiana Gulf Coast and shipped to Maryland for processing, the actual shingle drying, finishing, and staining was done on-site in Edenton by Progressive Contractors, Inc. Beyond the hand cutting of the shingles, the roof replacement required great innovation due to its complicated and unique design (Smith, Jim). Specific details could not be found in any of

Figure 2 (Photo by Progressive Contractors, Inc.)

the industry manuals to describe the swept valleys, so a shingle layout was designed exclusively for the courthouse renovation (Figure 1). The roof's fanned hips were also undocumented, leading the design team to create a specific layout and combination of cypress shakes and sheet metal interlayment to ensure water-tightness (Figure 2) (Willers 6, 10). The combed ridge and apse roof proved further challenges in aesthetics, historical continuity, and weatherproofing as the Edenton courthouse's intricate and unique style challenged the deign team and craftsmen (15-17).

The Edenton reroofing proved to the starting point of a spectacular restoration of one of the country's most significant courthouses. For their exemplary work, HagerSmith Designs was awarded a North Carolina American Institute of Architects Design Merit Award in Historic Renovation. Beyond the project itself, the Chowan County courthouse project attracted public attention and was able to garner unprecedented community support in the small, historic community. Though attention to preservation had been an important value in Edenton for many years, the courthouse renovation stood as a standard for preservation activity to come (Thomas, Reid). As Donald Rypkema asserts, "Historic preservation promotes active community preservation," creating a bond between a community and its citizens, an intangible benefit of the Edenton courthouse renovation that has greatly shaped the community and its citizens (52-53).

With such interest in the renovation project, the intricate and innovative roof reconstruction as the centerpiece, greater attention has undoubtedly been paid to the use of reclaimed sinker logs and other wood products. Efforts such as the Edenton courthouse can draw awareness to both the attractiveness and quality of such salvaged items and the greater need for sustainable lumber production worldwide. As the courthouse building remains a showpiece in Edenton and the greater area, the durable, attractive, and appropriate reclaimed cypress roof will continue to stand the test of time as both a responsible and beautiful alternative to modern forestry practices.

Works Cited

"Deconstruction: Back to the Future for Buildings?" Environmental Building News. 1 May 2000.

Donaldson, Alfred Lee. A History of the Adirondacks. New York: Century Co., 1921.

A Guide to Edenton, NC. 2008. 7 April 2008. <http://www.edenton.org/>

"History of Logging." The History Channel.

"Lake Superior Sunken Logs." TED Case Studies. American University, 1997.

"Logging in the US." IBISWorld Industry Report. 3 April 2008.

McKenna, Barrie. "U.S. Home Builders to Ban Old-Growth Wood." The Globe and Mail 31 March 2000.

A Plan for the Restoration of the 1767 Chowan County Courthouse. Gerald Allen & Jeffrey Harbinson Architects, PC. New York. 1993.

Reclaimed Wood Council. 2004. Reclaimed Wood Council. 18 March 2008. <http://www.reclaimedwoodcouncil.org/ >.

A Report on the 1767 Chowan County Courthouse for the Chowan County Board of Commissioners. Courthouse Study Commission. 4 Nov. 1989.

Rypkema, Donald. The Economic of Historic Preservation. Washington D.C.: The National Trust for Historic Preservation, 2002.

"The Destruction of America's Last Wild Forests." Save America's Forests. 1998.

Smith, Jim. Personal Interview. 7 April 2008.

Thomas, Reid. Personal Interview. 8 April 2008.

U.S. Green Building Council. 2008. The U.S. Green Building Council. 18 March 2008. <http://www.usgbc.org/>

Willers, John. Personal Interview. 4 April 2008.

Willer, John. "Wood Shingle Reroofing, Historic Chowan County Courthouse, Edenton, North Carolina." 27 July 2001.

Wood Handbook: Wood as an Engineering Material. Madison: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory.