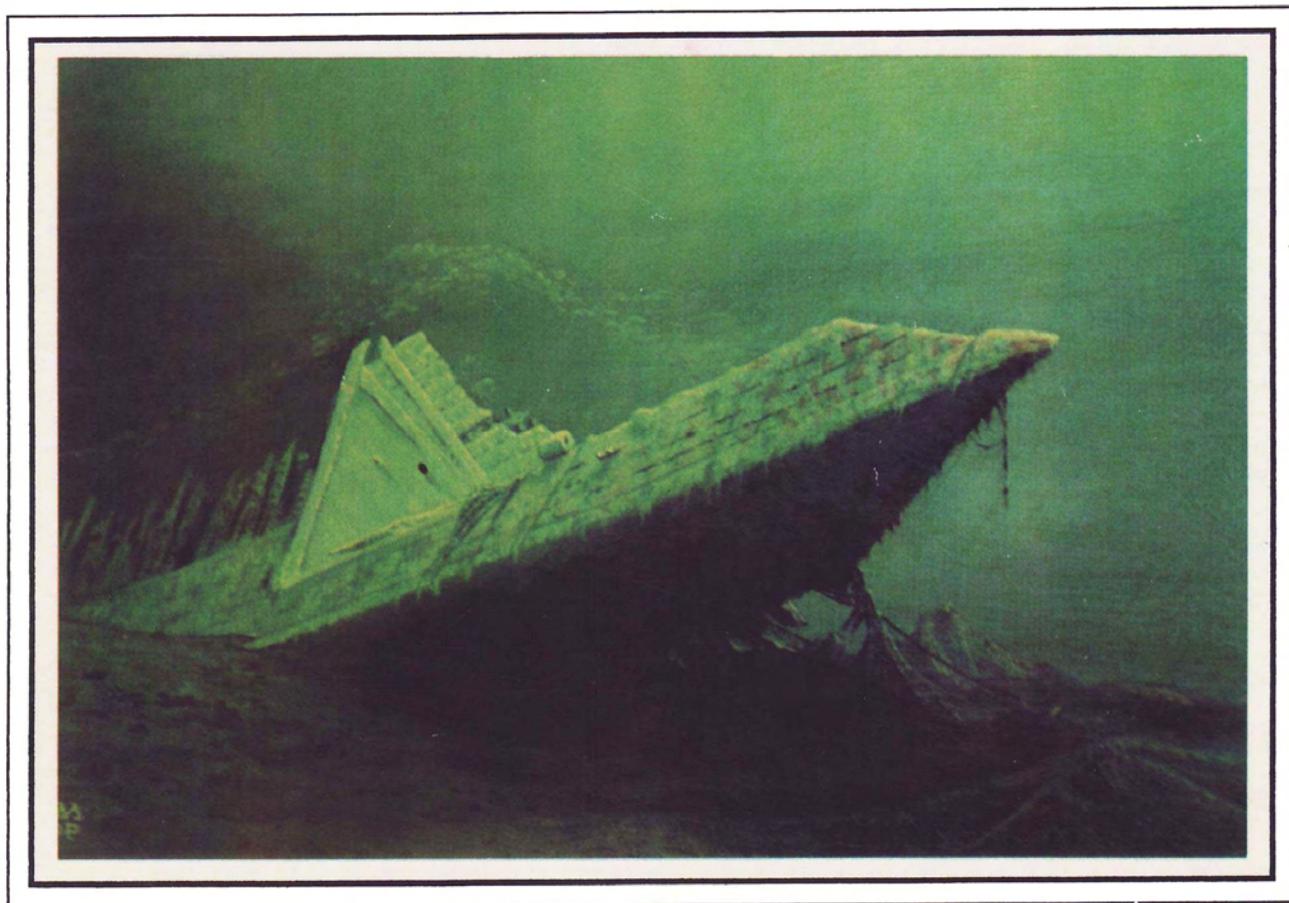


# *CSS Raleigh*

The History and Archaeology of a Civil War Ironclad  
in the Cape Fear River



by

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Underwater Archaeology Unit  
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Kure Beach, NC 1996

*CSS RALEIGH*  
THE HISTORY AND ARCHAEOLOGY OF A CIVIL WAR IRONCLAD  
IN THE CAPE FEAR RIVER

A Thesis  
Presented to  
the Faculty of the Department of History  
East Carolina University

In Partial Fulfillment  
of the Requirements for the Degree  
Master of Arts in History

by  
Martin D. Peebles  
March 1996

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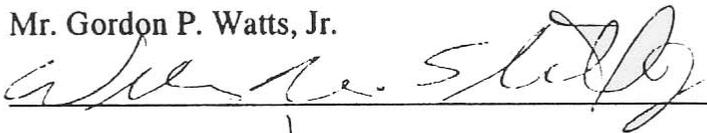
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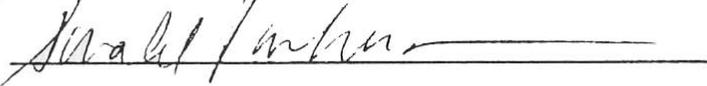
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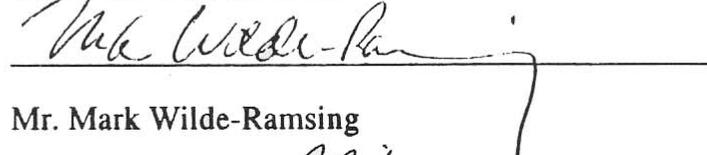
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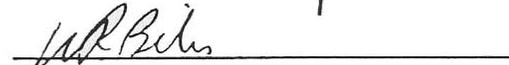
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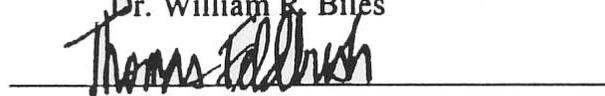
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**Martin D. Peebles. CSS *RALEIGH*: THE HISTORY AND ARCHAEOLOGY OF A CIVIL WAR IRONCLAD IN THE CAPE FEAR RIVER. (Under the direction of Prof. Gordon P. Watts, Jr.) East Carolina University, Department of History, March 14, 1996.**

This thesis is an historical and archaeological account of the Confederate ironclad *CSS Raleigh*, which after an overnight engagement with the Union blockade, was lost in the Cape Fear River in 1864. The ironclad was nominated to the National Register of Historic Places in 1985, but a comprehensive study of the vessel's history and archaeological integrity was never made. Historically, nothing remains in the way of builder's plans or written specifications for this particular ironclad. Personal accounts associated with the design and construction of the vessel are also scarce. The *Raleigh* has been given cursory mention in a number of secondary works. None of them elaborate on the reasons for Flag Officer William Lynch's attack on the Federal squadron, or the circumstances of the ironclad's loss.

Fortunately, the *Raleigh* belonged to a class of vessels that characterized Confederate ironclad design after the Battle of Hampton Roads, in which the USS *Monitor* fought *CSS Virginia*. Complimentary information on ironclads like the *Raleigh* includes builder's plans, engineering plans, a few written specifications and some visual material. Only a few naval historians have elaborated on the construction and service of Confederate ironclads. Some of their works present the broad scope of development of which the *Raleigh* was an integral part.

Meanwhile, the wreck of the *Raleigh* comprises one of the most extensive bodies of information on the most popular form of Confederate ironclad design. Archaeological examinations in 1993 and 1994 contributed some important findings to the historical record. The most valuable find was in assessing how much more information can be

gained from future investigations. Hence this thesis starts on a broad historical perspective of ironclad development, before narrowing to a focus on activities in Wilmington, and finally to an archaeological assessment of the *Raleigh's* present remains.

## ACKNOWLEDGMENTS

The writer of this thesis is indebted to a large number of contributors. First of all, this thesis was made possible by the Underwater Archaeology Unit (UAU) at Fort Fisher, a division of the North Carolina Department of Cultural Resources. My appreciation for their commitment goes to Leslie Bright, Barbara Brooks, Julep Gilman-Bryan, Sandy Jackson, Richard Lawrence and Mark Wilde-Ramsing. Several other people came and went within the UAU ranks. Glenn Overton and Howard Scott participated in the archaeological assessment of the *Raleigh* during the 1993 comprehensive survey of the Cape Fear River. Chris Olson of East Carolina University participated in the following investigation in 1994. Henry Harris came from Chapel Hill, North Carolina to assist with surface communications.

Several other institutions were of invaluable service. My thanks is also extended to Gerig Spencer and all the staff of the Fort Fisher State Historic Site in Kure Beach; the staff of the New Hanover County Library's North Carolina Room; the Randall Library at UNCW; the staff at Tidewater Atlantic Research (especially Robin for her logistical support with the director); and also the district office of the US Army Corps of Engineers, where the map files of Richard Kimmel were especially useful. Vital research material was also contributed by Edwin Combs of East Carolina University, Robert Holcomb of the Confederate Naval Museum (CNM) in Columbus, Georgia, and Bill Reaves, whose collection at the UAU is invaluable for North Carolina maritime resources. Several others have kept an eye out for miscellaneous contributions, including Jemison Beshears and Ray Tubby, both of East Carolina University, Chris Fonvielle and Sandy Jackson, both ECU alumni.

And finally, I would like to thank those individuals who took the time to read and critique the thesis through its many drafts. Committee members include Professor

Gordon Watts (director), Dr. William N. Still, Dr. Don Parkerson, and Mark Wilderamsing. Reviews were also given by UAU staff members Leslie Bright, Sandy Jackson, and Richard Lawrence. Other expert opinions were given by Edwin Combs (ECU), Chris Fonville (ECU-alumni), and Robert Holcomb (CNM, ECU-alumni).

To family and friends, to everyone who has lent their enduring support or simply expressed an interest - Thanks again.

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## INTRODUCTION

In March of 1862, the battle of Hampton Roads marked the first engagement between two iron ships of war. Just as the battle was significant to a much broader development, the USS *Monitor* and the CSS *Virginia* tend to overshadow the names of more than a hundred other ironclads constructed by both sides. Over the course of the war, the South laid down more than thirty ironclads and the North more than eighty. Ironclads were present in almost every naval engagement, from the campaigns along the Mississippi River to the actions along the Gulf Coast and the Atlantic Ocean. This thesis was originally intended to account for only one ironclad. Research led to a much broader perspective. While the history of the CSS *Raleigh* characterizes the full range of the South's attempt to match Northern industrial might, the vessel remains comprise the greatest body of information on the Confederate navy's most popular form of ironclad design.

Although nominated to the National Register of Historic Places in 1985, the *Raleigh's* history and archaeological integrity were never thoroughly researched. A lack of historical information on the vessel itself gives some explanation. The scope of research, however, was increased to include an overview of six ironclads built to the same design. Historical records on some of these vessels include builder's plans, engineering drawings, photos and other visual material, in addition to contemporary descriptions and various personal accounts. As for the *Raleigh's* extant remains, they were briefly examined in the Fall of 1993 by the North Carolina Underwater Archaeology Unit (UAU) as part of a comprehensive survey of the Cape Fear River. A follow up investigation was conducted in 1994. Both investigations contributed some vital findings to the historical collection.

This thesis is organized into six chapters. Starting from a broad historical perspective of ironclad development, the scope narrows to the war in Wilmington, and finally to a history of the *Raleigh*, carrying through to the most recent archaeological investigations.

“Chapter 1: The Search for a New Design,” begins with the implementation of ironclad construction in the South as inspired by earlier developments in Europe and America. The battle of Hampton Roads demonstrated both the advantages and limitations of ironclad warfare. The lessons of the engagement resulted in a new design that was the Confederate government’s first attempt to standardize construction in other parts of the South. This design is described on the basis of available evidence. At least six ships, including *Raleigh*, were built to these specifications and more than a dozen other ironclads shared similar characteristics. Nevertheless, disparities in construction and engineering resulted in dissimilar abilities. The careers of four vessels from the original class are highlighted for comparison with the *Raleigh* in later chapters.

“Chapter 2: Construction in Wilmington” accounts for the building of the *Raleigh* and its sister-ship, *North Carolina*. The naval defense of Wilmington presents a worst case scenario of the South’s logistical troubles, compounded by inter-service rivalry, labor strikes, and outbreaks of yellow fever. The *North Carolina* was completed first, and the *Raleigh* delayed for more than a year. For reasons unknown, the two ships represent one of the worst and one of the best ironclads ever constructed in the South. Some possible explanations for their disparity will be examined in this chapter.

“Chapter 3: The CSS *Raleigh*” chronicles the ironclad’s attack on the Federal blockade at Cape Fear. The blockade was scattered, but unlike the *Virginia* at Hampton Roads, the *Raleigh* proved unable to close with the enemy in spite of improvements in speed and maneuverability. The attack was heralded as a great success by some and a dismal failure by others. The lesser of opinions is due largely to the ironclad’s

subsequent fate immediately after the engagement. Leaving the details of its loss to the next chapter, the Confederates were deprived of an important link in the defense of Fort Fisher.

“Chapter 4: Site History, 1864 to Present” details the ironclad’s loss in the Cape Fear River and traces the history of the wreck from the Civil War to the present day. Apart from some industrious attempts at salvage during the war and a few years after, the works of both man and nature have inadvertently done much to protect the site until the latter part of this century. Although rediscovered in the 1970s, early investigations relied mostly upon remote sensing. Diver activity was limited by the swift currents and poor visibility of the Cape Fear River. The wreck’s identity has long been suspected but never officially confirmed until recently.

“Chapter 5: Investigations in 1993 and 1994” accounts for the UAU surveys. The findings confirmed the wreck’s identity and provided a means for assessing its overall condition. The *North Carolina* was also examined, and will be given a brief description in this chapter. The remains of the *Raleigh* were far more extensive, prompting the commencement of this thesis. The findings will be described in detail at the end of the chapter. Serious damage resulting from exposure is also evident in the description.

“Chapter 6: Past and Present” underscores the *Raleigh*’s significance among the wrecks of the Civil War. Where so few ironclads remain, the *Raleigh* is one of the better preserved representatives of the South’s most numerous and characteristic form of design. A management plan is recommended to protect the remains and facilitate future research.

## CHAPTER I

### THE SEARCH FOR A NEW DESIGN

The history of the *Raleigh* begins with the Confederate Navy Department's first experiment with an ironclad warship. Given the South's severe lack of naval resources, Naval Secretary Stephen R. Mallory was confronted with the dilemma of how to defend the Confederacy's major seaports against a far superior naval power. Clearly the agricultural South could not match the industrial North ship for ship. In April of 1861, Mallory wrote to Confederate President Jefferson Davis, "I regard the possession of an iron-armored ship as a matter of the first necessity. Such a vessel at this time could traverse the entire coast of the United States, prevent all blockades, and encounter, with a fair prospect of success, their entire Navy."<sup>1</sup> The battle of Hampton Roads forced Mallory to consider a more realistic role for the ironclad. Still in other circles within and outside of the navy, such high hopes would persist until the end of the war.

#### **Early Developments and Hampton Roads**

Stephen Mallory was clearly influenced by the revolution in naval warfare that had already begun in Europe. The concept of an iron warship had many precedents, including Robert L. Stephens' armored steam battery of 1,500 tons. In 1842, Stephens persuaded Congress to allocate funds for construction, but the vessel was never completed. For all practical purposes, the revolution began in response to improvements in the destructive capacity of the exploding shell as a naval weapon. During the Crimean War (1853-1856), French armored "floating batteries" were used successfully against the Russian fortress of Kinburn in the Black Sea. Before the outbreak of hostilities in

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<sup>1</sup> Stephen R. Mallory to President Jefferson Davis (April 26, 1861): Official Records of the Union and Confederate Navies, Ser. II, Vol. I, 51.

America, both Britain and France had at least one large sea-going ironclad. The race to create new warships of iron was well underway in Europe, but the war in America would prove the largest battleground of ironclads between 1861 and 1865.<sup>2</sup>

Secretary Mallory was not alone in expecting that ironclads could offset the Confederacy's numerical disadvantages. From the war's outset, several individuals submitted ironclad designs to the navy department. Independent constructions were also begun in other parts of the South. The most popular design included a sloping casemate that would deflect the main force of enemy projectiles. Many of the early ironclads were massive, like the 264 foot *Mississippi* which was designed to carry a battery of 18 guns. Such leviathans overstretched the limited resources of the South and were usually never completed. Even the few that were completed proved too unwieldy because of their large size.<sup>3</sup>

At the Gosport Navy Yard near Norfolk, Virginia, Lt. John M. Brooke joined with fellow officer John L. Porter to oversee the work on the old US steam frigate *Merrimack*. The salvaged hulk was stripped down to the main gundeck and rebuilt as the government's first ironclad ram. An armored casemate, 194 feet in length, was constructed over the 275 foot hull of the *Merrimac*. The sides of the casemate were constructed at an angle of 35 degrees. The wooden structure was two feet thick and protected with four inches of iron, using 2-inch plate. Ten guns were carried inside, including six 9-inch smoothbores from the *Merrimac*, and four others designed by John Brooke. Two of them were 6.4-inch guns, mounted broadside. The other two were 7-inch guns, mounted on pivoting carriages at either end of the casemate. A 1,500 pound ram was fixed to the vessel's bow.

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<sup>2</sup> Developments abroad discussed by A. Robert Holcomb, Evolution of Confederate Ironclad Design, (Greenville, NC, 1993), 2-6.

<sup>3</sup> The foremost authority on early designs and independent constructions is Holcomb, Evolution of Confederate Ironclad Design, 6-7, 39-56; for construction of the *Mississippi*, 43-46.

The converted ironclad had several imperfections. The waterline was inadequately protected with only one inch of armor. The vulnerability of this area was somewhat lessened by the loading of coal, stores, ammunition, and ballast. Consequently, the fore and aft decks were awash and a breakwater was constructed on the bow to shear the wake away from the gun ports. Drawing 22 feet of water, the converted ironclad proved very difficult to maneuver. Its rebuilt engines could only bring the giant armored ship to a speed of about five knots.<sup>4</sup>

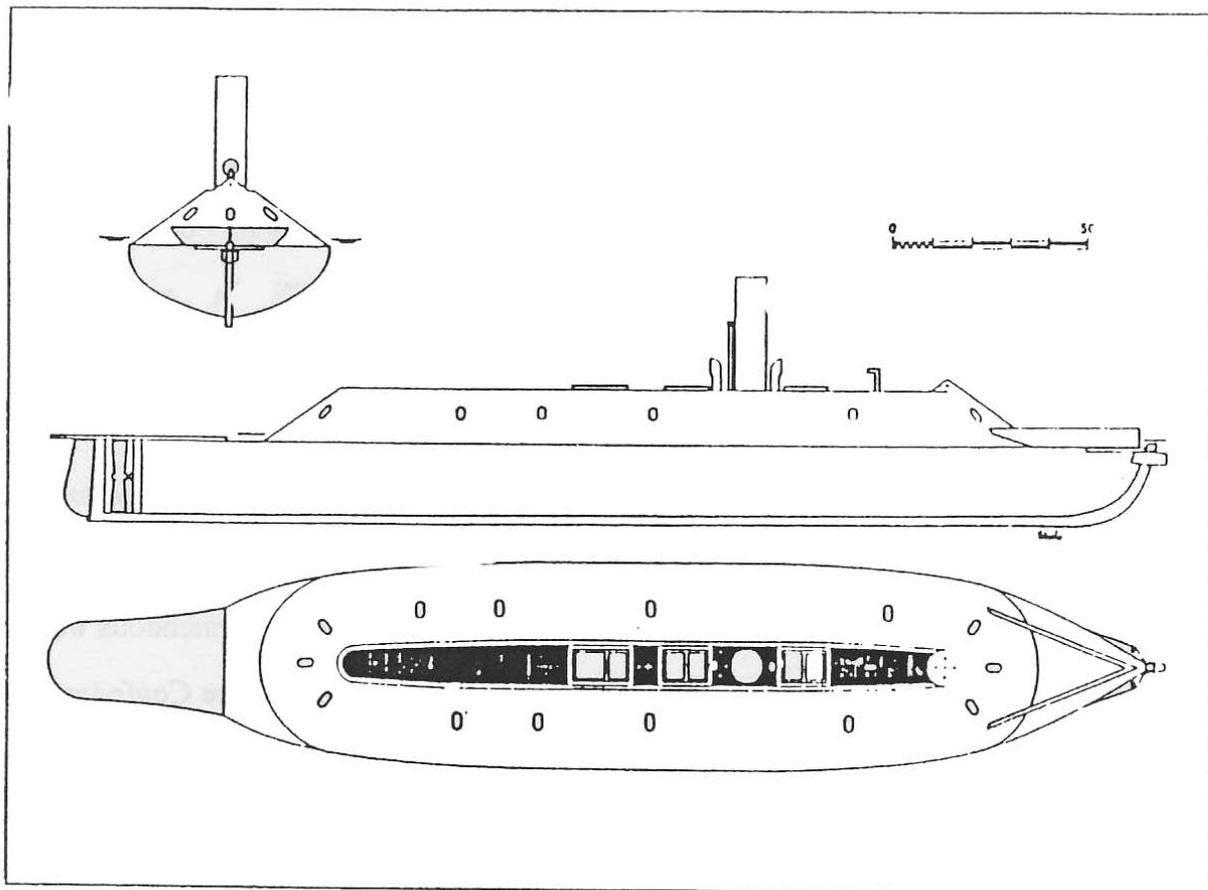


Figure 1: CSS *Virginia*. Reconstruction by Robert Holcomb, Evolution of Confederate Ironclad Design, 19.

<sup>4</sup> Holcomb, Evolution of Confederate Ironclad Design, 8, 17-21. See also William N. Still, Iron Afloat: the Story of the Confederate Armored Ships, (Columbia, 1985), 13-15, 18-25.

Re-christened as the CSS *Virginia*, Mallory's behemoth steamed into history at Hampton Roads on March 8, 1862. Its sluggish approach allowed ample time for the Federal fleet to beat to quarters. As they waited, *Virginia* closed in and opened fire on the USS *Cumberland*. The *Cumberland*'s 24 guns returned fire with the support of the shore batteries at Newport News. The shells glanced harmlessly over the *Virginia*'s sloping sides. After passing through the first barrage, the ironclad continued for two miles before it was able to turn around. After turning, the ironclad slowly built up to ramming speed and crashed into *Cumberland*'s hull. Although the Union ship was sinking, the ram of the Confederate ship was also stuck, threatening to take the ironclad down with its victim. Finally the ram broke away from *Virginia*'s stem and went down with the sinking wooden ship. Meanwhile, two other Union ships ran aground. Before the day's action was over, the *Virginia* was able to dispatch the 50 gun *Congress* with incendiaries, but a falling tide compelled the ironclad to leave the USS *Minnesota* for the following day.<sup>5</sup>

During the night, another ship of iron steamed into Hampton Roads and took its station in the shallows near the *Minnesota*. This was John Ericsson's turreted *Monitor*, a vessel that drew only ten feet in draft compared to the *Virginia*'s twenty-two. When *Virginia* returned on the following day, it was again hindered by its tremendous bulk while the smaller Federal ship chose its ground in shallower waters. The Confederate ironclad's deeper draft nearly proved fatal when it ran aground during the duel. The boilers were fueled to a dangerous capacity, risking explosion before the engines pulled the ironclad free. For three and a half hours, the *Monitor* prevented the *Virginia* from attacking the *Minnesota*. Finally, a Confederate shell exploded against the Union ship's pilot house, blinding Captain Worden. The *Monitor* withdrew temporarily. By that time,

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<sup>5</sup> Details of the first day's action at Hampton Roads are drawn from Still, *Iron Afloat*, 26-32; Virgil Carrington Jones, *The Civil War At Sea*, Vol. I, (New York, 1960), 412-437.

the tide was again ebbing and the *Virginia* was unable to close in on the defenseless wooden frigate. Before the *Monitor* could be brought back into action, the *Virginia* was already headed back toward Norfolk.<sup>6</sup>

With two Federal men-of-war destroyed, another severely damaged, and an enemy ironclad fought to a draw, the battle statistics were outwardly impressive. The victory, however, belied some serious drawbacks imposed by the *Virginia*'s great size. Not only did its draft hinder inland navigation, but the inherent burden of the armored casemate made it terribly unseaworthy. Thus, Secretary Mallory was forced to reconsider the potential of the ironclad as an offensive weapon, especially one that was capable of such feats as raiding the New England coast. He now realized that the chief value of building more ironclads in the South would be for harbor defense.<sup>7</sup>

It was with harbor defense in mind that Mallory commissioned John L. Porter to draft the plans for an entirely new vessel. Long before the war, in 1846, Porter had drawn up a plan for an ironclad that the United States government turned down. Now he set to work refining his old plan for the Confederacy.<sup>8</sup> Designed from the keel up, it would characterize the future of Confederate ironclad construction. The total number of ships built to Porter's first design is not known. The CSS *Richmond* was the first, giving its name as the prototype to a class of at least six vessels. Two were to have been built in New Orleans, but neither could have been under construction for very long when the city fell in April 1862. Others that were completed included the *Palmetto State* and *Chicora* in Charleston, the *Savannah* in Georgia, and the *North Carolina* and *Raleigh* in

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<sup>6</sup> Details of the *Virginia*'s encounter with the *Monitor* are drawn from Still, *Iron Afloat*, 33-34; Virgil Carrington Jones, *The Civil War At Sea*, Vol. I, (New York, 1960), 412-437.

<sup>7</sup> Holcomb, *Evolution of Confederate Ironclad Design*, 63.

<sup>8</sup> Holcomb, *Evolution of Confederate Ironclad Design*, 63-66.

Wilmington.<sup>9</sup> More than a dozen other Confederate ironclads varied in terms of size or propulsion, but otherwise shared the basic characteristics of Porter's original design.

### **The First Harbor Defense Ironclads: General Features and Construction**

Some of the general characteristics of Porter's first design can be found in the collective builder's plans, photos, artistic depictions, and miscellaneous details of published and unpublished sources. In the future, archaeological investigation may yield the most information. For now, the nature of existing sources will be addressed in order of the basic dimensions, the pilot house arrangement, armament, lower decks, construction materials, and the engineering details of the six known vessels. (For comparisons of visual material, refer to Figures 2 through 6 at end of chapter.)

As drafted by John Porter, at the Gosport Navy Yard in 1862, the builder's drafts for the CSS *Savannah* show the basic dimensions of a "Richmond Class" vessel (Figures 2 & 3).<sup>10</sup> The dimensions reflect some drastic size reductions in comparison to the 281 foot length of the *Virginia*. The length between perpendiculars is listed at 150 feet, but the armored projections at either end give the vessel an overall length of 174 feet. The casemate measures approximately 100 feet long, with the same 35 degree slope. The only departure from *Virginia*'s basic casemate form was the incorporation of flat, rather than rounded ends for easier construction. The planned breadth of the ironclad was somewhat elliptical so that the sides of the casemate curved inward along the vessel's beam. The fore and aft decks had two feet of freeboard and their sloping sides were also

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<sup>9</sup> Other vessels of same design noted by John L. Porter in a letter to Mallory (September 20, 1862): Official Records, Navies, Ser. II, Vol. II, 272. An unknown number of this class were also proposed for construction in New Orleans, but nothing is known of their commencement before the fall of the city to Federal forces in 1862: Holcomb, Evolution of Confederate Ironclad Design, 66-67.

<sup>10</sup>(Figures 2 & 3) The originals are in the H. F. Willink Collection, Emory University, Atlanta, GA. The plans referred to in this report were retraced from the originals by Robert Holcomb of the Confederate Naval Museum, Columbus, Georgia.

contiguous with the casemate. By different accounts, the draft measured from 12 to 13 feet.

The drastic reduction in size was a step in the right direction, but a more significant improvement was the built-on armored “knuckle.” This feature was designed to protect the lower hull against ramming and enemy projectiles. The top of the knuckle was contiguous with the casemate, and the underside was angled back toward the hull. Forming an iron girder along the waterline, the knuckle shielded the entire circumference of the vessel. The converging ends of the knuckle formed a ram at the bow, and also a rudder guard at the stern. The maximum width of the vessel was 44 feet at the knuckle’s edge, and four feet below the waterline, the hull was 34 feet in beam. Not only was the lower hull adequately protected, but the narrower configuration below the knuckle improved handling tremendously.<sup>11</sup> As it first appeared in this design, the built on armored knuckle was a standard feature for at least eighteen other Confederate ironclads.<sup>12</sup>

Another feature of less certainty was the location of the pilot house. Porter’s plans do not show its location and there are no written specifications. The clearest indication is in the engineering plans of *Savannah*, which detail a horizontal and plan view of the vessel’s stern (Figure 4). The wheel house is located behind the smokestack, directly above the engine room. The pilot’s platform is positioned low within the casemate and the helm is on another platform, nearly level with the gun deck. No cover is shown above the casemate, only an angled lip to deflect projectiles. This stern location is also evident in a contemporary watercolor of the *Palmetto State* (Figure 6). A

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<sup>11</sup> Handling qualities are noted for both the *Savannah* and the *Raleigh*. For the *Savannah*, see report of Flag-Officer, W. W. Hunter (June 30, 1863): Official Records, Navies, Ser. I. Vol. XIV, 713; for *Raleigh*, see the reports of Federal commanders, J. W. Balch, USS *Howquah* (May 7, 1864), and J. H. Porter, USS *Nansemond* (May 7, 1864): Vol. X, 21, 24.

<sup>12</sup>Holcomb, Evolution of Confederate Ironclad Design, 67.

photograph of the *Chicora* also displays a pilot house toward the stern (Figure 5).<sup>13</sup> As for the visual hindrance presented by the smokestack, inland navigation was usually conducted by an experienced regional pilot, with the assistance of lookouts or a leadsmen at the bow.

As some measure of practicality was surely intended, there were several advantages to the stern location. One was that the pilot house presented less of a target during ramming operations. The *Virginia*'s lucky strike against the *Monitor*'s pilot house could have inspired a safer location to the vessel's rear. The low position within the casemate was less exposed to enemy fire, but such an arrangement in the forward part of the vessel might have interfered with the gun crews. The gundeck measured less than 30 feet in width and the standard 7-inch Brooke rifle with its carriage, tackle, and accessories occupied about half of that space.<sup>14</sup> The staggered arrangement of the broadside guns was necessary to allow ample room for recoil without endangering the gun crews. Unless the pilot house was constructed entirely above the gundeck level, the only room inside the casemate was near the stern, above the engine room.<sup>15</sup>

The stern quarter also enabled direct communication with the engine room. This advantage was especially critical during ramming operations. The *Virginia*'s attack on the USS *Cumberland* was not the only demonstration of the hazards involved. Later in the war, the CSS *Albemarle* came close to sinking when it rammed into the USS *Southfield* in the Roanoke river, near Plymouth, North Carolina. Water rushed through

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<sup>13</sup>(Figure 5) A stern view is principally evidenced by comparing the location of the starboard broadside gun, which is somewhat blurred in the photo's background, with the gun arrangement in Porter's plans. The flag staff and the presence of the ship's launch are also somewhat suggestive. The pilot house is more distinct behind the officers standing under the flag.

<sup>14</sup>(Figure 2) The guns in Porter's drawing are not drawn to the scale of the actual weapons, hence they appear considerably smaller.

<sup>15</sup>A scale model of the *Raleigh* demonstrates this crowded condition (author's examination). Accurate in all other respects to the known specifications of the *Richmond* Class vessel's, the model was built by Mr. John Railey and is on display in the Cape Fear Museum in Wilmington, North Carolina.

the forward gunport before the ironclad managed to break free.<sup>16</sup> Before another engagement at Charleston, the engineer of the CSS *Chicora* was given careful instructions “to be ready to back out without delay.”<sup>17</sup>

With so much reliance on ramming, the *Richmond* Class ironclads carried only four guns (Figure 2). The casemate was constructed with eight shuttered gun ports to provide maximum serviceability. Three ports at the bow and three more at the stern were serviced by a single gun each, mounted on a pivoting carriage. In addition to the two broadside guns, this arrangement allowed as many as three guns to operate on either side at a time. An iron shutter covered the gun ports and was opened or closed with a chain running over the top of the casemate. The most vulnerable surface was the top of the casemate or spar deck. Iron or wood gratings in the spar deck provided the only means of natural lighting and ventilation. These hatches may have been closed with heavier iron covers before going into battle. A description obtained from deserters from the *Savannah* said that “when the hatches are on, (the ironclads) are almost hermetically sealed, the only opening being the ports.”<sup>18</sup>

Little is known of the guns that were carried except that the preferred model was designed by John M. Brooke, the same engineer who assisted John Porter in converting the *Merrimac* into the *Virginia*. In a letter to Gen. William H. C. Whiting, who was in charge of Wilmington’s defenses, Secretary Mallory described two of the *Raleigh*’s guns. “They are two 11,000 pound, double-banded Brooke, 6.4 -inch guns, whose penetration, as shown by our targets, equals that of the 7-inch.”<sup>19</sup> The projectiles for these rifles

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<sup>16</sup> Still, *Iron Afloat*, 161.

<sup>17</sup> Quotation from Second Assistant Engineer, James H. Tomb, CSS *Chicora* (January 30, 1863): *Official Records, Navies*, Ser. I, Vol. XIII, 622.

<sup>18</sup> For gun and port arrangement, see Plate I. Description of interior by deserters contained in report of Capt. John Rodgers, USS *Wabash* (March 19, 1863): *Official Records, Navies*, Ser. I, Vol. XIII, 767.

<sup>19</sup> Secretary Mallory to Gen. Whiting (April 25, 1863): *Official Records, Navies*, Ser. I, Vol. VIII, 873.

weighed 90 pounds. The *Raleigh*'s other two guns may have been 7-inch guns, also designed by Brooke.<sup>20</sup> Unfortunately, no tables have been found to suggest what the range or the penetration of either of these weapons might have been.<sup>21</sup> The nearest model for comparison is an 8-inch Brooke rifle, which according to General R. S. Ripley, could throw a 100 pound shell four miles with an elevation of 20.5 degrees.<sup>22</sup> This range, however, was severely restricted by the design of the casemate gunports. According to Gen. P. G. T. Beauregard, the elevation of the guns aboard the Charleston ironclads was less than seven degrees.<sup>23</sup> Their effective range was only about one and a half miles. By at least one Federal account, the *Raleigh* demonstrated a similar range.<sup>24</sup> (Brooke rifles, see Figure 8)

Below the gundeck were two other levels for berthing, storage, and engineering. A full complement of men numbered around 150 but only about half this number could be quartered onboard while the rest were housed onshore when not underway. Onshore housing was no doubt preferable as the interior of most ironclads was generally dark, dank, and poorly ventilated. Vents may have been added in some instances. Ironclads in general were notorious for their statistics of illness, low moral, and desertion, especially during the harsh months of summer and winter. Adding to the misery of the lower decks was the lack of any blowers to dispel the heat of the engines. As shown in the plans of

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<sup>20</sup>Sources on the *Raleigh*'s other two guns are suggestive but inconclusive. Two 7-inch guns were reportedly salvaged from the "*Roanoke*," a probable misnomer in reference to the *Raleigh*, and transferred to Fort Fisher in 1864: Scharf, History of the Confederate States Navy, 422. The 7-inch guns are mentioned again in a letter from John Brooke to General Whiting (January 11, 1865): National Archives, Record Group 109, Ordinance & Hydrography Letters.

<sup>21</sup>Warren Ripley, Artillery and Ammunition of the Civil War (1970), 136.

<sup>22</sup>Ripley's observation reported by Gen. P. G. T. Beauregard, CSA (November 14, 1863): Official Records of the Union and Confederate Armies, Ser. I, Vol. XXXV, 513-516.

<sup>23</sup>General Beauregard to Secretary Mallory (November 14, 1863): Official Records, Armies, Ser. I, Vol. XXVIII, 503.

<sup>24</sup>According to Commander William A. Parker of the USS *Tuscarora*, the *Raleigh* put a hole through the smokestack of the USS *Howquah* from 1 1/2 miles distant "by estimation." (May 7, 1864): Official Records, Navies, Ser. I, Vol. X, 19.

the *Savannah*, the engineering spaces cut through the officer's berthing with very little insulation between (Figures 2 & 4). The crew's quarters, up forward, were somewhat better insulated by the coal bunkers.<sup>25</sup>

If Porter included written specifications of the materials to be used in the construction of these ships, they have not been found. The details of fitting and joining will remain unknown unless further archaeological investigations are made of the known wrecks. What is available is a fairly detailed account of materials used in the construction of the *Richmond*, given to the Federals by a shipyard superintendent after Gosport fell in the summer of 1862. The report concurs with the cross-section in Porter's builder's plans (Figure 3):

She is built of good material and thoroughly fastened; her (hull) frame is 2 feet apart from center to center; sided to 8 inches, molded 10 inches at the heel and 6 1/2 at the head; filled in solid between the frames with yellow pine, fore and aft; her wales are 5 inches thick; her bottom plank 4 inches. Her roof (casemate) is built of yellow pine, oak, and iron; first yellow pine timber 13 inches deep, running up and down at an angle of 35 degrees; running fore and aft is a 5-inch thickness of yellow pine; running up and down a 4-inch thickness of oak plank; on that running fore and aft is a 2-inch thickness of iron; running up and down again is another 2-inch thickness of iron, making her altogether 26 inches thick. She is ironed 3 1/2 feet below her load lines.<sup>26</sup>

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<sup>25</sup> See Official Records, Navies, Ser I: deserters mentioned lack of blowers in *Savannah*, noted in report of Captain John Rodgers, USS *Wabash* (March 19, 1863), Vol. XIII, 767; deserters mentioned quartering ashore, noted in report of Commander William Reynolds, USS *Vermont* (Nov. 27, 1863), Vol. XV, 136-137. Muster rolls in Ser. II, Vol. I. Addition of vents to *Savannah* noted by Robert Holcomb, "Ask Infoer," Warship International, No. 3 (1983), 309-314. Conditions aboard are also described by Still, Iron Afloat, 100-101.

<sup>26</sup> Report of John H. Burroughs (November, 10, 1862): Official Records, Navies, Ser. I, Vol. VIII, 207. (See Figure 4 for comparison with builder's cross-section)

Of course the above account is best interpreted as a description of the preferred materials for construction. The South's general lack of shipbuilding resources and transportation troubles prompted the use of whatever materials could be found nearest the construction site. The unavailability of "good material" frequently led to the use of unseasoned timbers in ship construction all over the South. As for armor, plate iron was preferred but railroad iron was also used. Sometimes, the railroad iron was sent to Richmond to be melted down and rolled into plate armor. Other times, the T-rails were fitted to the casemate without rolling. There is no evidence that copper sheathing was used on any of the vessels.<sup>27</sup>

Other than the differences resulting from material shortage, there were few deviations from Porter's overall design. The *Palmetto State* differed slightly in having an octagonal casemate, fashioned with additional corner facets at each end (Figure 6). The most critical difference was not one of design, however, but of engineering.

Even greater than the limitations imposed by the lack of shipbuilding resources was the lack of engineering facilities. Stephen Mallory was well aware of the impossibility of manufacturing new engines for all of his ironclads. Excellent machinery works existed in Richmond, Virginia, and also in Columbus, Georgia. Mallory also sent foreign agents to Britain and France to find new engines. The preferred model was the "direct-acting horizontal type" as shown in the engineering plans of the *Savannah* (Figure 4). The two cylinders worked on a horizontal plane to either side of the crank shaft. In his search for engines abroad, agent James D. Bullock described this sort as "the simplest and most efficient, all the parts too being low and easily accessible."<sup>28</sup> In most cases,

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<sup>27</sup>The CSS *Savannah* is expressly noted as "not coppered" in the report of Commander W. Reynolds, USS *Vermont*, on information obtained from deserters (November 27, 1863): Official Records, Navies, Ser. I, Vol. XV, 137.

<sup>28</sup>Letter of James D. Bullock to Stephen Mallory (March 19, 1864): Official Records, Navies, Ser. I, Vol. II, 612.

however, salvage was the only resort. Very little is known of the models that were used or how they were fitted.

Regardless of the engine type, John Porter's new design would have fared well in the deeper waters of Hampton Roads. With its reduced underwater bulk, integrated knuckle, ram, and four guns, the plans marked a drastic improvement over the CSS *Virginia*. Unfortunately, the six vessels built to these specifications found service in the much shallower rivers and harbors of Richmond, Savannah, Charleston, and Wilmington. The services of four such vessels will be accounted for briefly in the next section, with respect to their intended "harbor defense" role and engineering limitations. The two Wilmington ironclads will be accounted for in the next chapter.

### **The "Richmond Class" Ironclads: Engineering and Performance**

The lessons of Hampton Roads may have forced Stephen Mallory to reconsider the use ironclads in naval defense. Throughout the war, however, many Southerners would wonder why other Confederate ironclads could not inflict similar damage to the Union navy. The pressure was always on the Confederate Navy Department to commit its ironclads to something more than "harbor defense." Of the six vessels built to John Porter's first design, four were able to assume more offensive roles. Three directly attacked the Union blockading forces on the Atlantic Ocean.

The career of the CSS *Savannah* exhibited one of the more typical dilemmas that all Confederate ironclads seemed to encounter. With its new set of engines, manufactured in the Naval Iron Works of Columbus, Georgia, the ironclad's general handling qualities were superior to most. The engines were capable of six and a half knots, which was adequate for navigation in the Savannah river. During the ironclad's

trials, it was reported that “her engine worked well; (and) she steers well.”<sup>29</sup> Nevertheless, it was the ironclad’s draft of 12 feet and 6 inches that prevented it from taking a critical part in the defense of Savannah, Georgia toward the end of the war.<sup>30</sup> In advance of Sherman’s approach to the port city, the *Savannah* was ordered up the river to protect the right flank of General Hardee’s defending troops. The shallows of the river prevented the ironclad from going far enough upstream, around the bluffs, to where the guns could be brought into action. Hardee was forced to evacuate. The ironclad was still able to provide a rearguard defense, shelling the Federal positions until the city was finally taken by land. Barred from escape by the mine defenses downriver, the *Savannah* was destroyed to prevent capture.<sup>31</sup>

Ironically, the first vessel to be constructed was also the last to enter combat. Before the *Richmond* was completed, the Gosport Navy Yard was in imminent danger of falling into Federal hands. In May of 1862, the unfinished ironclad was towed to the Confederate capital for completion.<sup>32</sup> The engines came from a former lightship, the *Arctic*. The type of engine is not known, but early trials of the *Richmond* prompted dismissive reports. The engines were said to be old and “not of much account,” and trial runs found them unable to steam “more than five knots, if that.”<sup>33</sup> Still, the ironclad’s draft of 12 and a half feet was the greatest impediment. Obstructions in the James River kept it out of action until the late years of the war.

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<sup>29</sup>Quotation from Flag-Officer W. W. Hunter, CSS *Savannah* (June 30, 1863): Official Records, Navies, Ser. I, Vol. XIV, 713-714.

<sup>30</sup>Draft reported by Flag-Officer W. W. Hunter, CSS *Savannah* (January 12, 1864): Official Records, Navies, Ser. I, Vol. XV, 702.

<sup>31</sup>Historical account of *Savannah* given by Holcomb. “Ask Infoser,” *Warship International*, No. 3 (1983), 314; also Still, Iron Afloat, 217-218.

<sup>32</sup>Report of John H. Burroughs, Shipyard Superintendent (November 10, 1862): Official Records, Navies, Ser. I, Vol. VIII, 207.

<sup>33</sup>Information derived from Emmanuel Shaw, quoted by Commodore Andrew A. Harwood (October 8, 1862): Official Records, Navies, Ser. I, Vol. V, 117; “more than five knots,” according to J. Taylor Wood, CS Navy (August 30, 1862): Official Records, Navies, Ser. II, Vol. II, 256.

The dredging of the channel at Drewry's Bluff in May of 1864 permitted the ironclad to take part in several assaults that year, but only as far as Trent's Reach where the shallows of the river again blocked the way. There, in company with the rest of the James River squadron, the *Richmond* came face to face with the monitors that had stood watch for it through most of the war. An afternoon of distant gunnery practice did nothing to entice any of them within range. The *Richmond* took a more effective role in the naval bombardment that drove the Federals from Fort Harrison in August 1864. Five months later, the ironclad and several other Confederate vessels were left grounded by the ebb tide at Trent's Reach. Federal shore batteries conducted a barrage that lasted all night. One of the wooden tenders was destroyed, but the *Richmond's* oak backed plates held firm.<sup>34</sup>

Even during the early years of the war, the *Richmond* aroused more concern in the Federal Navy Department than any other ships of its class. Apparently unaware that the Confederate ironclad was barred from action by the shallows of the river, the fears in Washington were given first consideration. In other Southern ports, the construction of ships like the *Richmond* was well known and their appearance expected. In January 1863, Admiral DuPont tried to persuade Gustavus Fox, assistant to Navy Secretary Gideon Welles, of the need to counter the threat in Charleston. DuPont complained bitterly to his wife, that "Fox . . . while keeping the ironclads all summer . . . to watch 'Merrimac No. 2,' has always pooh poohed those here."<sup>35</sup> Less than two weeks after DuPont wrote his wife, the *Chicora* and *Palmetto State* attacked his fleet, setting off a controversy over whether or not the blockade had been raised.

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<sup>34</sup>Accounts of CSS *Richmond* derived from Still, *Iron Afloat*: clearing of pass at Drewry's Bluff, 174; monitors at Trent's Reach, 177; Fort Harrison, 178-179; under fire at Trent's Reach, 183-184.

<sup>35</sup>Citation of DuPont by Still, *Iron Afloat*, 230: quoted from "Journal Letters" January 18, 1863 (Duke University Library, Durham, North Carolina).

It was General Pierre Gustave Toutant Bearegard, commanding the defenses of Charleston, who put the greatest pressure on the navy to commit the ironclads to something more than harbor defense. Foreign commanders, representing both Britain and France, had persuaded the general that if the blockade could be raised for only twenty hours, their respective countries would recognize it as legally broken. Under international law, this meant that the United States would have to go through the formalities of declaring another blockade, which could take several weeks before neutral powers were officially notified, and their ships again subject to legal seizure.<sup>36</sup>

Flag Officer Duncan Ingraham, commanding Charleston's naval defenses, doubted the ability of the ironclads to accomplish such a venture on account of their weak engines and questionable seaworthiness. Both of his ironclads were fitted with salvaged engines. The *Chicora's* engines were salvaged from the tugboat *Aid*. Those of the *Palmetto State* came from the *Lady Davis*, which was also a former tugboat, the *James Grey*. Both engines may have been manufactured in the Penn Iron Works, in Philadelphia, by Reanie & Neafie, but their types have not been specified.<sup>37</sup> According to one Federal informer, they were not capable of more than three or four knots.<sup>38</sup>

Nevertheless, on the morning of January 31, 1863, the ironclads slipped across the bar at high tide. According to Ingraham, the conditions were ideal, "the sea was perfectly smooth, as much so as in the harbor." The Flag Officer also commented that "the engines worked well, and we obtained a greater speed than they had ever before attained."<sup>39</sup>

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<sup>36</sup>Still, *Iron Afloat*, 117.

<sup>37</sup>This is by personal communication, according to Robert Holcomb, Confederate Naval Museum, Columbus, Georgia, December 6, 1995. The source has not been confirmed: see Reanie & Neafie Collection, Mariner's Museum.

<sup>38</sup>Speed of three to four knots noted by Charles Harris in account given to Federals at Morris Island, (September 7, 1864): *Official Records, Navies*, Ser. I, Vol. XV, 678.

<sup>39</sup>Report of Flag-Officer D. N. Ingraham, CS Navy (February 2, 1863): *Official Records, Navies*, Ser. I, Vol. XIII, 618.

A thick haze allowed the ironclads to close with two ships of the blockading squadron. First the *Palmetto State* rammed into the USS *Mercedita*, firing a single shot from the forward weapon. The ram “cut (the *Mercedita*) through, at and below (the) water line,” while the shell passed through ship and boiler, “blowing a hole in its exit some 4 or 5 feet square.”<sup>40</sup> With two men dead, and two more dying, the Union ship surrendered immediately. The captain was granted conditions of parole for his crew while they worked to stop the flooding. Then the *Palmetto State* moved to assist the other Confederate ship in attacking the next vessel. The officers of the *Chicora* reconsidered their plan of ramming, fearing that the engines would fail to withdraw the ironclad from a stricken enemy. They decided to rely on their guns instead, bringing as many to bear as possible. The USS *Keystone State* proved very obliging, the actions of her officers showing great gallantry but at great cost of life. At first driven away with a fire in the forehold, the crew was able to extinguish the flames before turning to run down the *Chicora*. They never succeeded. A shot from the ram injured the Federal ship’s steam drums, and the continuing barrage brought death to twenty men, injuring twenty more. Signals for surrender were somehow confused. The *Chicora*’s officers saw the Union colors come down and thought they saw the crew of the stricken ship rush toward the stern, waving their arms “in an imploring manner.”<sup>41</sup> The firing ceased and the *Chicora* put a boat over, but the engines of the Union ship kept working until it steamed out of range. As the morning fog lifted, the *Chicora* gave chase to several more vessels running southward for six or seven miles. The last engagement was with the USS *Housatonic*, but the captain of the Confederate ironclad finally broke off “unable to bring

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<sup>40</sup>Report of Captain H. S. Stellwagen, USS *Mercedita* (January 31, 1863): Official Records, Navies, Ser. I, Vol. XIII, 579; see also Stellwagen’s reports of January 31 and February 2: 580-581, 595-596.

<sup>41</sup>Report of Lt. G. H. Bier, CSS *Chicora* (January 31, 1863): Official Records, Navies, Ser. I, Vol. XIII, 620.

her to close quarters.”<sup>42</sup> Three and a half hours after crossing the bar, the two ironclads dropped anchor outside and waited out the day for the next high tide.<sup>43</sup>

General Beauregard lost no time in issuing a proclamation that the blockade had been raised and extended an invitation to Charleston’s foreign officials to tour the harbor. The British took their own initiative. Under one of the most controversial claims, the HMS *Petrel* steamed five miles beyond the usual anchorage of the blockaders, her officers seeing nothing of the enemy through their glasses. The French and Spanish consuls were also well enough impressed to forward the proclamation to their respective embassies in Washington.<sup>44</sup>

Of course, rather than recognize the legal technicalities of a temporarily broken blockade, the easiest recourse for the United States was denial. The cruise of the *Petrel* was construed as a demonstrably fictitious concoction of the British ship’s commander, who was a well known rebel sympathizer. However in the rational of one Federal commander:

It would hardly require a very learned authority on blockade or international law to show that it is not necessary for vessels conducting or keeping up one to be required to place themselves directly under the guns of land batteries or even floating batteries (for such these ironclads are) to maintain the requisites of a strict blockade.

Raids will be often made by the ironclads, and most of the vessels will be compelled to fall back to a convenient distance from them. They

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<sup>42</sup>Report of Commander J. R. Tucker, CSS *Chicora* (January 31, 1863): Official Records, Navies, Ser. I, Vol. XIII, 620

<sup>43</sup>Additional reports pertaining to battle are in Official Records, Navies, Ser. I, Vol. XIII, 448-623, *Chicora* changes her tactics, as reported by J. H. Tomb (January 30, 1863), 622; Federal accounts of *Chicora*’s attack on *Keystone State* (January 31, 1863), 581-586 (February 3, 1863), 586; for additional Federal accounts, 587-594, 596-599.

<sup>44</sup>Beauregard’s proclamation and tour offer (January 31, 1863): Official Records, Navies, Ser. I, Vol. XIII, 617; cruise of the *Petrel*, as related by S. F. DuPont, USS *Wabash* (February 9, 1863), 602; also statement of squadron commanders (February 10, 1863), 606; response of French and Spanish as related by Muncz de Moncada, Spanish consul (February 1, 1863), 621-622.

will find it more troublesome, perhaps, to ride comfortably at their anchors in deeper water, but the stringency of the blockade will not be necessarily impaired, nor the danger to the blockade runners (the material point) much diminished.<sup>45</sup>

In all practicality, the blockade might have been raised temporarily but it was not destroyed. As Engineer Tombs of the *Chicora* expressed, "They say we raised the blockade, but we all felt we would rather have raised hell and sunk the ships."<sup>46</sup> The Federal squadron was back to its full strength by the following day.<sup>47</sup>

As the Charleston ironclad's resumed their harbor defense roles, both sides continued to expect more of them. General Beauregard continued to press for more attacks. What more they could have done is uncertain. If the concerted conditions of tide, weather, and working engines ever presented another opportunity, it was not taken by the ironclads in Charleston. General Beauregard came to regard the ironclads as worthless. In a letter to Mallory, he condemned them as unseaworthy and unable to render effectual service "beyond river and harbor defense."<sup>48</sup>

Beyond harbor defense, however, the attacks sufficiently increased the value of the ironclads as a threat that had to be watched and guarded by the Federals. After the attack, Admiral Du Pont received his monitors. After the monitors arrived in February and March, the Confederate naval command may have regarded further attacks as not

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<sup>45</sup>Report of Captain S. W. Godon, USS *Powhatan*, (February 7, 1863): Official Records, Navies, Ser. I, Vol. XIII, 599-600.

<sup>46</sup>Report of Engineer James H. Tomb, CSS *Chicora* (January 30, 1863): Ibid., 623.

<sup>47</sup>Federal response to proclamation, Official Records, Navies, Ser. I, Vol. XIII, 599-608; descriptions of *Perrel's* commander by S. F. DuPont, USS *Wabash* (February 9, 1863), 602; on blockade's return to normal strength, letter of Frederick M. Edge (February 23, 1863), 611.

<sup>48</sup>Citation of Beauregard by Still, Iron Afloat, 127; quoted from Alfred Roman's, The Military Operations of General Beauregard in the War Between the States, 1861-1865, Vol. 2, 421.

only futile but an unnecessary risk. The short unhappy career of another, much more powerful ironclad may have confirmed their worst fears.

Considered by many to have been the finest ironclad ever built in the South, the *Atlanta's* encounter with the *Weehawken* was a lesson in the risks involved in attacking a monitor or any ship with guns of more than twice the caliber of its own. In the river below Savannah, Georgia, the *Atlanta* ran aground and was promptly battered into surrender. The event inspired the following from paymaster William F. Keeler of the USS *Florida*:

It was well for us that she was taken, for her plans, as we have since discovered, were to clean out our fleet off Savannah, then up to Port Royal where a similar operation was to be performed, then to Charleston where she was to be joined by the rebel ironclads in that place (three at the time) and our fleet there was to be obliterated, after which a similar performance was to take place off Wilmington . . .<sup>49</sup>

. . . and so on to collect the *North Carolina* and *Raleigh*, before moving on to threaten New York and Boston and destroy the entire Yankee fleet. Keeler's tirade touches once again upon the greater value of the ironclads as a fleet in being. Hardly up to the task of raiding the New England coast, their mere existence was nevertheless a persistent threat to the blockading forces. Men, ships, and materials that could have been put to better use elsewhere were tied up watching for them.

In time, paymaster Keeler recovered from his delirium and recognized the widespread impact that the ironclads were having on the blockade. In July of 1863, the USS *Florida* joined the Federal squadron around Cape Fear. As Keeler fell under the

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<sup>49</sup>William F. Keeler in a letter to his wife Anna (July 13, 1863): Robert W. Daly, ed., *Aboard the USS Florida: 1863-65*, "The Letters of Paymaster William Frederick Keeler, U.S. Navy, To His Wife, Anna," (1968), 65. For *Atlanta's* surrender, see Still, *Iron Afloat*, 136-138.

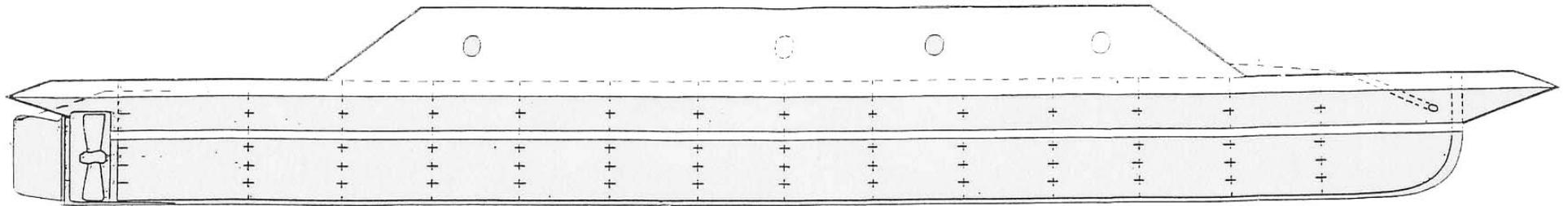
monotonous spell of blockade duty, he wrote about the symptoms of the disease he called “ram fever.”

. . . (it) is supposed to be brought on by occasional sights at a rebel ironclad passing up and down the river between Fort Caswell and Wilmington. The premonitory symptoms appear to be a disposition to gaze long and anxiously in the direction of the Fort, the frequent mistaking of little river steamers and tugs for the rebel ironclads and rams, sometimes even taking a small brown building on the beach with an escape pipe puffing out jets of steam for the dreaded rebel ram, the windows being the ports and the roof her sloping sides -- then sketching out on paper “the ram” as they saw it, an infernal machine covered and filled with torpedoes, rams, saws, and every other sort of diabolical contrivance for blowing up, running down, sinking, smashing, and otherwise destroying us Yankees.<sup>50</sup>

Keeler’s symptoms sound suspiciously like one of the two diabolical weapons then under construction in Wilmington. One of them had already made an appearance about three months before his arrival.

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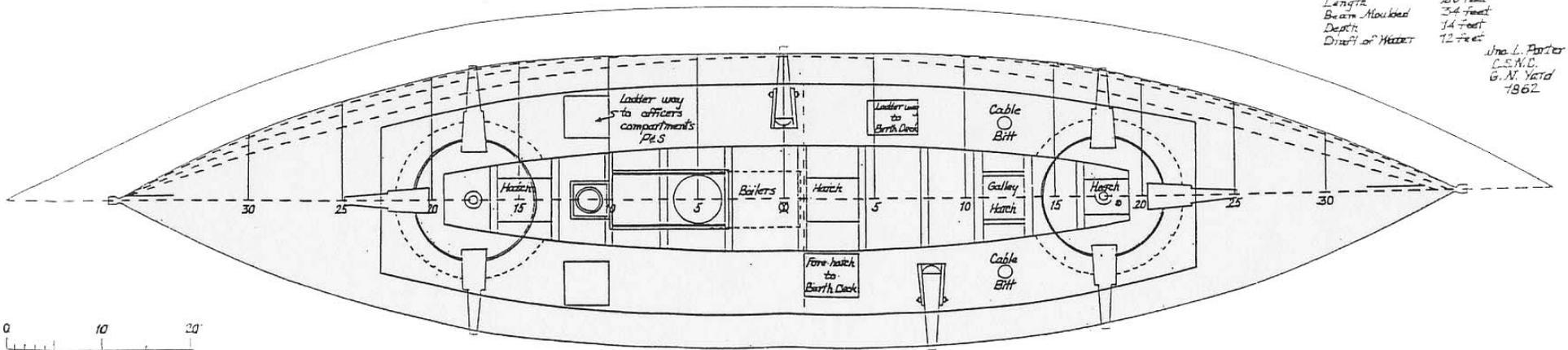
<sup>50</sup>Quotation of William Keeler in a letter to his wife Anna (July 31, 1863): Daly, *Aboard the USS Florida*, 66.



The red lines below show the arrangement of the upper deck and hatches.

Iron Clad Gun Boat—both ends the same  
 Scale Breadth = 1 inch  
 Length 150 feet  
 Beam Moulded 34 feet  
 Depth 14 feet  
 Draft of Heaviest 12 feet

Wm. L. Porter  
 C.S.M.C.  
 G. N. Yard  
 1862



Berth Deck Plan  
1862. Iron Clad Gunboat

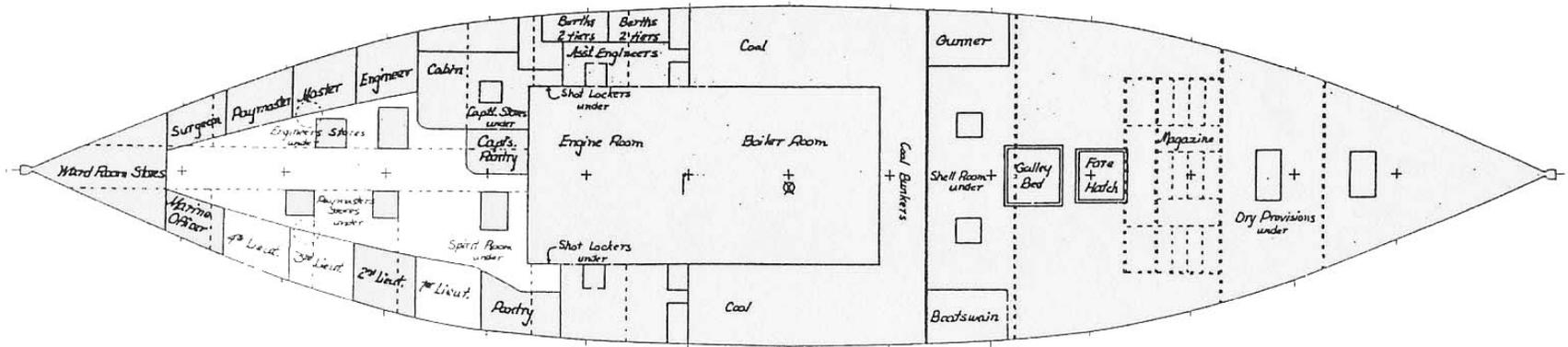


Figure 2: "Richmond Class" ironclad, builder's plans. Redrawn from original drafts of CSS Savannah. H. F. Willink Collection, Emory University, Atlanta. (Courtesy of Robert Holcomb, Confederate Naval Museum, Columbus, Georgia)

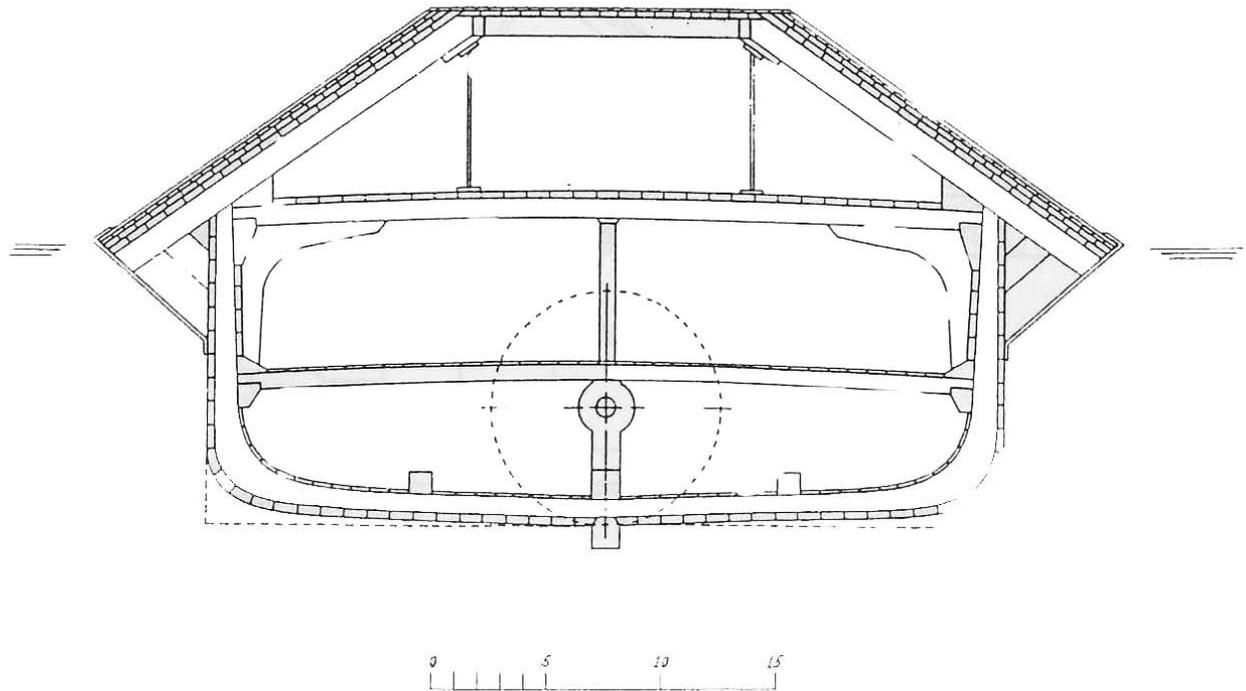


Figure 3: “*Richmond Class*,” cross-section, redrawn from the original builder’s drafts of the CSS *Savannah* in the H. F. Willink Collection, Emory University, Atlanta. (Courtesy of Robert Holcomb, Confederate Naval Museum, Columbus, Georgia) Below are the dimensions, derived from a Gosport Naval Yard superintendents account of the CSS *Richmond*. (*Official Records, Navies*, Ser. I, Vol. VIII, 207)

“She is built of good material and thoroughly fastened:”

Frames are 2 feet apart from center to center: sided 8 inches: molded 9 inches: 10 inches at heel; 6.5 inches at head.

Filled in solid between the frames with yellow pine, fore and aft.

Wales are 5 inches thick.

Bottom planks 4 inches thick.

“Her roof is built of yellow pine, oak, and iron:”

First yellow pine timber 13 inches deep, running up and down

Second: 5-inches of yellow pine, running fore and aft

Third: 4-inch thickness of oak plank, running up and down

Fourth: 2-inch thickness of iron, running for and aft

Fifth: 2-inch thickness of iron, running up and down

Total thickness: 26 inches

“She is ironed 3.5 feet below her load lines.”

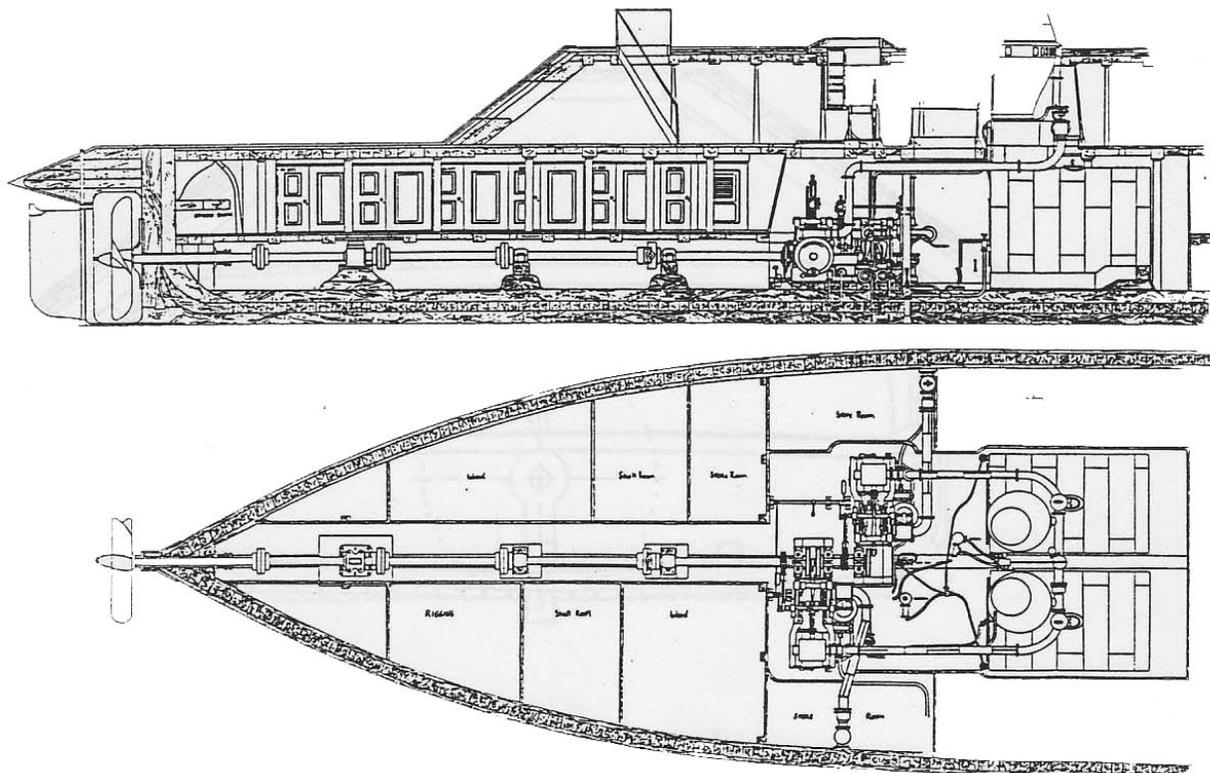


Figure 4: CSS *Savannah*, engineering plans. Note location and arrangement of pilot house over engine room, top elevation. Redrawn from original drafts of the CSS *Savannah*, H. F. Willink Collection, Emory University, Atlanta. (Courtesy of Robert Holcomb, Confederate Naval Museum, Columbus, Georgia) Below is the engine room cross-section.

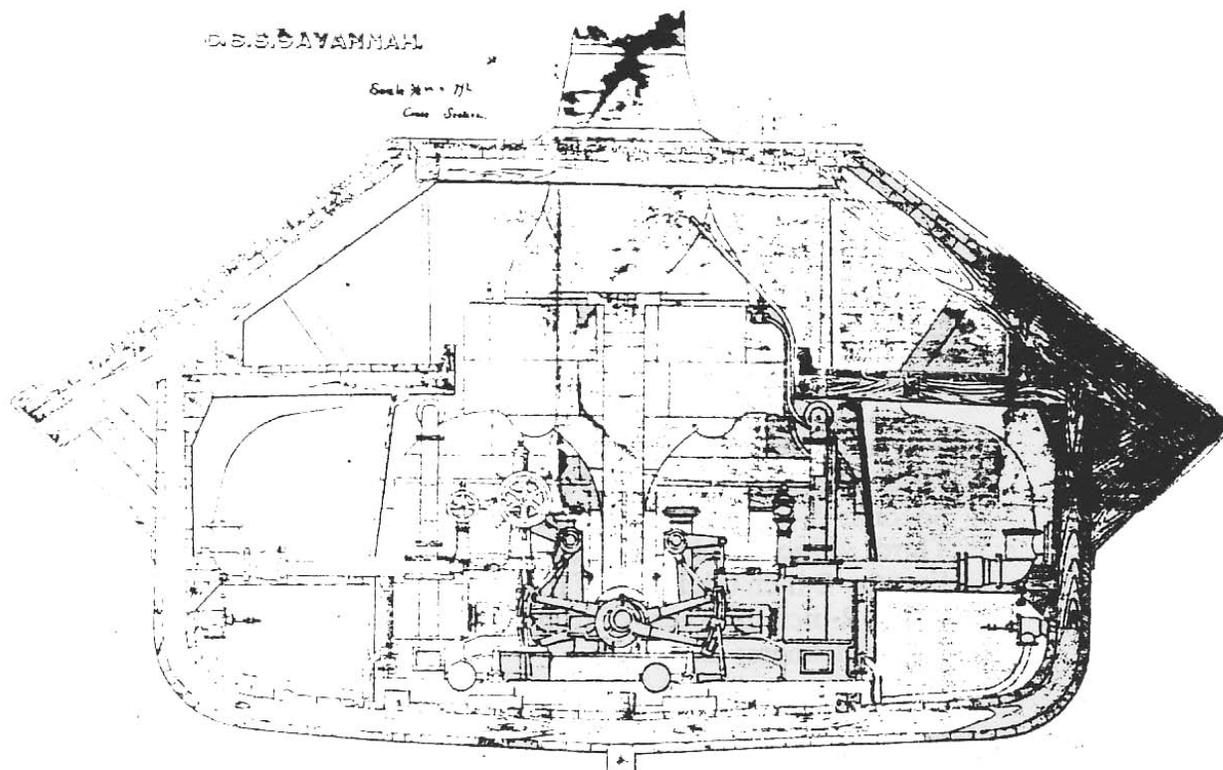




Figure 5: CSS *Chicora*, daguerreotype. Stern view is barely evident by comparison with other plans. Noting “starboard” side battery is considerably forward, in background, the pilot house is also to the rear, in the foreground behind the officers standing on the spar deck. (Photo: William C. Davis, ed., *The Image of War*, Vol. II, 80: Courtesy of Old Court House Museum, Vicksburg, Mississippi)

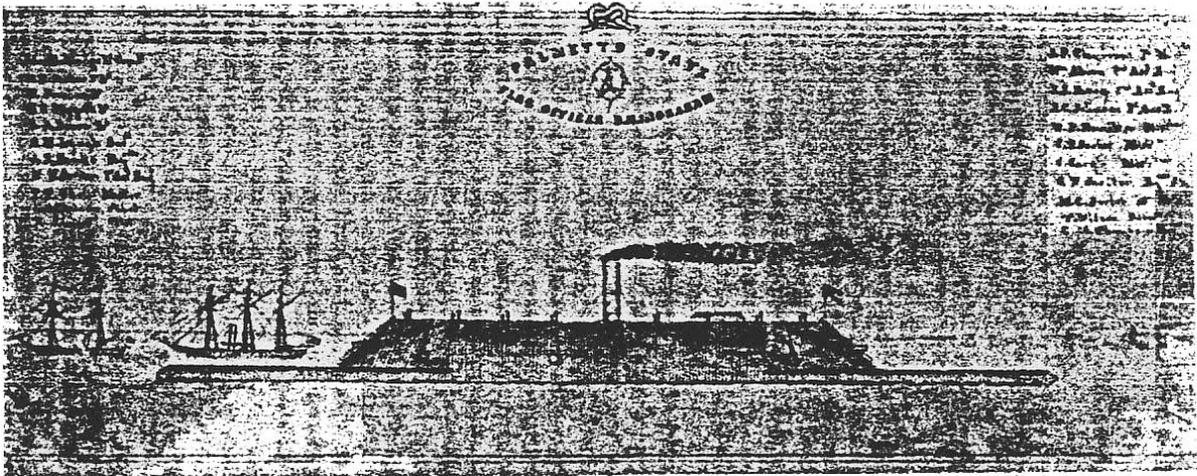


Figure 6: CSS *Palmetto State*, water color. Pilot house is also aft. Note octagonal construction of casemate. (Photo: William N. Still, *Iron Afloat*, 111: Courtesy of US Navy)

## CHAPTER II

### CONSTRUCTION IN WILMINGTON

Wilmington's importance to the Southern war effort was vital because of its geography and trade volume. Due to the heavy concentration of Federal forces around Norfolk, Wilmington became the nearest sea-link to the Confederate capital in Richmond and to the Army of Northern Virginia which bore the brunt of fighting in the east. Of the cities along the South's Atlantic seaboard, Wilmington's trade volume was second only to Charleston. The naval defense of the city presented a worst case scenario of logistical troubles and disaster. Nevertheless, a number of vessels were outfitted for its defense. They included the ironclads *North Carolina* and *Raleigh*. Although both were built to the same design, their abilities were markedly different. The reasons for the disparity are not entirely known, but some possible explanations will be examined in this chapter.

There were two entrances into the Cape Fear River during the Civil War (Figure 10). The northern entrance at New Inlet was the favored approach for blockade runners coming in from the east or Bermuda. The channel depth there measured about ten feet or less, but was still navigable for small or medium sized vessels. The main danger lay inside the inlet, where a treacherous shifting shoal, known as the "Rip," jutted southwest from Fort Fisher. About seven miles south of New Inlet, the mouth of the river was separated by the dunes and marshes of Cape Fear and by the shoals that extended eight miles further out to sea. The depth of that channel ranged from ten to fifteen feet.<sup>51</sup> Both channels depths could increase another five feet at high tide, or more during the Spring tides. The main tactic of blockade runners was to approach New Inlet from far to the north, or the mouth of the river from the far southwest. Creeping along the shoreline,

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<sup>51</sup>River and inlet description given by Stephen R. Wise, *Lifeline of the Confederacy: Blockade Running During the Civil War*, (Columbia, SC, 1988), 16.

they remained hidden from the blockaders until the cover of night allowed a final dash toward the inlets.

Heavily gunned defenses guarded both entrances. The giant earthen mounds of Fort Fisher guarded New Inlet to the north, and the high brick walls of Fort Caswell guarded the mouth of the river to the south. Naval forces were still needed to defend the inner passages and harbors in event that the Federals attempted to run past the forts or land troops for an attack along either peninsula. Two ironclads of Porter's design should have been well suited to harbor defense in the Cape Fear region. The layout of the river gave them command over the land approaches to either fort.<sup>52</sup>

As in Charleston, Savannah, and elsewhere in the South, the pressure was on the navy to commit its ironclads to something more than "harbor defense." Major-General William H. C. Whiting, who commanded Wilmington's land defenses, was often at odds with the navy over its policies. Flag Officer William F. Lynch was put in charge of the state's naval defenses in 1862. He would receive all of the blame for the navy's shortcomings in North Carolina. His first command in defense of the sounds was posed against overwhelmingly superior Union forces. After the loss of his "Mosquito Fleet" during the attack at Elizabeth City, he had ample motivation to do greater things with the ironclads under construction in various parts of the state. Unfortunately, the authority between General Whiting's army and Flag Officer Lynch's navy was poorly defined. Conflicts over the use of men, materials, transportation, and even ships reached to a deep personal level. The discord between Whiting and Lynch compounded the other problems that hindered ship construction in Wilmington.<sup>53</sup>

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<sup>52</sup>The reliance upon the ironclads for harbor defense was stressed by General W. H. C. Whiting, CS Army, to Confederate Naval Secretary Mallory in his letter of September 27, and again in his letter of October 6, 1864. Official Records, Navies, Ser. I, Vol. X, 751.

<sup>53</sup>Lynch's appointment, relations with Whiting, see Still Iron Afloat, 150- 156. Battle of Elizabeth City, see William R. Trotter, Ironclads and Columbiads (1989), 88-91.

Two ironclads were laid down in Wilmington during the Spring of 1862. The *Raleigh* was begun in the yard of J. L. Cassidy & Sons, at the foot of Church Street. Across the river on Eagles Island, the *North Carolina* was constructed in the yard of Beery & Brothers. Work on both vessels was hindered by every imaginable problem. Material shortages, labor strikes and the ravages of yellow fever brought work to a complete halt more than once.<sup>54</sup>

The resources for both vessels should have been similar. The *North Carolina* was clearly built of unseasoned timbers. The use of green wood throughout, including the decks, interior bulkheads, and the casemate caused many troubles. The hull timbers would not seal properly, causing the vessel to leak. Other timbers would eventually dry out, resulting in warping and structural instability.<sup>55</sup> The *North Carolina* was also fitted with salvaged engines from the tugboat *Uncle Ben*.<sup>56</sup> Nothing is known about them except that they were often in disrepair.

The naval authorities went to greater trouble to find reliable power for the *Raleigh*. Attempts to salvage the engines from the wrecked blockade runner *Modern Greece* ended in failure. New engines may have been sent from the Schockoe Foundry (Talbot & Brothers) in Richmond.<sup>57</sup> The engine model has only recently been discovered as the direct-acting horizontal type, described in the archaeological findings of this thesis. The builder's plate has not been found.

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<sup>54</sup>Construction sites, labor strikes and yellow fever reported to Federals by ship carpenter William Robins. Details related in report of Commander J. M. B. Clitz, USS *Penobscot* (September 23, 1862): Official Records, Navies, Ser. I, Vol. VIII, 89; yellow fever also noted in report of Lt. Commander G. A. Stevens, USS *Victoria* (September 17, 1862); consequent halt of construction noted by Lt. J. T. Wood, CS Navy (February 14, 1863): 859; and also Maj. Gen. J. G. Foster, US Navy (October 3, 1862): Vol. XVIII, 416.

<sup>55</sup>Unseasoned timber evidenced by consequent leakiness of hull and warping of deck timbers observed by engineer Charles Peek, CSS *North Carolina*, in letters home: Peek Papers (private collection of Charles V. Peery, Charleston, SC), 29, 30, 33, 38.

<sup>56</sup>Paul H. Silverstone, *Warships of the Civil War Navies*, 237, 238, 240.

<sup>57</sup>Report of Commander J. M. B. Clitz, USS *Penobscot* (September 23, 1862): Official Records, Navies, Ser. I, Vol., VIII, 89-90; report of Maj. Gen. J. G. Foster, US Navy (October 3, 1862): Vol. XVIII, 416.

In September, 1862, the *North Carolina* was finally launched. Railroad iron was available, but may have been sent to the rolling mills first.<sup>58</sup> Five months later, the unfinished vessel was still without its armor. On February 14, 1863, Confederate Lt. J. Taylor Wood wrote to President Davis on the construction of the two vessels:

Two iron-clad gunboats (four guns) were commenced here last Spring, but owing to the yellow fever and the constant anticipation of an attack they have been delayed. One, ready for the iron shield, is yet two months from completion, . . . .”<sup>59</sup>

Anticipation of an attack may have prompted the Confederates to send one of the ironclads down the river before it was actually completed. Only one week later, the Federals were convinced that an ironclad was already in service. The report of Lt. James Trathen, commanding the USS *Mount Vernon*, gives this first account of February 21, 1863:

Sir: I have to report that at 3 p.m. on the 20th instant the officer of the deck and the coast pilot of this ship observed a suspicious looking craft inside the bar at New Inlet. Upon examination with glasses she appeared to be a vessel about 200 feet in length, nearly level with the water, and drooping at both ends. She had nothing above decks except a very short smokestack, and a flagstaff on one end, at which a rebel flag was flying. She appeared to come down the river, and steered in behind Fort Fisher,

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<sup>58</sup>*North Carolina* was launched after September 22, according to a report of that date: “to be launched next Saturday and is to be clad with railroad iron down to the water’s edge, . . . (engine) to come out of the steamer *Uncle Ben*.” Information given by contrabands, related in report of Commander Scott, US Navy (September 22, 1862): Official Records, Navies, Ser. I, Vol. VIII, 88; engines from *Uncle Ben* also noted in report of Maj. Gen. J. G. Foster, US Navy (October 3, 1862): Vol. XVIII, 416.

<sup>59</sup>Lt. Wood to President Davis, (February 14, 1863): Official Records, Navies, Ser. I, Vol. VIII, 859.

moving very briskly, and from her general appearance we supposed her to be an ironclad ram.<sup>60</sup>

The report could be symptomatic of Keeler's "ram fever," except that subsequent reports over the next month included more accounts of an ironclad steaming between forts Fisher and Caswell. One included a sketch that distinctly resembles a vessel of the *Richmond* Class:<sup>61</sup>

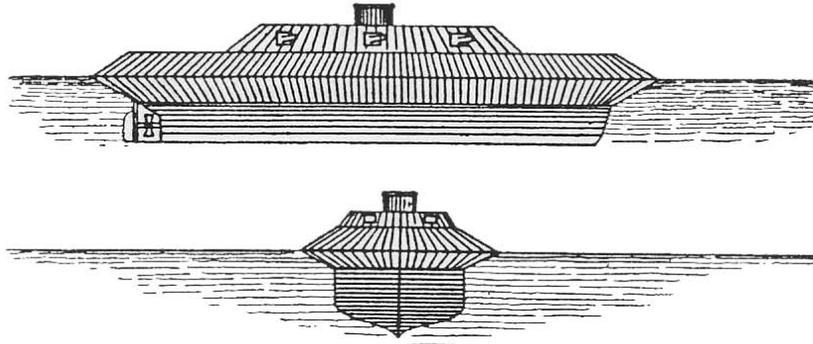


Figure 7: Sketch by Captain B. F. Sands, USS *Dacotah*. (*Official Records, Navies*, Ser. I, Vol. VIII, 597-599)

Only the *North Carolina* was anywhere near completion. If the *North Carolina* was indeed pressed into early service, it was likely running without its full compliment of armor and manned with a skeleton crew. The lack of armor would account for the "brisk" movement noted by the Federals, but not until April was the *North Carolina*

<sup>60</sup>Report of Lt. James Trathen, USS *Mount Vernon* (February 21, 1863): *Official Records, Navies*, Ser. I, Vol. VIII, 550.

<sup>61</sup>Sketch made by Captain B. F. Sands of the USS *Dacotah*, submitted as part of Rear-Admiral S. P. Lee's report, USS *Minnesota* (March 11, 1863): *Official Records, Navies*, Ser. I, Vol. VIII, 597-599. For additional Federal reports, 550, 582, 624-625.

reported as “very nearly ready for her crew.” According to Flag Officer Lynch, only 60 men were available to fill the needs for the entire state.<sup>62</sup> This figure fell far short of the 150 men needed for one ironclad. Lynch may have been referring to the number of professional servicemen, as opposed to the total figure which included conscripts. Other than Lt. Wood’s anticipation of a Federal attack, there is nothing in the Confederate reports to indicate what the *North Carolina* or any other vessel was doing down the river at this time.

If an early show of force was intended, the ruse apparently worked. Only three weeks before, Confederate ironclads had attacked the Charleston squadron. Now the Federal commanders expected another attempt to raise the blockade at Cape Fear. Commander A. Ludlow Case wrote to Rear-Admiral S. P. Lee, who commanded the Atlantic forces: “Their success or failure can only be known after the trial is made.”<sup>63</sup> Captain B. F. Sands of the USS *Dacotah* also wrote to Admiral Lee that he “would feel somewhat more at ease if we had an ironclad at each of these main inlets to the Cape Fear River, to fend off an attack upon the wooden vessels by this Confederate ram.”<sup>64</sup> The movements of the ironclad also proved a suitable diversion to the approach of blockade runners. In early March, the Federal lookouts were apparently preoccupied by the movements of the ironclad when another column of dense smoke appeared to the north of Fort Fisher. As the runner dashed in under the guns of the fort, the ironclad approached the bar to escort it into the river.<sup>65</sup>

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<sup>62</sup>W. F. Lynch, CS Navy (April 6): Official Records, Navies, Ser. I, Vol. VIII, 865.

<sup>63</sup>Report of Commander A. Ludlow Case, USS *Iroquois* (March 12, 1863): Official Records, Navies, Ser. I, Vol. VIII, 599.

<sup>64</sup>Report of Captain B. F. Sands, USS *Dacotah* (March 5, 1862): Official Records, Navies, Ser. I, Vol. VIII, 598.

<sup>65</sup>Report of Commander A. Ludlow Case, USS *Iroquois* (March 2, 1863): Official Records, Navies, Ser. I, Vol. VIII, 582. See also report of Captain B. F. Sands, USS *Dacotah* (March 5, 1863): Official Records, Navies, Ser. I, Vol. VIII, 598.

Some movement about the bar was all that ever came from the Confederate ironclad. If the *North Carolina* was even able to cross the bar, the Federals learned that it was “too shaky and weak,” and had to return “because she could not stand the sea.”<sup>66</sup> After receiving its full compliment of armor, the ironclad’s draft was too deep. A draft of 13 feet was not excessive, according to the builder’s plans. Nevertheless, it was enough to restrict the ironclad’s movement up and down the river, except during spring tides.<sup>67</sup> Unable to cross the bar, the ironclad was strictly confined to harbor defense. The trials of the *North Carolina* may have cast doubts upon its sister-ship.

In early April 1863, the *Raleigh* was also ready for its iron and Flag Officer Lynch expected that the ironclad would be ready for service in only eight weeks, “as far as the material is concerned.”<sup>68</sup> Clearly, however, two ships built to the same design, using the same quality of materials, would run into the same problem. Unless the *Raleigh* was built of seasoned timber, its draft would have been similar to the *North Carolina*. In other parts of the South, ironclads had been altered in mid-construction in order to reduce draft as well as conserve material. The *Raleigh* was too near completion for such drastic measures as reducing the length of the casemate. A more viable option would be the gutting of unnecessary bulkheads and interior structure. Other ironclads such as the *Atlanta*, had their staterooms and compartments partitioned with canvas instead of wood.<sup>69</sup> There is nothing in the historical records to suggest that the *Raleigh* was built of better material than the *North Carolina*, or that it was structurally modified in any way. There is only the lack of any explanation for its delay of yet another year, or for why it would ultimately prove able to pass the bar.

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<sup>66</sup>B. F. Sands, USS *Dacotah* (October 13, 1863), Official Records, Navies, Ser. I, Vol. IX, 235; also (March 23, 1863), VIII, 624-625.

<sup>67</sup>Peck Papers (private collection of Charles V. Peery, Charleston, SC), 31.

<sup>68</sup>W. F. Lynch, CS Navy (April 6): Official Records, Navies, Ser. I, Vol. VIII, 865.

<sup>69</sup>Still, Iron Afloat, 130; Holcomb, Evolution, 71, 73, 76, 80. Archaeological investigation of the *Raleigh* confirm that the casemate was built to the original plan.

The *Raleigh's* materials may have been shifted elsewhere to complete the ironclads in other parts of the state. While the *North Carolina* could at least make a show of force in the Cape Fear River, the need to counter the Federal threat in the North Carolina sounds was more pressing. Not until March 1864 was enough material finally available to finish the gunboats in all parts of the state.

Lynch wrote to secretary Mallory of another problem that had caused delays in Kinston, Halifax, and likely Wilmington:

Fourteen carloads of plate arrived last evening, and for a week past we have had two carloads waiting transportation to Kinston and Halifax. The whole rolling capacity of the road, except passenger trains, has been monopolized by the Army, and I fear the completion of the gunboats at those places will be delayed. Besides my own occasional visits to the depot, a reliable officer is detailed to be there twice every day and report the prospects of obtaining transportation. The rights of the Navy are not respected, its wants are utterly disregarded, and it is in the power of an acting assistant quartermaster to cause our transportation to be set aside at will.<sup>70</sup>

The rights of the navy were not respected in terms of procuring men either. The South lacked a sea-faring population but there were still many fishermen and pilots who were familiar with the sounds and rivers where they were needed most. Unfortunately, most of them were claimed by the army before the Confederate Navy had enough billets for them. Now that a number of ships existed, army commanders were reluctant to release any of their soldiers to another service. Back in April 1863, when the *North Carolina* was near completion, Flag Officer Lynch complained about the man shortage to

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<sup>70</sup>Flag-Officer Lynch to Secretary Mallory (March 8, 1864), Official Records, Navies, Ser. I, Vol. IX, 803.

state senator George Davis.<sup>71</sup> Not until March 1864 was the problem resolved by the Secretary of War, James Seddon. Army generals such as Robert E. Lee, Joseph E. Johnston, Pierre Beauregard, and William Whiting were notified that 1,200 men were needed for the navy. Naval officers were detailed to each headquarters to personally select the men to be transferred.<sup>72</sup>

During the year that the *Raleigh* was delayed, a new weapon was undergoing experimentation in other parts of the South. Tests of the “spar-torpedo” had demonstrated its potential in the relative calm of harbors. Afterward, it was fitted to a variety of coastal defense vessels including specially designed torpedo boats and some of the *Raleigh*’s sister-ships in Savannah and Charleston. The rig of the *Palmetto State* consisted of a 20 foot boom, carrying a charge with multiple contact fuses at the end. The boom was rigged to be raised or lowered from a windlass inside the casemate. Normally, the torpedo was carried in the raised position to prevent any incidental contact that might cause detonation. When needed, it could be lowered to the appropriate depth. The *Chicora* and another larger ironclad, *Charleston*, were noted to have carried spar-torpedoes by January of 1864.<sup>73</sup> The *Savannah* also carried one, and in the late years of the war, the *Richmond* and the other ironclads of the James River squadron may have also carried them.<sup>74</sup> The spar-torpedo was first used with some success in April 1863, when the torpedo boat *David* severely damaged the USS *New Ironsides*. In February of 1864, the submarine *Hunley* used one to sink the USS *Housatonic*. The submarine failed to

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<sup>71</sup>Report of Flag-Officer W. F. Lynch, CS Navy (April 6, 1863): Official Records, Navies, Ser. I, Vol. VIII, 865.

<sup>72</sup>Plan for the transfer of men from armies is detailed in the letter of Adjutant-General S. Cooper, by direction of the Secretary of War, to Gen. R. E. Lee (March 22, 1864): Official Records, Navies, Ser. I, Vol. IX, 805.

<sup>73</sup>Spar torpedoes on CSS *Charleston* and CSS *Chicora* noted by deserter George L. Shippe (January 8, 1864): Official Records, Navies, Ser. I, Vol. XV, 231.

<sup>74</sup>*Savannah*’s torpedo noted by deserters, reported by Commander W. Reynold’s, USS *Vermont* (November 27, 1863): Official Records, Navies, Ser. I, Vol. XV, 137. Reference to torpedoes on *Richmond* and other James River squadron ships by Still, Iron Afloat, 184.

return, but the weapon had proven its potential.<sup>75</sup> As the *Raleigh* neared completion, the spar-torpedo was becoming a common feature in harbor defense.

By March 2, 1864, the ironclad was again being pushed toward completion “with all expedition.”<sup>76</sup> In April, *Raleigh* was in commission. The muster rolls listed a total of 197 officers and crew, plus a detachment of 24 marines.<sup>77</sup> The commission roles list her with all four guns. In light of the widespread development of the spar-torpedo, one may have been added to the warship’s arsenal.<sup>78</sup> (Figures 8 & 9)

On April 19th, the *Raleigh* steamed down the river under the command of Captain J. Pembroke Jones. Flag Officer Lynch was also onboard.<sup>79</sup> There it joined the *North Carolina*, which had long been confined to the brackish elements of the lower Cape Fear. The older ironclad was only waiting for the next spring tide so that it could get upriver to rill the seaworms out of its hull. Expectations were rife that the new ironclad would be able to get across the bar and “do something,” for in the words of one *North Carolina* crewman, “the navy does not stand very high in this station.” Of his own ship, engineer Charles Peek had to say, “Our old craft draws too much water to go outside and we will never do anything unless the Yankees come to us.”<sup>80</sup> Whatever the reasons for their differences in draft, the *Raleigh* still had to be lightened for the occasion.<sup>81</sup> Such means could have included the removal of one or two guns or carrying a lighter supply of coal

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<sup>75</sup>A more complete historical account of the adaptation of spar torpedoes to ironclads and other craft is given by Milton F. Perry in *Infernal Machines: the Story of Confederate Submarine and Mine Warfare*, (Baton Rouge, 1965): torpedo rig of CSS *Palmetto State* described, 70-71; David and submarine attacks, 78-80, 105-108.

<sup>76</sup>Flag-Officer Lynch to General Whiting (March 2, 1864), *Official Records, Navies*, Ser. I, Vol. IX, 513.

<sup>77</sup>*Raleigh* listed under commission, report of Secretary of the Navy (April 30, 1864): *Official Records, Navies*, Ser. I, Vol. IX, 809; *Raleigh’s* muster rolls, Ser. II, Vol. I, 301-302.

<sup>78</sup>The only reference to a torpedo on the *Raleigh* is in J. W. Balch’s report on the attack of May 6-7, USS *Howquah* (May 7, 1864): *Official Records, Navies*, Ser. I, Vol. X, 21.

<sup>79</sup>Peek Papers (private collection of Charles V. Peery, Charleston, SC), 24.

<sup>80</sup>Peek Papers (private collection of Charles V. Peery, Charleston, SC), 25.

<sup>81</sup>Reference to “measures” in the naval inquiries of June 6, 1864: *Official Records, Navies*, Ser. I, Vol. X, 24-25.

and stores. The officers and crew of the *Raleigh* drilled and worked to get their ship in fighting trim, and waited for a tide that could carry them across the bar.<sup>82</sup>

On the afternoon of May 6, 1864, Flag-Officer William Lynch went ashore to reconnoiter the position of the blockade ships from Fort Fisher and to arrange with Colonel William Lamb for the fort's cooperation. Lynch agreed to use red over white lights to identify his flotilla, which was to include the lightly armed steamers *Yadkin* and *Equator*. A set of three range lights were established inside the fort so that the *Raleigh* could mark its position and navigate more directly toward the Federal ships. From the ramparts of the fort, Lynch observed seven blockade ships and marked their positions.<sup>83</sup> That same evening, a blockade runner came down from Wilmington to take advantage of the situation.

The first word that the Federals heard of the impending attack came through the escaped servant of Fort Fisher's commander. As usual, the report contained some element of confusion. From the former slave, the Federals heard that the *North Carolina* was planning to come out if it could get across the bar. They were also told that the *Raleigh* had run aground about eight miles up the river from New Inlet. It was believed that the ironclad would not get off.<sup>84</sup>

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<sup>82</sup>Peek Papers (private collection of Charles V. Peery, Charleston, SC), 25, 26.

<sup>83</sup>James Sprunt, *Tales of the Cape Fear Blockade*, (Wilmington, NC, 1960), 36-37; Sprunt's particulars of Lynch's visit to Fort Fisher are "indebited to a distinguished ex-Confederate officer," 35. The number of range lights was noted by Lt. Samuel Huse, USS *Britannia*, (May 8, 1864): Official Records, Navies, Ser. I, Vol. X, 21.

<sup>84</sup>This report came six days before the *Raleigh* crossed the bar. A statement that "she draws 16 feet" is also contained here, an impossibility which would have flooded the gun ports: Report of Lt. J. B. Breck, USS *Nippon* (May 1, 1864): Official Records, Navies, Ser. I, Vol. IX, 714.

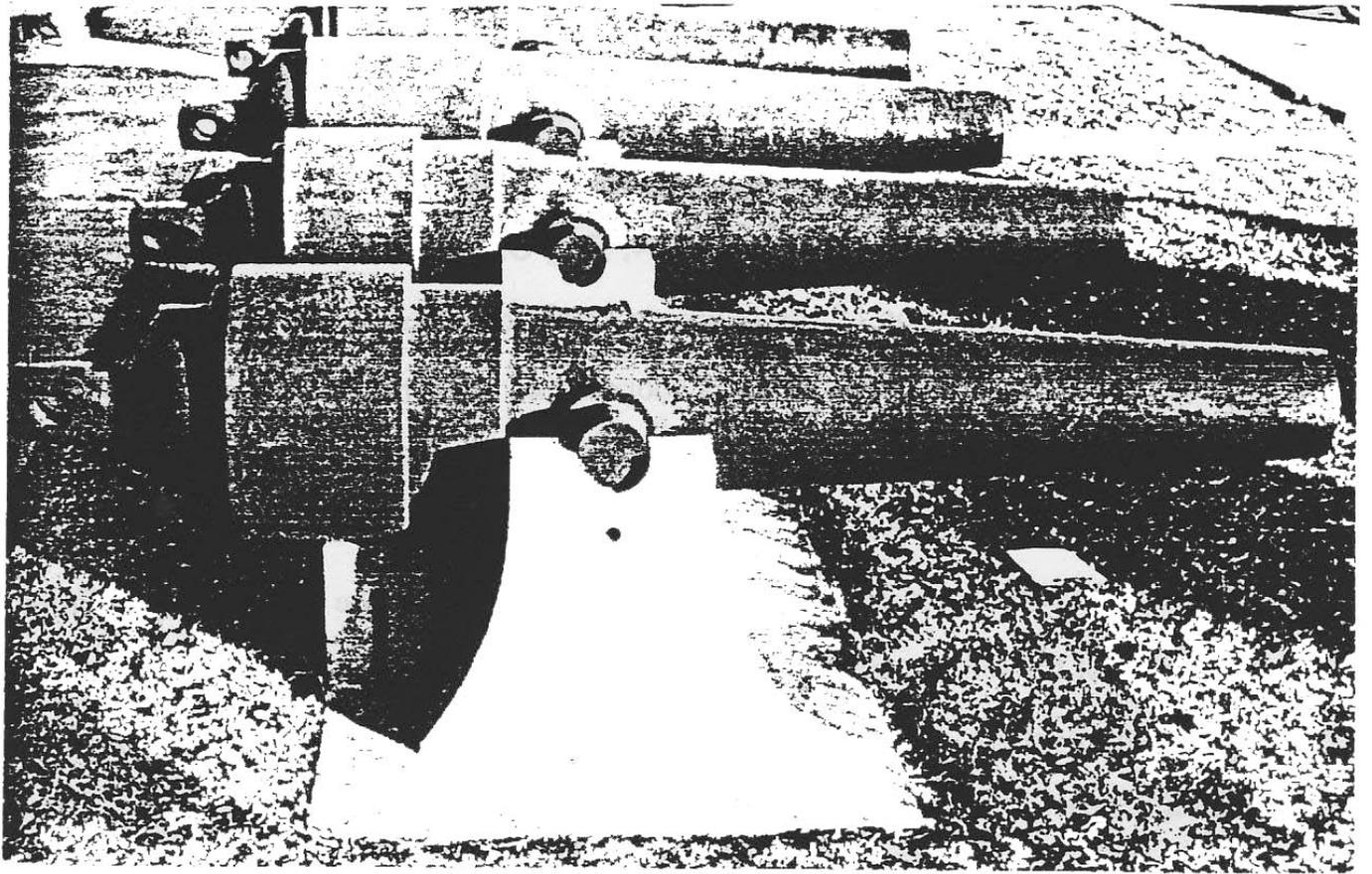


Figure 8: Brooke rifles. The *Raleigh's* battery of four guns consisted of at least two, double banded Brooke rifles of 6.4-inch caliber. Two such weapons are shown in the foreground of this picture at the Washington Navy Yard, D.C. (Photo: Warren Ripley, *Artillery and Ammunition of the Civil War*, p. 129)

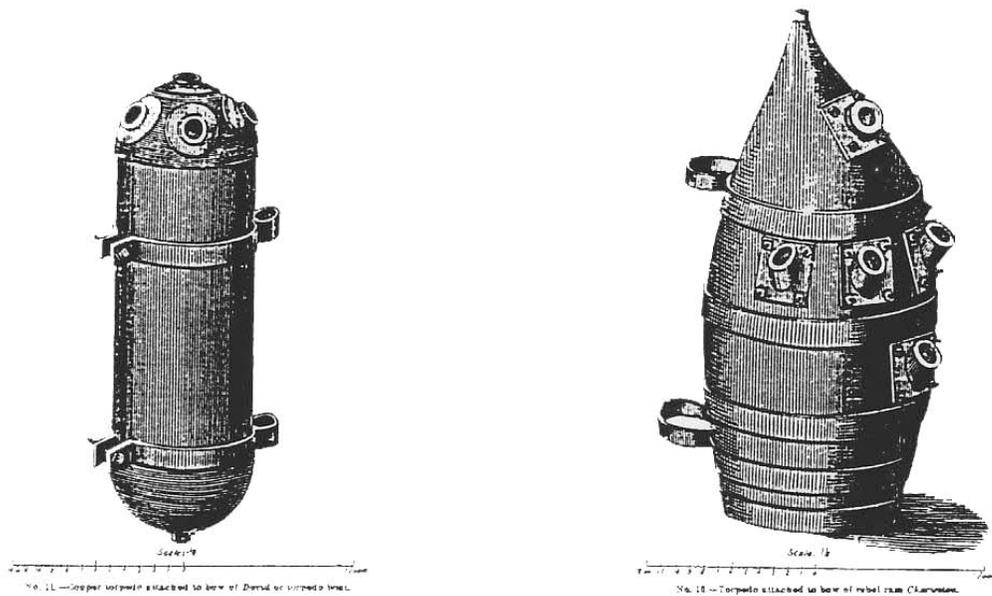


Figure 9: Spar torpedoes. The *Raleigh's* arsenal may have included one of these, as noted by the captain of the *USS Howquah*. (*Official Records, Navies*, Ser. I, Vol. XVI, 396-397)

### CHAPTER III

#### THE CSS RALEIGH

##### **A Promising Career Cut Short**

On the evening of May 6, 1864, the United States paddle steamer *Britannia* moved to its station guarding New Inlet, just south of Fort Fisher. Twilight was setting in when the Federal ship's acting commander, Lt. Samuel Huse, noticed a "suspicious-looking vessel" moving across the bar. He moved his ship closer, hoping to confirm rumors that it might be one of the rebel ironclads, long expected and known to have been building in Wilmington. Lights appeared inside the fort, red, green, and white, "used in a manner quite different from anything ever noticed there before." The strange vessel moved toward the fort, "preceded by (the) lights as guides." Then it turned suddenly, revealing a smaller vessel to one side, and headed straight for the *Britannia* at full speed. Huse fired his rockets to alert the other blockaders, then turned his main weapon, a 30-pounder Parrott rifle on the enemy. The first shot caused the smaller ship to break away, running to the northeast, but the larger ship continued toward the *Britannia*. It did not take Captain Huse long to find out that the rumors were correct.<sup>85</sup>

The attacker was not a fast ship, moving at about six or seven knots by some estimates. The *Britannia* was not very fast either. A paddlewheel blockade runner of Scottish construction, the *Britannia* had once achieved speeds as great as 12.5 knots. After its capture in 1863, it was impressed into the Federal blockade service.<sup>86</sup> On this night it served with the inner line of blockade ships, whose main purpose was to alert the

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<sup>85</sup> Report of commanding officer Samuel Huse, USS *Britannia*, (May 8, 1864): Official Records, Navies, Ser. I, Vol. X, 21-22; on use of lights to guide attack, see also Captain B.F. Sands report, USS *Fort Jackson* (May 8, 1864): 23.

<sup>86</sup> *Britannia* was built by Barclay & Curle in 1862, captured and commissioned into the US Navy, 29 September 1863. Paul H., Silverstone, Warships of the Civil War Navies, (Annapolis, 1989), 81.

faster ships in the outer line if a runner was spotted trying to escape. Many of these ships went for months without service in a dry-dock. Whether because of unserviced engines or the fouling of marine growth on the hull, *Britannia* was ill prepared to outrun its adversary. As the ram bore down, the Union ship headed for the station buoy while turning the stern 24-pound howitzer to meet the attacker. As commander Huse relates, it did not take long to find that he was also in dangerous range:

She then commenced firing at us; the first shot put out our binnacle lights and the next went a little over the starboard paddlebox, sounding very much like a 100-pounder Parrot shot when it tumbles. We now burned a blue light, when the enemy fired again. Our course was changed three times, hoping to elude him, but he followed and gained on us considerably, being within 600 yards when we passed the buoy, . . . .<sup>87</sup>

The *Britannia* altered its course one last time, heading toward the northeast. The ironclad was subsequently lost in the dusk. A gun sounded from somewhere in the southeast, showing that the Confederate ship had failed to see the *Britannia*'s last turn. Whether or not the reports of the week before were true, the Federals were uncertain about the identity of their attacker. Believing refugee reports that the *Raleigh* had run aground several days before, they thought the *North Carolina* had somehow managed to cross the bar and attack them.<sup>88</sup>

If the *Raleigh* had in fact grounded, it had gotten off. Captained by J. Pembroke Jones, and with Flag Officer William Lynch also onboard, the new ironclad had just accomplished its first mission. Its escort, a blockade runner, was spotted and chased by

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<sup>87</sup>Report of commanding officer S. Huse, USS *Britannia* (May 8, 1864): Official Records, Navies, Ser. I, Vol. X, 21-22.

<sup>88</sup>Ibid. Other than the "binnacle lights," no damage is reported by Huse, although the Wilmington Daily Journal of Tuesday, May 10, 1864, described a shot as "crashing through her sides." Article reproduced in James Sprunt's Chronicles of the Cape Fear River: 1660-1916 (Wilmington, 1992), 482.

one other Union ship before escaping to the open sea.<sup>89</sup> The accompanying gunboats *Yadkin* and *Equator* followed shortly after and took their stations under the guns of Fort Fisher. There they waited for the ironclad to round up a prize that they could escort in. The first quarry had escaped, but Flag Officer Lynch looked to the range lights inside the fort to get a fix on the *Raleigh's* position. He then altered course toward the next Federal position, and a night of blind-man's-bluff with the Union navy began.

Four of the blockade ships responded to the *Britannia's* rockets and the flashes of distant artillery. The commander of the USS *Mount Vernon* "heard the report of seven heavy guns and saw the flashes of six more."<sup>90</sup> A similar number was reported by the commanders of the blockade ships *Kansas*, *Howquah*, and *Nansemond*. None of them suspected anything more than a blockade runner trying to escape. Setting their courses for interception, most of them cruised only a short while before returning to their stations. The commander of the USS *Nansemond* saw the *Britannia* "running offshore," but was out of hailing reach. He sighted no other vessel, and "believing it unsafe to leave the bar unwatched, (we) returned to our station."<sup>91</sup> At 9:10, the *Nansemond* was approached by the USS *Howquah* and mistakenly fired upon before giving the proper signal. Shortly after passing, the captain of the *Howquah* heard three more shots and saw some rockets being fired, and went on in search of another blockade runner.<sup>92</sup>

The movement of the Federal ships may have fouled the *Raleigh's* search pattern. Flag-Officer Lynch gave up the blind cruise and took a position outside the inlet where

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<sup>89</sup>The name of the blockade runner remains unknown. It was spotted and chased by the USS *Nerous* before it escaped. Reported by Commander William A. Parker, USS *Tuscarora* (May 7, 1864): Official Records, Navies, Ser. I, Vol. X, 19.

<sup>90</sup>Report of commanding officer James Trathen, USS *Mount Vernon* (May 7, 1864): Official Records, Navies, Ser. I, Vol. X, 19-20.

<sup>91</sup>Report of commanding officer J. H. Porter, USS *Nansemond* (May 7, 1864): Official Records, Navies, Ser. I, Vol. X, 23-24; accounts of the USS *Kansas*, *Mount Vernon*, and *Howquah* (May 7, 1864): 18, 19, 20.

<sup>92</sup>Report of commanding officer J. W. Balch, USS *Howquah* (May 7, 1864): Official Records, Navies, Ser. I, Vol. X, 20-21.

the Federals were most likely to find him. No other encounters were reported until around midnight, when the USS *Nansemond* came across the ironclad. Commander J. H. Porter discovered the vessel “apparently lying still,” but he was unable to see if the stranger was a blockade runner or one of his own. He flashed his identification signal and waited for a response:

. . . the strange vessel started ahead steering N.E. and crossing our bow. Put our helm hard a starboard to prevent collision, and challenged again, which was answered by a steady red light, the vessel now steering directly for us. Challenged a third time with the Coston signal for the night; not being answered, opened fire on her from 24-pounder howitzer aft. She immediately replied by a shot which passed over and near our walking beam. The vessel at this time was not over 500 yards from us; could see the outline of her hull and the white water from her propeller.<sup>93</sup>

Now the ironclad closed on the *Nansemond*, gaining by Porter’s estimation, “from 6 to 7 knots.” Another shot from the Federal ship’s 24-pounder was answered by an enemy shell passing overhead. Slowly but surely, the *Nansemond*’s engines were able to increase the distance between the two vessels. A blue light was fired to alert the other blockaders. The ram continued to fire until the light went out and then both ships lost sight of each other.<sup>94</sup> Later, around 2:35, the USS *Howquah* sighted another rocket, but no other Federal encounters were reported that night.<sup>95</sup>

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<sup>93</sup> Report of commanding officer J. H. Porter, USS *Nansemond* (May 7, 1864): Official Records, Navies, Ser. I, Vol. VIII, 23.

<sup>94</sup> As with the *Britannia*, the Wilmington Daily Journal claimed that a shell was sent “whistling through her bulwarks.” Commander Porter acknowledged no damage. Article is in Sprunt’s Chronicles, 482. Report of commanding officer J. H. Porter, USS *Nansemond* (May 7, 1864): Official Records, Navies, Ser. I, Vol. VIII, 23.

<sup>95</sup> Report of commanding officer J. W. Balch, USS *Howquah* (May 7, 1864): Official Records, Navies, Ser. I, Vol. X, 20-21.

The *Raleigh* was spotted by a third vessel, but this one was the blockade runner *Annie*, coming in from the sea. The steamer elected to steer clear of the ominous shape, unaware of its identity until the next morning.<sup>96</sup> It was perhaps just as well, for the growing frustration of the *Raleigh*'s commanders led to the order to fire on the next light that appeared. Lieutenant Henry M. Doak was responsible for sending a round into Fort Fisher. He was arrested momentarily before the intervention of Captain Jones, who recognized that the firing was in obedience to a faulty order.<sup>97</sup>

The "bright star light night," according to one individual, was enough to foil the ironclad's approaches toward the enemy, but to the watchers along the ramparts of Fort Fisher, the distant ocean remained "dark as Erebus."<sup>98</sup> The shell that landed in the fort must have added greatly to their consternation. Nothing could be made of the random appearance of lights and rockets, and the infrequent flashes of artillery followed by the echoing boom of the guns. Many were caused to wonder, "Had the foe been dispersed or destroyed?"<sup>99</sup>

The relief of dawn was related by a reporter from Wilmington's Daily Journal, who captured the scene from the 54 foot peak of the fort's Mound Battery. A panoramic view unfolded as the early morning fog rolled away from the breakers.

Daylight first disclosed the small steamers *Yadkin* and *Equator* about two miles from shore awaiting orders from the *Raleigh*, which they accompanied over the bar. Soon the horizon was clear, and we discovered the iron-clad eight miles to sea, in quiet possession of the blockading

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<sup>96</sup>*Annie*'s encounter related by pilot James William Craig in Sprunt's Chronicles, 400-401. See also Francis T. Graves, "CSS *Raleigh* to the Attack," State (August, 1977), 16.

<sup>97</sup>Misfire and account of Lt. Henry M. Doak: Ralph W. Donnelly, History of the Confederate States Marine Corps, (1989), 107.

<sup>98</sup>"Bright star light night" described by Charles Peek, *CSS North Carolina: Peek Papers* (private collection of Charles V. Peery, Charleston, SC), 25. "Dark as Erebus," by Sprunt, Tales, 37.

<sup>99</sup>James Sprunt, relating the account as given him by an "ex-Confederate officer": Sprunt, Tales, 35, 37.

anchorage. Soon after, the blockaders that had run off to sea appeared on the horizon, and the little black dots developed themselves into gunboats.<sup>100</sup>

The *Raleigh* first spotted the screw-steamer *Howquah*, and started a morning of futile ramming attempts and long range dueling. The *Howquah*'s commander saw the ram, one and a quarter miles distant, "making toward us fast (good 6 knots per hour). Wore ship, head(ed) offshore, and commenced firing, our shot striking near her." The ram returned fire with its forward weapon, "the shell exploding close to our starboard quarter." It then turned to bring its broadside guns to bear, alternately firing from either side while the Federal ship maintained its range.<sup>101</sup> The USS *Nansemond* was the second vessel to approach. When the ram's shots began to fall short of the *Howquah*, it turned toward the *Nansemond*, firing a shell that exploded before hitting its mark.<sup>102</sup>

One by one, other Federal ships appeared on the scene. When the USS *Mount Vernon* arrived, the ironclad was again closing with the *Howquah*. The *Mount Vernon* came in on *Howquah*'s port quarter to draw away some of the ram's fire while returning shots from its 100-pounder and 9-inch guns.<sup>103</sup> At about the same time, the USS *Kansas* appeared with its main weapon, a 150-pounder rifle. This was the most powerful weapon to be brought into action against the ironclad, but the *Kansas* fired only two rounds, both of which tumbled and fell short.<sup>104</sup>

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<sup>100</sup>Wilmington, Daily Journal, Tuesday, May 10, 1864, reprinted in Sprunt, Chronicles, 482-483.

<sup>101</sup>Report of commanding officer J. W. Balch, USS *Howquah* (May 7, 1864): Official Records, Navies, Ser. I, Vol. X, 20-21.

<sup>102</sup>Report of commanding officer J.H. Porter, USS *Nansemond*, (May 7, 1864): Official Records, Navies, Ser. I, Vol. X, 24.

<sup>103</sup>Report of commanding officer James Trathen, USS *Mount Vernon* (May 7, 1864): Official Records, Navies, Ser. I, Vol. X, 19-20.

<sup>104</sup>Report of commanding officer P. G. Watmough, USS *Kansas* (May 7, 1864): Official Records, Navies, Ser. I, Vol. X, 18.

By 5:30 a.m., four ships engaged the *Raleigh* while more appeared on the horizon, including the *Britannia*, *Fahkee*, *Nippon* and the steam sloop *Tuscarora*. With its arsenal of nine pieces, including two 11-inch guns, the *Tuscarora* was perhaps the most powerful ship in the squadron. The ship's commander, William A. Parker, "stood for (the ram) to reconnoiter, but did not get within fighting distance."<sup>105</sup>

Only the USS *Howquah* scored any hits as it traded shots from about a mile and a half away. The Union ship fired a total of nineteen rounds, using mostly 30-pound solid shot, but only two struck the armored casemate. Lt. Doak described the impact on board the *Raleigh*, "inciting a momentary fear that Atlas had carelessly dropped this planet."<sup>106</sup> The *Howquah* received a projectile through its smokestack "about two-thirds of the way up" in return.<sup>107</sup>

After two hours of this sort of action, there seemed to be little hope of closer engagement. Lynch and his officers considered the options. At 7:00 a.m., the tide was again high. To continue the engagement, the *Raleigh* would have to wait another twelve hours before it could cross the bar with the next high tide. To stand the seas that long would be at the risk of whatever conditions the weather might incur. So far, the action had proven inconclusive with the present Federal ships able to stay clear of the *Raleigh*'s advances, passing and receiving shots without serious injury to either side. As seen from Fort Fisher:

About six o'clock eight blockaders came in site, but notwithstanding the *Raleigh* steamed defiantly around their anchorage, eight miles from the guns of Fort Fisher, not one dared to take up the gauntlet. At 7 o'clock the

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<sup>105</sup>Report of commanding officer W. A. Parker, USS *Tuscarora* (May 7, 1864): Official Records, Navies, Ser. I, Vol. X, 19.

<sup>106</sup>Citation of Lt. Doak by Donnelly, Confederate States Marine Corps, 107: quoted from H. M. Doak Papers, Manuscript Section, Archives Division, Tennessee State Library and Archives, 35.

<sup>107</sup>Report of commanding officer Balch, USS *Howquah*, (May 7, 1864): Official Records, Navies, Ser. I, Vol. X, 20-21.

flag officer, wishing to save the tide on the bar, signaled for his steamers and turned the *Raleigh's* prow to shore. The little trio formed in line some five miles out, and steamed slowly in, the Confederate flag waving saucily above their decks.<sup>108</sup>

As the *Raleigh* steamed in, the U. S. steamers *Howquah*, *Kansas*, *Mount Vernon*, *Niphon*, and the *Nansemond* followed at a respectful distance. When it crossed the bar into New Inlet, the Federals heard the guns of Fort Fisher ring out nine times in salute.<sup>109</sup> They didn't follow closely enough to notice the ironclad's progress toward the river come to a sudden halt.

The details of the *Raleigh's* subsequent fate will be left to the next chapter, where they can be better accounted for within the context of site development. In the meantime, the overnight attack aroused some very different responses on both sides, with repercussions lasting until the end of the war.

### **Federal Impressions**

Long before the attack, William Keeler of the USS *Florida* wrote of the inclination of ram fever sufferers to keep their ships "well out to seaward."<sup>110</sup> For all of Wilmington's naval activities, for all the sightings that induced "ram fever" over the last two years, the *Raleigh* was the first and only Confederate ironclad to cross the bar and challenge the Cape Fear squadron. In Keeler's summation, "notwithstanding (that) 'wolf'

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<sup>108</sup>Wilmington, Daily Journal, Tuesday, May 10, 1864, reprinted in Sprunt, Chronicles, 482-483.

<sup>109</sup>Blockade ships reported to have "pursued" the *Raleigh* by commanding officer James Trathen, USS *Mount Vernon* (May 7, 1864): Official Records, Navies, Ser. I, Vol. X, 20; nine gun salutation reported by commanding officers P. G. Watmough, USS *Kansas* and J. W. Balch, USS *Howquah* (May 7, 1864): 18, 21.

<sup>110</sup>Letter of paymaster William F. Keeler, to his wife Anna (July 13, 1863): reprinted by Daly, Aboard the USS Florida: 1863-65, Vol. 2: 67.

had been cried so often and so long that many had grown careless and affected to laugh at it, it did not find our vessels unprepared -- to run, which they did . . . ."<sup>111</sup>

Although some Federal commanders attributed the *Raleigh's* retirement to the "prospect of encountering heavier metal in the light of the day," the heavier metal had fallen short for more than two hours before the ironclad broke off the action.<sup>112</sup> During this time, they seemed well enough impressed with the ironclad's "most formidable and dangerous" appearance, further describing the ironclad as "fast," a good "6 or 7 knots," and able to turn "very quickly." The captain of the USS *Howquah* also reported that the ironclad carried "a torpedo on her bow, such as the *Atlanta* had."<sup>113</sup> Although none of the other Federal officers mentioned a spar-torpedo, the popular use of the weapon during the late years of the war substantiates the observation. The shot through the *Howquah's* stack offers the only account of *Raleigh's* effective gun range within the casemate's restricted elevation of seven degrees. By Commander William Parker's estimation, the shot was fired from "1 1/2 miles distant."<sup>114</sup> Commander Parker wrote of engaging the *Tuscarora* with the rebel ram, if it should come out again, but he also doubted the ability of "any wooden vessel on this station to contend successfully."<sup>115</sup> He requested that Adm. Samuel P. Lee add an ironclad to the Cape Fear squadron.

Some confusion over the ram's identity persisted however, as the New York Herald related the encounter with the *North Carolina*. The *Raleigh* was believed never to

<sup>111</sup>Letter of paymaster William F. Keeler, to his wife Anna (May 15, 1864): Ibid., 170-171.

<sup>112</sup>Report of Captain B. F. Sands, USS *Fort Jackson* (May 8, 1864): Official Records, Navies, Ser. I, Vol. X, 22-23.

<sup>113</sup>Respective quotations: "most formidable and dangerous," W. A. Parker, USS *Tuscarora*; "fast," and "torpedo on her bow," J. W. Balch, USS *Howquah*; "6 or 7 knots," and "turns very quickly," J. H. Porter, USS *Nansemond* (May 7, 1864): Official Records, Navies, Ser. I, Vol. X, 19, 21, 24.

<sup>114</sup>Report of Commander W. A. Parker, USS *Tuscarora* (May 7, 1864): Official Records, Navies, Ser. I, Vol. X, 19. A similar range was attributed to the Charleston ironclads, including the *Chicora* and *Palmetto State* in General Beauregard's letter to Secretary Mallory (November 14, 1863): Official Records, Armies, Ser. I, Vol. XXVIII, 503.

<sup>115</sup>Report of Commander Parker, USS *Florida*, (May 9, 1864): Official Records, Navies, Ser. I, Vol. X, 36.

have crossed the bar on account of having run aground before the battle. The Herald reported that the *Raleigh* was still grounded in the river several miles above Fort Fisher, but “no doubt will get off with the next high tides.”<sup>116</sup>

By May 18th, the Federal forces had learned that one of the ironclads was aground inside the inlet. Its position was barely visible to the distant blockaders, as described by paymaster Keeler of the *Florida*:

. . . with the same ill luck which seems to follow all the rebel rams and ironclads, she ran aground on a bar at the mouth of the river where we have since seen her, through the glasses, surrounded with tugs trying to get her off.

Refugees who came off to the *Fort Jackson* today say that she has broken in two and will be a total loss. If this information is correct, and we have reason to think it is, it is hoped that it will tend to allay the “ram fever” which has been running high ever since we have been down here.<sup>117</sup>

A Federal sketch of the Fort Fisher defenses shows how the rebel ironclad might have appeared to the blockading forces. The low casemated shape is barely discernible with two salvage vessels flanking its sides (Figure 11).

For some reason, even seeing the wreck of the ironclad through binoculars did not alleviate the “ram fever.” Confusion over the identity of the two rams may have persisted, and so did the fear that at least one of them was still in operation. Two weeks after the attack, Lt. William B. Cushing submitted a plan to Naval Secretary Gideon Welles for the capture or destruction of the “*Raleigh*.”

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<sup>116</sup>New York Herald, reprinted in Wilmington, Daily Journal, May 25, 1864.

<sup>117</sup>Keeler to his wife (May 18, 1864): Daly, Aboard the USS *Florida*, Vol. 2, 170-171.

Lt. Cushing would later gain fame for destroying another ironclad with the use of a small ship's launch and a spar torpedo. This ironclad, CSS *Albemarle*, was already threatening Federal control of the North Carolina sounds. During one engagement, the *Albemarle* rammed and sank the USS *Southfield* during a joint operation with Confederate troops to retake Plymouth, North Carolina. The *Albemarle* attacked again on May 5, 1864, only a day before the *Raleigh's* attack at New Inlet.<sup>118</sup> Cushing's plan speaks for the threat that the Federal's still felt existed in the Cape Fear River:

Selecting a time when the ram is anchored at Smithville, I can, as I have often done, take boats by the forts and up to the anchorage, and, covered by darkness, approach to within a short distance of the enemy. The *Raleigh's* low, flat decks are very favorable to boarders, while there are but two small hatches communicating with the officers' quarters and berth deck. The lookouts can easily be swept away and these hatches guarded, while the main force, rushing through the ports and hatch, will secure the unprotected gun deck, which will give us the engine room and magazine hatch.

Objections have been made that after gaining the deck we could no more get at the lower portion of the vessel and the crew than they could get at us. To settle this point, I propose to take in the boats a dozen long-fuzed shell and a piece of slow match. One shell down each hatch would be likely to bring all hands to terms.<sup>119</sup>

A month and a half after the battle, he was granted permission to "attempt the destruction of the ironclad ram *Raleigh*."<sup>120</sup> On the evening of June 23rd, Cushing and a

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<sup>118</sup>Still, *Iron Afloat*: CSS *Albemarle's* first attack, 157-162; second attack, 163-165; sunk by Lt. Cushing, 213-214.

<sup>119</sup>Report of Lt. William B. Cushing to Secretary of the Navy, Gideon Welles (May 21, 1864): Official Records, Navies, Ser. I, Vol. X, 77.

<sup>120</sup>Report of Lt. Wm. B. Cushing, to Rear-Admiral S.P. Lee (July 2, 1864): Official Records, Navies, Ser. I, Vol. X, 203.

small band of men rowed in through the mouth of the Cape Fear River to reconnoiter the Confederate defenses and learn the true condition of both ironclads. From captured papers, they learned that the *North Carolina* was currently anchored up in Wilmington. A captured pilot took them to where the *Raleigh* was said to be wrecked. "She is indeed destroyed," Cushing reported, "and nothing now remains of her above water."<sup>121</sup>

### **Confederate Impressions**

The people of Wilmington were less informed than the Federals as they read glowing accounts of the overnight action. The papers held no mention of subsequent misfortune. Almost a week after the attack, papers as far away as Hillsborough, N. C. still trumpeted the news of the scattering of the blockade:

Nine blockade runners have come into Wilmington since the "Raleigh" iron-clad scattered the blockade squadron a few days since. Five of them are entirely new vessels on their first trip. They saw no blockaders on their way in.<sup>122</sup>

The New York Herald's account of the battle found its way back to Wilmington and was also re-printed in the Daily Journal. The story included the Federal belief that the *North Carolina* had made the attack while the *Raleigh* was still aground, but "no doubt will get off with the next high tides."<sup>123</sup> Of course, the full story could not be censored in the private letters of military personnel, nor hidden from passengers aboard the river steamers that passed by New Inlet. News of a much worse disaster eventually

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<sup>121</sup>Report of Lt. Wm. B. Cushing, to Rear-Admiral S.P. Lee (July 2, 1864): Official Records, Navies, Ser. I, Vol. X, 203.

<sup>122</sup>Hillsborough Recorder, May 11, 1864.

<sup>123</sup>New York Herald, reprinted in Wilmington, Daily Journal, May 25, 1864.

traveled as far away as the Confederate capital. On June 3rd, the Daily Journal gave up on trying to hide the complete story:

The Richmond correspondent of the Charleston Mercury says that news has been received in that city that our iron clad *Raleigh* broke in two on the way below Wilmington. A Wilmington correspondent stated the same a few days since. We suppressed the news at the time and would not publish it until now had it not been made public by other papers.

Augusta Chronicle & Sentinel.

Some papers and some correspondents would publish *anything*, we think. It is perfect folly for us here to try to keep anything back. The “correspondent” has grown to be an institution. (emphasis in original)<sup>124</sup>

Now known to everyone on both sides, the grounding dealt a sharp blow to the sagging reputation of Wilmington’s naval squadron. According to one *North Carolina* crewman, Flag Officer Lynch was “very much down in the mouth about it, (as he) expected to do great things with her.”<sup>125</sup> In the eyes of some of Wilmington’s most prominent citizens, the triumphant scattering of the blockade was turned into disreputable defeat. James Sprunt later gave his account of the *Raleigh* in his Tales of the Cape Fear Blockade. He called the attack a “dismal failure.” Sprunt continues, “It was with great disappointment that the garrison saw the *Raleigh*, *Yadkin* and *Equator* come over the bar and under the guns of the fort, leaving the blockading squadron apparently unharmed.”<sup>126</sup> The safe passage of blockade runners went unnoticed by another naval officer, who wrote that, “What [the *Raleigh*] . . . went out for has never been ascertained.”<sup>127</sup> A bit of badly needed glory is apparent by all accounts, but as

<sup>124</sup>Wilmington, Daily Journal, June 3, 1864.

<sup>125</sup>Peck Papers (private collection of Charles V. Peery, Charleston, SC), 26.

<sup>126</sup>Sprunt, Tales, 35, 38.

<sup>127</sup>Lt. William H. Parker, CSN, cited by William N. Still, “Southern Ironclads Struggle,” Military History, (August 1984), 63.

Lieutenant Doak expressed it, “We had done all we purposed . . . all we could do . . . and prow was turned shore-ward.”<sup>128</sup> The best account that Charles Peek of the *North Carolina* could give was of a “bloodless victory & nobody hurt, the Yankees driven off to return as soon as she (the *Raleigh*) came in.”<sup>129</sup>

The circumstances of the *Raleigh*'s grounding are uncertain. One of the more suspicious accounts from a *North Carolina* deserter says that the *Raleigh* “was run on a bank by the captain (J. P. Jones) purposely . . . (that) he thought it would not hurt her.”<sup>130</sup> Such an action might be conceivable if the *Raleigh* was having trouble stemming the outrushing tide. Lynch's wish to “save the tide” may have come too late as he dallied with the Union fleet.<sup>131</sup> Gunnery Lt. Doak attributed the grounding to “careless sounding” or a “reckless pilot.”<sup>132</sup> The Confederate naval inquiry concluded:

In the opinion of the court, the loss of the *Raleigh* can not be attributed to negligence or inattention on the part of anyone on board of her, and every effort was made to save said vessel. We further find that the *Raleigh* could have remained outside the bar of (the) Cape Fear River for a few hours with apparent [safety], but, in the opinion of the court, it would have been improper; and in view of all the circumstances, “her commanding officer was justified in attempting to go back into the harbor when he did.”

It is further the opinion of the court that the draft of water of the *Raleigh* was too great, even lightened as she had been on this occasion, to render safe passage of the bar, except under favorable circumstances, . . . particularly as her strength seems to have been insufficient to enable her to

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<sup>128</sup>Citation of Lt. Doak by Donnelly, *Confederate States Marine Corps*, 76, 242: quoted from H.M. Doak Papers, Manuscript Section, Archives Division, Tennessee State Library and Archives, 35.

<sup>129</sup>Peek Papers (private collection of Charles V. Peery, Charleston, SC), 25.

<sup>130</sup>John B. Patrick, former seaman, CSS *North Carolina*, statement given aboard USS *Malvern* (June 27, 1864): *Official Records, Navies*, Sec. I, Vol. IX, 770.

<sup>131</sup>Lynch's wish to save the tide was stated by the Wilmington, *Daily Journal*, May 10, 1864.

<sup>132</sup>Citation of Lt. Doak by Donnelly, *Confederate States Marine Corps*, 107: quoted from H. M. Doak Papers, Manuscript Section, Archives Division, Tennessee State Library and Archives, 35.

sustain the weight of armor long enough to permit every practicable means of lightening her to be exhausted.<sup>133</sup>

### **Harbor Defense and Fort Fisher's Fall**

Had the *Raleigh* not been lost upon the most treacherous shoal in the Cape Fear River, the ironclad might well have survived until the end of the war. The date of its launch is unknown, but the *Raleigh's* late commission delayed its entry into the brackish waters of the lower Cape Fear. While seaworms shortened the life of the *North Carolina*, the *Raleigh's* hull was protected by the fresh waters around Wilmington. The reasons for its lighter draft cannot be determined conclusively, but should have made it less susceptible to grounding. Barring all Federal attempts to destroy it, Flag Officer Lynch's wish to "do great things" might have come true as events unfolded toward the fall of Fort Fisher.

The *North Carolina* became increasingly unreliable due to its unseasoned timbers and poor engines. The deck timbers warped until the guns were almost unserviceable. The hull leaked so badly that the pumps had to be kept running at all times. Eventually the *North Carolina* was run into the shallows next to Battery Island, across from Smithville (present day Southport) near the river's mouth. There it would spend the rest of its career as a floating battery, guarding the blockade runner anchorage. Finally, the worm-eaten hull let in more water than the pumps could handle. On September 16th, 1864, Engineer Charles Peck wrote that the "old *North Carolina* is no more."<sup>134</sup>

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<sup>133</sup>Report of Confederate Secretary of the Navy, Stephen R. Mallory, on the court of inquiry concerning the loss of the CSS *Raleigh* (June 6, 1864): Official Records, Navies, Ser. I, Vol. X, 24-25.

<sup>134</sup>Peck Papers (private collection of Charles V. Peery, Charleston, SC): deck timbers warped, 29, 30; hull leaks, 33; grounding, 31; positioned near Smithville, 32; "is no more," 38.

General Whiting complained bitterly to Secretary Mallory, with emphasis on the repercussions:

I have less force to secure Wilmington now than at any time during the war, and every available man and gun are needed more than ever. The two ironclads, the *Raleigh* and *North Carolina*, on which we relied to defend the rips, or inner bars, are both gone. We have here no naval forces afloat, and one is greatly needed.<sup>135</sup>

The message was repeated in October, again emphasizing the loss of the “*North Carolina* and the *Raleigh*, which were to defend the inner bars.” General Whiting may have anticipated a Federal attempt to run through New Inlet, leaving Fort Fisher exposed from behind and Wilmington defenseless. There was little that Mallory could contribute to the defense of the river. A new ironclad, *Wilmington*, could not be finished in time and the only available vessel was the lightly armed raider *Chicamauga*.<sup>136</sup>

The ability of an ironclad such as the *Raleigh* to stop the passage of more than fifty ships is extremely doubtful, but the attack was not to come through New Inlet. Indeed, the inlet was too shallow for the larger Federal warships to run through. The attacks on Fort Fisher were preceded by heavy naval bombardments, but the final execution was to come from landed troops attacking from the north along the peninsula. An ironclad in the river would have provided the Confederates with a much more critical advantage.

The first attack on Fort Fisher came on December 20th, 1864. The detonation of the bombship *Louisiana* was expected to destroy the fort or at least stun the defenders. The plan, as conceived by General Benjamin F. Butler, would supposedly enable the

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<sup>135</sup>Whiting to Mallory (September 27, 1864), Official Records, Navies, Ser. I, Vol. X, 751.

<sup>136</sup>Whiting to Mallory (October 6, 1864), Official Records, Navies, Ser. I, Vol. X, 774-775.

Federals to take the fort with little resistance. The *Louisiana*, however, was positioned too far to the north and the explosion proved only a minor disturbance to the garrison. The morning before Christmas began with a day long bombardment, followed by General Butler's half-hearted assault along the seaward side of the peninsula. The ramparts of the fort were never contested.<sup>137</sup>

The return of the Union fleet in mid-January brought more men and more determined commanders. A three day bombardment concentrated on Fort Fisher's 24 guns along the northern or landward face. When they were finished, only one gun was left that could be brought to bear on the attacking troops. None of the seacoast guns could be turned toward the action, obstructed by their own traverses. The CSS *Chicamauga* was in the river, but its one 84-pounder and four smaller guns were little compensation for the loss of the fort's defensive weapons. Ten thousand Federal troops prepared for another attack, this time along both sides of the peninsula. The fort's 1,500 defenders managed to repel the seaward assault, but the attack along the river took the fort's main entrance. After more than six hours of bloody resistance inside the fort, the fate of the last Confederate seaport was closed.<sup>138</sup>

Fort Fisher's fall can be attributed to many factors. The lack of naval forces was no less a factor than the lack of men and guns inside the fort. A force of more than 6,000 was in Wilmington under the command of Gen. Braxton Bragg. When appointed to the city's defense, the general's career of incompetence inspired the Richmond Examiner to proclaim, "Goodbye Wilmington." While Fort Fisher was under siege, Bragg had several

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<sup>137</sup>The first attack is related by Sprunt, Chronicles, 383-386, 493-494.

<sup>138</sup>The second attack is related by Sprunt, Chronicles, 383-386, 494-495. *Chicamauga's* participation in Fort Fisher's defense: J. Thomas Sharf, History of the Confederate States Navy, (New York, 1887), 426. *Chicamauga's* armament consisted of one 84-pounder, two 32-pounders and two 24-pounders: Silverstone, Warships of the Civil War Navies, 210.

opportunities to execute counter attacks that could have turned the Federal campaign into disaster. To the end, General Whiting's telegraphs for assistance went unanswered.<sup>139</sup>

The loss of the ironclads was more critical than Whiting could have foreseen, especially after the second bombardment. In addition to the fort's one remaining landface weapon and the *Chicamauga's* 85-pounder, an ironclad in the river would have added four more heavy guns to the fort's defense. As demonstrated by the *Raleigh's* attack of May 6 - 7, the ironclad could have held its range over the peninsula from the river's deepest channel. It is impossible to say how an ironclad in the river might have affected the Fort Fisher campaign. Without doubt, the defense of Fort Fisher would have proven the most consequential test of the *Raleigh's* harbor defense capability.

Ironically, the *Raleigh's* grounding on the rip saved it from the more thorough destruction that befell its sister-ships as the war came to an end. It was with some credit to the *Richmond*, *Savannah*, *Chicora*, and the *Palmetto State*, that none of their port cities were taken by opposing naval forces. The ironclads formed vital links in the chain of Confederate fortifications. As mobile batteries, they were ready to meet any Federal advances into the waters they patrolled. When Richmond, Savannah, and Charleston were ultimately taken by land, the ironclads were destroyed to prevent capture. The next chapter details how the *Raleigh* managed to survive as one of the most extensively preserved Confederate ironclads known to exist.

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<sup>139</sup>On General Braxton Bragg, see Sprunt, *Chronicles*, 492. A thorough historical account of Fort Fisher, the campaigns and leaders of both sides is Rod Gragg's *Confederate Goliath: the Battle of Fort Fisher*, (Baton Rouge, 1991); citation of the *Richmond Examiner* also by Gragg, 27.

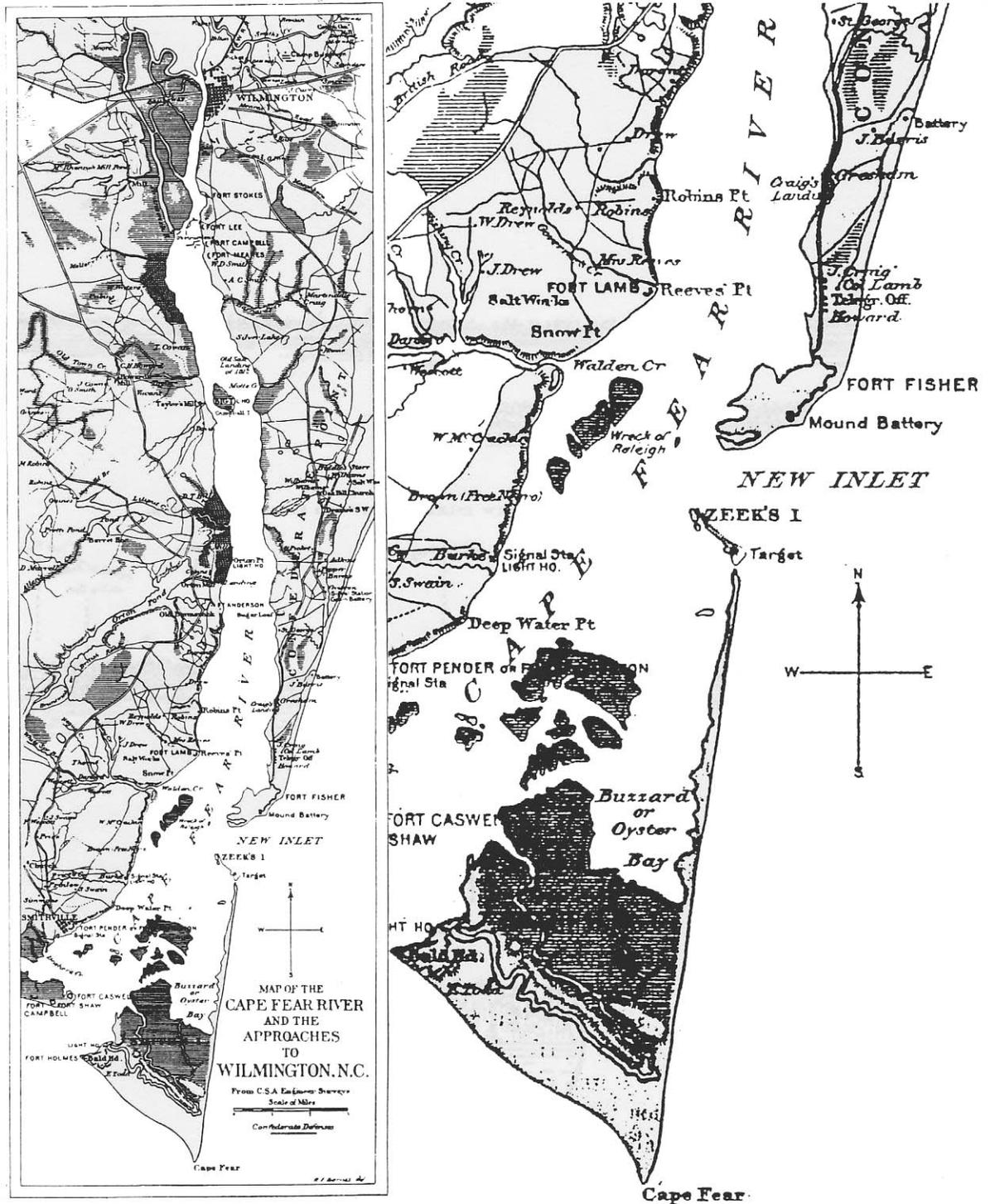


Figure 10: Cape Fear, c. 1864, showing Wilmington and defenses. Note wreck of Raleigh inside New Inlet. (*Official Records, Navies, Ser. I, Vol. XII, 38*)

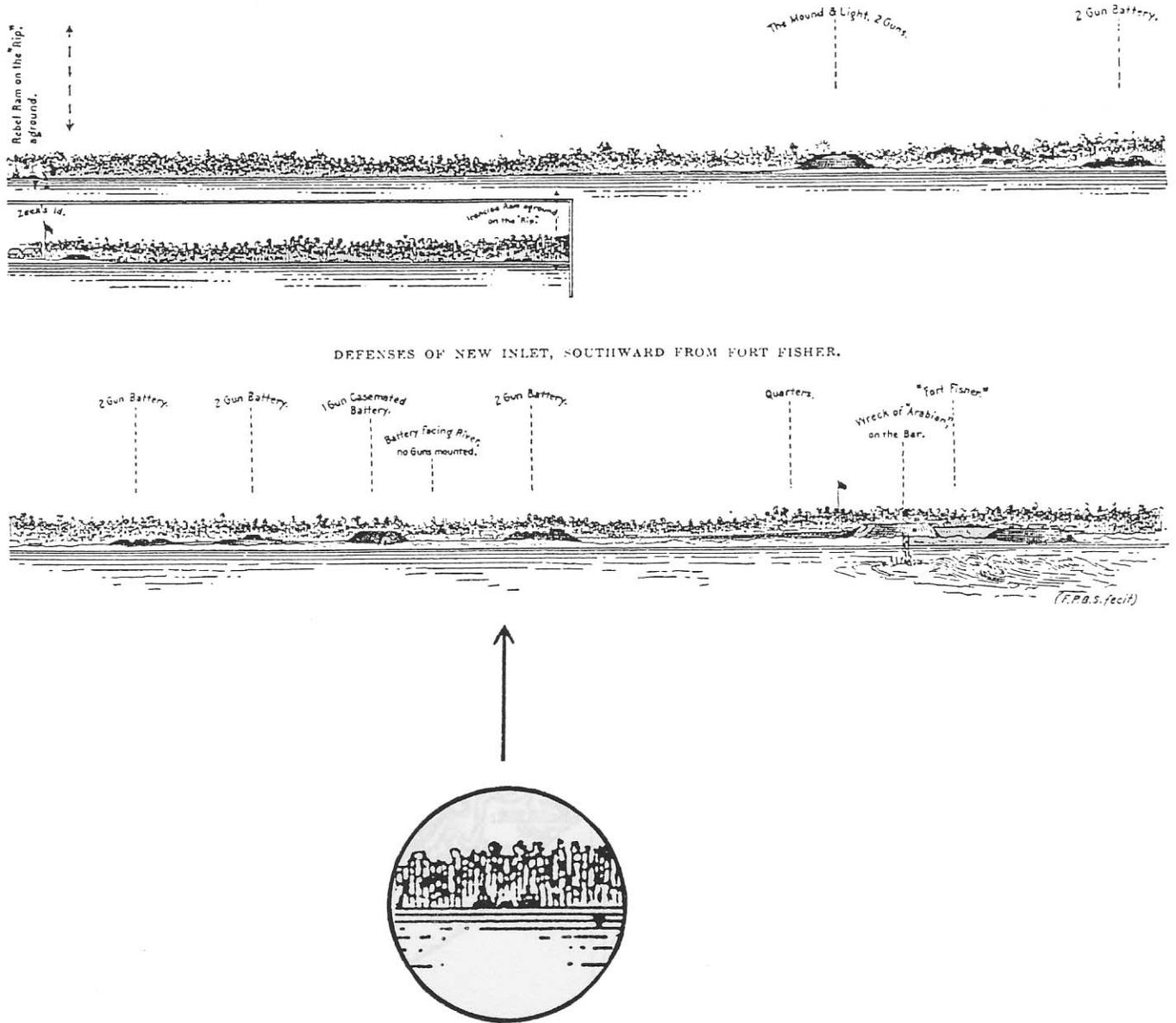


Figure 11: Federal Sketch of Fort Fisher defenses, showing wreck of *Raleigh*. Inset is an enlargement of wreck, as it appears to be flanked by salvage vessels. Artist and date unknown. (*Official Records, Navies, Ser. I, Vol. X, 125*)

## CHAPTER IV

### SITE HISTORY, 1864 - PRESENT

The wreck of the *Raleigh* is noted on modern charts at Latitude 33° 57' 25.258'', and Longitude 77° 57' 08.593''. Its only indication is a small circle of dots, and the abbreviation "Wk." Its official documentation number in the files of the North Carolina Underwater Archaeology Unit is 0003NEI. After the Civil War, the wreck disappeared from marine charts for almost a hundred years. This chapter accounts for the ironclad's destruction in May 1864, for all instances of site formation induced by man and nature, and all known instances of salvage and visitation before 1993.

#### **Environment, Grounding, and Salvage**

The Cape Fear River has a history of drastic change at the hands of man and nature. In 1761, a hurricane cut across Cape Fear, opening the passage into the river known as New Inlet. The inlet substantially weakened the flow toward the mouth, causing the main channel to silt in. Efforts to dredge the channel were conducted as early as 1827, and attempts were made to close the inlet in 1853. The project was incomplete when the War Between the States began in 1861.<sup>140</sup>

The forces of the river are particularly strong even today, as the tides run in or out. It is conceivable that an ironclad, capable of only seven knots, would be difficult to maneuver except during the relative calm of slack tide. The rise and fall of the tide ranges as much as five feet or more. The average turn between the tides is six hours, but the actual rise or fall can occur within a much shorter time. The strength of these alternating currents is what gave such sand bars as the "Rip" their notorious shifting

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<sup>140</sup>Sprunt, *Chronicles*, 10.

tendencies. The river bottom was also constantly changing. The strength of the tidal forces is indicated in the report of Lt. J. Taylor Wood on the attempts to sink obstructions in the river: "At the mouth of the river, on the bar, vessels have been sunk, but owing to the nature of the bottom they soon disappear."<sup>141</sup>

The same forces were at work when Flag-Officer Lynch decided to break off the morning action of May 7, 1864. Returning over the bar, approximately 12 hours after crossing, the river was once again at some stage of high tide. Whether the current was running in, running out, or still calm between the tidal flux is unknown. When the ironclad grounded on the Rip, the natural forces of the river took over.

As described in the Confederate naval inquiry, every effort was made to lighten the vessel before the fall of the tide.<sup>142</sup> Whether every means was actually exhausted, or if the tide simply fell faster than the efforts to remove all the heavy equipment, the inquiry does not make clear. The imminent danger was captured in Charles Peck's account of the *North Carolina's* grounding several weeks later:

We got a log in our propeller as we were crossing the shoals and had to anchor. When the tide fell we were about five feet out of the water, that is we draw about 13 feet, and there was not but eight feet on the shoals. I thought that the weight on the shield would crush in and I pack(ed) up my cloths ready for a start but the old ship stood it well and we were towed off next evening by two tugboats and are now safely at anchor off Smithville.<sup>143</sup>

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<sup>141</sup>Report of Lt. J. Taylor Wood, CSN, to President Davis (February 14, 1863), Official Records, Navies, Ser. I, Vol. 8, 859.

<sup>142</sup>Capt. George N. Hollins, CSN, to Judge-Advocate J. W. B. Greenhow (June 6, 1864), Official Records, Navies, Ser. I, Vol. X, 24-25.

<sup>143</sup>Peck Papers (private collection of Charles V. Peery, Charleston, SC), 31.

The *Raleigh* must have been caught in a similar situation. Unfortunately, it was also stranded over a more uneven stretch of sand bar. The heaviest equipment and stores had to come off first. With only six hours between high and low tide, the situation would have become critical in a very short time. As the tide ran out, the vessel began to hog. Finally the “weight of the iron upon (the *Raleigh*’s) shield just crush(ed) her decks in.”<sup>144</sup> The hull was also “broken in two.”<sup>145</sup>

The sudden violence of the break up is suggested by Engineer Peek’s concern for his own ship, especially with getting his clothes together, “ready for a start.”<sup>146</sup> It is unlikely that the *Raleigh*’s crew was able to worry about personal gear until it was too late. With the hull broken and straddled over the bar, the lower decks were flooded. By the next day, the tide was “up even with her gun deck.” Charles Peek noted a passing steamer “towing a flat with two of her guns on it.”<sup>147</sup> According to Wilmington’s chronicler, James Sprunt: “Little was saved from her, but the crew were not endangered, as the weather was calm.”<sup>148</sup>

The Confederates attempted to save more, but how much they were able to recover is uncertain. If the *Raleigh* was carrying all four guns, only two have been accounted for. The two 7-inch guns, perhaps the ones observed by Charles Peek, were transferred to Fort Fisher.<sup>149</sup> Attempts to salvage the armor were made by firing the

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<sup>144</sup>Peck Papers (private collection of Charles V. Peery, Charleston, SC), 26.

<sup>145</sup>Letter of William F. Keeler to his wife; Daly, *Aboard the USS Florida*, 171.

<sup>146</sup>Peck Papers (private collection of Charles V. Peery, Charleston, SC), 31.

<sup>147</sup>Peck Papers (private collection of Charles V. Peery, Charleston, SC), 26.

<sup>148</sup>Although James Sprunt’s account comes much later, many of his details fit those of refugee reports, as described by William Keeler of the *USS Florida*, and the personal letters of Charles Peek, of the *CSS North Carolina*: “Efforts were made to lighten her and get her off, but the receding tide caused her to hog and break in two, on account of the heavy armor, and becoming a wreck, she subsequently sank and went to pieces.” Sprunt, *Tales of the Cape Fear Blockade* (1960); also reprinted in *Chronicles*, 482.

<sup>149</sup>A reference to guns from the sunken “*Roanoke*” is probably a misnomer: Scharf, *History of the Confederate States Navy*, 422. The 7-inch guns are mentioned again in a letter from John Brooke to General Whiting (January 11, 1865): National Archives, Record Group 109, Ordinance & Hydrography Letters.

inside of the casemate to expose the bolt heads.<sup>150</sup> The recurring tide prevented sufficient scouring in some places. Salvage efforts lasted for about a month, but the sands continued to shift from under the wreck, causing it to sink slowly by the stern.

On June 3rd, the same day that the Wilmington Daily Journal publicly acknowledged the loss of the ironclad, the steamer *Cape Fear* passed by, carrying James Ryder Randall amongst its passengers. Randall, who had served as Flag Officer Lynch's secretary, gave this account of the wreck in a letter to his fiancée:

About a mile further inward (from the ocean) and just a few yards in from the channel, was all that remains of the ironclad *Raleigh*. She was very much sunken at the stern, lifting her bow considerably. Her sides had been stripped of their armor, the smokestack prostrate, and altogether she had the appearance of a monstrous turtle stranded and forlorn. As we passed, the divers were engaged in removing her boilers and machinery.<sup>151</sup>

The boilers were successfully salvaged and sent to Columbus, Georgia for use on another gunboat.<sup>152</sup> Eventually, however, the Confederate diving operations had to be abandoned as even the *Raleigh's* spar deck was submerged. The final inquiry of the navy department noted the *Raleigh's* "guns, equipments, iron, etc.," as "being saved."<sup>153</sup> Evidently less was saved than the report suggests. Some of the unsalvaged portions will be accounted for in the next chapter's description of the *Raleigh's* extant remains.

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<sup>150</sup>Burning reported by John B. Patrick, formerly of the CSS *North Carolina*, taken before Fleet Captain John S. Barnes, USS *Malvern* (June 26, 1864), Official Records, Navies, Ser. I, Vol. IX, 768-770.

<sup>151</sup>Letter of James Ryder Randall to his fiancée, Kate S. Hammond (June 3, 1864): reprinted by Isabel M. Williams and Leora H. McEachern in "River Excursions, 1864," Lower Cape Fear Historical Society - Bulletin, Vol. XXI, No. 3 (May 1978), 3.

<sup>152</sup>Letter of A. McLaughlin, commanding CS Navy Yard at Columbus, GA., to Cmdr. Catesby R. Jones (November 15, 1864), National Archives, Record Group 45, Area 6, File 0747-0748.

<sup>153</sup>Capt. George N. Hollins, CSN, to Judge-Advocate J. W. B. Greenhow (June 6, 1864), Official Records, Navies, Ser. I, Vol. X, 24-25.

During his nocturnal raid of almost seven weeks after the grounding, Union Lt. William Cushing made his report that the ironclad was "indeed destroyed," and that "nothing now remains of her above water."<sup>154</sup> His summation was less attributable to the work of Confederate salvors than to the natural forces of the river.

The history of the site henceforth is relatively scant in documentation. After disappearing beneath the waves, the wreck became a navigation hazard. At least two ships grounded on top of it, including the blockade-runner *Talisman* in 1864, and the schooner *L. Waring*, in 1868. On both occasions, adverse weather conditions induced the collisions.

The *Talisman* was one of several blockade runners that prepared to leave port when news of the first invasion fleet came to Wilmington. In spite of increasingly adverse weather conditions, several vessels made the run from the mouth of the river. The *Talisman* attempted to go through New Inlet. In the storm, the blockade runner crashed onto the wreck of the *Raleigh*. The vessel was successfully pulled off but had to return to Wilmington for repairs. One week later, the *Talisman* succeeded in getting through the inlet, only to break up in a heavy sea on December 29th. All hands were saved by a passing steamer enroute to Bermuda.<sup>155</sup>

After the war, circumstances were almost as bad for the *L. Waring*. On April 15, 1868, the schooner became stranded on top of the wreck during a heavy gail. The wind and waves defeated attempts to get her off and the vessel's hold filled with water. It was feared that the ship, which was un-insured and carried a cargo of 3,000 bushels of corn, would become a total loss. Fortunately, the next day brought calmer conditions. *L. Waring*'s hold was cleared of its cargo and pumped dry. The schooner was safely

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<sup>154</sup>Report of Lt. Wm. B. Cushing, to Rear-Admiral S. P. Lee (July 2, 1864): Official Records, Navies, Ser. I, Vol. X, 203.

<sup>155</sup>Wise, Lifeline, 208, 323.

removed and towed to the yard of J. L. Cassidy & Sons. In the same shipyard that completed the *Raleigh*, the *L. Waring* was hauled over and refitted for service.<sup>156</sup>

A few years later, on November 5, 1874, the schooner *F. Merwin* was reported aground "near the wreck of the *Raleigh*." Whether the schooner was stuck on top of the ironclad or only grounded nearby is uncertain. The *F. Merwin* "was expected to get off without damage."<sup>157</sup>

Although the location of the *Raleigh* is noted in the Confederate Engineers Survey map of 1864, the wreck subsequently disappeared from marine charts. After 1870, the concern for the navigation hazard may have lessened as the port authorities resumed an interest in closing New Inlet.<sup>158</sup> The wreck was buoyed as late as April 27, 1874, when it was used as a range marker during a sounding survey.<sup>159</sup> The wreck is also noted in a survey chart of 1875, but in following years, the buoy must have been lost and the wreck apparently forgotten.<sup>160</sup>

A chance encounter with the wreck was reported again in 1881. A story in the Wilmington Star of April 6, suggests that the ironclad had held up remarkably well in spite of Confederate salvage efforts and the groundings of at least two vessels on top of it. Unfortunately, the visit of the wrecking schooner *Wave* occasioned perhaps the worst instance of destruction:

A curiosity is now to be seen at Capt. Skinner's shipyard in the shape of a portion of the gunboat *Raleigh*, which was built here in 1863 and soon

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<sup>156</sup>Wilmington, Star April 15, 16, 22, 1868.

<sup>157</sup>Wilmington, Morning Star, November 5, 1874.

<sup>158</sup>Sprunt, Chronicles, 10.

<sup>159</sup>Only a copy of the sketch is available, titled "Soundings of New Inlet," Apr. 27, 1864: Map files of Richard Kimmel, U.S. Army Corps of Engineers, Wilmington Office.

<sup>160</sup>"Comparative Chart of Lower Part of Cape Fear River, North Carolina," made under direction of Maj. W. P. Craighill, Corp of Engineers, USA, latest date 1875: UAU Map Files (Cape Fear River), Kure Beach, NC.

afterwards sunk on the rip off New Inlet. Mr. James Nolan, on the wrecking schooner *Wave*, under command of Capt. Horton, was cruising in that neighborhood a day or two since, when they came across some obstacle on the bottom, whereupon Capt. Loring, an experienced submarine diver, donned his suit and went down, placing two kegs of gun powder in the midst of the obstruction and setting it off. The result enabled him to ascertain that it was a wreck of a vessel, and he next placed a thirty-five pound package of powder under the wreck and blew it apart, when a portion of the sunken gunboat, which proved to be the front of the turret, was brought to the surface, hitched on to the schooner and brought to this port, where it was dropped on the railway at Capt. Skinner's yard and hauled up out of the water. It is chiefly valuable for the iron which is attached to it, but if it was in some sections of the country Mr. Nolan and his "confreres" would be overrun with applications from relic seekers, and the enterprise might eventually prove an exceedingly profitable one.<sup>161</sup>

The description of the "front of the turret" apparently refers to some portion of the casemate, and not necessarily the front portion. Nevertheless, the article attests to a considerable amount of armor left behind by the Confederates. This grim tale is also a taste of what more would have followed if New Inlet had remained open to shipping traffic and the wreck exposed to additional chance discoveries.

### **Closing New Inlet**

The *Wave*'s encounter with the *Raleigh* was likely associated with the activities of building the rock jetty between Federal Point and the inlet's southern reach at Zeek's

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<sup>161</sup>Wilmington, Morning Star, April 6, 1881.

Island. During the same year that Captain Loring exploded his powder kegs, New Inlet was effectively closed to navigation.<sup>162</sup>

With the New Inlet “Swash Defense Dam” completed in 1881, the Corps of Engineers continued the work of closing the smaller breaches and estuaries along Smith’s Island, which comprises the principal coastline between New Inlet and Cape Fear. Another jetty was constructed between Zeek’s Island and the marshy interior of Smith’s Island, about two miles further south. In addition to the jetties, dredging operations helped increase the main channel depth to 20 feet by 1890.<sup>163</sup> Continued dredging and maintenance of the rock jetties gives the Cape Fear River its present depth of 40 feet.

All of these operations resulted in some major changes to the old location of New Inlet. Today, the channel that the *Raleigh* came through is silted in behind the swash dam (Figure 19). The ocean passage is closed by a formation of dunes. The actual inlet has shifted more than two miles down the beach where it disappears into a marshy estuary. Although the wreck’s location was forgotten for almost a hundred years, the projects to deepen the river had a drastic effect on the wreck site as well.

In 1965, a channel was dredged to the north of the site for the passage of the Fort Fisher - Southport ferry. The *Raleigh*’s location was still unknown. The effect that this constant traffic may be having on the site will be discussed in a later chapter.

### **Early Investigations**

The tale of the *Raleigh* lived on as a local legend, although the wreck’s location remained unknown until the early 1970’s. The invention of the aqua-lung in the 1950s

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<sup>162</sup>Richard H. Rayburn, “One of the Finest Rivers in the South: Corps of Engineers Improvements on the Cape Fear River Below Wilmington, 1870-1881,” Lower Cape Fear Historical Society Bulletin (May 1984), Vol. XXVII (No. 3), 5.

<sup>163</sup>Richard H. Rayburn, “One of the Finest Rivers in the South: Corps of Engineers Improvements on the Cape Fear River Below Wilmington, 1881-1919,” Lower Cape Fear Historical Society Bulletin (February 1985), Vol. XXVIII (No. 2), 1, 3.

made shipwrecks more accessible as a source of public recreation and archaeological study. However, the natural conditions of the Cape Fear River discouraged most underwater activities. A swirl is sometimes visible around the site as the tides run in or out, making the wreck's chance discovery possible. Claims to visitation on the *Raleigh* are rare, and generally vague in description.

Something in the area was known to local fishermen as a "bad hang," and if they were fortunate to recover any part of their net, it was usually marked with rust. "Covered with shrimp net, isn't she," is the most common observation, as inquired by Mr. William Thorsen.<sup>164</sup> A local shrimper, Mr. Thorsen is one of many who dragged their nets too close, prompting his own futile attempt at diver recovery. Marine charts of 1970 still failed to note anything more than the presence of a number of pilings, some distance away from the swash dam's first southward turn.

The Foard brothers, Charles and John, along with Hall Waters were principally responsible for finding most of the wrecks around Cape Fear, which included many of the British and Confederate blockade runners and Union blockade ships that were wrecked along the coast. Charles Foard was a civil engineer, whose main interest was in finding and plotting the wrecks of the Cape Fear region. His brother John was the owner and director of the Blockade Runner Museum in Carolina Beach, which is now closed. Hall Waters, an airplane pilot, provided the principal instrument for finding the wrecks. Although aerial detection worked well along the coast, other means had to be found to survey the turbid waters of the river.

Charles Foard found the old maps that led to the *Raleigh*'s rediscovery. One was a Coast & Geodetic Survey chart of 1873 that still marked the location of a "*Raleigh* Wreck Buoy." Another chart of 1857 provided additional geographic features of the

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<sup>164</sup>William Thorsen. Personal communication, Sons of Confederate Veterans meeting, August 18, 1994.

“Rip” on which the ironclad grounded. These two charts provided enough geographical evidence for estimating the ironclad’s position on a modern chart.<sup>165</sup>

Concurrent interest was also found at the Preservation Laboratory of the North Carolina Division of Archives and History, located on the grounds of the Fort Fisher State Historic Site. Later known as the N. C. Underwater Archaeology Unit (UAU), the laboratory was in the early years of developing a professional unit for investigating and managing the state’s underwater cultural resources. In the 1970’s, Leslie Bright and Gordon Watts were the main operatives who directed the first field operations to finding the *Raleigh*. Students from the Cape Fear Technical Institute in Wilmington provided the remote-sensing skills. Both fathometric and sub-bottom profiling equipment were used for surveying the location of the old Rip, as indicated by the Foard maps.<sup>166</sup>

The Sunday Star News carried the results on the feature page of May 5, 1974. An anomaly was detected at North Latitude 33° 57’ 20’’ and West Longitude 77° 67’ 12’’. The water depths ranged from 20 to 30 feet, but the fathometric profiles recorded a “jumble of wreckage fragments,” some rising to within 12 feet of the surface.<sup>167</sup> Sub-bottom sensors detected that most of the vessel was buried in the sediment.<sup>168</sup> Unfortunately, the swift currents of the river prevented diver verification, but according to UAU staff archaeologist Leslie Bright, the wreck was “just about where he (Charles Foard) said it was.”<sup>169</sup>

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<sup>165</sup>Gordon P. Watts, “CSS *Raleigh* - Research Proposal,” North Carolina Underwater Archaeology Unit, Kure Beach, NC, File CSS *Raleigh* 003 NEI.

<sup>166</sup>Gordon P. Watts, “CSS *Raleigh* - Research Proposal,” North Carolina Underwater Archaeology Unit, Kure Beach, NC, File CSS *Raleigh* 003 NEI; Wilmington, Sunday Star-News May 5, 1974, feature page, one -f.

<sup>167</sup>Wilmington, Sunday Star-News May 5, 1974, feature page, one -f.

<sup>168</sup>T. Francis Graves, “CSS *Raleigh* to the Attack, Part II” The State, August 1977, 35.

<sup>169</sup>Wilmington, Sunday Star-News May 5, 1974, feature page, one -f. See also Watts CSS *Raleigh* - Research Proposal,” UAU, Kure Beach, NC, File CSS *Raleigh* 003 NEI.

Local interest was immediately piqued toward raising the wreck, or “significant pieces” of it, with recollections by John Foard that “I knew old ‘Pem’ (Lt. John Pembroke Jones) well when I was a kid.” “History warrants it,” said another local historian, Tom F. Graves, “The *Raleigh* sortie was one of the rare occasions that a Confederate man-of-war challenged and withstood the Union fleet on the high seas.” These ambitions, however, did not go any further than the feature page of the Sunday Star-News.<sup>170</sup> The wreck would have to wait several more years before any more steps were taken towards positive identification.

No other investigations were conducted until 1980. In August of that year, UAU staff members Watts, Richard Lawrence, Jim Duff, and Dianna Lange conducted another remote sensing survey. The existence of a significant target was again confirmed. “No diving assessment of (the) target was conducted . . . the location of the *Raleigh* has been traditional . . . no confirmation known.”<sup>171</sup>

In 1985, the UAU was working to nominate several wrecks including the suspected site of the *Raleigh* to the National Register of Historic Places. A letter to the Corps of Engineers from the North Carolina Historic Preservation Office expresses a concern which may have had more impact in recent years:

In the Horseshoe Shoal Channel vicinity, the Underwater Archaeology Unit of this division has recently confirmed that a wreck, probably that of the CSS *Raleigh*, a Confederate ironclad, lies perpendicular to and protrudes over the shoulder of the channel (see enclosed map<sup>\*</sup>). It is our opinion that continued maintenance dredging of this portion of the Wilmington Harbor entrance channels may be causing an adverse effect to the wreck site by undermining it.

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<sup>170</sup>Wilmington, Sunday Star-News May 5, 1974, feature page, one -f.

<sup>171</sup>“*Raleigh* and North Carolina Site Magnetometer Survey,” August 26, 1980, North Carolina Underwater Archaeology Unit, Kure Beach, NC, File CSS *Raleigh*, 003 NEI.

\* This map has not been located.

We therefore recommend that an archaeological investigation of this wreck site be undertaken to determine its nature and present condition and to assess past and potential affects from maintenance dredging activities.<sup>172</sup>

The letter, which strangely foretold the wreck's present condition, is contained in its entirety in the thesis Appendix (Document A). Unfortunately, the investigation never went beyond another remote sensing survey. The Corps of Engineers conducted the survey in February 1985. The hydrographic and magnetic contours indicated that the wreck was not closer than 923 feet to the existing navigation channel and appeared to be well consolidated. Since the wreck was situated at such a great distance from the channel, no further assessment was deemed necessary. This assessment is also contained in the Appendix (Documents C & D).<sup>173</sup> Still, UAU staff members Barbara Brooks, Leslie Bright, and Mark Wilde-Ramsing returned to the site for another attempt at diver verification. Wilde-Ramsing made the descent, but the sudden outrush of tide prevented any more assessment than the presence of wood and iron wreckage.<sup>174</sup>

Inspite of the discouraging limitations of the river, a number of individuals claim to have dove on the site since its rediscovery in 1974. The few that the author has come across may be representative of many more. Their personal recollections are generally

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<sup>172</sup>David Brook, Deputy State Historic Preservation Officer, memorandum to John R. Parker, Office of Coastal Management, and Col. Wayne Hanson, Corps of Engineers, Wilmington District (November 2, 1984). On file at the North Carolina Underwater Archaeology Unit, Kure Beach: CSS *Raleigh*, 033 NEI.

<sup>173</sup>Col. Wayne Hanson, Corps of Engineers, Wilmington District, to Dr. William S. Price Jr., State Historic Preservation Officer (February 19, 1985). On file at the North Carolina Underwater Archaeology Unit, Kure Beach: CSS *Raleigh*, 033 NEI.

<sup>174</sup>"Dive Assessment at 003 NEI, *Raleigh* wreck site," on file at the North Carolina Underwater Archaeology Unit: File *Raleigh* 003 NEI.

vague on account of the poor visibility. Only the identification of wood and iron wreckage is common to all accounts.<sup>175</sup>

One of the more lucid accounts is that of Gordon Watts, who left the UAU in 1981 to co-direct the program in Maritime History and Underwater Research at East Carolina University. While conducting another survey in the same vicinity of the Cape Fear River, Watts opportuned one of the slack tides to examine the suspected remains. He found the wreck considerably exposed toward the bow. The armored knuckle was easily identified, and the remains were seemingly in better condition than they are today. A sketch prepared at the time by Mr. Watts would prove useful in this analysis, but is currently unavailable.<sup>176</sup>

Once again, modern marine charts note the position of a wreck in the area approximated by Charles Foard. Its rediscovery in 1974 was also due to the staff of the Underwater Archaeology Unit with the help of students from Cape Fear Technical Institute and the U. S. Army Corps of Engineers. The site's nomination to the National Register of Historic Places in 1985 included the comment that site 0003NEI "is a difficult one for underwater investigators to work in, however remains that were not removed by the Confederates or destroyed by salvors should remain in an excellent state of preservation due to its buried state."<sup>177</sup>

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<sup>175</sup>Personal communication with William Thorsen in person, Sons of Confederate Veterans meeting of August 18, 1994; personal communication with Jeff Johnson by telephone, September 25, 1995.

<sup>176</sup>Personal communication with Gordon Watts, in person during the summer field school at Fort Fisher, 1994; telephone, 11 and 12 October 1994. The date of this investigation is also unknown.

<sup>177</sup>"Cape Fear Civil War Shipwreck District / National Register of Historic Places Inventory - Nomination Form," on file, North Carolina Underwater Archaeology Unit, Kure Beach: File CSS *Raleigh* 003 NEI.

## CHAPTER V

### INVESTIGATIONS IN 1993 & 1994

Once again, the growth of Wilmington as a modern seaport demanded the accommodation of more ships of greater tonnage. The main channel of the Cape Fear River had to be deepened and widened. In accordance with state laws which protected North Carolina's cultural resources, the dredging areas had to be surveyed for the presence of shipwrecks or structures that might warrant protection. These included the probable locations of both the CSS *Raleigh* and the CSS *North Carolina*.

This chapter accounts for the UAU's investigations of the *Raleigh* in 1993 and 1994. The first conceptions of the wreck were subject to change as new discoveries were made in the following year. Therefore, the first two sections of this chapter will focus primarily on the objectives and methods of each survey. Although both of these sections include brief descriptions of the site, the findings will be more thoroughly explained in the next section. A discussion of site stability will follow at the end of the chapter.

The first section on the 1993 survey also includes a brief site description of the CSS *North Carolina*. The sister ship to the *Raleigh* was not as well preserved, but it might be worthy of future investigations for structural comparison. These were the first official investigations in which UAU staff diver's were able to confirm the identity of both wrecks, and the first steps were taken toward documenting the remains.

#### **1993 Investigations**

The 1993 comprehensive survey of the Cape Fear River included more than eighty different sites, covering an area of about thirty miles between Wilmington and the river's mouth. The United States Army Corps of Engineers (USACOE) conducted the initial magnetometer survey, plotting the targets with a Mini-Ranger positioning system.

Priority areas were then selected by the Underwater Archaeology Unit by comparing the target locations with historical research. Many of the anomalies corresponded with areas of historically documented maritime activity. Other targets corresponded with known or suspected wreck sites, including *Raleigh* and *North Carolina*.<sup>178</sup>

Conducted during the late months of Fall, 1993, the UAU's comprehensive survey involved both remote sensing and diver investigation. The UAU's research vessel, *Snap Dragon*, was fitted with a Mini-Ranger positioning system, with the transponders set up on shore in the same locations used during the Army Corps survey. Remote sensing was conducted with a proton precession magnetometer and high-resolution side-scan sonar. Both the *Snap Dragon* and the UAU's smaller McKee craft were used for diving operations. Personnel included Glenn Overton as the principal investigator, Julep Gillman-Bryan, Howard Scott, and the author. Richard Lawrence was also present through most of the project as the UAU's director. Other members of the UAU who alternately assisted in the project were Leslie Bright and Mark Wilde-Ramsing. Claude "Sandy" Jackson provided the historical background for determining investigation priorities.

While remote sensing could be conducted at almost any time, barring severe weather, the diving operations could only be conducted during slack tide. Tidal windows could be expected to last from two to three hours. Visibility ranged from zero to three or more feet depending upon tides, weather, and the area of the river. Upstream conditions usually ranged less than a foot because of the heavy silt suspension. Downstream, the inflow of ocean water tended to improve conditions within the saltwater column. With calm surface conditions, divers often experienced visibility of three or more feet at high

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<sup>178</sup>Claude V. Jackson, "The Cape Fear River Comprehensive Survey: Historical and Cartographic Research in Southeastern North Carolina," Underwater Archaeology Proceedings from the Society for Historical Archaeology Conference (1995), 9; Glenn Overton, "Cape Fear River Comprehensive Study: Methodology and Results of the Field Investigation," UAPSHAC, 15.

tide. To assist with underwater searches, the divers were equipped with wireless single side-band transceivers for communication between themselves and with the surface.

Along the western shore of Battery Island, opposite Southport, the position of the *North Carolina* is somewhat sheltered from the main force of the tides. After sinking at its moorings in 1864, the ironclad was not subjected to the strong currents that caused the *Raleigh* to sink beneath the waves. Enough was above water in 1868, so that fifty tons of armor were removed and sold for scrap.<sup>179</sup> In 1871, someone set fire to the wreck and it “burned to the water’s edge.”<sup>180</sup> The probable remains were rediscovered in August 1980 using remote sensing equipment, but never examined by UAU divers.<sup>181</sup> The following description is given for reference in later portions of this text.

Today the remains of the *North Carolina* rest in waters hardly deeper than its draft of 13 feet. The wreck was found lying perpendicular to the river channel with the upstream end directed to the northeast. The site is characterized by a scattering of features, most of them heavily concreted. The extant remains are mostly sanded over. None of the exposed features afforded positive identification of the bow or stern, and only a few features could be given any material description. (Figure 12)

Most of the exposed features were associated with the lower hull, and none were exposed more than three feet into the water column. A number of heavy timbers ran down the site’s center. They were badly worn and broken but the presence of vertical drift pins suggested stringers or parts of the keelson. Another segment at the downstream end was joined to a series of close fitting frames of heavy construction. No wood samples were taken, but their perpendicular arrangement alongside the “keelson” was also suggestive of the lower hull. Approximately three feet beyond the end of the

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<sup>179</sup>Sold at auction. Wilmington, *Wilmington Post*, July 2, 1868.

<sup>180</sup>Wilmington, *Morning Star*, September 8, 1871.

<sup>181</sup>“*Raleigh* and *North Carolina* Site Magnetometer Survey,” August 26, 1980: UAU, Kure Beach, North Carolina, *North Carolina* File 0052CFR.

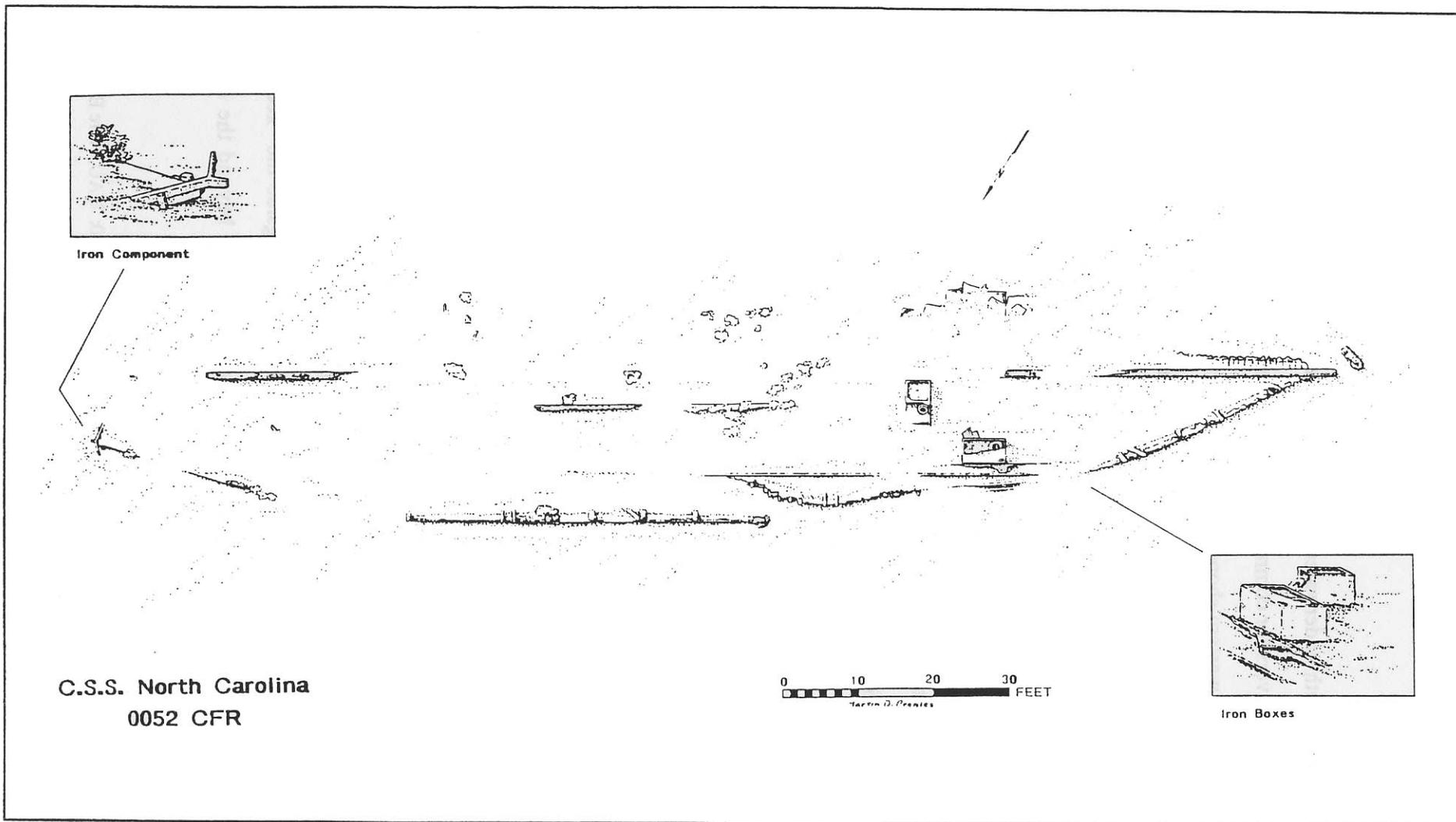


Figure 12: *CSS North Carolina* - 1993 Site Survey Plan. Remains appear to comprise the lower hull, with portions of the keel and stringers exposed. The purpose of the iron component and boxes has not been determined. (Underwater Archaeology Unit, Kure Beach, NC: file 0052 CFR)

downstream structure was a large concretion which may be associated with the rudder or skeg. The object was too concreted for positive identification but may be the key to determining which end is the stern. Nothing else could be positively identified. The broken edges of the wreck were partially exposed along the northeast side, facing the river channel.

The only other features that afforded any material description were an iron component at the upstream end, and two iron boxes closer to the downstream end. The iron component consisted of two-inch plate with an angular fastening, also of iron, attached to the exposed corner. The two iron boxes measured 3.5 by 7 feet with a height of 2.5 feet. A round port was found resting inside of each box, but the association is unknown. The broken remnants of two other boxes were found on the opposite side of the wreck.

A number of artifacts were also found, including several glass and stoneware bottles, a brass flange, and a mounting bracket of undiscovered purpose. A detailed description of the artifacts is given in the comprehensive report on the Cape Fear River survey, which is presently on file at the UAU, and will later be printed for the U. S. Army Corps of Engineers' district office in Wilmington.<sup>182</sup>

On October 20, the survey team returned to the site that had for so long been credited as the final resting place of the *Raleigh*. A buoy was dropped at the coordinates previously noted by USACOE. A second buoy was prepared, and the magnetometer run out over the side of the research vessel. The *Snap Dragon* ran several more lanes to determine where the frequencies were strongest. The depth averaged 30 feet, but the fathometer jumped to about 25 feet in conjunction with the stronger frequencies. On one

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<sup>182</sup>Claude V. Jackson, The Cape Fear-Northeast Cape Fear Rivers Comprehensive Study: A Maritime History and Survey of the Cape Fear and Northeast Cape Fear Rivers, Wilmington Harbor, North Carolina, Manuscript on file, Underwater Archaeology Unit, Kure Beach, North Carolina.

run, the fathometer detected a large object that rose to within 15 feet of the surface. Another buoy was dropped and the research vessel came about to anchor. The tide was still running in at a speed of about four knots, and a rough swirl was present on the surface. After about an hour, the tide slackened enough for diving operations to begin.

What the divers found is more easily described than the day and a half it took to figure it out. The remains were indeed significant. The ironclad was oriented along an East / West axis, marking its fatal course toward the river channel. The downstream side was characterized by a high mound of wreckage, most of it jumbled and shrouded in fishing net. The upstream side contained more recognizable features, with the end toward the channel prominently exposed. The lines of the armored knuckle and casemate were identified along a sharp list, with the ram suspended ten feet above the river bottom. The other end of the wreck was much better consolidated. The condition of the starboard side was indeed impressive, but the two day examination left too little time for examining the heavier concentration of wreckage along the downstream side.

The two days amounted to less than eight hours of diving time. The first investigation was conducted at high tide, and the next day brought two tidal windows. During this time, the ends were buoyed and a baseline established with zero marking the bow. Measurements were taken in as near calm conditions as the tide permitted. The length of the vessel was recorded as well as the ends of the casemate. The approximate width of the wreckage area was determined by six measurements along the baseline. The length of the vessel measured about 172 feet, and the overall sprawl of the wreckage measured about 50 feet in width.

The lines of the ironclad were unmistakable, but very few artifacts were found that contributed to its identity. The first items recovered did not even belong to the ironclad, but to one of the ships that grounded on top of it. Two brass pintles from a lost

rudder were recovered from inside of the casemate. The larger pintle contained remnants of oak timbers, and copper sheathing.

Both the wreck and the artifacts will be described more thoroughly on the basis of this investigation and another one conducted in the following year. The initial impression was that at least one side of the ironclad was remarkably well preserved. Still other more surprising finds were hidden amidst the wreckage along the downstream side.

### **1994 Investigations**

In the past, the North Carolina Underwater Archaeology Unit has managed to survey a number of the state's submerged cultural resources by working closely with East Carolina University's program in Maritime History and Underwater Archaeology. The decision of the author to research the *Raleigh* as a master's thesis led to the UAU's commitment to another investigation. The five day visit presented enough time to examine the starboard side more closely, and also the larger mass of wreckage along the downstream side. The findings yielded far more details about the wreck's features, and also about its configuration.

When the UAU returned to the site over the week of June 20 - 24, 1994, the team consisted of several members who were present during the previous year's survey. With the author assisting as a volunteer, the UAU staff included Richard Lawrence, Julep Gillman-Bryan, Leslie Bright, and Mark Wilde-Ramsing. Chris Olsen from ECU, who was presently under internship with the UAU, also participated in the underwater investigations. Henry Harris of Chapel Hill, North Carolina assisted with surface communications, allowing more divers to work on the wreck at the same time. As before, the wireless transceivers proved useful in relaying notes and measurements to the surface.

The week presented a better time range for assessing the effects of weather and tide on visibility. Only two low tide investigations were attempted during the survey. Visibility with a flashlight ranged less than a foot, and the information obtained was minimal. As before, the high tides presented better conditions. Natural illumination of three feet predominated with calm surface conditions. A visibility range of six feet was experienced on the third day. A high tide investigation was also attempted on the last day, but with deteriorating weather and a surface chop, the natural illumination was again reduced to zero.

The principal objective of the survey was to determine the list or configuration of the wreck. A series of level tests were conducted, using a carpenter's rule, a bubble level, and a measuring tape. The orientation of various structural components was measured against a horizontal plane. Using Porter's plans of 1862, their orientation was then used to determine the probable location of the wreck's other features. The starboard side was the focus of these tests, but other discoveries would reveal that it was not the main part of the wreck.

The key to the wreck's configuration was hidden amidst the jumbled wreckage that covered most of the midship area. Historical records about the salvage of the engines were suggestive but inconclusive. Nevertheless, their discovery was unexpected. Even more surprising was their orientation on a near level plane. A more thorough description of the engines will be saved for the chapter findings, along with a discussion of their probable association with the main hull.

Not until the last day of the survey were any structural features recognized along the port side. Like the engine bed, the orientation of the port casemate also indicated that the main wreck rested closer to an even keel. Unfortunately, the deteriorating weather prevented a complete analysis of their extent and condition.

At the end of the UAU's second investigation, a total of seven days, including two from the first survey, were committed to examining the *Raleigh's* remains. This amounted to less than 27 hours of research in conditions of low visibility, sometimes made worse by low tide or poor weather. This was hardly enough time to record all of the wreck's main features, much less the smaller details encompassing a far greater area. Nevertheless, the survey team was able to come away with a much better conception of the vessel remains, and some important findings were added to the small historical collection. The next section will describe the findings in more detail.

### **Findings**

The *Raleigh's* remains show the effects of more than 130 years of site development. A brief review of the forces involved, or Site Dynamics, will do much to explain the wreck's present configuration. A General Description of the site will be given next. The rest of the findings will be described within the context of their structural orientation. Due to project limitations, some of the measurements could only be estimated.

### Site Dynamics

Ever since the *Raleigh* ran aground in 1864, the natural forces of the Cape Fear River have been at work. Personal accounts attest to the severe forces of hogging that destroyed the ironclad as the tide ran out. With its midship suspended over the bar, the weight of the armor "just crushed the decks in," and the hull was "broken in two."<sup>183</sup> Without the hindsight of these historical testaments, the wreck's present configuration would be almost impossible to determine. These forces probably explain why many of

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<sup>183</sup>See p. 61.

the midship features, including the engines, were exposed high amidst the wreckage, while the ironclad's sides have collapsed around them (Figure 15). Portions of the hull that were not crushed may have been further exposed to worm damage and erosion. Either the forces of nature, or the work of salvors caused the starboard side to fall away from the main part of the wreck.

#### General Description (Figure 13)

In the "1994 Survey Plan," only the starboard side and the engines are shown in detail, based upon field notes and observations. The overall wreck area contained many other significant features that could not be identified or properly examined due to project limitations. A few of them are indicated in the accompanying key (Figure 13). Wherever possible, the builder's plans of John L. Porter were used to determine the structural lines of the wreck's main features.

The remains are oriented along an East / West axis, with the bow directed toward the main shipping channel. This sets it perpendicular to the cross-currents of the river. Water depth ranges from 30 feet at the stern to 35 feet at the bow. The main hull appears to rest close to an even keel, although the starboard remains have fallen to one side. The lower portion of the wreck is consolidated in a bottom of sand and shell hash, while most of the remaining upper works are visible. Only the bow is openly exposed.

The hull is buried, but the outline of the wreck is defined by prominent structural features along both sides. The starboard side comprises the full length of the armored knuckle and much of the casemate. The port side (not shown) rests closer to an even keel, but a full examination was not completed. The heaviest concentration of wreckage is along the downstream side of the baseline, covering the midship area and most of the port side. This area is characterized by a high elevation of broken structural remains, filled in with debris, and partly obscured by shrouds of netting.

### Hull (Figure 13)

Although the hull is buried, its probable outline is indicated by the dashed lines in the "Site Survey Plan." The engines were the only exposed link to the hull's configuration as indicated by the shaft-line. Their probable association is suggested by the similar arrangement of the CSS *Savannah's* engine room (Compare Figures 4 & 15). Level tests on top of the two cylinders determined a list of 5 degrees. This slight angle, however, may reflect the broken condition of the hull. While the propeller shaft disappears along a marked incline further aft, severe hogging may also explain the high concentration of exposed wreckage toward the wreck's center.

If only the midship was crushed, then the ends of the hull may be buried deeper. Using the dimensions of John Porter's plans, a sub-bottom trajectory of the rudder may indicate the approximate location of the skeg or keel (Compare Figures 13 & 17). Other elements of the hull may be exposed toward the bow.

### Port Side (Figures 13 & 15)

Due to project limitations, the port side was not thoroughly examined. The structural remains were significant, but their identification did not become evident until the last day. Before that time, divers had traversed the length of the vessel several times. Toward the stern, the structural remains were low in profile, disappearing into the sand about ten feet short of the rudder. The midship remains were higher in profile, rising several feet into the water column. Only on the last day were they identified as part of the casemate. Level tests determined that they rested close to an even keel. Toward the bow, the vessel remains were badly broken, and their structural association with the casemate, knuckle, or lower hull was not determined.

The sides of the casemate were badly eroded, as one diver aptly described, like "Swiss cheese." The erosion cut through several layers of wood, enabling a closer examination of their composition. The structural pattern was identical to Porter's 1862 cross-section (Figure 3). Closer to the bottom, the edge of the knuckle was exposed between 80 and 100 feet along the baseline. Armor plating was still extant along the underside (Figure 15). Running aft, the edge of the knuckle disappeared into the sand. Running forward, the remains were shrouded in fishing net. Neither the front end, nor the back end of the casemate was identified due to worsening weather conditions on the last day.

#### Starboard Side (Figures 13 - 15)

The starboard side comprises the ironclad's most distinctive features, including the knuckle and the casemate. A series of level tests were conducted to cross-examine with other visual evidence of its integrity. On the front end of the casemate, the seams between the armor plates served as a line for comparison against a horizontal plane. Four more level tests were conducted alongside the casemate, and its designed inclination of 35 degrees was factored into the findings. The angle of the rudder's axis was also measured. All of these tests determined a near average list of 35 degrees, with slight variation due to worn or concreted surfaces.

The starboard bow was prominently exposed, with the end of the knuckle or ram suspended ten feet above the river bottom (Figure 16). This exposure enabled the area below the knuckle to be examined. Timbers below the armor belt were worn and broken. The stern was too well consolidated to investigate the presence of hull timbers below the knuckle. The rudder head was still seated in the exposed structural remains (Figure 17).

Although the deterioration of the lower hull apparently caused the starboard side to collapse, the remaining armor seems to have preserved its structural integrity. Where

both ends were exposed, the extant armor covered the underside of the knuckle and part of the casemate. The interior of the casemate was filled mostly with sand.

#### Casemate (Figures 13 - 17)

Remains of the casemate were prominent along both sides. The full length of the port side casemate was not sufficiently examined, although the forward end appears to be badly broken. The starboard casemate comprised its full length and also retained more of its armor. Along the starboard bow, 10 rows of the first course remained below the gunports. Both courses of iron were extant on the front end of the casemate, but no armor was left on the stern face.

The front end of the casemate was one of the site's most prominent features, protruding 15 feet into the water column. The surviving portion was broken down the center, around the gunport, but still retained both courses of armor. The starboard corner rose to the height of the spar deck, which was missing. The underside was characterized by the worn ends of the casemate's heavy timbers. Either the gun deck has worn away, or separated when the starboard side fell over. This feature was supported by only a few timbers at its base nearest the knuckle, and is in imminent danger of collapsing.

The *Raleigh's* casemate was identical in composition to the plans of John L. Porter. The materials were the same as described for other ironclads of the same class (Figure 3). The interior frames were scarred by fire and erosion, making their dimensions difficult to verify, but the use of yellow pine and white oak has been confirmed by lab analysis.<sup>184</sup> The casemate was initially constructed of vertical timbers of yellow pine. Accounting for scarring and erosion, these were approximately one foot in thickness. A

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<sup>184</sup>Analysis conducted by Harry A. Aldu (December 16, 1994) at the Center for Wood Anatomy Research, US Forest Products Laboratory, Madison WI. Confirmation document on file at the Underwater Archaeology Unit, Kure Beach, North Carolina: *Raleigh* 003 NEI.

second layer of horizontal pine timbers measured about 5 inches in thickness. The third layer was of vertical oak timbers, approximately 4 inches thick.

The wooden structure was covered with two more courses of iron. The iron plates were heavily concreted in some places, but appeared to match the dimensions of the 2 x 8 inch plates manufactured in the Tredegar foundry in Richmond.<sup>185</sup> The first course ran horizontally and the plates were separated by a gap of approximately 1 inch. This gap may have been necessary to accommodate the passage of iron pins for securing the second course of armor. The exterior plates ran vertically and were set closely together without any noticeable fastenings or seams. The bolt heads were apparently counter-sunk, presenting a smooth, seamless surface.

Wherever the armor had been stripped away, many of the fastenings were left. The iron pins measured approximately 1 inch in diameter, and penetrated the thickness of the casemate. No analysis was made of the interior fastenings.

#### Gunports (Figures 13 - 16)

During both investigations, three short gaps were observed along the starboard side of the casemate. Only after replotting the lines along a 35 degree list were these openings suspected to correspond with the gunports. The tops of the gunports were worn away. The measured reconstruction of the forward face of the casemate, based only on the field notes, found it to be broken around the gunport. Future investigations may be able to identify similar openings along the port side.

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<sup>185</sup>Plates described in personal correspondence by Bob Holcomb (January 27, 1994), Confederate Naval Museum, Columbus, GA.

### Knuckle & Ram (Figures 13 -17)

Since the knuckle's topside was contiguous with the casemate, its structural composition was mostly the same. One entire course of armor still covered the starboard bow. Toward the starboard stern, only one strip of armor was left above the knuckle's edge. Wherever exposed, the underside of the knuckle was also completely armored. Like the exterior armor of the casemate, the knuckle's underside was plated without any noticeable seams or fittings.

The structural continuity between the casemate and the knuckle's topside was visible wherever the armor had been stripped away (Figure 15). The only differences would have been along the edges, where the casemate timbers joined with the knuckle's underside, or toward the bow or stern, where the sides converged into the ends. Due to project limitations, the structural composition of these areas was not examined.

### Bow & Fittings (Figures 13, 14 & 16)

The bow is the most seriously threatened by exposure. The forward end of the port side was apparently destroyed, and much of the lower hull may have also been damaged. In contrast, the starboard bow is in remarkably good condition inspite of its collapse away from the main hull. With the hull timbers broken away, the end of the ram is suspended by its own integrity, rising 10 feet above the river bottom. Wreckage was also found below the ram, shrouded in netting. Future examinations may be able to determine if they comprise any elements of the hull.

Several fittings were also noted in the vicinity of the starboard bow. These included a small cleat, a chock, and a hawsehole in the front end of the casemate. These three features were oriented along the same line, suggesting their association with handling the anchor. A padeye was also noted on the front of the casemate. Two other features in the forward deck area have not been conclusively identified.

The cleat was noted at 17 feet along the baseline, and was fixed into the side of the knuckle. The cleat was iron, about one foot in length, and fashioned in the shape of a cross. Although small and of unusual shape, the fitting may have served as a cathead for securing the anchor.

A few feet aft of the cleat, an iron chock was noted at 21 feet, 4 inches along the baseline. The chock was seated inside the structural remains of the main deck and oriented alongside the knuckle. This feature was constructed of two iron components, comprising the chock and its base. The fitting was cylindrical, measuring 12 inches in diameter, and 14 inches in length, and the interior diameter was 6 inches. The chock was centered over an iron base measuring 4 feet long, 16 inches wide, and of undetermined thickness.

Oriented along the same line as the cleat and chock was a small opening in the front of the casemate. The opening was 2 feet above the deck, as measured along the slope of the casemate from the base or front end. Because of the casemate's slope, the opening was oblong, measuring 12 x 8 inches. The inside diameter of 8 inches penetrated through to the interior. A comparison with the builder's plans suggests a passage for the anchor hawser (Figure 2).

Fixed to the outside of the casemate, approximately two feet above and to the left of the hawsehole, was a padeye. The fitting was approximately 4 inches in diameter with a 2 inch center. The association of the padeye with the other deck features is uncertain. The fixture could have served any number of purposes, principally as a means for securing block and tackle.

Two other heavy fittings have not been positively identified but may be associated with deck ports, vents or hawsepipes. At least one of them has shifted from its original position (Figure 13). Both were observed in 1993, within the sanded area in front of the forward casemate. The one nearest the starboard side was fashioned like a heavy iron

coaming, about 2 feet in diameter. The other object was suspended in the sand about six feet over to port. This object was cylindrical and also about 2 feet in diameter. The exposed end was elevated toward the bow, and also fitted with a heavy coaming.

In 1994, the coaming nearest the starboard side was found in its former position, at about 30 feet along the baseline, and 2 feet upstream. The interior diameter was 18 inches, and the coaming thickness measured 8 inches. Both the inside of the object and the area around it were sanded in. Its structural association with the deck was uncertain.

The other cylindrical object could not be located in its former position. During the last day of the survey, however, an object of similar appearance was found at about 25 feet along the baseline, down at the foot of the wreckage. This object was also about 2 feet in diameter, but the exposed end was elliptical and not fashioned with a heavy coaming. The similar appearance suggests that it could be the opposite end of the same object. If this analysis is correct, the object may have flipped over when it fell to the river bottom.

As for their identification, the position of the starboard coaming is suggestive of a deck port or vent. Porter's plans also depict a hawsepipe arrangement that passes through the knuckle (Figure 2). The heavy construction of both objects, and also the cylindrical shape of the port side fitting would appear to suit this purpose. The analysis is inconclusive.

#### Stern: Rudder & Propeller Chamber (Figures 13, 14 & 17)

Most of the stern is well consolidated. The remains of the port side disappear into the sand at approximately 160 feet along the baseline, and their structural association was not identified. The starboard remains comprise the end of the knuckle, which ends 5 feet above the river bottom. Only one strip of armor remained along the top of the knuckle's edge, but the underside was completely sheathed. The rudder and propeller chamber

were also partly exposed. The identity of two other shaft-like objects has not been confirmed.

The rudder was identified underneath the knuckle, 5 feet forward of the stern. The rudder was swung over to starboard and exposed near the top. Angle measurements along the axis determined the same 35 degree list as noted elsewhere along the starboard side. The rudder was of iron construction, measuring 3.5 inches thick. Only 3 feet and 4 inches of its front side, or axis was exposed. It's fore and aft width measured 5 feet. The rudder head was still seated in the vessel remains.

Just in front of the rudder was the propeller chamber (Figure 17). This area was built into the underside of the knuckle to accommodate the full diameter of the propeller. The interior surfaces were sheathed in armor, the same as the knuckle. Leaning against the rudder was an iron feature that appeared to be the end of a propeller blade. The object was 2.5 inches in thickness, with only two edges exposed. Less than 2 feet of the side edge was exposed, running alongside the rudder's axis. The other edge, possibly the end of the blade, was slightly curved and measured 4 feet, 4 inches wide. Its leaning position against the rudder suggests that it may be a broken fragment of the propeller, or that the entire propeller was unseated.

Further forward, two shaft-like objects were located between 145 and 155 feet along the baseline (Figure 13). Both were hollow, and measured approximately 6 inches in diameter. One was lying at an angle with one end passing under the baseline. Its other end was broken, and the length measured about 10 feet. The other shaft ran parallel to the baseline, about 2 feet to starboard. This one was exposed over a length of 14 feet, but the end nearest the stern was still imbedded inside the wreck.

Although similar in appearance to segments of the propellor shaft, their position on the river bottom is too high. Another possibility is that the two shafts formed through-hull passes for the steering cables. The tapered stern left little room for a steering

quadrant, which may be why a cable arrangement is indicated in Porter's plans (Figure 2). Either a closer examination of the rudder head, or the underside of the knuckle would confirm this probability. Future examinations may be able to identify the cable passes in the knuckle's underside.

#### Decks & Interior Structure (Figure 13)

Although decking and interior structure were evident in many parts of the wreck, the project duration was too short to examine them closely enough for comparison with the builder's plans. With the midship crushed, the Confederates may have removed part of the spar and gundecks to salvage the boilers. Whatever was left, and not destroyed by worms and erosion, is either buried or partly obscured amidst other wreckage.

Damage to the interior structure may have also caused the starboard side to collapse. Some portions of the deck may have been carried with it, as indicated by the remaining frames along the starboard bow. Still attached inside of the knuckle, these timbers were oriented perpendicular to the baseline. All were badly worn and broken at various lengths, not more than five feet. The spaces between and underneath the frames were sanded in nearer the casemate. Toward the bow, the deck's substructure was openly exposed to the river's current. No other information was obtained on their dimensions, spacing, material composition, or fitting.

While some of the forward deck was carried over by the starboard side, the break may have occurred below the casemate. Directly across from it, amidst the port side wreckage, was a structural composition of fore and aft planking (Figure 13, # 4). The timbers were partly buried and the analysis inconclusive, but they may comprise some part of the gundeck. Because of the broken condition of the port bow, other elements of the gundeck, berth deck, and storage spaces might also be exposed in this area.

Most of the interior wreckage was too jumbled for a quick and positive analysis, but one other structure of probable identity was noted at 78 feet along the baseline. A bulkhead, constructed of 4 inch studs may be part of the coal bunkers. The starboard end was buried in the sand and the port end was buried under the main wreckage mound.

#### Engines (Figures 13 & 15)

Because of their low profile, the engines were not discovered during the first survey of the wreck in 1993. In 1994, they were found between 100 and 120 feet along the downstream side of the baseline. Contrary to historical records indicating their salvage, the two cylinders were found half buried among other engine components. Only the crank-shaft was missing, with the mounts standing empty. A large segment of the propeller shaft was also exposed. Their high elevation amidst other wreckage probably reflects the broken condition of the hull. Level tests determined that the engine bed rested close to a level plane of about 5 degrees.

The two steam cylinders were arranged to either side of the shaft line. Each unit was composed of a cylinder with a built-in valve chamber, measuring 3 x 3 feet on the horizontal plane. The cylinders measured 2 feet in diameter by 3 feet in length. Each unit was mounted on a pair of concrete blocks, measuring 9 inches wide and of undetermined thickness. The exposed blocks extended 3 feet into the shaft alley.

The starboard cylinder still had its piston rod. The piston rod was 3 inches in diameter, and the end was fashioned with a 6 inch eye for securing the connecting rod. The connecting rod was unattached, but still sitting between the two engine mounts. The rod was 4-inches in diameter, and the end nearest the cylinder was U-shaped to fit around the eye of the piston rod. The other end of the connecting rod was buried in the sand, near the shaft alley.

The port engine was missing both its piston and connecting rod, but still had its steam port seated on top of the valve chamber. The top of the steam port, or flange measured about 6 inches in diameter. The disconnected steam pipe rested on top of the engine.

Along the shaft alley were several mounts for the crank shaft. Only four were identified, although others may have been removed. The mounts were fixed at an angle to support the crank shaft along both sides. The mounts were cylindrical, with the ends squared and molded to fit the crank shaft. The squared brackets measured 9 inches wide, with a 6 inch concave seating. The corners were fashioned with four bolts for securing the caps. The caps were apparently removed in order to salvage the crank shaft.

Immediately aft of the fourth mount was a large coupling attached to the propeller shaft. The coupling was formed of three components. The front component was 3 feet in diameter and 6 inches wide. The mid-section of the coupling was about 1.5 feet in diameter by 1 foot long. The aft end of the coupling was slightly larger in diameter and about 3 inches wide. The propeller shaft measured 9 inches in diameter. The shaft was suspended at a slight angle, disappearing into the sand about 8 feet further aft. This angle may be a result of salvage attempts, or it may also reflect the angle of the broken hull.

The *Raleigh's* engine arrangement was the same as the *Savannah* (Figure 4). Some differences were apparent, such as the built-in valve unit alongside the cylinders. The engineering plans of the *Savannah* show a separate valve chamber on top of the cylinders. The builder of the *Raleigh's* engines is still unknown. Still they were of the preferred type, as described by James Bullock in 1862.<sup>186</sup> This archaeological find affords the most probable explanation to why the *Raleigh's* performance was rated so much higher than other Confederate ironclads.

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<sup>186</sup>Letter of James D. Bullock to Stephen Mallory (September 22, 1862): Official Records, Navies, Ser. I, Vol. II, 612.

The builder's plate, if still attached, was either buried or covered under the thickness of marine growth. Future investigations may be able to locate the builder's plate, identify other engine components, or examine the workings of the valve units more closely.

#### Disassociated Features & Materials

The greater part of the site is characterized by scattered elements of structural material and fittings. A few more were identified, but not carefully examined. A windlass was observed just inside the forward casemate, somewhere between 40 and 50 feet along the baseline (Figure 13, # 9). A ventilator pipe was noted at 112 feet, about 20 feet over to port. (Figure 13, # 7).

The greatest concentration of material was downstream, or along the port side of the wreck. The highest exposure was around the midship section, apparently suspended over the hogged and broken hull. Portions of bulkheads and decking were obscured amidst other broken structures of uncertain identity. Other elements included iron plate, copper and brass piping, and a variety of other unidentified fittings. All were sanded in amidst a scatter of coal, brick, and shrouds of netting.

#### Artifacts (Figure 18)

Only a few artifacts were recovered during the course of both surveys. The first artifacts did not even belong to the ironclad but to one of the ships that grounded on top of it. Other artifacts included two bottles, a fragment of a third, and a copper fitting of uncertain identity.

In 1993, two brass pintles were recovered. Both were cast to slightly irregular dimensions. The larger pintle (03-NEI-1) measured 17 inches long by 8.75 inches wide, and the sides measured about 2.5 x 0.5 inches thick. Fragments of oak were still

attached, along with copper sheathing and nails. The smaller pintle (03-NEI-2) measured 13 inches long by 6.30 inches wide, with the sides narrowing to 5 inches near the front. The sides measured 2 x 0.5 inches thick. Both were tapered around the pins, which measured 1.75 in diameter by 3 inches in length. Each pintle was secured with three 0.5 inch copper pins running through the rudder. The pintles were recovered from the midship area, just inside the starboard casemate. The ship to which they belonged may never be known, but there are only three known candidates, including the blockade runner *Talisman* and the schooners *L. Waring* or *F. Merwin*.

Among the artifacts belonging to the *Raleigh* were two complete bottles and the broken bottom of a third. The smaller bottle (03-NEI-3) was dark brown and measured 9.6 inches in height by 2.5 inches at the base. The pontil was recessed about 1 inch. A cork fragment remained inside. The largest of the bottles (03-NEI-4) was green and measured 12 inches in height and 2.75 inches at the base, or about 3.25 inches at its widest diameter. The pontil was improved and recessed about 1.5 inches. The broken fragment (03-NEI-5) was dark brown and measured 3 inches at the base. The pontil was recessed 1.5 inches.

The identity of a fourth artifact (03-NEI-6) is uncertain. A lamp fitting has been suggested but the purpose is unknown. Made of thin copper, the object was small and circular, measuring about 2 inches in diameter by 1 inch in height. The artifact was composed of two main components, comprising a container and a receptacle. The lower part was a small bowl or container, fitted with a top of more complex fashioning. The center of the top was open, and the perimeter was concave and pierced with small holes. The upper component was a short funnel or receptacle, fitted over the open center of the container, and measured 1.25 inches in diameter at the top.

All artifacts, except for the pintles, were recovered from the port stern area where the *Raleigh's* officers would have been quartered. While these represent a small sample, they may be indicative of much more that is buried in the lower confines of the hull.

### **Discussion: Site Stability**

Just as the ironclad's remains are so visibly extensive, their exposure to the water column threatens their integrity. Only a little damage was noted during the interim of the two surveys, where one of the hawsepipes (or vents) had fallen to the river bottom. More serious is the overall condition of the bow. Most of the port side is gone and the starboard side's prominent features may shortly follow. As early as 1985, the North Carolina Historic Preservation Office expressed concern that dredging operations might be having an "adverse effect" on the remains "protrud(ing) over the shoulder of the channel."<sup>187</sup> The ironclad is located several hundred feet away from the channel, but dredging may have resulted in more sloughing than expected.<sup>188</sup> Another party may be responsible for the erosion that seems to have occurred. While on site, the UAU team observed the movements of the Fort Fisher ferries. On several occasions, they passed outside of the marked channel, taking advantage of the high tide. On at least one occasion, a ferry passed within fifty yards of the wreck site. Thirty years of prop-wash may have done more damage than the last hundred years. (Figure 19)

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<sup>187</sup>David Brook, Deputy State Historic Preservation Officer, memorandum to John R. Parker, Office of Coastal Management, and Col. Wayne Hanson, Corps of Engineers, Wilmington District (November 2, 1984). On file at the North Carolina Underwater Archaeology Unit, Kure Beach: CSS *Raleigh*, 003 NEI. (See Appendix: Document A)

<sup>188</sup>Col. Wayne Hanson, Corps of Engineers, Wilmington District; William S. Price Jr., State Historic Preservation Officer (February 19, 1985). On file at the North Carolina Underwater Archaeology Unit, Kure Beach: CSS *Raleigh*, 003 NEI. (See Appendix: Document C)

**C.S.S. Raleigh**  
1994 Site Survey

Due to project limitations, most of the port side features and interior wreckage could not be sufficiently examined. The dash lines indicate the probable extent of exposed wreckage. Additional features are noted in the key.

This site plan is based on field notes provided by the Underwater Archaeology Unit in Kure Beach, North Carolina, and builder's plans provided by the Confederate Naval Museum in Columbus, Georgia.

- KEY (numbers indicate approximate location)
1. Unidentified structure (hull or knuckle)
  2. Armored knuckle (exposed between 80°-100°)
  3. Iron structure
  4. Wood structure
  5. Disarticulated wreckage (iron and wood)
  6. Coal & brick scatter
  7. Ventilator shaft
  8. Bulkhead (broken)
  9. Windlass

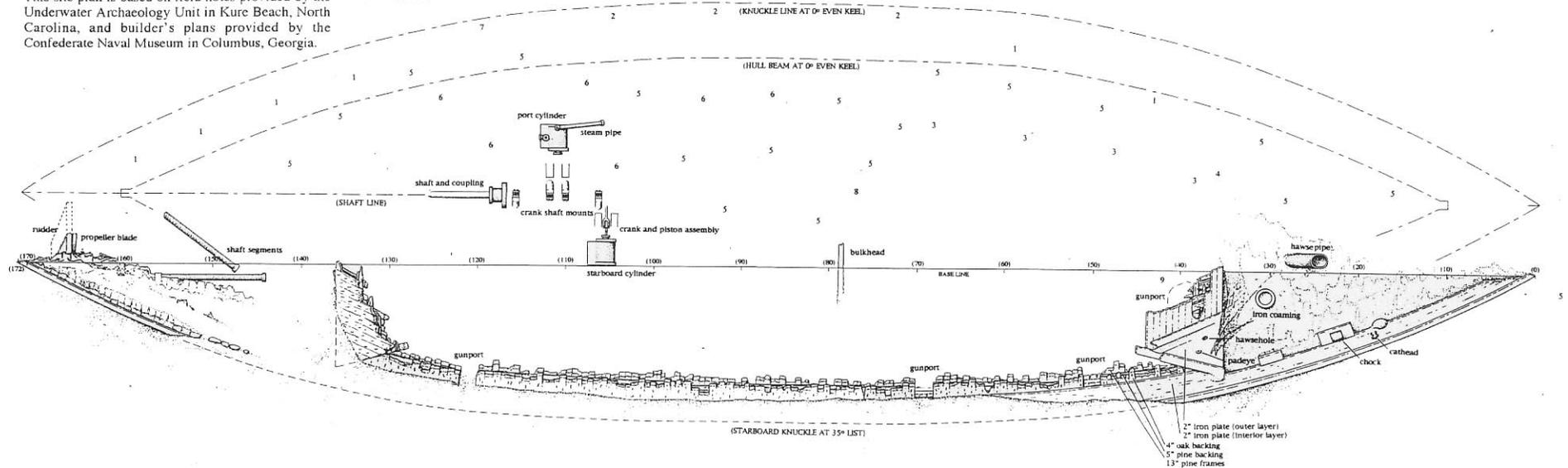
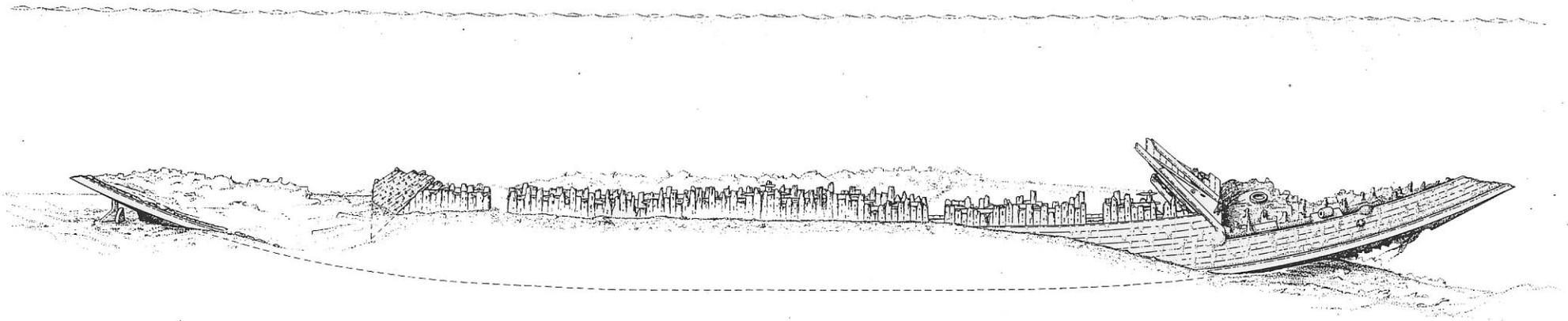
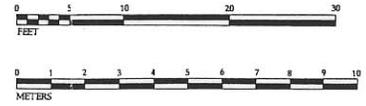


Figure 13: CSS *Raleigh* - 1994 Site Survey Plan. Due to project limitations, most of the port side features and interior wreckage were not sufficiently examined (see key). Dotted lines indicate the approximate extent of the wreckage.



C.S.S. Raleigh  
Horizontal Conception - Starboard Side  
1994



*Drawn by Martin D. Peoples*

Figure 14: Horizontal Conception - Starboard Side.

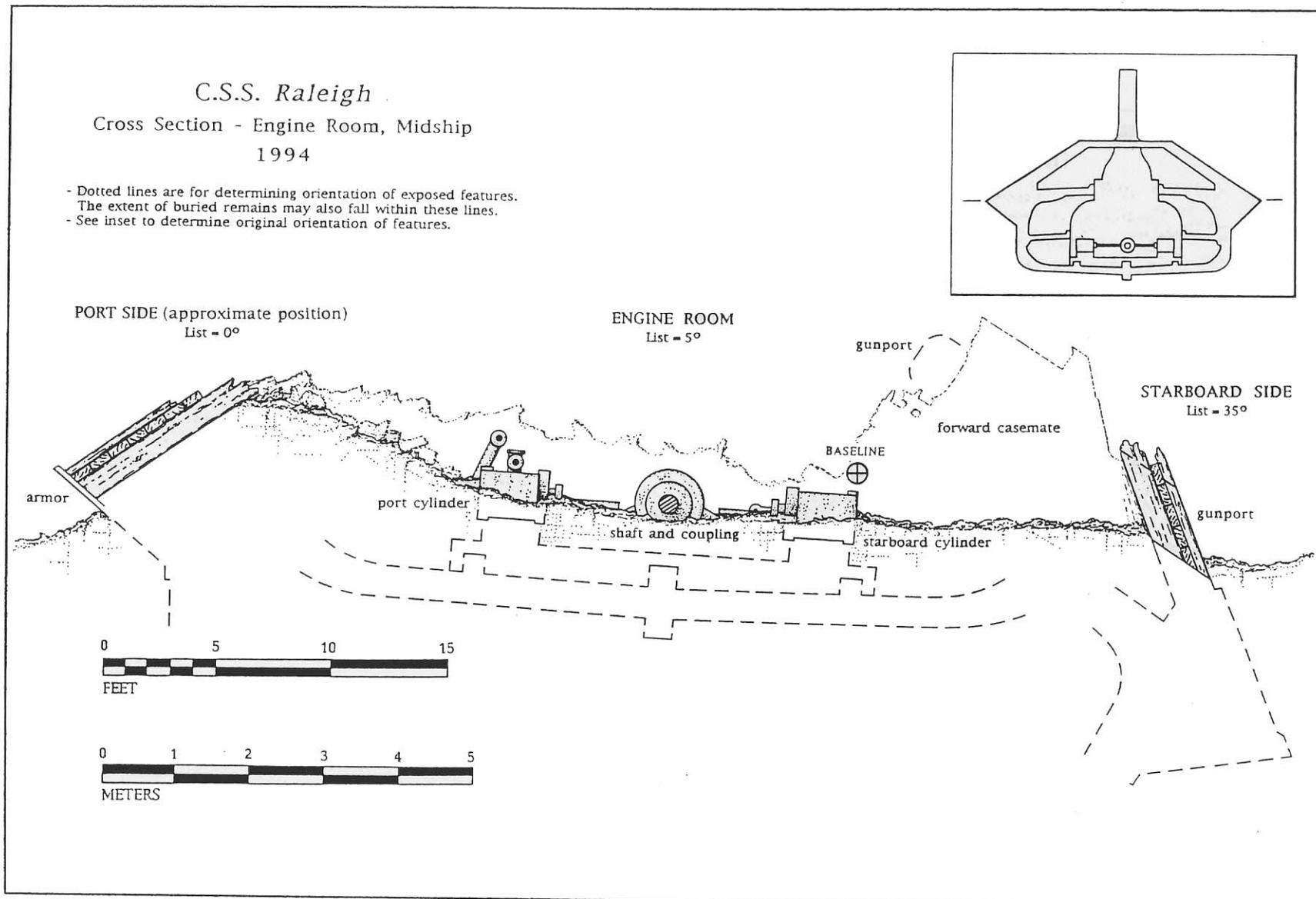


Figure 15: Engine Room / Midship Cross-Section (Forward View)

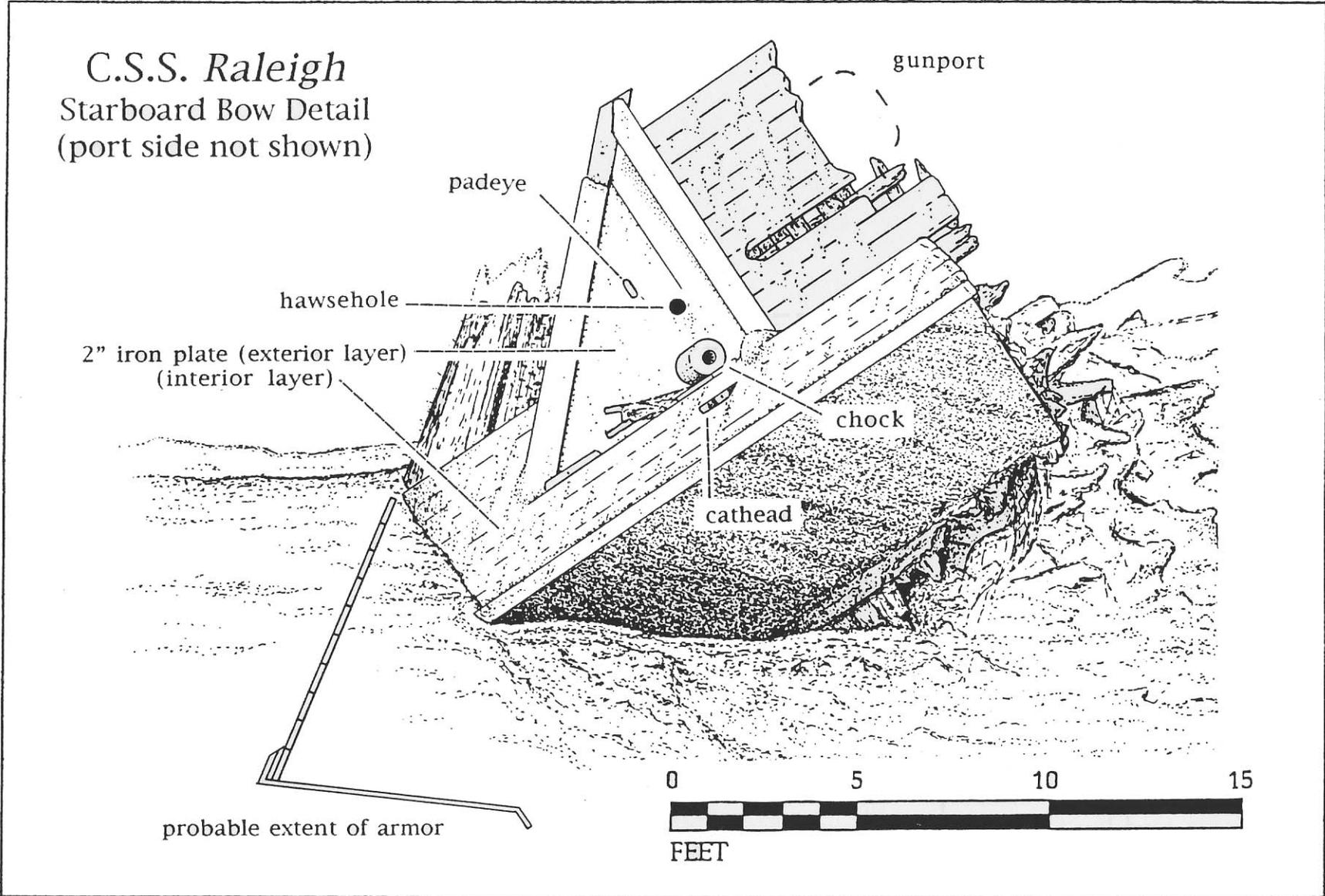


Figure 16: Detail of Starboard Bow (End View)

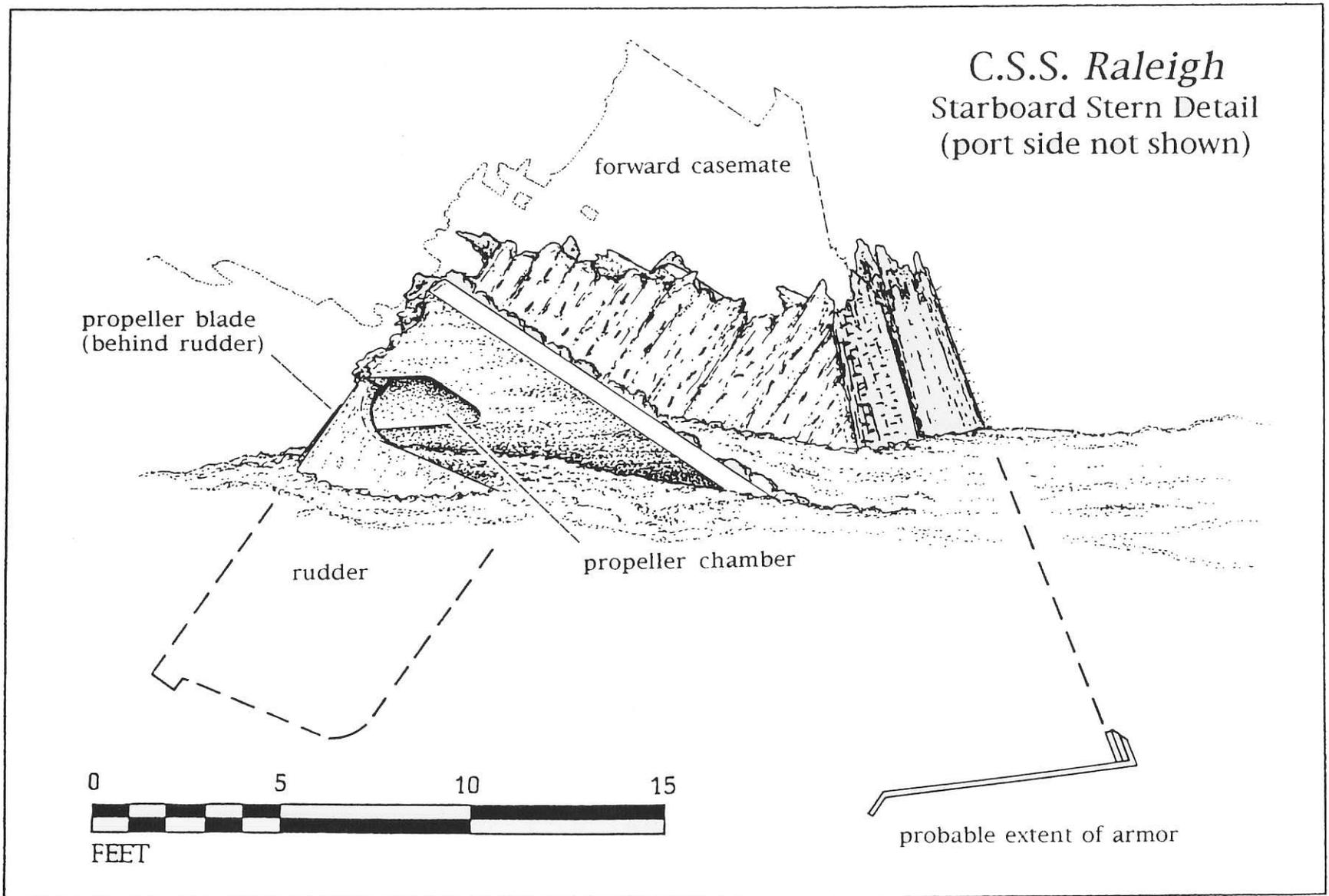
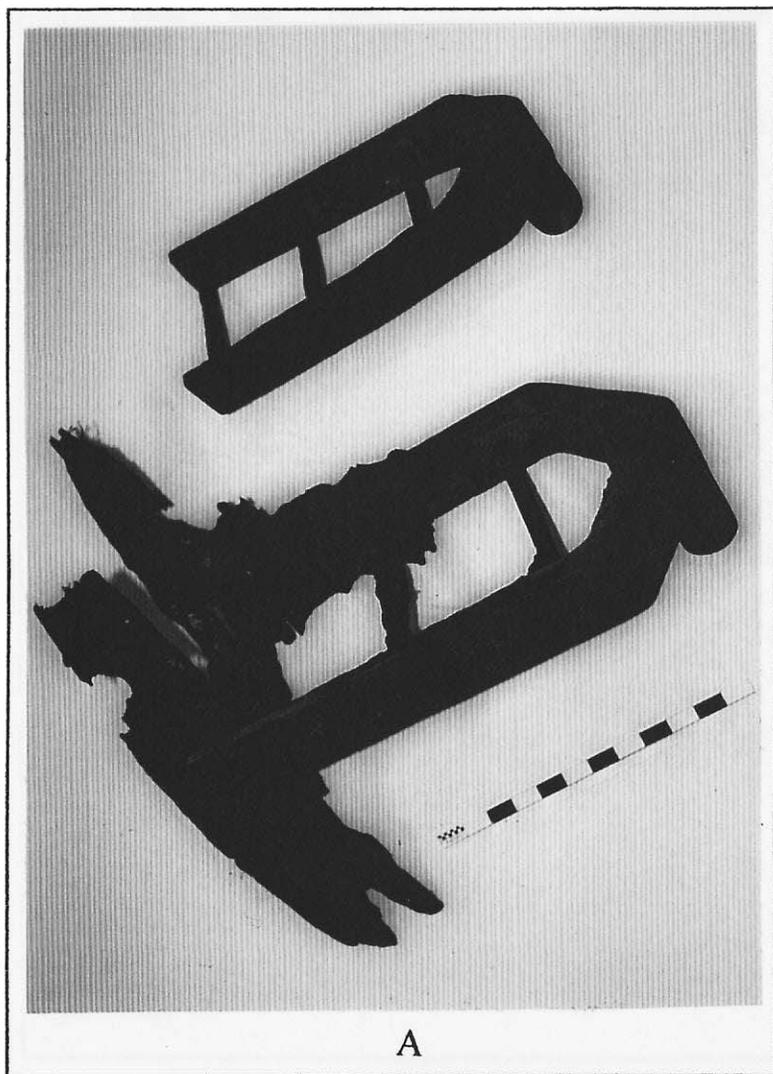
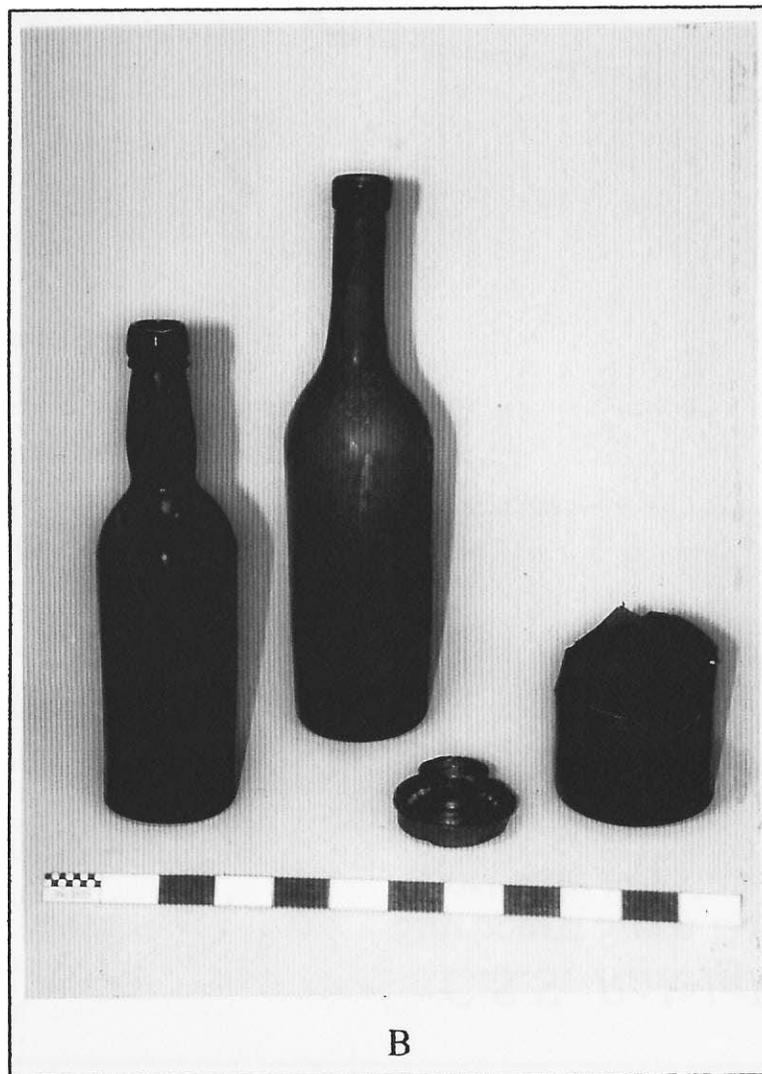


Figure 17: Detail of Starboard Stern (End View)



A



B

Figure 18: Artifacts. A - pintles from a lost rudder: large pintle (003-NEI-1); small pintle (003-NEI-2). B - left to right: brown bottle (003-NEI-3); green bottle (003-NEI-4); brown bottle fragment (003-NEI-5); unidentified copper fitting (003-NEI-6).

## CHAPTER VI

### PAST AND PRESENT

#### **Conclusions**

The CSS *Raleigh* was integral to a much broader development that revolutionized naval warfare as well as national destiny. The history of this one ironclad characterized the many troubles that the Confederacy had to overcome in fighting a far superior naval power. This thesis presents some explanation for why it was built, how it was built, and how well it served in the capacity for which it was intended.

The first question as to why the *Raleigh* was built is easily answered. Stephen Mallory's basic strategy for combating a larger wooden navy was to build a fleet of ironclad ships. After the battle of Hampton Roads, the Confederate Naval Secretary adopted a more defensive strategy, but the need for ironclads was the same. The *Raleigh* and ships like it were built for harbor defense. The *Raleigh* was sent into more aggressive action against the Union blockade anyway. Its grounding might have been an accident, but was no less a result. The *Raleigh's* potential as a harbor defense weapon had been proven and lost, with serious consequences for a major Confederate seaport that was in dire need of strong naval defenses.

More difficult to explain is how the *Raleigh* was constructed and why its handling qualities were so superior to other Confederate ironclads. With very little historical information on this particular vessel, the surviving records on others of the same class provided a few general characteristics. Archaeological investigations found at least one explanation for its superior maneuverability. The discovery of the engines in 1994 confirmed that the *Raleigh* was fitted with a better model than most others carried. Clearly, they made a critical difference in how well John Porter's design was able to serve.

The only difference that cannot be accounted for was the *Raleigh's* lighter draft. Some variation could have resulted from material differences, using dry or seasoned timbers, instead of green wood. A different engine model could have also figured in the ironclad's total displacement. There is also the unexplained year long delay in finishing the ironclad, even though the materials were available. The question of structural modification holds too many imponderables, including why similar measures would not have worked for the *North Carolina*. The historical records are simply insufficient. The ironclad's present remains may hold the only answers.

The archaeological investigations contributed several other findings to the historical record. Many of them were small, such as the fittings, structural details, and personal artifacts. As described in the findings, these only represent a sampling of how much more information the wreck contains. A more thorough examination of timber joining, fastenings, interior structure, engine components, material culture, and more will have to await future investigations.

The most important assessment was of how much remained after 130 years. The ironclad's extant condition was key to determining that the entire vessel was submerged by shifting sands in less than six weeks after grounding. Historical records maintain that the guns, some of the armor, and the boilers were removed. How much else was saved in terms of other heavy equipment, stores, and personal belongings is unknown. Along with the engines, extant armor, and a few artifacts, the ironclad's present condition supports contemporary claims that "little (else) was saved from her."<sup>189</sup>

Still, there is more to be gained from archaeological research than the details concerning one ironclad. Very little is known about the present condition of *Raleigh's* sister-ships. In most cases, their destruction was more thorough, and the passage of time

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<sup>189</sup>Sprunt, *Chronicles*, 482.

more severe. The condition of the *North Carolina* is true to most wrecks of the Civil War, comprising nothing above the bilge. Recently, in 1993, the probable remains of the CSS *Richmond* were located in the James River. These comprise some portion of the casemate, which is upside down.<sup>190</sup> Many other Civil War ironclads have been discovered, representing various designs of both sides. A few have even been dragged from rivers for display.<sup>191</sup> The condition of most is not known. In spite of its broken back and collapsed starboard side, the wreck of the *Raleigh* may comprise the most extensive record of the Confederacy's most important ironclad warship design.

### **Recommendations**

If the gain of future investigation is to be considered, then the wreck's present condition must be documented immediately. As described in the findings, the bow of the ironclad is highly exposed and the damage is severe. In addition to the constant traffic of the Fort Fisher - Southport ferries, shrimp boats continue to drag their nets around the site. The only guarantee against additional erosion and fouling is to establish a buffer zone, off limits to river traffic.

If the site is protected with a buffer zone, a detailed bathymetric survey of the area is also necessary to determine patterns of environmental change. The findings can be compared with those of earlier surveys conducted by USACOE in 1985. Both may determine whether the exposure resulted from sloughing into the main channel, or if the ferry traffic is a direct cause. Even with a buffer zone, the exposed portion of the bow may require an artificial barrier to promote reconsolidation. The forward casemate should also be examined to determine the feasibility of artificial support. The advantages

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<sup>190</sup>Watts, Underwater Archaeological Site Survey in the Vicinity of Chaffins Bluff, James River, Virginia, (1993), 18-19, 23-31.

<sup>191</sup>Three ironclads have been recovered: The CSS *Neuse*, in Kinston, North Carolina; CSS *Jackson*, in Columbus, Georgia; and USS *Cairo*, in Vicksburg, Mississippi.

of further documenting the exposed remains should also be considered. This may be the most viable option if no other means are found to protect or reconsolidate them.

For the buffer zone to be effective, the perimeter would have to be marked with buoys. Marking the site in any fashion would require a management plan to prevent unlawful artifact collecting or disturbance. While the state's cultural resources are generally open to the public, the *Raleigh's* unusual significance may require some means of controlling access. The hazardous conditions of the Cape Fear River warrant discouragement for safety reasons alone. Prior notification of state officials should be encouraged. The buoys should be posted with the necessary information regarding the terms of visitation. Fortunately, the site is close to several state facilities, including the Fort Fisher State Historic Site. The zone could be monitored from shore, or arrangements made with the state ferries to report unauthorized visitations.

Apart from the immediate need to stabilize the wreck, the course of future research can be directed as funding allows. Every wreck presents a different set of limitations and the *Raleigh* site is no different. Any plans for future research will have to account for the environmental circumstances. The strong currents of the Cape Fear River prevent the sort of systematic mapping and excavation that might be preferred. Still the regular intervals of high tide present highly favorable conditions compared to most inland environments. With calm weather, two or three hours of slack tide can be expected along with visibility of three or more feet. Dry spells have resulted in similar visibility at low tide. The only limitations are devising a means to work around the tide tables.

If the wreck is sufficiently monitored to prevent looting, then a few relatively simple steps could make work on the site much easier. Even if research is conducted on a limited basis and over a long period of years, some minor preparations can save much time at relatively little cost. Suggested measures include the establishment of mooring

buoys at either end of the wreck, a permanent baseline, and two or more datum stations outside of the wreck.

The establishment of mooring buoys at each end would eliminate the chances of dragging anchors across the wreck in the future. The buoys should be placed far enough away from the wreck to prevent entanglement at low tide.

In addition to the buoys, a permanent baseline would eliminate the trouble of having to relocate the ends of the wreck at the beginning of every survey. Insulated stainless steel cable should prove long lasting and resistant to tidal forces. The baseline should be prepared in advance and marked with metal crimps at ten foot intervals. The crimps can either be tagged or serve as a reference for monitoring slack in the measuring tape. One end of the baseline should be fitted with a replacement section to accommodate a turn-buckle. This can be used for maintaining tension, or if fouled, cut away for replacement.

Since the port side features are obstructed from the main baseline by the wreck's profile, two datum stations should be set up along the downstream side. The two stations, set at some distance away from the wreck, would allow the knuckle and other features to be triangulated.

Running a line between the mooring stations, the ends of the baseline and the two datum stations would assist diver navigation in limited visibility. As research warrants, additional datum stations or survey lines can be established. Research objectives, however, should be organized to prevent the build-up of too many entanglements. Likewise, some netting will have to be removed to examine some of the wreck's features.

Eventually, the benefits of excavating the wreck or some portion of it should be considered. For this kind of work, the Cape Fear River is less favorable. The work of three hours is likely to disappear without a trace between the tides. Still, one or more test pits could determine the location of significant features or assess the contents of material

culture. Artificial barriers would have to be constructed for anything more intensive. In at least two other archaeological investigations, barriers have been used with great success. In Jacksonville, Florida, canvas screens diverted the silt layer around the excavations of the Civil War transport *Maple Leaf*, improving visibility and preventing backfill.<sup>192</sup> Similarly, the construction of an iron cofferdam around the British collier *Betsy*, provided an even more favorable environment for working in the river at Yorktown, Virginia. A structure of somewhat larger size would be needed for the *Raleigh*. The results of both projects should be considered, along with any means for improvement.

Meanwhile, there is enough exposed wreckage to occupy several field seasons. Future investigations should try to identify the rest of the main features, particularly along the port side. The most threatened areas, such as the bow, should then be given priority for closer examination. Elements of the lower hull may confirm other indications that the ends are buried deeper than the broken midship section. The wreckage mound should then be examined for decks, bulkheads, or other elements that are still associated with the ironclad's main structural features. When these features are identified, the builder's plans may again prove useful in determining the location of cabins, storerooms and other areas. Priorities can thus be developed for focusing on areas of interest, or studying the main features in closer detail. Several other objectives are suggested in the findings.

Even if no further steps are taken to examine the remains, their protection is vital to future integrity. Similar steps have been recommended for the CSS *Richmond* in the James River, although less than 3 feet of that wreck is exposed to the water column as

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<sup>192</sup>Frank Cantelas, The 1992 *Maple Leaf* Investigation (1993); *Maple Leaf: The 1993 Field Investigations* (1994).

compared to the *Raleigh's* 15 foot casemate.<sup>193</sup> As dredging operations in the Cape Fear River move upstream, so do the spud barges and their heavy equipment. Recently, the *North Carolina* was fouled with a 15,000 pound anchor.<sup>194</sup> In its currently unmarked state, *Raleigh's* exposure and the fouling of shrimp nets are among the lesser concerns (Figure 20).

As when nominated to the National Register of Historic Places in 1985, the *Raleigh* is still "in an excellent state of preservation . . ." <sup>195</sup> A buffer zone is the least of measures to insure that it stays that way. Further documentation is needed in event that the exposed features are lost. The *Raleigh's* remains are significant to more than just a generation of ironclads. At a time when ironclads were changing the course of naval warfare, they were vital to a war that changed the course of American history. Where so few remain in such good condition, the *Raleigh* may be of national landmark significance. The recognition is long overdue, but perhaps not too late.

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<sup>193</sup>Watts, Underwater Archaeological Site Survey in the Vicinity of Chaffins Bluff, James River, Virginia, (1993), 23, 34-36.

<sup>194</sup>The author was present during the UAU inspection of the *North Carolina* on October 3, 1995. The anchor was dropped into the middle of the wreck. The iron boxes were also destroyed.

<sup>195</sup>"Cape Fear Civil War Shipwreck District / National Register of Historic Places Inventory - Nomination Form," on file, North Carolina Underwater Archaeology Unit, Kure Beach: File CSS *Raleigh* 003 NEI.

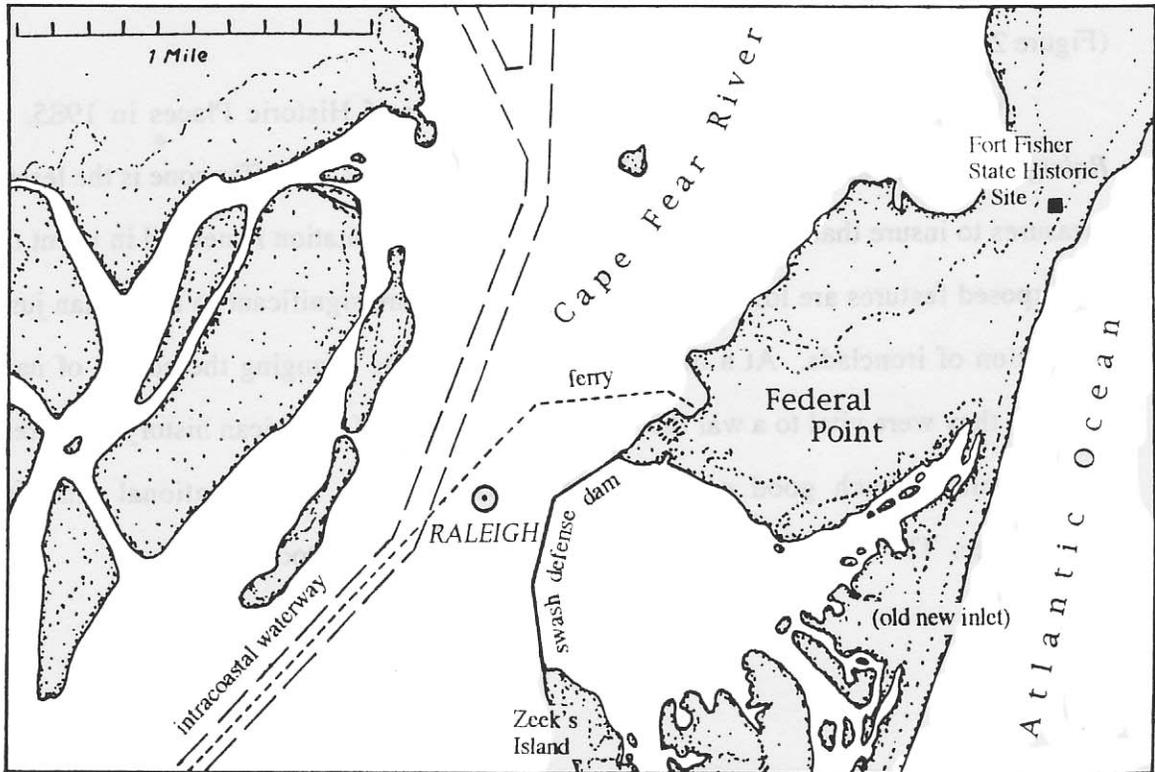


Figure 19: New Inlet Today



Figure 20: Above: Spud barge next to *CSS North Carolina*. The spuds missed the wreck but the bouy at center is anchored in the midship area. Below: Author's foot is on 15,000 pound anchor of the type dropped on the *North Carolina*.



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**APPENDIX**  
**LETTERS REGARDING SITE PROTECTION PURSUANT TO**  
**STATE REGULATIONS**

The following documents are included which underscore early concerns for site integrity in 1984 and 1985. While channel dredging may not have been the direct cause of foreseeable damage, concerns about exposure allude to the wreck's present condition.

Document A:

Recommendations for preserving site integrity in accordance with state regulations.

(Two Enclosures).

November 2, 1984

DEPARTMENT OF  
 NORTH CAROLINA  
 DIVISION OF  
 CULTURAL  
 RESOURCES

Raleigh  
 North Carolina  
 27611

November 2, 1984

MEMORANDUM

TO: John R. Parker, Permit Coordinator  
 Office of Coastal Management, DNRC

Colonel Wayne A. Hanson  
 Corps of Engineers, Wilmington District

FROM: David Brook, Deputy State  
 Historic Preservation Officer

SUBJECT: SAWCO-ND-85-10-65-0002, Maintenance Dredging  
 in Wilmington Harbor, N.C., New Hanover and  
 Brunswick Counties, ER 85-7452

We have reviewed the above public notice concerning your agency's proposal to perform routine maintenance dredging of Wilmington harbor channels.

The extensive maritime activities and many reported shipwreck losses in the lower Cape Fear River make the project area one of high potential for containing submerged cultural resources. Our office recognizes that maintenance dredging within controlled and previously dredged channels normally has a minimum impact on intact cultural resources. Therefore, with the exception of a portion of the Horseshoe Shoal Channel, we recommend no archaeological investigation be conducted.

In the Horseshoe Shoal Channel vicinity the Underwater Archaeology Unit of this division has recently confirmed that a wreck, probably that of the CSS Raleigh, a Confederate ironclad, lies perpendicular to and protrudes over the shoulder of the channel (see enclosed map). It is our opinion that continued maintenance dredging of this portion of the Wilmington Harbor entrance channels may be causing an adverse effect to the wreck site by undermining it.

We therefore recommend that an archaeological investigation of this wreck site be undertaken to determine its nature and present condition and to assess past and potential affects from maintenance dredging activities. The Underwater Archaeology Unit has additional site data and historical information. Please do not hesitate to contact Mark Wilde-Ramsing at 919/458-9042 for further site information or assistance in developing an investigative plan.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act of 1966, the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800, and to Executive Order 11593, "Protection and Enhancement of the Cultural Environment."

Mark W. Hopkins  
 Secretary  
 James B. Hunt, Jr.  
 Governor



Parker/Hanson  
November 2, 1984, Page Two

Thank you for your cooperation and consideration. If you have questions concerning the above comments, please contact Ms. Renee Gledhill-Earley, Environmental Review Coordinator, at 919/733-4763.

DB:slw

Enclosure

Document B:

Public Notice, describing effects of channel dredging. (One Enclosure)

November 21, 1984

EA

21 NOVEMBER 1984

SUBJECT: PUBLIC NOTICE SAWCO-ND-85-10-65-0002, MAINTENANCE DREDGING,  
WILMINGTON HARBOR AND CHANNELS.

THRU: SAWPD-EA/LONG  
SAWPD-E/JACKSON  
SAWPD/INGRAM  
SAWCO/SHUFORD  
SAWCO-N/HOLLIDAY  
TO: SAWCO-ND/WELLS

FROM: KIMMEL

1. Reference: N.C. Department of Cultural Resources letter of 2 November 1984, copy attached.
2. The referenced letter suggests that the C.S.S. RALEIGH may be impacted by continued maintenance dredging. Presumably, this could be in the form of direct contact with the dredge plant or through sloughing of the channel shoulder such that the wreck breaks apart and falls into the channel. Either one of these impacts is, of course, undesirable.
2. SAWCO-ND is unaware of any past contacts by the dredge plant and future dredging in the immediate vicinity of the wreck (i.e. on the eastern side of Horseshoe Shoal Channel) is not likely.
3. Nonetheless, it is recommended that a magnetic survey be accomplished during the pre-dredging hydrographic survey in order that the wreck's position can be more precisely determined. This is advisable because the state will very likely nominate this vessel, along with others in the lower Cape Fear vicinity, to the National Register of Historic Places in the near future.
4. A letter outlining the above action is being prepared in response to the State's notification.



Copy furnished:

SAWPD-EW/WILDER  
SAWCO-NS/BOONE

Document C:

Letter from the Army Corps of Engineers, Wilmington District, describing remote sensing survey results. (One Enclosure)

February 19, 1985



DEPARTMENT OF THE ARMY  
WILMINGTON DISTRICT, CORPS OF ENGINEERS  
P.O. BOX 1890  
WILMINGTON, NORTH CAROLINA 28402-1890

February 19, 1985

IN REPLY REFER TO

Planning Division

Dr. William S. Price, Jr.  
State Historic Preservation Officer  
North Carolina Division of Archives and History  
109 East Jones Street  
Raleigh, North Carolina 29611

Dear Dr. Price:

The Wilmington District has recently completed a magnetic survey of a portion of Horseshoe Shoal Channel in accordance with your notification of November 2, 1984. A copy of the magnetic and hydrographic contour plan is enclosed.

The magnetic contours clearly show the wreck center at about Latitude 33 57' 25.758", Longitude 77 57' 08.593" (X= 2317730.96, Y= 77072.73). The anomaly recorded at the control line offset of 200 feet and chainage of 600 feet is an existing range marker. The hydrographic and magnetic data indicate that the wreck is not likely to be closer than 923 feet to the existing navigation channel and that it is currently well consolidated.

Since the wreck is situated at such a great distance from our maintenance project, I am not planning any further investigations at this time.

If you have further questions or comments, please contact Mr. Richard Kimmel, Archeologist, at (919) 343-4994.

Sincerely,

*Wayne A. Hanson*  
Wayne A. Hanson  
Colonel, Corps of Engineers  
District Engineer

Enclosure

Copy Furnished w/o Enclosures to:

Department of the Interior  
National Park Service  
Southeast Regional Office  
Archeological Services Branch  
75 Spring Street, S. W.  
Atlanta, Georgia 30303

FEB 21 1985  
- 7776  
111112

Document D:

Letter from the Department of Cultural Resources, assessing that no further investigations were necessary. (One Enclosure)

March 11, 1985



North Carolina Department of Cultural Resources

109 East Jones Street • Raleigh, North Carolina 27611

James C. Martin, Governor

Patric Dorsey, Secretary

March 11, 1985

Colonel Wayne A. Hanson  
 District Engineer  
 U.S. Army Corps of Engineers  
 P. O. Box 1890  
 Wilmington, N.C. 28402

Re: Position of the C.S.S. Raleigh wreck  
 adjacent to Horseshoe Shoal Channel, Cape  
 Fear River, New Hanover and Brunswick  
 Counties, ER 85-7776

Dear Colonel Hanson:

We have received and inspected the information your agency furnished us concerning the position of the suspected wreck of the C.S.S. Raleigh in relation to Horseshoe Shoal Channel. We concur with your assessment that no further investigations are necessary by your agency due to the distance between the wreck and the maintained channel.

Thank you for your cooperation and consideration. If you have questions concerning the above comments, please contact Ms. Renee Gledhill-Earley, Environmental Review Coordinator, at 919/733-4763.

Sincerely,

David Brook, Deputy State  
 Historic Preservation Officer

DB:slw

bc: Richard Kimmel