CAPE FEAR'S FORGOTTEN FLEET:

THE EAGLES ISLAND SHIPS' GRAVEYARD,

WILMINGTON, NORTH CAROLINA

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By

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Sami Kay Seeb CAPE FEAR'S FORGOTTEN FLEET: THE EAGLES ISLAND SHIPS' GRAVEYARD, WILMINGTON, NORTH CAROLINA (Under the direction of Dr. Nathan Richards) Department of History, March 2007.

Settlers established Wilmington, North Carolina on the east bank of the Cape Fear River in 1731. The town grew rapidly as a result of the lucrative naval stores industry supported by the abundant pine forests of the surrounding the area. From the early nineteenth century, through the turn of the twentieth century, Wilmington grew to be the most populous city in North Carolina and the only significant port. Wilmington continued to grow and decline with changing local and global economic and cultural conditions, but its maritime industry always remained at the forefront of the development of the port city.

Eagles Island sits directly across from downtown Wilmington and for decades was the location of several industrious commercial maritime operations. The active maritime commerce no longer exists in that location on Eagles Island, but the abandoned vessels adjacent to Eagles Island are a reminder of the vibrant industrial past. This thesis demonstrates that the wrecked and discarded abandoned watercraft that form the Eagles Island Ships' Graveyard represent a microcosm of the cultural, economic, and technological characteristics and changes of Wilmington and Southeastern North Carolina. Correlating data from archaeological field work to the comprehensive historical record of the area provides the means for analysis. Interpretation of the archaeological remains is based on the theoretical framework of behavioral archaeology. Accordingly site formation processes reflect behaviors motivated by conditions of the cultural climate.

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DEDICATION

This thesis is dedicated to:

My parents for their endless love and support

My brothers for letting me be the smart one

And to my Grandmother for her constant encouragement,
enduring spirit,
and infinite wisdom

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CHAPTER ONE: INTRODUCTION

Introduction

The Port of Wilmington is situated 174 miles northeast of Charleston, South Carolina, 259 miles northeast of Savannah, Georgia, and 412 miles south of Norfolk, Virginia (see Figure 1.1; The Board of Engineers for Rivers and Harbors 1940: 3). The mouth of the Cape Fear River is approximately five miles west of Cape Fear and provides a deepwater approach to the Port of Wilmington from the Atlantic Ocean. The city of Wilmington lies on the east bank of the Cape Fear River about thirty miles north of the mouth of the river. From Wilmington, the northwest branch of the river curves in a northwesterly direction for about 115 miles to Fayetteville, North Carolina, while the northeast branch extends nearly due north 103 miles to the Kornegays Bridge area in Duplin County. The Brunswick River branches off the Cape Fear River at Navassa, about four miles above Wilmington, flowing southeast for about five miles until it rejoins the parent stream just below Wilmington (The Water Resources Support Center 1987: 1). Eagles Island sits directly across from Wilmington bordered by the Cape Fear River on the east and the Brunswick River on the west.

Figure 1.1: Wilmington, North Carolina in relation to Norfolk, Virginia and Savannah, Georgia (Image courtesy of Google Earth).

Settled in 1731, the abundance of products derived from the pine forests surrounding the area resulted in the rapid growth of Wilmington. Naval stores including tar, pitch, and turpentine formed the primary industry with shingles, barrel staves and lumber providing additional export items. Early inhabitants settled along the navigable streams to facilitate goods production and transport. This resulted in nearly all commerce passing through Wilmington or nearby Brunswick Town (Jackson 1996a: 24). From the beginning of the nineteenth century through the turn of the twentieth century,

Wilmington developed and remained North Carolina's most populous city and only significant port (Watson 1992: 46, 136).

At the outset of the twentieth century, Wilmington's economy gradually began to fall behind other cities with more developed industrialization and expanding large businesses (Watson 1992: 139-140). During the period of the World Wars and the Great Depression, the economy fluctuated due to a variety of localized, national, and international circumstances. While the traditional export business dwindled in the twentieth century, Wilmington remained an active port and a regional trade center through World War II. By the 1950s, trade in Wilmington's port dwindled to little more than a trace of its vibrant past. While history provides remembrances of Wilmington's importance as a trade center in North Carolina, the landscape of the Cape Fear River augments those memories with the large collection of abandoned vessels, wharves, marine railways, and associated structural features. These abandoned watercraft and maritime features are a testament to the once thriving industry that endured on both banks of the Cape Fear River in the vicinity of Wilmington.

The abandonment of vessels adjacent to Eagles Island and Wilmington are a result of a number of behaviors associated with disposal. Previous studies show that at least four vessels were true wrecks, lost accidentally at their moorings and not re-floated or salvaged by their owners. Some vessels were pulled out of use and stored for later reactivation. However, these vessels, for a variety of reasons, were not put back into active service. In some cases, vessel owners left intact vessels in actively used areas of

the waterway and shoreline. Other vessels show evidence of abandonment and reuse (Wilde-Ramsing 1986: 4-5).

It is the goal of this thesis to analyze the remains of vessels associated with the maritime activities of Wilmington in order to better interpret Wilmington's historic past and add important detail to our understanding of the area. The scattered remains in the Cape Fear River are located both on the historic riverfront of Wilmington itself and across the river along the shore of Eagles Island, the now abandoned site of several formerly industrious marine railway companies and shipyards. While to many locals and tourists alike, the derelict remains are an eyesore in their scenic port (Wilde-Ramsing 1986: 1), to the scholars of history and archaeology, the abandoned vessels provide a valuable and tangible means of studying past societies. The abandonment of maritime associated material can be traced to the earliest days of shipbuilding, yet few studies exist on the historical and archaeological importance of such sites (Richards 2002:2). This thesis will demonstrate that the wrecked and discarded abandoned watercraft that form the Eagles Island Ships' Graveyard represent a microcosm of the cultural, economic, and technological characteristics and changes of Wilmington and Southeastern North Carolina.

Research Questions

Studying the material remains of the maritime industry along the banks of the Cape Fear River provides a unique means of assessing the culture that produced those remains. As Keith Muckelroy (1978:3) said, "In many societies it [the dominating position of maritime activities] has pervaded every aspect of social organization." The

role of maritime activities can not be underestimated in a town established and developed as a result of those very activities. The Cape Fear River has been the lifeblood of Wilmington and that is reflected in the material culture remaining along the river. Understanding the history and archaeology of the remains in the Cape Fear River will provide a means of understanding the social organization of the society that produced the remains.

The primary research question of this thesis is: how do the archaeological remains of the vessels in the Eagles Island Ships' Graveyard reflect the social, political, economic, and technological events and processes of Wilmington and adjacent communities? Secondary research questions for this thesis relate to three main areas of enquiry. This includes questions emerging directly from the observation and interpretation of archaeological data, as well as the correlation of archaeological information with archival sources. The first area of enquiry concerns abandonment behavior and site formation. Research questions revolve around the processes that influenced the creation of the archaeological record and how those processes reflect behavior and influence decision making associated with localized watercraft abandonment. The second area of enquiry deals with economic trends revealed in the material remains. Questions pertain to how the abandonment and reuse of vessels in the Cape Fear River reflect the economy of Wilmington and surrounding areas. The third area of enquiry relates to technological trends. Questions concern how the material remains reflect the life-cycle of vessels (from construction through reuse and deposition) and what implications that has on a broader technological level.

Research Design

This thesis has a theoretical foundation based on the importance of site formation processes in recognizing and understanding the behaviors associated with the material remains. Chapter Two, theory, outlines the main ideas put forward by a variety of archaeological theorists. Michael Schiffer performed extensive studies on archaeological site formation processes, including investigating behaviors associated with abandonment and reuse (Schiffer 1972, 1996; Schiffer, Downing, and McCarthy 1981). In his studies, he concentrates on various cultural site transformation processes and explains their relevance not only to the analysis of the sites individually, but also their relevance to spatial analyses, both of which are undertaken as part of the site formation process studies. Catherine Cameron and Steve Tomka's (1993) edited volume, *Abandonment of Settlements and Regions*, also addressed a theoretical topic with validity to the study of the Eagles Island Ships' Graveyard in their work assessing abandonment of settlements and regions. In understanding the causes and effects of abandonment, regardless of the entity being abandoned, establishing a theoretical framework can help to explain characteristics of abandonment and associated behavior.

Chapter Three outlines the methodology of the project. The chapter consists of a section describing the historical research including the repositories of information and the type of information gathered. The next section describes the archaeological fieldwork

conducted on the site. The final section describes the process of synthesizing and analyzing the information gathered from the historical and archaeological work.

The history of the area is a vital aspect of the research for this thesis and is therefore split into two chapters. Chapter Four outlines the general history of Wilmington from the post-bellum era through years of growth and decline, to the decades after World War II. The time frame outlined in the history chapter is that which directly correlates to the abandoned watercraft in the Cape Fear River.

Chapter Five concentrates on the specific history of Eagles Island. The chapter traces the various industries that occupied the western bank of the Cape Fear River from before the Civil War through to the 1960s. The evolution of industry on Eagles Island is vital component to understanding the material resources which remain there today and a detailed investigation of that evolution provides the necessary background to conduct a thorough behavioral analysis.

Chapter Six describes the archaeology of Eagles Island. The first section of the chapter describes and critiques the results of previous archaeological work conducted in the vicinity of Eagles Island. The second section describes the results from archaeological work conducted for the purposes of this thesis, including the augmentation of previous information and the additional data not addressed in previous work.

Chapter Seven and Chapter Eight present results from the correlation of historical and archaeological research. Using the theoretical framework from Chapter Two, the results chapters describe the processes that occur in the archaeological record at Eagles Island and investigate the behaviors related to those processes. Chapter seven explores

the use and deposition of the material remains on Eagles Island. Using the signatures of the archaeological record in association with the historical record allows for interpretation of the forces that went into the creation of the graveyard. Chapter Eight is an investigation of the post-depositional processes acting on the material remains. Additive and reductive activities in association with the material remains can be read through an exploration of the signatures in the archaeological record. The signatures reveal activities and behaviors linked to the conditions present in Wilmington throughout the development of the Graveyard.

The final section, Chapter Nine, summarizes the aspects of Wilmington culture, economy and technology that are represented in the archaeological remains on Eagles Island. Using the historical record and correlating it to the archaeological signatures provides a means of thorough analysis of Wilmington. Also, the chapter will highlight innovations this research made in the areas of abandonment and site formation studies. The research suffered from limiting factors, but also motivates additional specific and general topically related work in the future. The appendices consist of data produced from field work at Eagles Island. Appendix A includes site forms which prompted thorough descriptions of each site. Appendix B consists of scaled site maps of six abandoned vessels.

Correlative Research

Previous studies, both archaeological and historical, indicate that watercraft abandonment is internationally widespread temporally and geographically, and reasons for abandonment are characteristically diverse (Richards 2002: 52). The following

sources identify the length and breadth of abandonment studies around world. A number of categories of vessel abandonment exist in the archaeological record relating to a variety of behaviors. These abandoned vessels relate to Eagles Island because of the similarities in abandonment causes and effects (Christensen 1972, 1987, 1997a, 1997b; Delgado 1979, 1983, 1997; El-Baz 1988; Evans 1997; Jenkins 1980; Marsden 1974, 1994; Merrifield 1983; Reiss 1987, 1997). Few investigations on the topic of ships' graveyards exist. The most comprehensive work on the topic thus far is an examination of deliberately discarded watercraft throughout Australia (Richards 1997, 1998, 1999a, 1999b, 2001, 2002; Richards and Staniforth 2006). Nathan Richards (2002: 72-73) outlines specific criteria to classify a ships' graveyard and further suggests two types of graveyards. The classification and typologies from the Australian study will be tested in the analysis of the Eagles Island remains. Richards also suggested that the formation of ships' graveyards stem from *catastrophic*, *consequential*, and *deliberate* abandonment (Richards 2002: 7-10). He concluded that non-catastrophically discarded vessels are not shipwrecks, and the thought processes that define their discard reflect their role as an indicator of technological and economic circumstances associated with their abandonment. His causal factors are clear and definitive, but will be tested. In his analysis of the signatures and causes of abandonment, Richards tested his hypotheses with a uniformly Australian dataset. The study in Eagles Island will be an extension of his work by testing his hypotheses in a different geographic region with varying cultural, economic, and technological history, both regionally, and nationally.

A topically similar study is that of Mallows Bay, Maryland, the largest ships' graveyard in the United States (Shomette 1995, 1996; Hopkins 1996). The graveyard consists of nearly 160 vessels, most of which the government built during World War I as a response to Germany's unrestricted submarine warfare and deliberately scuttled following the conclusion of the conflict. In performing their study, the researchers answered additional questions pertaining to abandonment and salvage behavior, in addition to addressing issues of economics, technology, and politics. The study in Mallows Bay consists of an extremely different collection of vessels from Eagles Island, yet, the study asked similar theoretical questions. In addition to Richards's work, it will be a framework upon which the Eagles Island investigation can build.

Other research institutions around the world conducting related projects. Parks Canada conducted an inventory of a ships' graveyard in the middle of Thunder Bay in Lake Superior. The study found a comprehensive collection of tugs, scows and dredges related to the operation of Canada's largest grain handling facility. Vessel owners originally abandoned the vessels along the shores of the harbors of Port Arthur and Fort William. In 1936, the creation of the Department of Transportation provided a financial and political impetus to move the vessels, considered obstructions, to a dumping ground in the middle of Thunder Bay (Harris and Laroche 2005). Another project took place at a graveyard in Inner Harbour, Kingston, Ontario. The graveyard consists of a variety of vessels deposited from the late nineteenth century through the early twentieth century. Historical research indicates that by the 1920s, there were forty or more vessels abandoned in the Inner Habour graveyard, but efforts in 1925 and 1937 resulted in the

movement of those vessels to deep water graveyards. Research from the project revealed that some abandoned vessels served as breakwaters and pier extensions, but were mostly seen as eyesores and hazards to shipping and health (Moore 1996).

East Carolina University (ECU) conducted an archaeological assessment of eleven wrecked or abandoned watercraft in Washington, North Carolina. The collection of vessels consists of a wide variety of vessel typologies, providing a means of studying the construction of the collection of vernacular working craft. The collection also offers a means of understanding the area's economic base through analysis of the varied industries associated with the various vessel types including fishing, agriculture, and lime production.

Conclusion

This thesis will examine an aspect of maritime history and archaeology that is rarely investigated or recognized for the magnitude of insight it can provide. Though the vessels in the Eagles Island Ships' Graveyard are, for the most part, not shipwrecks, the resources still provide a valuable means for understanding the past. On a local level, this thesis will expand and develop the understood basis of the history of Wilmington and North Carolina. On a broader level, the thesis will contribute to studies of site formation and behavioral archaeology, testing the theories present in the archaeological community. The next chapter explores and outlines the existing theories and relates their association to the study of abandoned watercraft.

CHAPTER TWO: THEORY

Introduction

Theory is the backbone of behavioral studies conducted through archaeological investigations. Understanding the theoretical basis of behavioral types is key to the interpretation of material remains in an archaeological context. Isolated material remains do not, on an individual basis, reveal details about the cultural framework from which they came. Analysis of a culture must come from recognizing patterns in the material record. This creates a foundation for theoretical analyses, and thereafter for behavioral analyses. As one archaeological theorist remarked,

> It has often been suggested that we cannot dig up a social system or ideology. Granted we cannot excavate a kinship terminology or a philosophy, but we can and do excavate the material items which functioned together with these more behavioral elements with the appropriate cultural sub-systems (Binford 1962:218-219).

In order to determine the behavioral elements of cultural systems, archaeologists must understand how and why the material items came to exist in the context of the archaeological record. As Lenihan (1983:49) stated, without incorporating germane theoretical issues into archaeological analysis, returns are descriptive rather than analytical. This chapter will outline the theories associated with site formation, including the processes specifically applicable to the Eagles Island Ships' Graveyard, mainly discard, abandonment, and reuse in order to create a theoretical base for the work presented in this thesis.

Site Formation

Archaeological theory spans a substantial range of topics which can be incorporated into countless focus areas of research. This thesis is theoretically grounded in the processes of site formation and the various behaviors associated with those processes. The archaeological record, "contains culturally deposited objects that are no longer part of an ongoing society" but do not appear to the modern society in their original form, unchanged from the time they entered the archaeological record. The processes that act upon the cultural depositions, formation processes, are the factors that create the historical and archaeological records (Schiffer 1996:3-4, 7). The detailed exploration of formation processes emerged from the belief that the traditional analysis of sites based on the entropy view and statistical sampling were too simple and exclusive of important aspects necessary to reach the core of understanding activities occurring in the archaeological context. To correct this limiting framework, Schiffer proposed the transformation position which suggests that the archaeological record is a transformed or distorted view of artifacts as they once participated in a behavioral system (Schiffer 1996:8-10). According Schiffer's position, it is the role of the archaeologist to recognize the distortions in the archaeological record.

This position emphasizes that the processes that form the historical and archaeological record must be ascertained and understood before assessments can be made on the record itself. This limitation on analysis occurs because archaeologists can not read behavior and organization directly from patterns in the archaeological record, but rather must rectify distortions by using analytical and inferential tools to recognize

the patterns created from formation processes (Schiffer 1996:10). The distortions to the site consist of a series of transformations that occurred on the remains from the time they participated in a behavioral system to the time the archaeologist observed them. The transformations are modeled through two sets of archaeological laws, "c-transforms" or cultural transforms and "n-transforms" or noncultural transforms (Schiffer and Rathje 1973; Schiffer 1975, 1996; Murphy 1983). Schiffer (1975:838) explains:

> The first set, "c-transforms," describes the cultural formation process of the archaeological record. These laws relate variables pertaining to the behavioral and organizational properties of a sociocultural system to variables describing aspects of the archaeological outputs of that system. The laws of noncultural formation processes are termed "n-transforms." N-transforms specify the interaction between culturally-deposited materials and variables of the environment in which those materials were deposited. Taken together, c-transforms and n-transforms provide means for modeling the processes by which an archaeological site acquired specific formal, quantitative, relational, and spatial attributes.

Once the transformation processes are recognized, identified, and assessed, the archaeologist can use *correlates* to infer behavior from the material culture. *Correlates*, "embody relationships between behavioral and organizational variables of a sociocultural system and variables relating to the material culture and environment of that system" (Schiffer 1975:838). Using site transformations to determine site formation processes and relating them to correlates create conditions to allow for a more complete analysis of the human behaviors associated with a particular site.

N-Transforms

Keith Muckelroy was one of the first archaeological theorists to apply theories about site formation processes to the maritime archaeological context. Muckelroy (1978) concentrated his efforts on exploring, primarily, the effects of noncultural transforms on

submerged shipwreck sites. He recognized the value of understanding site formation processes in the archaeological record and saw the need for its application to a broader context, specifically to submerged sites, but primarily in association with environmental factors because human interference was limited underwater compared to the terrestrial context. Muckelroy (1978:157) wrote, "The validity of any conclusions reached in maritime archaeology depends fundamentally on the understanding of these processes, so that their study must occupy a central place in the sub-discipline."

In his evaluations of various conditions, Muckelroy (1978:163) determined that those with the greatest effects on submerged sites deal with the nature of the seabed and the variety of disturbing forces that act on a particular site. He proved, in contrast to traditional modes of thought, that water movement across a site and depth of the site were not as important as processes acting on a site. While his analytical work regarding n-transforms on submerged sites is important for the sub-discipline as a whole, it does not pertain directly to the area of enquiry for this thesis. The sites on Eagles Island are not wrecks, and apart from a limited number, are not fully submerged. In addition, this thesis is an exploration of the behaviors associated with the material remains at Eagles Island and therefore requires a theoretical basis that accounts for human interaction as a result of various processes affecting the site.

C-Transforms

Cultural transformations on a site, the processes of human behavior that affect or transform artifacts after the initial period of use, are responsible for acting on material remains in a variety of ways. Primarily, cultural processes can retain items in the

systemic context by reusing such items. The *systemic context* refers to the condition of an element or artifact which is participating in a behavioral system. Cultural processes are also responsible for the deposition of artifacts into the *archaeological context*. The *archaeological context* describes materials which passed through a cultural system and are in a context in which they interact only with the natural environment. In addition, cultural processes are responsible for all subsequent cultural modifications (Schiffer 1972: 157, 1996: 7).

According to Schiffer, there are four stages of systemic context that an artifact travels through before entering the archaeological context. Artifacts begin as materials, procured from the natural environment. After procurement, artifacts go through a manufacturing stage in which modifications take place to change the procured material into an intended, usable form. After manufacture, the artifact is used for a *socio-function* (the use of an object for social purposes), *techno-function* (the use of an object for practical purposes), or *ideo-function* (the use of an object for ideological purposes). From the use stage, the artifact will either be reused in the systemic context, or be discarded, at which point it leaves the systemic context and enters the archaeological context as a type of refuse (Schiffer 1972:158, 1996:14). It is important to note that not all elements pass through all stages of the life cycle process (Schiffer 1972:159).

Each stage of the life cycle is a type of cultural transformation on the artifact. The model for the life cycle of an artifact directly pertains to the study at Eagles Island because recognizing the changes throughout the life cycle of the abandoned vessels and associated material provides information about the processes that occurred, both

systemically and archaeologically, to those artifacts. Richards (2002:30) suggests, "[A ship is] an object highly sensitive to the cultural conditions of the time of its creation (as reflected in elements of its design), but also to the cultural transformations that it may also reflect (in the form of archaeological signatures)." The watercraft at Eagles Island can be seen as artifacts on an individual basis. In addition, the vessels can be seen as components of one large artifact (the graveyard) demonstrating a variety of types of human behavior observed through a number of processes.

Reuse

Reuse, the change in use or form of an artifact following initial use, is an important process within the systemic context. The cycling of an object back into systemic context occurs, "when an object breaks, wears out, or for other reasons can no longer carry out its utilitarian or symbolic functions," and is therefore reinserted into use in a different way (Schiffer 1996:28). There are four primary types of reuse: *lateral cycling*, *recycling*, *secondary use*, and *conservatory processes*.

Lateral cycling is a change in the user of the artifact, but not in the form or use of the artifact itself. This type of reuse is difficult to infer from the archaeological record because, by definition, the artifact does not undergo significant physical change during lateral cycling. Schiffer suggests that lateral cycling is common through gift, sale and theft in modern America, while Richards equates lateral cycling in maritime commerce with the common practice of transferring vessel ownership from one person or business to another while maintaining the function of the vessel (Schiffer 1996:29; Richards 2002:44). Lateral cycling did occur with artifacts on Eagles Island, but the indicative

signatures do not exist in the archaeological record and the process can only be inferred from the historical record.

Recycling consists of returning a used artifact to a manufacturing process in which the artifact is transformed to the point that its new use is entirely different from its previous use. This occurs when an object fulfills its useful function and can not be used further in its original capacity or when waste materials from manufacturing are put to a new use (Schiffer 1996:29). Richards (2002: 44) suggests that this is common in the maritime industry in the form of salvage for purposes of remanufacture and reuse of materials removed from abandoned and unwanted watercraft by dismantling processes. From a maritime perspective, this process correlates to behaviors and decision making strongly associated with economic benefits. If, as Richards, suggests, materials are salvaged and re-manufactured, the benefit of that work must outweigh the cost of conducting the work. While signatures of salvage appear in the archaeological context, as with lateral cycling, interpreting recycling involves the historical record to understand what processes occurred on salvaged materials.

Secondary use is a type of reuse in which objects take on new functions without significant modification to the form or structure of the object. This is common when an object possesses significant use-wear, breakage, or maintenance and the object is more appropriate for secondary use. In order to recognize secondary use in objects, there must be physical indictors of wear different in type or placement of that which would exist based on the originally intended use of the object (Schiffer 1996:30-31). As Richards (2002:44) points out, this type of reuse is common in the maritime commerce industry

with the conversion of vessels for a different type of use (ie. a passenger vessel becoming a cargo vessel). On Eagles Island, secondary use can be seen both among the remains of vessels and associated materials on the island.

The fourth type of reuse, *conservatory process*, occurs when an object's major function changes, usually from a techno-function to a socio-function or ideo-function, with the intention of permanent preservation in its new role. This process is uncommon in association with maritime industries, unless a vessel goes through a conservatory process for its historical value and ceases to operate a primary or secondary function (Richards 2002:45). This process is widely reflected in collections of maritime related materials throughout the world in maritime museums and collectible stores. In addition, towns and cities with strong connections to maritime cultures often display maritime related material, likely recovered from primary or secondary use, for aesthetics such as decoration, including the port city of Wilmington. An activity that transforms used objects from person to person or facilitates reuse is known as a *reuse mechanism*. Schiffer (1996:36) recognizes an array of reuse mechanisms in modern culture from inheritances, gambling, flea markets, auctions, thrift stores, etc. A ships' graveyard can be considered an unconventional type of reuse mechanism (see Chapter Seven).

Figure 2.1: An anchor appears in the foreground along the Riverwalk in Riverfront Park in Wilmington, North Carolina (image courtesy of http://www.wilmington-nc.com/tours/Downtown_-_Waterfront/wilmington-nc-tour-0460.php).

Deposition

Cultural deposition is the transformation of objects from the systemic context to the archaeological context through processes associated with discard. Discard processes occur at the termination of use life when an artifact is no longer functional, can not be reused, and is therefore transformed into the archaeological context. *Refuse* is the post-deposition condition of discarded elements no longer participating in a behavioral system. Because there is no ongoing cultural activity on Eagles Island in the immediate area surrounding the ships' graveyard, the area is theoretically considered a discard site and

the cultural material is refuse. Discard is usually the result of irreparable damage to objects through breakage, use-wear, and deterioration. At times, however, whole serviceable items can appear in the archaeological context indicating specific types of associated behavior such as accidental deposition, or deposition reflecting change such as occurs with obsolescence or low reuse value (Schiffer 1972:159, 1996:47-48).

Once deposited outside of the systemic context, archaeologists can study the traces left by activities and processes that acted on the refuse material. Schiffer devised four dimensions of variability that provide a means of illustrating the traces that formation processes leave: *formal dimension, frequency dimension, relational dimension,* and *spatial dimension.* Each dimension of variability has direct application to a ships' graveyard or similar type abandonment site (Schiffer 1996:15).

The *formal dimension* concerns the physical attributes of artifacts. Variability in the formal dimension is the basis of artifact typologies. Any physical changes, such as additives or reductions on artifacts appears as a variable to the formal dimension of the artifact. As Schiffer (1996:17) remarks, "The effects of formation processes on the formal dimension of artifacts are varied and pervasive. The possibility that any item or deposit survived to the present without undergoing some formal changes is indeed slight." In the maritime context, archaeological remains often reveal signatures of physical changes on vessels. The historical record, too, aids in understanding physical processes, such as lengthening a vessel or refitting an engine.

The *frequency dimension* of variability relates to the number of occurrences of a particular type of artifact in the archaeological record. Frequency dimension is affected

by a large variety of formation processes which all can have similar effects on the frequency variable. The many processes which affect the frequency variable require that artifact quantity measurements are directed at specific variables. It is still unclear how to discern the cause of variability when it comes to frequency and how to determine the variables that are of particular interest to understand frequency (Schiffer 1996:18-19).

The *relational dimension* of variability refers to patterns of co-occurrence of artifacts. Patterns of co-occurrence, also known as "associations" can occur in two major types. *Singular association* is the discovery of two or more items in close proximity. Richards relates this, in the case of ships' graveyards, to groups of watercraft. *Recurrent associations* are singular associations recurring repeatedly in the same area or in the same behavioral context (Schiffer 1996:19; Richards 2002:46-47). For example, finding two different types of ships abandoned together in one location would be a singular association. But, finding the same two ship types abandoned together in several sections of a ships' graveyard or in various graveyards in a geographic region would imply recurrent association.

Relational dimension is directly related to the variability of *spatial dimension*, that is, the location of an artifact. Schiffer (1996:17) suggests that locations can provide behaviorally significant divisions of space and processes can both create and alter the spatial dimension. This is a particularly important dimension of variability for this thesis because, "This relates to the reasons for the location of watercraft abandonment sites, and is an important premise for interpreting how major ship discard sites (such as ships' graveyards) have come to be formed" (Richards 2002: 46). There are two categories of

variability when determining the spatial context of refuse. *Primary refuse* consists of artifacts discarded at the place of use. Schiffer believes that large amounts of primary refuse are uncommon and produced in limited circumstances. This is due to the fact that activity areas in use do not allow for accumulated discard because it inhibits the activity of the area. *Secondary refuse* is artifact discard at a place elsewhere than the associated activity area, even if it is adjacent to the place of use (Schiffer 1996:58-59). Schiffer (1996: 62) suggests that "An unmistakable characteristic of secondary refuse distributions in most settlements is clustering. People tend to dump trash where others have previously dumped trash; thus concentrations arise." Richards (2002:46) correlates primary refuse with the area in which a vessel remained in the systemic context, either through use or reuse, including salvage. According to that assertion, secondary refuse sites for watercraft consist of the discard of vessels in a location other than that of operation or reuse.

When considering the theories of Schiffer and Richards, Eagles Island presents an undocumented and possibly rare example of spatial variability. The entire site was the location of use, reuse, and discard of materials, indicating that it is a primary refuse site (regardless of the infrequency of such sites), despite its central location in the active waterway of a significant port city. Additionally, clustering appears regularly at Eagles Island in a variety of locations and with a variety of material types. This, therefore, disputes Schiffer's claim that clustering is a characteristic of secondary refuse sites.

Abandonment Processes

Abandonment, a type of deposition, is "the process whereby a place-an activity area, structure, or entire settlement-is transformed to archaeological context" (Schiffer 1996:89). Abandonment is the discard process that creates the variables responsible for the presence of usable elements in the archaeological record (Schiffer 1972:160). Prior to the 1970s, archaeologists studied abandonment in the limiting contexts of regional exodus (the movement of entire nations) or spectacular, rapid abandonment (disaster related) as a passive effect for which they had to find the cause (Cameron 1993:3; Nelson 2000:57). After synthesizing a range of studies conducted over many years, archaeologists now see abandonment as a site formation process rather than a single, isolated event and believe the gradual nature of abandonment reflects adjustments made to fluctuations in economic, demographic, ecologic, or regional sociocultural conditions (Tomka and Stevenson 1993:192, Nelson 2000:57). Experts studying abandonment suggest it should be seen on a continuum with a range from full time occupation on one end of the spectrum to complete-irreversible abandonment on the other (Rothschild et al. 1993:136).

There are two primary processes linked to the act of abandonment; the creation of *de facto* refuse and the exhibition of *curate behavior*. *De facto* refuse is when usable or reusable tools, facilities, structures and other cultural materials are left behind during the abandonment of an activity area. Clustering or caches are an abandonment behavior specifically associated with *de facto* refuse. *Curate behavior* describes the process of removing and transporting still usable or repairable items from the abandoned activity area for continued use elsewhere (Schiffer 1996:89-92).

Determining the behaviors associated with d*e facto* refuse is based upon understanding the conditions/modes of site abandonment. There are a wide variety of conditions of abandonment from season of abandonment to size of abandonment or activity being abandoned; however, some conditions are more important in association with watercraft abandonment. Those conditions deal primarily with the rate of site abandonment and anticipated return to the activity area. Stevenson (1982) studied these two modes of abandonment together and created criteria to asses the refuse in order to better understand the behaviors occurring:

> •*Rapid abandonment-anticipation of return* will demonstrate a strong association between *de facto* refuse at the location of activity for future use. These conditions will also result in some clustering or caching of valuable items with anticipation of use upon return, generally away from the use location.
>
> •*Rapid abandonment-no anticipation of return* will exhibit similar behavior of the previous conditions with *de facto* refuse. However, valuable items will be curated and removed from the site while common items will likely be abandoned on the site as refuse.
>
> •*Gradual abandonment-anticipation of return* will result in the caching or clustering of valuables, generally way from the activity location for use or reuse upon return. There will be little accumulation of *de facto* refuse in association with the activity area.
>
> •*Gradual abandonment-no anticipation of return* will not demonstrate caching of valuables but it is likely that trash refuse will be abundant. Also, these conditions will show significant evidence of dismantling, likely through planned salvage.

Watercraft abandonment, other than under catastrophic circumstances (wrecking/grounding), requires thought and deliberation. The element of human

decision making associated with watercraft abandonment suggests the gradual mode of abandonment will be the most common type at watercraft abandonment sites.

Another important mode of abandonment is access to the abandoned site for post-abandonment processes. The ability to access an abandoned site easily and the distance between an abandoned use area and a new use area are significant determinates of the type of processes that will occur during abandonment. If the distance between sites is great, access to the abandoned site is limited, or mobility between sites is a problem, there must be priorities for what is curated and what is left as refuse. If the distance is near and there is an ease of mobility and access, curate behavior is likely and a more gradual pattern of abandonment will appear in the material record despite any haste in the initial departure (Lightfoot 1993:167-168).

In addition to the mode and conditions affecting abandonment, *de facto* refuse can be depleted through a series of processes. Because of the depletion properties, Archaeologists can not consider *de facto* refuse a sufficient representation of the systemic context. Lateral cycling results in the retention of materials in the systemic context through reuse or curate behavior, rather than deposition into the archaeological context as *de facto* refuse. Draw down, or failing to replace items that approach or reach the end of use-life, also depletes *de facto* refuse (Schiffer 1996:97). In addition, salvage, scavenging, and looting of *de facto* refuse sites results in a depletion of the resource from the archaeological context (Lightfoot 1993:166). Depletion processes are most pronounced when settlements remain inhabited in close proximity to abandonment areas

(Cameron 1993:5). Because the Eagles Island Ships' Graveyard is close to Wilmington and easily accessible, depletion processes must be a serious consideration in site analysis.

Reclamation Processes

Though there is a distinct differentiation between the systemic context and the archaeological context, it is important to understand that artifacts can move between the two contexts. Reclamation is the transformation of material from the archaeological context back into the systemic context (Schiffer 1996:99). There are several processes of reclamation that are especially prevalent with abandoned watercraft sites, and particularly Eagles Island.

The most prominent reclamation process associated with watercraft abandonment is salvage. Schiffer (1996:103) defines salvage as the reincorporation, including facilities and structures, of *de facto* refuse into the systemic context by the people who originally abandoned the site. Salvage is a complex process exhibiting specialized behavior in terms of watercraft, both wrecked and abandoned. As Lenihan (1983: 40) said, "The history of marine salvage extends back almost as far as the history of ships." Scholars from Muckelroy (1978) and beyond have tried to categorize salvage behavior, particularly on wreck sites. But the categories may be applied to abandoned watercraft as well. McCarthy (2000:93) refers to primary salvage as the recovery of materials by the owners, operators, or agents of that material, which is different from secondary salvage which is the action of professional salvors or hobbyist salvors in recent times. Gibbs (2006:14) criticized these categories on salvage claiming the temporal distinction excludes continued access to salvage a site and focuses on the legality rather than the

range of access. He modified the types of salvage, categorizing by opportunistic and systematic. According to his distinctions, opportunistic salvage is the non-systematic removal of items. He suggests people without direct link to the remains likely perform this type of salvage and the frequency is based on accessibility to the site. Professionals conduct systematic salvage with the proper training and technology for an intensive and sustained effort to remove a significant amount of material from a site. In association with abandoned vessels, Richards (2002:345) suggests that salvage falls into three phases: primary, secondary, and tertiary. Primary salvage refers to pre-depositional salvage activities. Secondary salvage refers to post-depositional salvage in the short term after abandonment, usually by the owner or abandoner of a vessel. Tertiary salvage occurs through time after abandonment and is usually intermittent and opportunistic in character. Though these categories of salvage reflect behaviors, they are a direct result of the processes of salvage and have a direct correlation to the formation process of reclamation.

Scavenging is another process of reclamation with direct association to watercraft abandonment sites. The generic term scavenging refers to the exploitation of previously discarded materials and is important because it is often associated with economic factors (Schiffer 1996:106; Richards 2002:48). Richards (2002:48) suggests that in relation to watercraft abandonment studies, scavenging can refer to, “unsanctioned, illegal, and often clandestine salvage of material from watercraft abandonment sites.” Schiffer distinguishes between varieties of scavenging depending on the types of deposits that are being exploited. Gleaning is reclamation of discard from secondary refuse sites. The

type of gleaning is determined by variables including proximity of the secondary refuse location to the activity area, dispersion of material over a discard site, accessibility to secondary refuse on discard sites. Scavenging of *de facto* refuse is often influenced by variables as well. Intact items with a higher potential for longer use life are more likely to be scavenged. Some materials tend to be more desirable than others, including stone, wood, and metal, and are more likely to be recovered for reuse. Also, the likelihood of recovery is related to the availability and demand of a material and the potential utility of that material in the systemic context (Schiffer 1996:107-111).

Another reclamation process is that of collecting or looting sites. According to Schiffer's (1996:114) definitions, salvage and scavenge activities are carried out by the inhabitants of the settlement from which the materials came. Collecting and looting, in contrast, are processes in which items are transferred into a different systemic context than that associated with the original archaeological context. This behavior is congruent with what Richard's refers to as unsanctioned scavenging, and in many cases can be considered theft.

Conclusion

The fist step in archaeological analysis is to identify the formation processes that affected the archaeological deposits (Reid 1985). Schiffer (1996:303) believes,

> The importance of identifying formation processes *before* behavioral or environment inferences are attempted cannot be overemphasized. In far too many cases, the evidence used by an archaeologist owes many of its properties, not to the past phenomena of interest, but to various formation processes.

After the vital step of determining the processes acting on the material remains, archaeologists can identify patterns that relate to behavior and make inferences concerning the cultures inextricably linked to the material remains. The cultural transformations occurring on sites are a direct connection to the behaviors associated with the formation of a site. Recognizing the formation processes and discerning the associated behaviors initiates the most comprehensive analysis of the cultural conditions that manifest those behaviors. Understanding the life cycle of watercraft from construction through use, reuse, discard, and reclamation provides a means of understanding the technology, economy, and society of those associated with the watercraft. The theoretical framework presented here will be the foundation for analysis of the Eagles Island Ships' Graveyard (see Chapters 6 and 7).

CHAPTER THREE: METHODOLOGY

Introduction

The goal of this research is to determine how the wrecked and discarded abandoned watercraft that form the Eagle's Island Ships' Graveyard represent a microcosm of the cultural, economic, and technological characteristics and transformations of Wilmington and adjacent communities. The remains lining the shore of Wilmington and Eagle's Island reflect the once active maritime culture of the region and provide a comprehensive view of the harbor's past through time. The research area consists of the east and west shores of the Cape Fear River from the US 17 bridge south of downtown Wilmington to the USS *North Carolina* battleship to the north, where the Cape Fear River divides into the Northeast and Northwest Cape Fear Rivers (Figure 3.1).

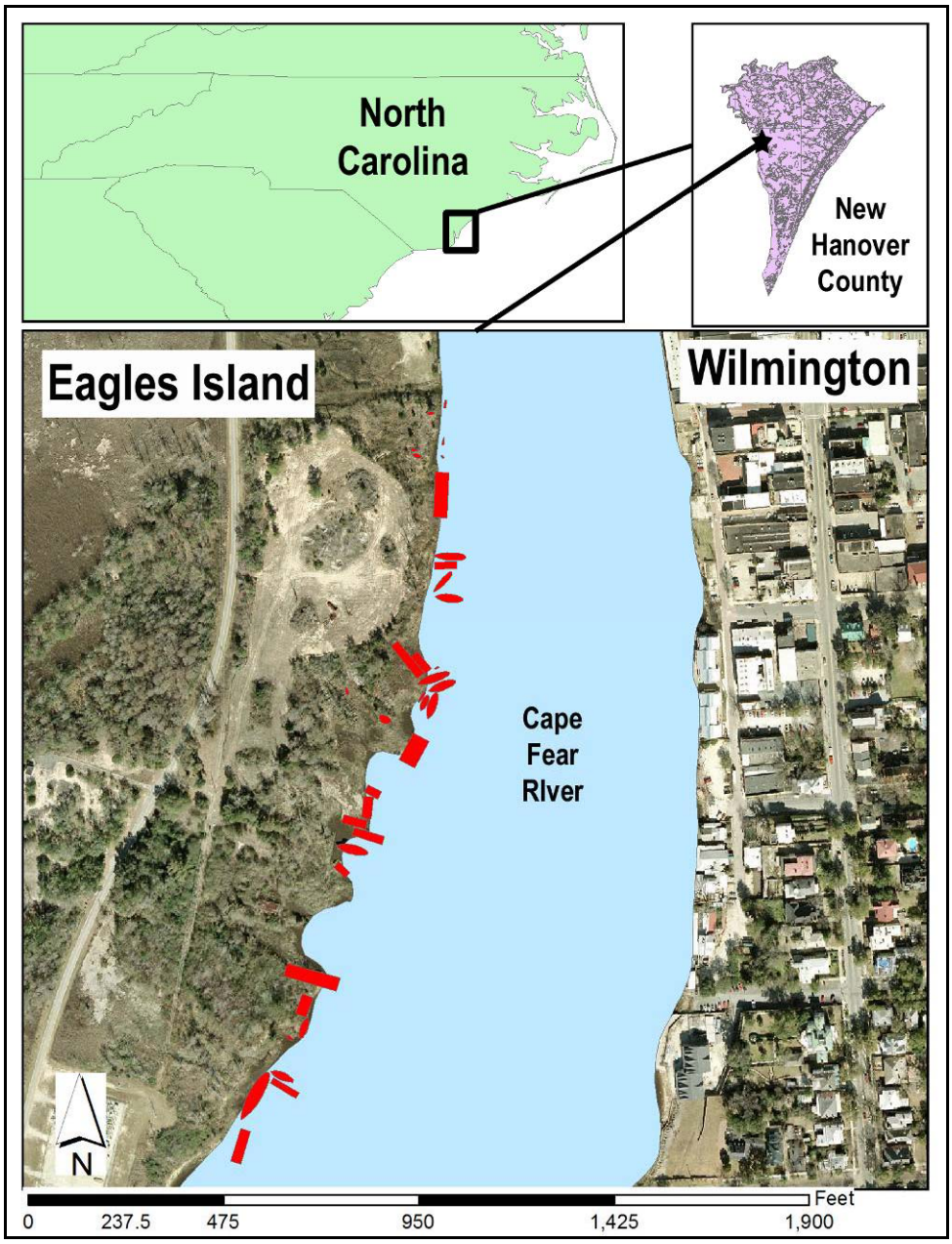


Figure 3.1: The research area for the project

The research consisted of three primary phases of inquiry: historical research, archaeological field work, and analysis. Researching the history of the region required locating and compiling all material historically relevant to the topic. The second phase consisted of field work conducted on the archaeological remains in Wilmington to gather

physical data pertaining to the vessels. The final phase required analysis of both the history and archaeology of the ships' graveyard to demonstrate the value of the site as a microcosm of society.

Historical Research

The initial phase of research required locating and compiling all historical material relevant to the topic. The importance of such a vast collection of historical documentation is to both obtain an accurate historical description of the port of Wilmington and to understand the role of the specific remains within the designated research area. In order to create an accurate history of the region, it was necessary to assemble all historical information relating to the history of Wilmington as a port town including development of both the culture and economy of the town. Gauging changes in Wilmington provided a context within which to analyze specific changes and patterns in the material record. Equally important, the development of maritime related industries through time was crucial to understanding the evolution of the port town of Wilmington and the growth and changes of the industries reflected in the abandoned material culture under investigation. A number of repositories held the materials necessary for the development of the historical research component.

J.Y. Joyner Library

The library at East Carolina University provided a wealth of information. A variety of books from the stacks provided the basis for writing a strong theoretical foundation to the history and archaeology portions of the research. The library's Special Collections held several important manuscript collections containing primary source

material, including the *Stone Towing Line Records, 1937-1960* (Stone Towing Line Records: Manuscript Collection #679). The Stone family operated a number of businesses along the shores of Wilmington and Eagle's Island dating from the late 1800s through the 1980s. The manuscript collection consists of two series; the first relating to operations of the ship chandler Oscar E. DuRant in Wilmington throughout World War I and the second consisting of correspondence concerning the Stone Towing Line. The correspondence within the second series frequently mentions the Line's oil and coal burning steamers and diesel tugs, a number of which are now abandoned along the shore of Eagle's Island. Additionally, information relating to daily operations, incident reports, World War II operations, tax information, and other pertinent historical information came from the records. The Stone Towing Company ran a considerable operation from its office in Wilmington and its site on Eagle's Island and knowledge of the history of that operation was crucial to understanding and evaluating industry along the Cape Fear River.

The North Carolina Collection provided the most extensive repository for primary and secondary sources. The stacks within the collection held a number of books, reports, and theses vital to compilation of a comprehensive history. The most helpful secondary resource, *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* Volume 1 Maritime History, provided an enormous amount of history relating to the Cape Fear River from prehistory through to modern times (Jackson 1996). The author utilized a number of primary source books from Wilmington writers,

extensive newspaper collections, and a number of secondary source history books written about Wilmington and its maritime history. United States Army Corps of Engineer reports also proved to be an invaluable source for assessing the development of the port of Wilmington. The reports contained shipping statistics and detailed descriptions of port facilities, including companies operating along the shores of the Cape Fear River in the Wilmington vicinity (The Board of Engineers for Rivers and Harbors 1935; 1940). Additionally, two dissertations in particular, "An Historical Geographic Study of North Carolina Ports" (Logan 1956) and "Geographic Factors in the Growth and Economy of Wilmington, North Carolina" (Randall 1965), aided in refining the historical geographic and economic analyses of the area.

Joyner holdings also included the list of *Merchant Vessels of the United States* or *Annual List of Merchant Vessels of the United States* beginning in 1908 and running through 1975 inclusive. Several volumes are not within the library holdings including the years 1940, 1942, 1950, 1966, and 1973. This Department of Commerce published series proved useful in aiding the determination of abandonment year for several vessels within the Eagles Island graveyard. Because a majority of the vessel names are unknown, this source mainly contributed to the history compilation of known vessels, namely, the Stone Tugs. However, the Stones did not insure vessels until 1951 (Theus 1951) and therefore most of the vessels are not listed in the publication. Additionally, the Stone Towing Company insured a number of vessels post-abandonment, and therefore the dates provided in the list did not accurately reflect the year of abandonment in each case.

The North Carolina Underwater Archaeology Branch (UAB), a unit of the Division of Archives and History in the North Carolina Department of Cultural Resources provided invaluable resources to aid in the collection of historical information and data. The UAB retains a management interest in the Eagles Island Ships' Graveyard and assisted in all aspects of research for the completion of the study. The UAB maintains extensive files with primary and secondary source information, archaeological investigation results, maps and images, and reports pertaining to the topic.

Archaeologists form the UAB nominated some of the remains on Eagles Island to be added to the National Register of Historic Places Wilmington Historic District in 1973. The UAB furthered their interest in the site conducting field work on Eagles Island for the first time in the summer of 1983 in order to document the wrecked and abandoned sites located within the boundaries of the Wilmington National Register Historic and Archaeological District. The UAB documented thirty-four sites along the shore of Eagles and three sites on the Wilmington side of the river (Lawrence 1985).

Based on the field investigations and historical research, the UAB staff created an extensive collection of information on each vessel abandoned on Eagles Island. The UAB assigned each vessel a Cape Fear River (CFR) designation number and maintains a file on each vessel with all related archaeological data and historical information, including newspaper clippings and photographs, in each file. The files are organized in sequential order, beginning with the Eagles Island abandoned vessels running from 0001 CFR through 0068 CFR.

In addition to specific information on each vessel, the UAB maintains files on the various industries and businesses that line the shores of the Cape Fear River. The files contain articles from the Bill Reaves collection pertaining to all activities associated with Wilmington. For the project, the author consulted files with the Industry and CFR headings. The industry files contained information on miscellaneous industrial endeavors in Wilmington and on Eagles Island, fishing, iron works, oil terminals, and marine railways. The files with the CFR heading contained information on specific railways and shipbuilding companies, Wilmington commerce, and general information.

The amount and breadth of information pertinent to this project within the UAB collection is unmatched by any other repository used for research. The detailed archaeological information provided a base from which to conduct further field investigations. The files of historical information aided in the creation of the framework to understand the history of Eagles Island and Wilmington.

New Hanover County Public Library

The Local History Room at the New Hanover County Public Library (NHCPL) maintained an extensive collection of newspaper clippings pertaining exclusively to Eagles Island. Like the UAB, the NHCPL holdings include files from the Bill Reaves collection. Nearly every article mentioning Eagles Island from the 1860s through the early 1970s is contained within the NHCPL Eagles Island folders. The author organized the articles by year and scanned them for project use and for the library's use. The information gained from the articles from the NHCPL sometimes replicated information from the UAB, but for the most part enhanced the historical database for the project.

In addition to the Bill Reaves file collection, the Local History Room maintains two comprehensive photographic collections, the Fales Photo Collection and the L.T. Moore collection. The photo collections, available for viewing on the library's website, provided images directly relating to the history of Wilmington and Eagles Island. In addition to providing images to include in the history sections of this thesis, the photos from the Local History Room collections provide concrete evidence for determining dates of abandonment of vessels along Eagles Island. A critical source for this type of site analysis came late in the research process as a new acquisition to the NHCPL. A series of historical aerial photos compiled by a local historian provide the most comprehensive physical overview of the Cape Fear River at Wilmington (Pleasants 2005). The author was able to obtain high resolution digital copies of the aerial images from the compiler of the collection which could be used to identify and date several abandoned vessels along Eagles Island.

Cape Fear Museum

The Cape Fear Museum houses a research library organized by topic. An Eagles Island folder contained only a small amount of information about the history of the island. A folder on tugboats highlighted the important role the vessel type played in the history of Wilmington. The file contained a significant amount of information including articles providing several dates of abandonment for vessels on Eagles Island (*Wilmington Morning Star* 02/07/1958). The tugboat folder also contained the senior class paper of Russell Stone, a member of the Stone family who eventually took over the business (Stone 1934). Another folder pertained specifically to the Stone Towing line Tugboats

and contained a Marine Survey of the Stone Towing fleet for insurance purposes (Theus 1951).

US Army Corps of Engineers

The Corps of Engineers played a significant role in the development of Wilmington as a port city and maintains the Wilmington District office in Wilmington, along with a field office on Eagles Island, south of the project research area. The Corps recently contracted and archaeological remote sensing and diver survey of the Wilmington Harbor waterfront and Northeast Cape Fear River. The Corps supplied the contracted report to the author, providing a significant amount of archaeological and historical information to the author (Hall 2004).

In addition, the Wilmington District headquarters has a library containing a large collection of materials pertaining to the history of projects from the Wilmington District. The most useful source within the library was the *Annual Report of the Chief of Engineers, United States Army* (United States Corps of Engineers 1867-Current). The series, published since 1867, contains an annual report on the Corps of Engineer activities in the Wilmington District, including Wilmington Harbor. The reports provide a significant amount of information about improvements to the river channel and harbor. Several government vessels are mentioned for their role in making improvements along the Cape Fear River including the *H.G. Wright* which is now abandoned on Eagles Island. Additionally, the reports provide detailed descriptions of commerce and the port facilities available at Wilmington each year. These descriptions create a framework to analyze the prosperity and decline of the maritime commerce in Wilmington.

Problems with Primary Source Materials

While the author consulted a considerable amount and variety of primary source material, there were major difficulties researching historical records. Most of the vessel identifications in the Eagles Island Ships' Graveyard remain unknown. Without knowing the name or vessel number, it is nearly impossible to conduct successful historical research. The identities of vessels abandoned on Eagles Island remain unknown because many were work vessels (i.e. the numerous barges) and had indistinct names, or were not important enough to the owners, and the citizens of Wilmington, to be recorded in newspapers or vessels registers. In some cases, archaeological measurements of vessels could be compared the historical record for identification purposes, but even that could be flawed because the archaeological remains may not accurately reflect the original dimensions of vessels.

Additional problems in vessel identifications arose because many of the identified vessels, such as the Stone Tugs, are known based on oral traditions. Archaeologists from the UAB conducted interviews with residents of Wilmington during their historical research in the 1970s and 1980s (Richard Lawrence 2005, pers. comm.). In talking to older residents of Wilmington, including the surviving Stone Brothers, the UAB archaeologists obtained identifications that may not be entirely accurate.

Archaeological Field Work

Performing field work provided a means of obtaining accurate archaeological data to combine with the historical research in order to demonstrate how the archaeological remains reflect the society of Wilmington. There were three main goals for the

archaeological field work: to create and analyze an accurate map of the abandoned vessels and related material on Eagles Island, to conduct individual site inspections, and in some cases create archaeological plans of specific vessels, and to thoroughly document the site photographically.

The author, professors, and other students conducted the field work in three phases between February and November of 2006. The first phase consisted of reconnaissance and familiarization with the site. The site spans a distance of approximately 2500 feet (833.34 yards) from north to south along the western bank of the Cape Fear River. Mud, marsh, tide, and other environmental conditions and cultural remains make moving through the site difficult. An initial reconnaissance trip included the author and student volunteers. The next reconnaissance trip took place aboard the North Carolina Underwater Archaeology Branch 24' Privateer, *Snap Dragon*, with state underwater archaeologist Richard Lawrence, UAB archaeological technician Julep Gillman-Bryan, and archaeologist Mark Wilde-Ramsing. The trip included a river tour viewing and learning about the history of the Cape Fear River and Northeast Cape Fear River. The group also investigated the sites on Eagles Island in order for those more familiar with specific history and data to identify and explain previously gathered information.

Figure 3.2: The UAB vessel used to conduct reconnaissance on the site and along the Cape Fear and Northeast Cape Fear Rivers

The second phase of field work consisted of site specific documentation and site mapping in conjunction with Dr. Nathan Richards spring 2006 HIST 6820 Field Methods course. The third phase of field work included additional site specific documentation to complete data collection on each individual abandonment and GPS documentation of the site in its entirety.

There were several limitations encountered while conducting field work. Many of the vessels are entirely submerged except at low tide, limiting the time of day and amount of time that could be spent on a site. Also, because the methodology did not include diving, portions of vessels that remained fully submerged even at low tide were not

photographed or positioned with GPS. In addition, vessels entirely submerged or too far in the channel to reach were not recorded at all (*John Knox*, Last One Wreck). Also, vessel remains on the Wilmington side of the river were either entirely submerged, or inaccessible due to waterfront construction (*A.P. Hurt, Blanchard*, Workboat Number 2, Skinner's Dock Wreck). Because no archaeological observations could be made, those vessels are not part of the analysis.

Graveyard Overview

A general map and overview of the graveyard and associated material was necessary to determine the spatial layout of the site and understand the chronology of the site formation. Several previous maps of the site exist, but, after conducting reconnaissance during the first stage of field work, it became clear that an updated map of the entire site was necessary to create a more detailed and accurate picture of the entire site.

Previous Site Plans

In conducting reconnaissance on the site and gauging the spatial layout, teams consulted maps from two previous projects (see Figures 3.3 and 3.4). The maps provided the approximate location of known abandoned vessels and aided crews in identifying locations and correlating known history and archaeology of vessels to their archaeological remains.

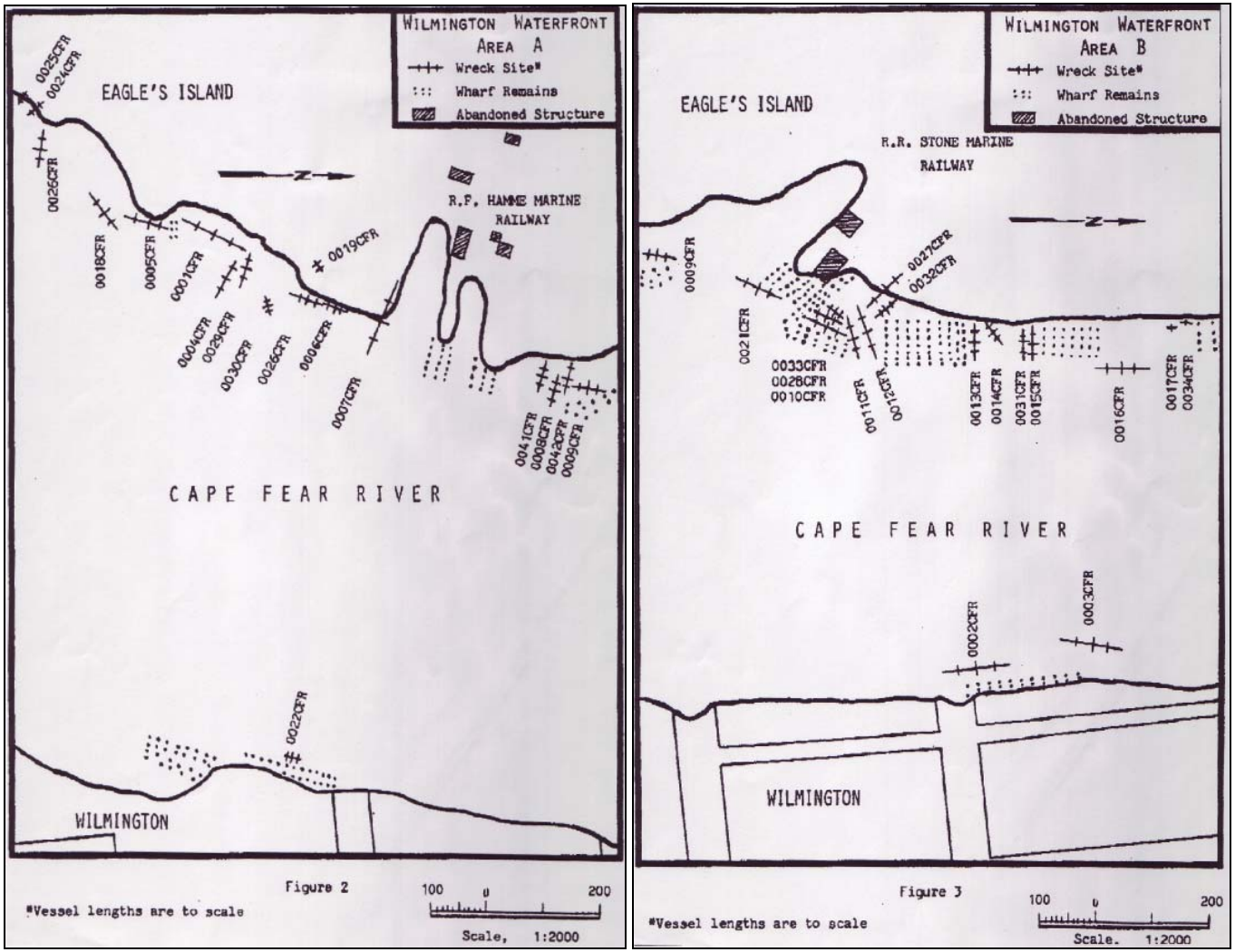


Figure 3.3: Maps of Wilmington waterfront remains from 1983 field work (Wilde-Ramsing, 1986).

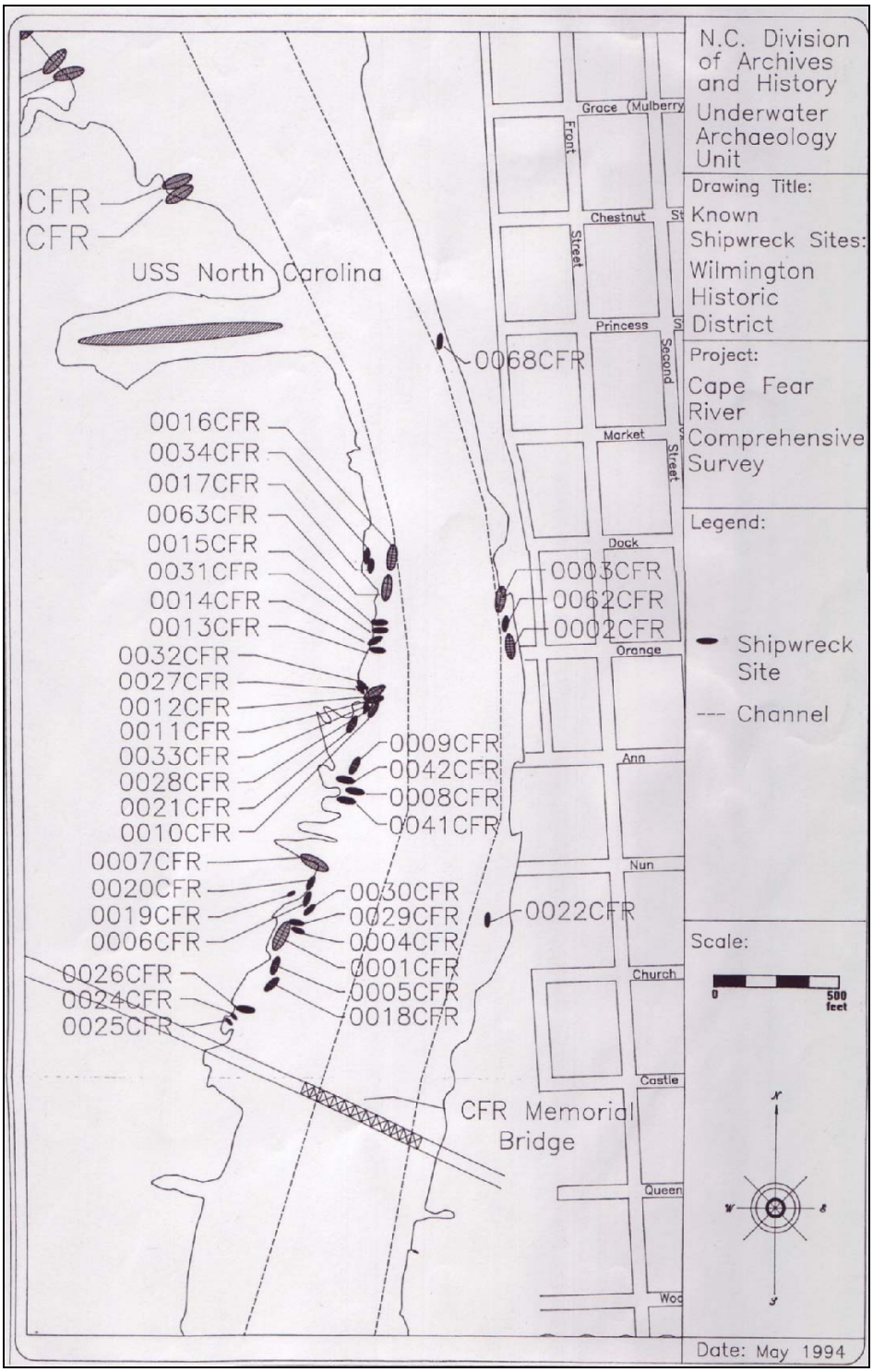


Figure 3.4: Map of Wilmington Waterfront from fieldwork conducted from 1993-1994 (Overton and Lawrence 1996:143).

Updated Site Plan

The goal of creating an updated site plan was to fill in gaps in previous research. A detailed and accurate site plan would aid in understanding the chronology of abandonment on the site and provide data for spatial analysis of the site remains. While the previous maps were useful for orienting throughout the site, the current project aimed to gain data with higher accuracy by using high-quality equipment and capturing location data on the abandoned vessels and associated material on shore.

The GPS team consisted of the author and two East Carolina University MA candidates, Matthew De Felice and Tiffany Pecoraro (Figure 3.5). The team worked daily from 1 November 2006 through 6 November 2006, spending approximately four hours per day on site, tidal levels and daylight allowing. The equipment, a National Park Service backpack GIS unit, consisted of a CSI MBX-3 beacon receiver which receives the free Differential Global Positioning System signals broadcast by networks of 300kHz radio beacons worldwide. The battery powered receiver uses the broadcast DGPS corrections and outputs differential correction data in standard industry format. For the Eagles Island project, the GPS team programmed the receiver's operating parameters to receive the signal from a nationwide DGPS beacon station in New Bern, North Carolina. The receiver powered the MGL-3 combined GPS/DGPS antenna, a single, compact unit which attached to the receiver. The antenna did not require a ground connection and therefore was ideal for conditions on Eagles Island. The team used a handheld Garmin GPS Map60CS interfaced with the DGPS and antenna to capture and store the corrected

DGPS data. Average accuracy using the DGPS is generally 1-5 meters, whereas with GPS average accuracy is about 17 meters.

The purpose of the high accuracy DGPS system was to collect a series of points on each feature on the site. The team collected points outlining the perimeter of the feature while spacing points approximately 1-3 meters from the previous point. In cases of associated material onshore, the team captured only one point to designate the location of the associated material. At times, natural barriers such as water depth and muddy marsh built up over the cultural remains prevented outlining a feature in its entirety, but the team took as many points as possible on the accessible parts of the feature.

Figure 3.5: The author capturing a GPS point and De Felice recording the point description and photograph information.

The author traced the outline of each feature, capturing points along the way. Each point name contained the name of the feature and the point number on the feature

(i.e. CFR001-01, CFR002-02, etc.). Pecoraro photographed each point for use with Photolink (see below). De Felice recorded the point name, feature on which the point was located, description of each GPS point and a description/orientation of the accompanying photograph (see Figure 3.6).

Recorder Name:			Location:	Date:
GPS Point	**Feature Description**	**Photo Orientation**	**Point Description**	**Image Number**

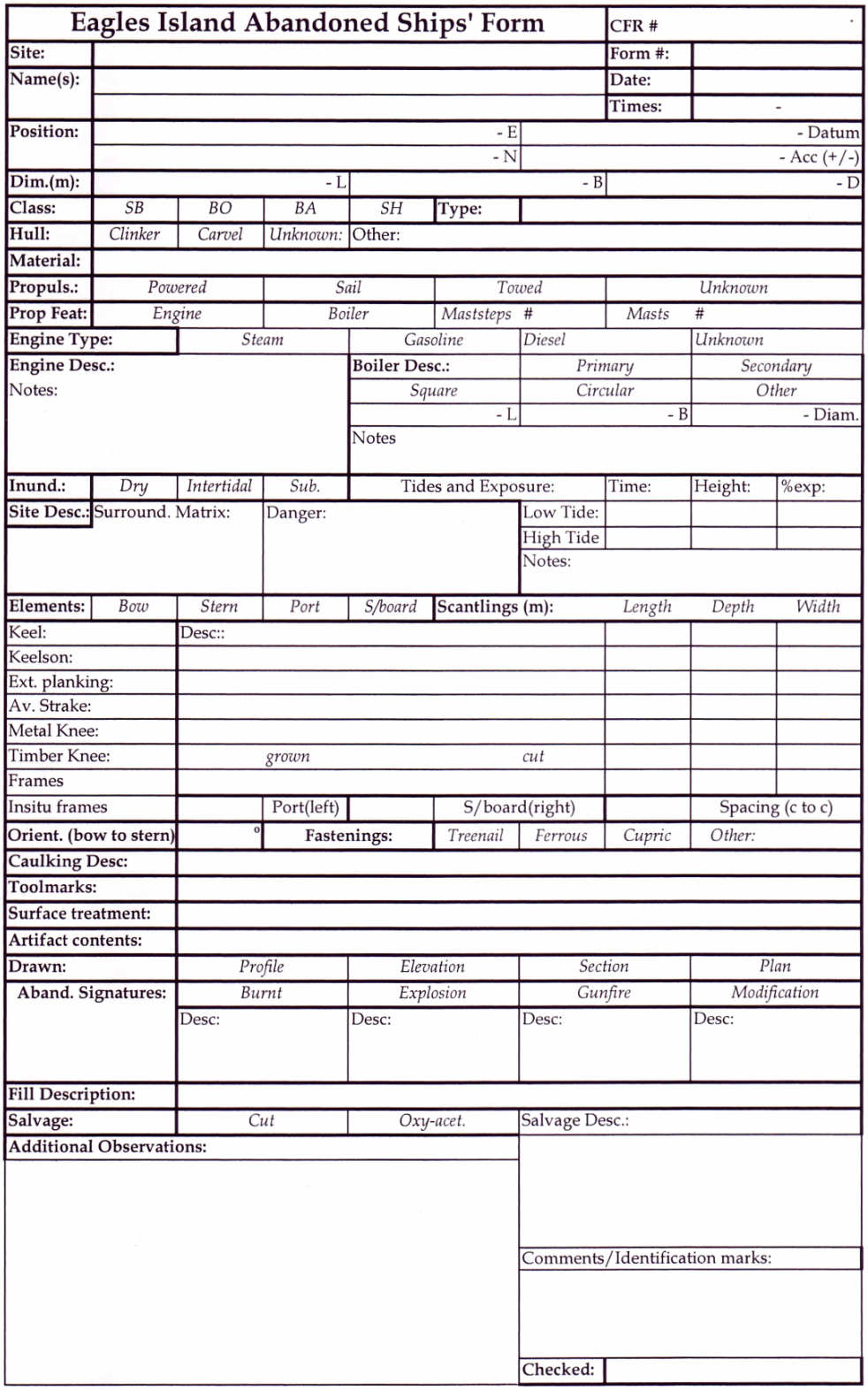
Figure 3.6: The GPS data collection form

At the end of each day, the team uploaded data from the handheld Garmin GPS unit and transcribed field forms into digital format. Additionally, daily GPS data was imported into the Eagles Island ESRI ArcGIS project.

Site Inspections

In addition to creating an updated overall site plan, teams inspected sites individually to obtain specific information pertaining to individual sites. Teams conducted site inspections on three different occasions. The first site inspection took place under the auspices of Dr. Nathan Richards's field methods course. Each student was assigned a vessel to document, conduct historical research, and write a site report. Sites assigned to students included: 0010 CFR *Stone 5*/*Sadie E. Culver* (Dodds 2006), 0014 CFR *Stone 3*/*Isabel* (Damian 2006), 0015 CFR *Argonauta* (Friedman 2006), 0027 CFR *H.G. Wright* (Hoyt 2006), 028 CFR *Stone 4*/*Eva* (Tock 2006), and 0041 CFR Intact Tug/*Isco* (Leuchtmann 2006). The next field excursion consisted of the author, Dr. Richards, and other student volunteers. The final field excursion took place simultaneously with the GPS data collection and consisted of the GPS team members.

Each site inspection consisted of filling out a site documentation form, extensive photography, and in some cases, mapping to scale or drawing vessel remains or machinery. The site form, adapted from Richards (2002) and Milne, *et al.* (1998), provided a means for collecting a variety of comprehensive data for each abandoned vessel or related material (Figure 3.7). While conducting site inspections, six additional sites or related material were located. Teams assigned identifications to the additional finds beginning with the number 1001 CFR and conducted a full inspection and photographic documentation on additional sites.



Eagles Island Abandoned Ships' Form										CFR #		
Site:										**Form #:**		
Name(s):										**Date:**		
										Times:	-	
Position:							- E				- Datum	
							- N				- Acc (+/-)	
Dim.(m):			- L				- B				- D	
Class:	*SB*	*BO*	*BA*	*SH*	**Type:**							
Hull:	*Clinker*	*Carvel*	*Unknown:*	Other:								
Material:												
Propuls.:	*Powered*		*Sail*		*Towed*			*Unknown*				
Prop Feat:	*Engine*		*Boiler*		*Maststeps #*			*Masts #*				
Engine Type:		*Steam*		*Gasoline*		*Diesel*			*Unknown*			
Engine Desc.: Notes:				**Boiler Desc.:**		*Primary*			*Secondary*			
				Square		*Circular*			*Other*			
				- L		- B			- Diam.			
				Notes								
Inund.:	*Dry*	*Intertidal*	*Sub.*	Tides and Exposure:				Time:	Height:	%exp:		
Site Desc.:	Surround. Matrix:		Danger:				Low Tide:					
							High Tide					
							Notes:					
Elements:	*Bow*	*Stern*	*Port*	*S/board*	**Scantlings (m):**			*Length*	*Depth*	*Width*		
Keel:	Desc::											
Keelson:												
Ext. planking:												
Av. Strake:												
Metal Knee:												
Timber Knee:	*grown*				*cut*							
Frames												
Insitu frames		Port(left)			S/board(right)				Spacing (c to c)			
Orient. (bow to stern)	°	**Fastenings:**		*Treenail*	*Ferrous*	*Cupric*	*Other:*					
Caulking Desc:												
Toolmarks:												
Surface treatment:												
Artifact contents:												
Drawn:	*Profile*		*Elevation*		*Section*			*Plan*				
Aband. Signatures:	*Burnt*		*Explosion*		*Gunfire*			*Modification*				
	Desc:		Desc:		Desc:			Desc:				
Fill Description:												
Salvage:	*Cut*		*Oxy-acet.*		Salvage Desc.:							
Additional Observations:												
					Comments/Identification marks:							
					Checked:							

Figure 3.7: Teams filled out a site inspection form for each site located on Eagles Island

Descriptions and Identifications

The site descriptions included dimensions, vessel class and type, construction techniques, construction materials, construction element descriptions, propulsion, and machinery specifications. These descriptive features provided evidence to corroborate the historical and archaeological records. For instance, there is only one known metal hulled vessel abandoned on Eagles Island, *Argonauta*, and therefore, the only vessel with the metal hull in the archaeological remains must be *Argonauta*.

Figure 3.8: Student Adam Friedman of the HIST 6820 course documents the iron hulled *Argonauta*, the only metal hulled vessel abandoned on Eagles Island.

Site descriptions provided concrete evidence to confirm or deny previous identifications on Eagles Island. The descriptions also provided the means to identify previously unidentified features based upon the historical record, and identify newly discovered vessels and features.

Site Formation

The field work also consisted of documentation for site formation analyses. The purpose of the updated site plan is to provide information about the chronology of vessel deposition on the site. In addition, individual feature descriptions provide specific information pertaining to abandonment and salvage behaviors associated with individual vessels and associated materials. The site survey forms provided options to identify signatures on the archaeological remains to determine the means used in vessel abandonment such as burning or structural modifications. The forms also prompted documentation teams to identify archaeological signatures of salvage, such as oxy-acetylene or cutting. In addition, it was vital to record associated features that might indicate purposeful abandonment or reuse, such as pilings on the river side of an abandoned vessel. Any signatures associated with abandonment, salvage, or reuse were recorded on site forms and photographed when possible.

Site Plans

The students who recorded vessels for the ECU HIST 6820 course each produced a scaled drawing of the sites to which they were assigned (see Appendix B). The students mapped the sites using traditional methods of trilateration and baseline offsets. Methodology for each student varied slightly, but the majority of students set a baseline either down the middle of the vessel, or offset to either the port or starboard side of the vessel, parallel to the vessel's centerline, and took offset or trilaterated measurements along the lines of the surviving hull structures. Also, the students measured and documented the locations of prominent features such as machinery or remaining interior

construction features. The purpose of the site plans was to create a detailed plan view of each of the six sites in order to identify signatures of use, abandonment, salvage, and reuse present in the modern archaeological context.

Photographic Documentation

Photographic documentation of the abandoned sites took place on each visit to Eagles Island. While duplicate photographs exist, excessive photographic documentation guaranteed a large array of photographs with which to conduct photographic analysis on the sites. Volunteers used ECU Program in Maritime Studies (PMS) 5.1 Mega pixel Sony Cybershot cameras during the February and March 2006 visits to Eagles Island. The author and GPS crew used Canon PowerShot SD550 Digital Elphs in association with a WP-DC9 waterproof housing on loan from the National Park Service Submerged Resources Center on the October and November field excursions.

There were three main goals associated with photographic documentation of the site. The first was to document the individual sites from the macro environment to the micro environment. Photographic documentation ranged from overall site photos, photographs of specific construction or mechanical features on sites, and photographs of specific behavioral signatures on sites. The second goal of photographic documentation was to maintain images of the methodology used in fieldwork. The third goal of photographic documentation was for the purposes of PhotoLink, which will be discussed below.

Analysis

The analysis portion of the methodology consisted of merging the historical and archaeological information to answer the primary and secondary questions set forth in the hypothesis. The author conducted analysis of collected data according to two primary areas of inquiry, GIS analysis and data integration and interpretation.

Geographic Information Systems

The ESRI ArcGIS 9.1 software out of Redlands, California consists of a combination of computer programs into which data can be input in order, "to view and manage information about geographic places, analyze spatial relationships, and model spatial processes" (ESRI Support Center 2006). The software provides a means of gathering and organizing data so it can be displayed and analyzed more easily by the user.

PhotoLink

GPS PhotoLink software produced by Geospatial Experts of Thornton, Colorado allows the integration of digital images into the ArcGIS database. The software uses a time correction calculation to match the photograph capture time to a known GPS point capture time, linking the known point location to the associated photograph of that point. After linking the phographic file to the associated GPS point, the photograph was linked to its corresponding point in the ArcGIS database.

Once linked and integrated in to the database, PhotoLink, in association with ArcGIS, enables users to view a photograph of any captured point by scrolling over that point with the mouse. When the mouse sits on a point in the GIS project, a thumbnail

image of the point and any associated information the user would like, pops onto the screen. The use of PhotoLink for this project allowed for integration of positional data and photographic data, both of which are critical to analysis of the site for site formation and behavioral analysis. The link between the two creates a framework for facilitated analysis.

Processing

Processing the GIS consisted of analyzing the spatial data in order to determine the chronology of abandonment. To do this, the author connected the various points associated with each vessel to one another, creating the outline of the accurate shape and dimensions of vessels abandoned on Eagles Island. After creating the outlines of vessels and associated sites, the author and GIS processors created maps in GIS which allowed for better understanding of spatial analysis of the geographic data. Also, processing of the GIS produced several maps of the collected data.

Data Analysis

After creating the GIS for spatial analysis and map creation, further data analysis could be conducted. The combination of primary source data with archaeological data from GIS and site specific documentation created a base of information upon which to apply the theoretical framework to answer research questions relating to the Eagles Island Ships' Graveyard.

Historical and Archaeological Correlations

Correlating the historical record to archaeological data was facilitated by the creation of the GIS database. The maps created in GIS helped suggest a timeline of

abandonment, which could then be compared to the historical record. In addition, the GIS allowed for spatial analysis based on the historical land use of Eagles Island. Additional correlations could be made from more general archaeological conclusions stemming from field work combined with the comprehensive historical research and documentation of Eagles Island, Wilmington, and broader contexts of analysis.

Specific Archaeological Analysis

Site specific analysis, when viewed as a whole throughout the site, created a means of recognizing and assessing patterns of behavior associated with use, abandonment, salvage, and reuse. These patterns revealed behaviors exclusively associated with Eagles Island and provided a means of answering behavioral questions on a localized level. Additionally, conclusions from Eagles Island, when compared to similar projects in other areas provided a means of analyzing behaviors in a wider regional, national, and international context. Theories used to analyze the processes and behaviors at Eagles Island could be tested based on the analytical results from the local analytical results and the wider context of analysis.

Conclusion

By conducting historical research and archaeological field work, a comprehensive analysis of the Eagles Island Ships' Graveyard took place. Correlating the historical and archaeological record provided a means of demonstrating how the abandoned vessels and associated material on Eagles Island represent a microcosm of the cultural, economic, and technological characteristics of Wilmington, North Carolina.

CHAPTER FOUR: WILMINGTON HISTORY

Introduction

A 1914 pamphlet entitled *The Gateway of Progress* claimed, "As a distributing point Wilmington has no superior on the South Atlantic Coast. It is the gateway of North Carolina, and should be availed of by all the principal cities in the Carolinas" (Wilmington Chamber of Commerce 1914:10). Granted 640 acres each, John Maultsby and John Watson settled the land near the confluence of the Cape Fear River and Northeast Cape Fear River in 1731. Realizing the value of the location, other settlers joined Maultsby and Watson on their land in the following year with intentions of establishing trade along the rivers and tributaries of the area. In 1740, the North Carolina Assembly passed an act formally designating the town of Wilmington. The early growth of the town was a result of the products derived from the abundant pine forests of the surrounding area. Initially, the crown subsidized the production of naval stores including tar, pitch, and turpentine. Shingles, barrel staves, and lumber also came from the area. Shipping and trade entirely sustained the economy and life in the Cape Fear region, and the majority of river commerce from local areas, the West Indies, and Europe passed through Wilmington.

Inhabitants settling in North Carolina purchased property based upon its proximity to navigable streams for transport and trade (Jackson 1996:23-24). Small vessels including canoes, row boats, rafts and flats provided the earliest means of transporting goods. The creeks, sounds, and rivers of southeastern North Carolina became natural highways for moving goods to the coast for further transport. The

waterways eventually grew into major channels of commerce for the state, retaining their commanding position in the trade network for nearly two centuries (Johnson 1977:9-18). By the late nineteenth century, the maritime activity of southeastern North Carolina propelled Wilmington to the forefront of commercial success and aided in making it the most populous city in the state (Watson 1992:2).

Though Wilmington experienced tremendous growth throughout its years as a major trade center for the state of North Carolina, it also experienced significant decline. In its early years, Wilmington's superiority over other state ports could be seen in its population and development as a town and commercial center. After the Civil War, Reconstruction and industrialization affected the commercial prominence of the port both positively and negatively. Though Wilmington generally boomed in wartimes, the port also experienced significant hardships through the twentieth century. Eventually, the Port City's commercial significance declined significantly, trailing behind Savannah, Charleston, and Norfolk in later years (Watson 1992:11). The various commercial industries that lined the shores of the port town reflect both the growth and decline throughout decades of change locally, regionally, nationally, and internationally. The developments of commerce and industries that lined Wilmington's shores have a direct association with the maritime history of the port city. Outlining the changes and developments of the port from just after the Civil War through the 1960s will provide a narrative of the social, political, economic, and technological history of the area. The historical narrative of Wilmington and Eagles Island will create a framework of events indicative of the causes that led to watercraft abandonment in Wilmington.

Post-war Recovery and Commercial Development

The port town of Wilmington gained both capital and population during the Civil War while cities nationally suffered from a loss. Increased trade activity brought more goods and wartime price hikes brought greater profits, generating a large capital gain for Wilmington. Also, an influx of people looking for work created a larger labor force and aided the production and economy of the town. Throughout the country, civilians suffered from a diversion of resources to military use. Meanwhile, Wilmington was amply supplied with both military and private resources, including luxury goods that came through the blockade.

Wilmington entered reconstruction economically strong from the war. Merchants reestablished trade connections quickly because of their continued activity during the war (Jackson 1996:30). A lively coastwise trade resumed, consisting chiefly of schooners ranging from 150 to 600 tons (Figure 4.1). Additionally, a larger volume of business in foreign bottoms, including vessels of British, German, and Scandinavian origin, initiated direct trade from Wilmington to Europe and the West Indies (Sprunt 1916:501). Because of its commercial climate, Wilmington possessed a cosmopolitan air that contrasted sharply with the rural agrarianism and isolation of the rest of the state. This attitude allowed Wilmington to resume state dominance in ocean commerce, prohibiting the smaller ports of Albemarle, Pamlico, and Beaufort, which experienced idleness through the war, to recover commercially. By the end of the century, foreign trade through the smaller ports was virtually non-existent (Watson 1992:104).

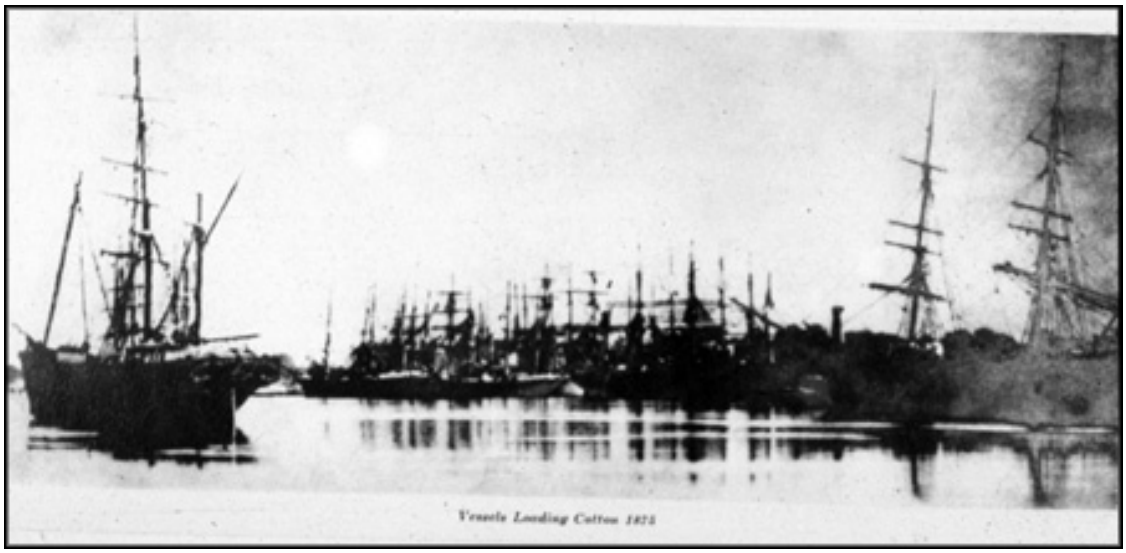


Figure 4.1: Vessels loading cargoes in Wilmington, 1875 (Image Courtesy of the Dr. Robert M. Fales Collection, New Hanover County Public Library).

Wilmington received valuable cargoes in return for a vibrant coastal and international export trade. By the 1870s, the Port City of North Carolina could be considered a trade metropolis in the southeastern United States:

> [I]t will be seen that we furnish cargoes of everything required in the markets of the West Indies and South America, with perhaps the single exception of flour, which will soon be within our grasp. Hence we are enabled to furnish full cargoes outward, and the return voyage with cargoes of sugar, coffee, fruits, molasses and other tropical products would be laid down in our market cheaper than in any other on the coast. Again, being 'headquarters' for spirits of turpentine, rosin, tar, pitch, lumber, timber, etc., we are enabled to furnish the European markets with these products on the best terms and to receive cargoes in return of their products and manufactures laid down at as low cost as in any other port (Wilmington Chamber of Commerce 1872:20-21).

The resumed prewar activities pushed naval stores and lumber as the major export items for the region (see Table 4.1). The naval stores recovery made Wilmington the leading exporter in those goods. Companies housed and shipped naval stores from the eastern shore of the river and a significant industry of distilleries and mills occupied the

western shore on Eagles Island. The distilleries proved to be extremely active with countless reports of fires throughout final three decades of the century. The destructive fires warranted enough concern to establish an "Eagle Island Fire Company," and to require the movement of a fire engine onto the west side of the river: "The Engine No. 2, known as 'Fire King,' is the one selected for the purpose, and is said to be in good order…It is understood that the company to man this engine will be subject to the regulations of the city Fire Department, but that the engine will only be used on that side of the river" (*Wilmington Star* 07/26/1871). Wood and wood products proved to be the most valuable of the city's exports in the decades following the war with nearly every port with which Wilmington traded receiving the popular cargoes (Watson 1992:106).

Year	Spirits of Turpentine (Casks)	Rosin (Barrels)	Tar (Barrels)	Crude (Barrels)
1860	147,962	497,557	49,176	75,723
1866	57,007	343,451	37,730	30,523
1870	101,855	509,673	60,197	16,187
1874	125,925	689,289	68,619	15,595
1880	102,725	447,710	53,441	3,356
1888	61,626	351,827	68,865	18,171

Table 4.1: Naval Stores Exports from Wilmington (Watson 1992:107)

Cotton exportation also became significant in the post-war recovery effort (see Table 4.2). Cotton distribution from North Carolina's primary port began before the war, in small amounts, but steadily increased in value after the war. The Chamber of Commerce reported, "The production of Cotton in the State has been very largely increased, and although no accurate figures can be given…it is believed that the crop amounts to at least 200,000 bales. At this port is handled cotton from Georgia and South Carolina, as well as our own State" (Wilmington Chamber of Commerce 1872:20-21).

Despite steady growth, cotton exportation did not reach prominence until improvements on the river allowed for larger international vessels. Subsequent to harbor improvements in the 1880s, foreign trade in cotton comprised two-thirds or more of the city's exports (Watson 1992:104). Insurance maps from 1884 and 1889 reveal that naval store refineries and distributors, lumber mills, and cotton companies occupied the entirety of the Wilmington waterfront on both sides of the river (Sanborn Map and Publishing Co. Limited [SMPC] 1884:2, 4, 6; Sanborn Map and Publishing Co. Limited [SMPC] 1889:8, 9, 11, 12, 14).

Year	Domestic	Foreign	Total
1866	24,492	162	24,654
1868	31,828		31,828
1873	35,016	4,634	39,650
1875	53,123	18,140	71,263
1880-1881	50,042	69,810	119,852
1884-1885	28,282	65,862	94,144
1887-1888	47,120	121,903	169,023

Table 4.2: Cotton Exports in Bales (Bonitz 1889)

In addition to its maritime commerce, the port of Wilmington thrived after the war as a result of railroad development. "During Reconstruction there was no more important railroad center in North Carolina than Wilmington," the home of three major railway companies which carried goods from vast interior regions to the port (see Figure 4.2; Evans 1967:185).

Figure 4.2: Rail yard leading to Main Terminal in Wilmington with waterfront in background (Image Courtesy of the Dr. Robert M. Fales Collection, New Hanover County Public Library).

The first railroad to Wilmington was the Wilmington and Weldon Railway, built in 1840. At the time of its completion, the track spanned 161.5 miles and was the longest single line in the world (Jackson 1996:28). At Weldon, the railroad connected to another line leading further into major cities in Virginia. Because it spanned through the rich Roanoke Valley, the rail line provided an economical means for attracting cotton and wheat to Wilmington as opposed to the port at Norfolk. The success of the rail line stimulated commerce and encouraged merchants to build additional railroads including the Wilmington and Manchester. That rail line tapped inland resources of lumber and naval stores in considerable quantities. Also, the Wilmington and Manchester line became a link on a major north-south railway and provided the only connection between eastern North Carolina and South Carolina. The third line was the Carolina Central Railroad, a 268 mile track at the time of its construction prior to the Civil War. The Carolina Central went through the Piedmont and ran to the base of the great Blue Ridge.

The line traversed Piney Woods which provided naval stores in warm months and cotton during the cooler months (Evans 1967:185-192).

Persisting Port City

Wilmington managed to maintain itself as an active distribution center and endured the labor stress felt elsewhere in the later decades of the nineteenth century. While workers began to leave the rural outposts of North Carolina farms and plantations, Wilmington's workforce grew and by 1890 Wilmington boasted a population of nearly 25,000 people, one of the highest populations in the state (GEOSTAT Center: Collections [Database Online] 1995). Despite decline in the surrounding rural communities, Port City merchants continued to develop their commercial industries as a result of increased labor and increased production. In the last decade of the nineteenth century, Wilmington merchant Alexander Sprunt was possibly the largest compressed cotton export house in the United States (Watson 1992: 110). In his history of Wilmington, James Sprunt (1896:XVII) described his prosperous family business near the turn of the century:

> The property includes 420,000 square feet of warehouse and dock space, with storage capacity of twenty thousand bales of cotton. Two of the largest Morse Compressors of ninety inch cylinders, are kept going from the beginning to the end of the cotton season. Their capacity is 3,000 bales in twenty-four hours, and more than a million bales of cotton have been pressed by them during the past fifteen years, with scarcely a break of serious consequence. The plant is said to be the most convenient and complete of its kind in the United States.

By 1908, the company operated six presses and employed thousands of workers (Sprunt 1896:110).

Sprunt was also innovative in pioneering a direct connection to European ports from the Wilmington wharfs, transforming the company and Wilmington into a potent

force in the Atlantic mercantile world. Sprunt described the primitive system of marketing cotton in the years immediately following the Civil War to the Interstate Commerce Division in Washington, DC:

> Up to the year 1875 the movement of the cotton crop in North Carolina, South Carolina and Georgia (from which we draw our business), depended largely and almost entirely upon factors…The Factor received and stored the farmers' consignments of cotton and sought at his convenience a buyer at the port. The Factors' charges including his commission aggregated at least $1.50 per bale, often more than that. The port buyer, in turn, shipped the cotton North at a profit to himself of about $2.00 a bale margin and commission. The Receiver of this cotton in the North made *his* profit, sometimes amounted to as much as $5.00 a bale, by selling it to a northern mill or by exporting it to a foreign market. By this process the farmer paid three intermediaries $6 to $8 per bale-a burdensome tax on his well earned product (Killick 1981:146-147).

Initially, Sprunt began making changes in compresses, warehouses, and wharves on the Wilmington waterfront to increase the efficiency of the trade. Sprunt classified, sorted, and recompressed shipments for overseas directly on the shores of the Cape Fear River. The Sprunts improved the compress facilities and updated the machinery to increase efficiency and decrease costs.

Another major advancement came in the form of shipping. Beginning in the 1870s, the Sprunts, associated with naval stores at the time, began direct trade to Europe. Starting in the early 1880s when the Sprunts shifted the commercial focus to cotton, international trade replaced the typical coastal trade, and steamships replaced the traditionally utilized sailing vessels (Figure 4.3). The Sprunt company took over the movement of cotton from the farm to the destination port, decreasing costs per bale (Killick 1981:147-148). The increased efficiency and lower costs allowed the Sprunts to move larger volumes. James Sprunt established direct business relations with foreign

consumers to purchase the quantities of cotton, rather than go through importing houses (Killick 1981:154). Alexander Sprunt and Son revolutionized the way Wilmington merchants did business when it began to open branch offices in European cities in 1905. Eventually, the Sprunts had branches in Liverpool, Bremen, Le Havre, Rotterdam, and Barcelona and had strong connections with firms in Italy Killick 1981:158). Alexander Sprunt and Son entirely changed the face of business in the port of Wilmington through commercial industrialization and innovations in marketing that made Wilmington a competitive port in an international market.

Figure 4.3: Alexander Sprunt and Sons Co., Champion Compress, loading cotton into English Steamer in 1915(Image courtesy of the Dr. Robert M. Fales Collection, New Hanover County Public Library).

Harbor improvements played a major role in the development of the port through the latter decades of the nineteenth century when commercial growth was at a peak in Wilmington. Congress adopted the original project for the Cape Fear River in 1829, recognizing the advantageous location as a motivation for improvement (The Board of

Engineers for Rivers and Harbors 1935:120). After the Civil War, the Corps of Engineers renewed efforts to improve the vital waterway. In 1870, Congress appropriated $100,000 for a three phase improvement project for the Cape Fear River. The Corps began by closing New Inlet and nearby swashes to prevent sand from washing into the river and collecting on the bar, inhibiting the passage of large vessels. The Corps also removed natural obstructions and artificial "Yankee Catchers" placed in the river by Confederates to block Union vessels from the river (Figure 4.4). Finally, the Corps dredged the channel to a depth of twelve feet (Hartzer 1984:32-33).

After completing the closure of New Inlet near the mouth of the Cape Fear River in 1881, the Corps of Engineers began a serious dredging effort along the length of the river to Wilmington and beyond. In the Rivers and Harbors Act of 1881, Congress adopted a project for a channel 16 feet deep and 270 feet wide from the bar outside the mouth of the river, up through the 30 mile channel to Wilmington. To maintain the channel, the Corps had to run constant re-dredging projects. With each new project, the desired depth and width of the channel increased as shipping and vessel sizes increased. In 1890, the Corps further increased the depth of the channel to twenty feet (Hartzer 1984:46-48).

In 1881, Congress also appropriated $30,000 for river improvement above Wilmington. The Corps cleared snags, dredged, and built jetties along the river, but Fayetteville residents called for additional improvements. In 1902, an act from Congress provided $1,350,000 for the construction of three locks and dams on the Cape Fear between Wilmington and Fayetteville. The Corps approached the plan with trepidation

believing the river to be unworthy of such considerable improvement. Fifteen years after the initial appropriation, despite the high costs and significant problems, the Wilmington District engineers completed two identical locks between Wilmington and Fayetteville, creating nearly an eight foot depth between the two cities.

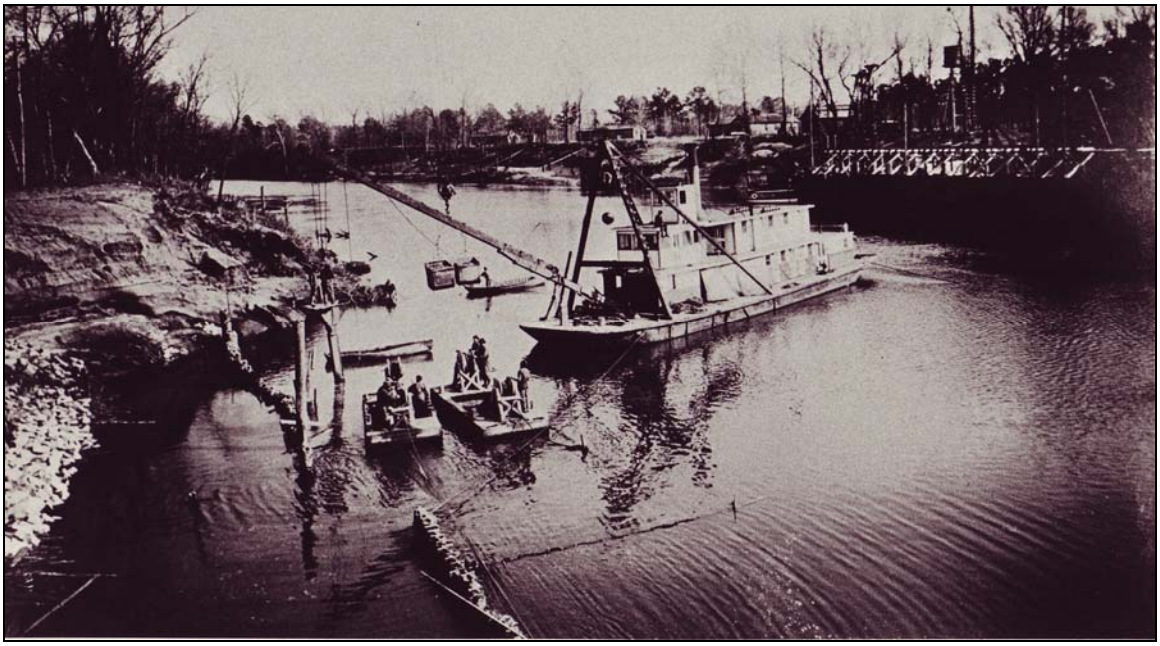


Figure 4.4: Corps of Engineers snag boat *H.G. Wright* making improvements on the Cape Fear River (Image courtesy of the North Carolina Underwater Archaeology Branch).

Decline-The Port City's Fall from Grace

After a long history of success as a major maritime center in the southeast, shipping in Wilmington began to decline towards the end of the nineteenth and beginning of the twentieth centuries. A number of causal factors contributed to the dramatic commercial decline and created an unstable atmosphere for shipping in which commerce suffered significant distress. Primarily, the deterioration of industries from which Wilmington drew its export base threatened the national and international status of the port. Naval store production and shipping shifted to South Carolina and Georgia, and

timber exports waned (Randall 1965:39-43). The depletion of considerable local resources of pine in addition to the reduction in wooden sailing ship construction significantly reduced supply and demand of timber and naval stores exports (Jackson 1996:30; see Table 4.1, there is a considerable decline in all naval store products beginning in 1880 and continuing through the decade). Cotton production and exportation compensated for the declining naval stores market, though cotton failed to recover the stalled export economy (Watson 1992:107). Despite its status as the primary export for the port after the decline of wood products, cotton exportation from Wilmington was fourth behind other southern ports exporting the product. At the same time, imports, mainly in fertilizer materials, were going up. In 1905, for the first time in Wilmington's history, domestic trade reached a balance of imports and exports, instead of leading with exports (Watson 1992:130-140).

Other companies around the United States slowly began to eclipse the production and output of Wilmington merchants. As a geographical analysis of Wilmington notes, "[A]fter experiencing steady growth throughout most of the nineteenth century, Wilmington all but ceased to grow during the first two decades of the twentieth century" (Randall 1965:43). In 1900, exports valued nearly $11 million while imports scarcely reached $100,000. In 1914, while exports were down, imports increased to nearly $2 million. Wilmington companies did not have the manufacturing or distribution capabilities to compete with some of the extremely large companies forming throughout the South at the time. Additionally, big businesses continued to grow, forcing smaller businesses to suffer; some small industries attempted to expand item production to reach

a broader base in order to compete with big business. Wilmington merchants generally did not do that. Major local companies, such as Alexander Sprunt and Sons, adhered to one item (Sprunt 1916:595).

In 1905, Wilmington shipping compared favorably with that of Norfolk and Charleston. In the following decades, the tonnage going through Wilmington increased slowly over preceding years, but no longer compared to that of the surrounding major ports because of regional rail development (Logan 1956:123). In the 1890s northern financiers consolidated major railroad lines throughout the South. In 1892, the consolidation forced the exclusion of Wilmington as a stop on any major North-South line. The consolidations left four companies in control of all primary and short lines throughout North Carolina and accelerated the declining role of the port in the region.

The major inland industries of North Carolina shipped their goods to Norfolk and Charleston on the consolidated major lines. The superiority in technological innovation and commercial importance of ports in Virginia and South Carolina caused a diversion of the cargoes necessary to insure frequent sailings from the port of Wilmington (Randall 1965:40-43). Modest industrial growth in the Piedmont in North Carolina starting in the 1890s slightly compensated economically for the absence of industrialization in eastern North Carolina, including Wilmington. But, because the industrial connection carried products away from the port of Wilmington, the city experienced a significant decline in exports. In 1915, for the first time in the history of the port, Wilmington's import tonnage exceeded its export tonnage, a trend that persisted relatively regularly from that point forward (Watson 1992:141).

The World War I Era-A Stalled Decline

On the eve of World War I, with a declining economy and a reversal of the traditionally high exports and lower imports, Wilmington began to lose the remaining hold it had over the export economy: the direct trade line with major European cities. The total value of exports fell over $14.5 million dollars from 1914 to 1915 (Sprunt 1916:595). With the onset of the war, Wilmington lost the German cotton market, a major portion of the total cotton exports. Postwar recovery of the international market was difficult and forced Wilmington into further decline after a short wartime boom. Consequently, cotton farming and textile manufacturing industries in the state suffered from severe deterioration throughout the post World War I decade. North Carolina farmers suffered through the 1920s, and speculation in the latter part of the decade augmented their suffering (Badger 1981:1-2).

Another major causal factor for decline was Wilmington's deficiency in contemporary industrial innovation. Starting before the Civil War, industrialization and modernization, stimulated by an increased population (and therefore labor force), led to a rise in manufacturing and urbanization nationally (Bruchey 1975:1-2). Manufacturing developed in geographic regions with little agricultural prospect such as New England where profitable land was scarce (Atack and Passell 1994:175). In the south where land was abundant, agrarianism remained preeminent over industrialization; but southern farmers developed an increased dependence upon industrialization elsewhere. Cotton had a growth rate of five percent per year from 1830 to 1860, but that growth was highly dependent upon the increasing prospects of textile production, mostly in Britain.

Southern exporters also relied on the growth and demand of foodstuffs. Both dependencies proved problematic: "The economy of the prewar South was hitched to a falling star" (Bruchey 1988:49-55). Between the Civil War and World War I, the United States emerged as the leading industrial nation causing the retreat of agriculture (Bruchey 1988:100). Before the 1880s, agriculture was the chief sources of wealth in America, while, by 1890, the value of manufactures was three times that of agricultural products. In 1880, a majority of the nation's manufacturing industry surrounded New York, Philadelphia, and Chicago with machinery and foundry production leading the industry (Atack and Passell 1994:465-466).

While there was significant oration and literature describing the south's desire and need for modernization in the late nineteenth and early twentieth centuries, there was little progress towards industrialization or the urbanization that accompanied it. Historian C. Vann Woodward emphasized that by World War I, "the sum total of urbanization in the South was comparatively unimportant," and that the South continued to be, "by far the most rural section of the Union." By the early twentieth century, the south had nearly the same proportion of the country's factories and capital that it did immediately before the Civil War in 1860 (Durden 1984:310). Wilmington merchants recognized the need for modernization and industrial diversification. In 1902, a Wilmington Chamber of Commerce (1902:6) report tried to entice goods manufacturers to the port:

> Opportunities are presented in Wilmington to the manufacturer in certain lines of a much more advantageous character than are offered by larger cities, inasmuch that while in most respects equal conditions are at hand, the cost of living and labor and, therefore, production is lower at the same time that suitable and convenient sites are available at comparatively little cost. Wilmington and its inhabitants are prepared to welcome any who

> may purpose to make this city the seat of their operations and to lend them every assistance which is in their power. The manufacturer who comes here will find everything provided for the successful operation of his enterprise and a helping hand will be extended him by every citizen of the community.

But the port city failed to capitalize on industrialization, modernization, and urbanization.

The insufficient port modernization at the beginning of the twentieth resulted in commercial failure in trade and another vital aspect of a successful port, shipbuilding. Shipbuilding in Wilmington languished from the turn of the century due to an increased dependence on rail traffic and Wilmington's failure to follow the trend in ship construction from wood to iron and steel. Wilmington maintained a deep channel and protective port that should have appealed to shipbuilders early in the century, but the commercial industry did not manifest itself. World War I, however, temporarily transformed shipping in Wilmington through a major revitalization in shipbuilding. In 1910, North Carolina had ten small shipyards scattered throughout the state employing 66 workers. By 1919, there were at least eighteen yards employing more than 7000 workers; the revival was a direct result of the war (Still 1981:188).

In September 1916, Congress created the United States Shipping Board, an agency intended to build, purchase, lease, or requisition merchant vessels for the nation. A number of new shipbuilding companies organized in North Carolina, representing interests from outside the state, hoping to capitalize on the national emergency. The shipbuilding firms sent representatives to Washington, D.C. to petition government officials for contracts; a Wilmington agent even offered to donate over one mile of waterfront property to the government for facilities. Wilmington attracted the most

interests in the state. Two Philadelphia shipbuilders established the Wilmington Wood Ship Construction Company while New York business men created the Naul Shipbuilding Company and the Cape Fear Shipyards, Inc. All three companies began construction on wooden vessels; however, none received contracts from government officials who were in the process of expanding steel and concrete vessel construction, not wooden (Still 1981:189-192).

Despite insufficient government interest in wooden shipbuilding, Wilmington managed to work for the benefit of the government and prosper from developing shipbuilding facilities. To increase efficiency and speed, the government adopted the concept of fabricated shipyards in which yards built vessels from standardized, interchangeable parts sent from factories and mills. The shipping board established the only such yard in the state, the Carolina Shipbuilding Company, in Wilmington after intensive lobbying from local leaders and significant dissention from other southern port cities. The contract called for twelve 9,600 ton steel cargo vessels at a price of over twenty million dollars for the shipyard and ships (Still 1981:193-195). A wartime shortage in steel prompted the shipping board to look for alternatives. The board, therefore, contracted the Liberty Shipyard, a subsidiary of a Boston company, to build concrete vessels for which there were ample supplies in the form of sand (Figure 4.5). Originally, the contract called for six vessels ranging from 3,200 to 7,500 tons, but only two came to fruition (Still 1981:196-197).

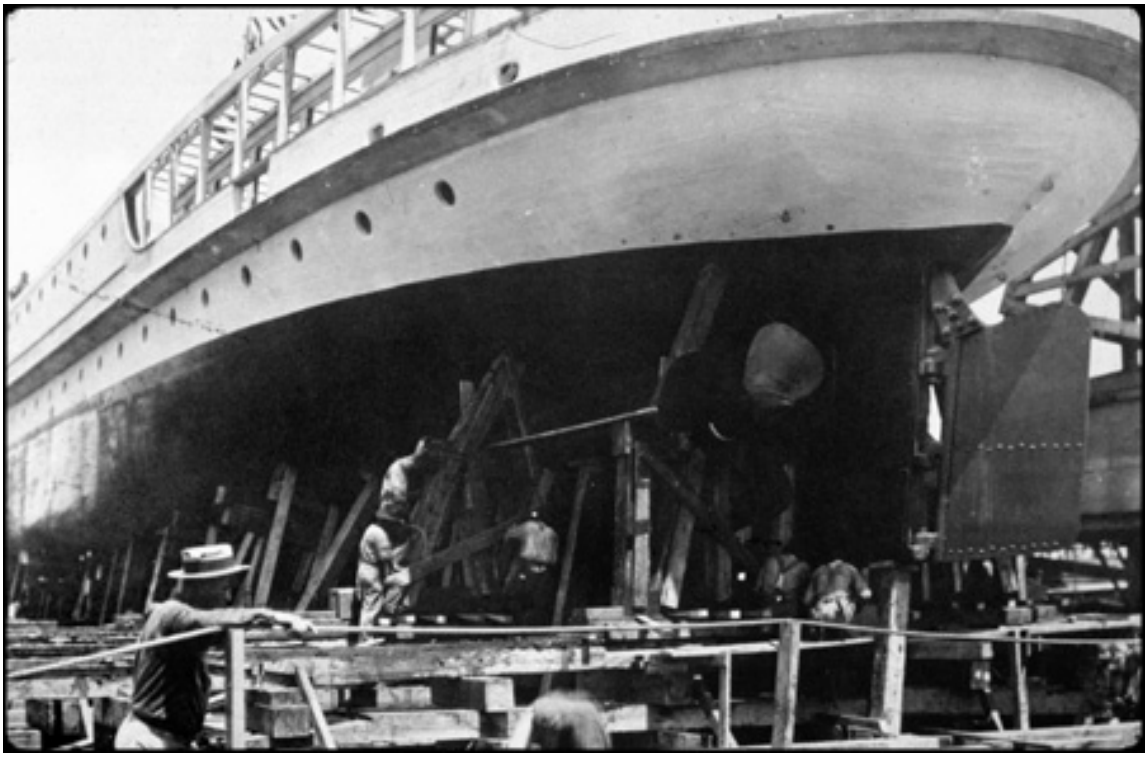


Figure 4.5: Construction of concrete ship at Liberty Shipyard, 1918 (Image courtesy of the Dr. Robert M. Fales Collection, New Hanover County Public Library).

Wilmington attempted to maintain shipyard production after World War I, but the prosperity was fleeting and shipbuilding in Wilmington declined to little more than nothing. Wilmington shipyards both during the war and immediately after had difficulty retaining workers. Labor disputes over race, wages, and quality of life pervaded shipyard facilities and discouraged workers from remaining. Additionally, exhausted local labor forced the importation of skilled workers to the shipyards. Worker turnover was high owing to poor living conditions, inexperienced management, high costs (both construction supplies and living expenses), and difficulty obtaining materials (Watson 1992:142). After the armistice, the government dropped contracts resulting in the closure of most of the shipbuilding companies (Still 1981:205).

A primary reason for decline of shipbuilding in the port city after the war was a deficiency of technological innovation, which created an inherent competitive disadvantage: “The conversion of ship construction from wood to iron, then to steel had a detrimental effect on Wilmington’s shipbuilding industry…” (Scott 1979:5-6). Other major ports at the time, such as Norfolk to the north and Charleston to the south eclipsed Wilmington in development because of their position at the forefront of technological innovation in shipbuilding and repair (Watson 1992:142-145). Despite progress during the war, on the eve of a period of significant industrial development, Wilmington did not take the necessary steps to launch itself into the coming era of technological advancement.

Wilmington in the Great Depression

Unable to generate an export base and suffering from a competitive disadvantage to other regional centers, Wilmington existed as little more than an import distribution center at the onset of the Great Depression (Randall 1965:45). Yet, the weakened commercial economy began to transform just before the Depression and continued to change and grow through the 1930s because of an initiation of commercial diversification. Nearly four months after the market crashed, the merchants of Wilmington did not believe their industry would be harmed in any way. A headline on 10 February 1930, read, “Local Trade Body Sees Fine Business Outlook.” The article continued, “The Wilmington Chamber of commerce feels that the recent business outlook is better than at the same time last year.” The article discussed a variety of projects which the chamber hoped would assure economic growth for the area in 1930 including

several new bridges, sewage and street upgrades, major waterway improvements, and new industrial developments (*Wilmington Morning Star* 02/10/1930:6).

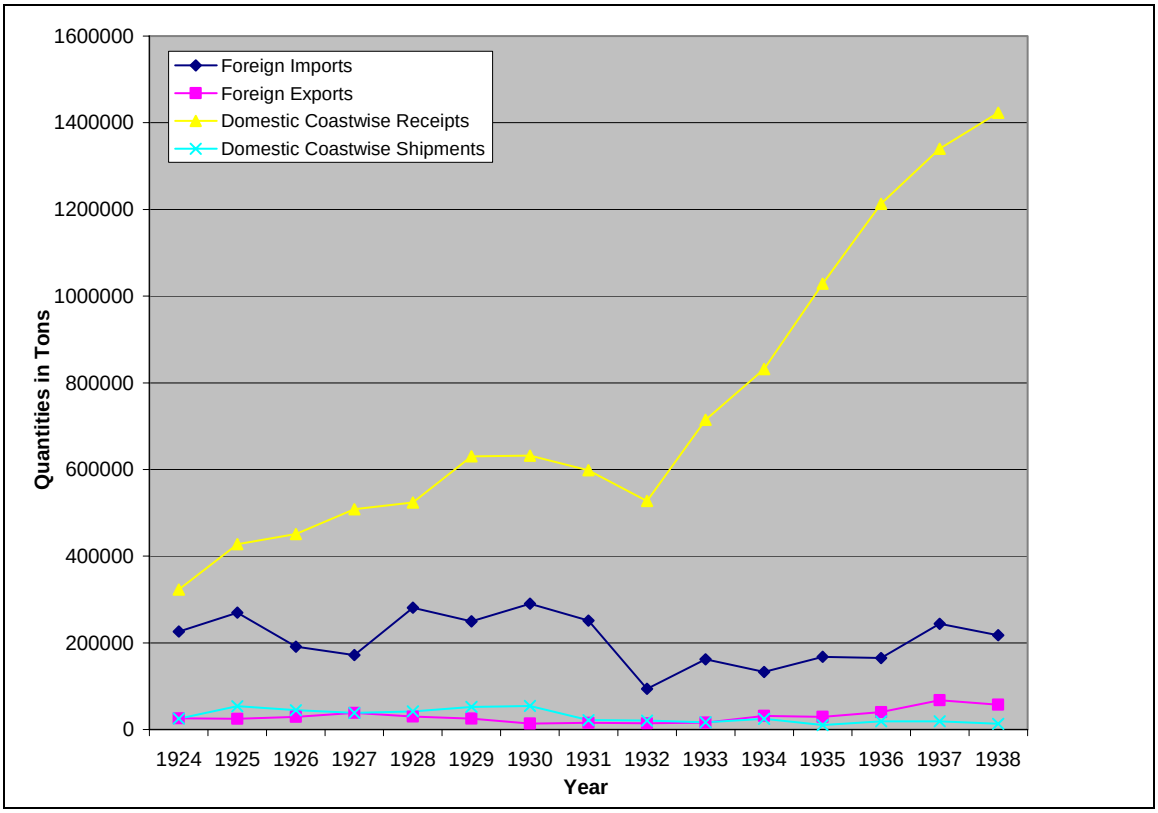
A port report written in 1934 described the facilities of the harbor in the midst of the Great Depression. The port maintained 42 piers, wharves and docks with a combined available berthing space of 15,153 feet. There was an unused municipal wharf owned by the city and two federal government ports, one for the Coast Guard and one for the United States Engineers. Railroad companies owned nine wharves, three of which were leased to private companies. Fertilizer companies owned eight piers along the waterfront. Steamship lines owned and operated several general merchandise wharves. The remaining berths dealt in lumber, petroleum, molasses, groceries, coal lighters, and private business. Across the river on Eagles Island, several towing lines provided service and repair to vessels in Wilmington (The Board of Engineers for Rivers and Harbors 1935:135-149, 163). The harbor did not include any mechanized loading or unloading facilities and required a sufficient number of manual laborers:

> [C]argoes are trucked to and from the ship and are handled by the ship's tackle when goods are transferred to and from lighters alongside. Cotton is handled entirely by the ship's tackle at the piers of the Champion Compress & Warehouse Co. The railroad wharves and the wharves of the fertilizer companies are all equipped with unloading towers and overhead trestles for unloading fertilizer materials from incoming vessels. The oil companies have unloading heads on their wharves for kerosene and gasoline from tankers. The American Molasses Co. of North Carolina is equipped in a similar manner for unloading molasses in bulk…There is sufficient Negro Labor at this port for handling all cargoes coming into the harbor. This labor is not controlled by unions (The Board of Engineers for Rivers and Harbors 1935:129-130).

Charleston, included in the same publication, had a variety of mechanized loading and unloading facilities including electrically operated buckets, elevated tram cars, mechanized hoppers, and gantry cranes; the facilities were indicative of more extensive modernization than that of Wilmington (The Board of Engineers for Rivers and Harbors 1935:20). The facilities at Wilmington were sufficient for the needs of the port at the time, but acted as a deterrent to attracting major industry to the area, especially during worldwide economic hardship.

Statistics relating to commerce in Wilmington indicate that trade moving through the port was not negatively affected during the Great Depression, and the port experienced a slight improvement, demonstrating the plausibility of material progress (Bell 1982:55-61). Data indicates that between 1924 and 1933, waterborne commerce averaged 1,048,502 short tons ranging from 833,636 tons in 1924, the lowest tonnage year to 1,258,147 in 1930, the highest tonnage year (The Board of Engineers for Rivers and Harbors 1935:183, 1940:66). Of those tons, coastwise traffic accounted for 54.4 percent, foreign traffic for 23.1 percent and internal trade made up the remaining 22.5 percent. Graph 4.1 (see below) provides a summary of the value, in tons, of both foreign and domestic receipts and shipments. From half a decade before the depression to over half a decade after the introduction of the New Deal, there was a relatively consistent trend associated with the tonnage moving through Wilmington. Exports, both foreign and domestic, were minimal when compared to imports. Though imports declined in 1932, increases immediately followed in 1933, compensating for the downturn of the previous year (domestic receipts went up 73 percent in 1933). Imports remained far

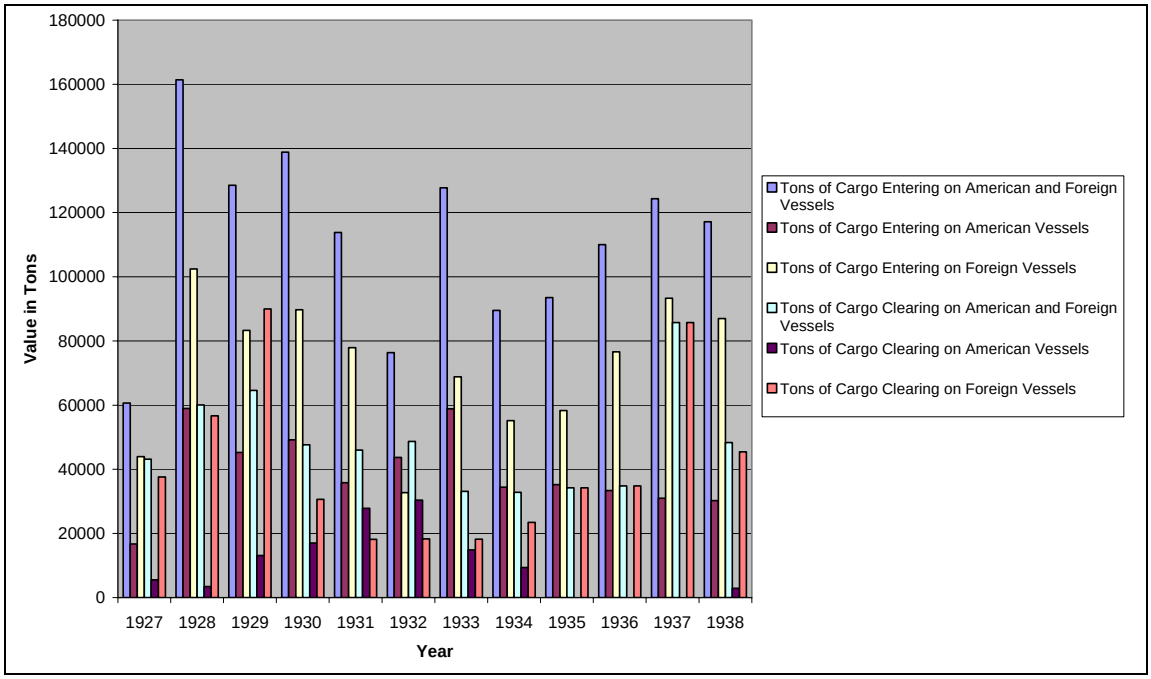
higher than exports at any given point during the span of 15 years, and shipping tonnage in general went up after 1932. There were far more domestic imports than foreign throughout the span of 15 years, and starting in 1932, after years of relatively inconsequential growth, domestic imports soared.



Graph 4.1: A Summary of Water-borne Commerce of Wilmington, NC from 1924 to 1933, Inclusive (The Board of Engineers for Rivers and Harbors 1935:183; 1940:66).

The tonnage information presented for the Wilmington District verifies that cargo entering the District far exceeded cargo clearing the District (see Graph 4.2). More tons of cargo entered the District on foreign vessels than on American vessels. This suggests that large quantities of foreign goods entered North Carolina through ports other than Wilmington, while, according to data in Graph 4.1, a majority of the tonnage entering Wilmington was domestic cargo. Graph 4.2 also indicates that there were significantly

more foreign exports than domestic exports from the Wilmington district (The Board of Engineers for Rivers and Harbors 1935:183, 1940:66; Department of Commerce 1928 to 1940).



Graph 4.2: Tons of Cargo Entering and Clearing the Wilmington District on American and Foreign Vessels, 1927-1938 (Department of Commerce 1928 to 1940).

While exports significantly declined from the early 1900s through the Depression, they did not completely disappear. Merchants did not ship tobacco through Wilmington or the Wilmington District until 1931, from which point tobacco exportation steadily increased. The amounts declined slightly in 1936 and 1938, but generally tobacco exportation maintained growth as North Carolina climbed out of the Depression. Starting in about 1925, cotton ceased to be the primary export commodity from Wilmington, and tobacco farmers eagerly pushed tobacco to take the place of cotton in exportation (see Table 4.3; Logan 1956:125). The decline of cotton as an export commodity was drastic

and rapid over a short period of time. The commencement of tobacco exportation through Wilmington coincided with the Great Depression and might have been a positive direct result of circumstances associated with the Depression. The decline of cotton production and exportation began far before the depression and left a vacuum for a major crop from North Carolina; tobacco was able to fill the void.

Year	bright flue-cured leaf tobacco		raw cotton-upland		
	pounds	dollars	Bales	pounds	dollars
1927			140,909	70,575,395	12,147,900
1928			111,228	56,016,183	11,082,100
1929			98,926	49,041,325	9,479,600
1930			53,951	26,986,133	3,594,150
1931	7,106,293	1,992,561	38,255	19,031,387	5,156,420
1932	9,429,865	3,031,820	34,818	17,255,426	1,221,888
1933	11,943,767	4,379,700	34,321	17,190,767	1,317,775
1934	19,285,874	10,444,999	8,084	4,053,320	540,180
1935	32,442,672	16,528,450	2,102	1,057,092	147,140
1936	23,887,187	13,129,270	8,799	4,434,527	552,940
1937	30,016,161	14,574,599	3,700	1,843,025	234,000
1938	28,557,718	12,868,900	400	203,374	18,773

Table 4.3: Tobacco and Cotton Exports from Wilmington District, 1927-1938 (Department of Commerce 1928 to 1940).

The most telling statistics are those pertaining to the average annual commerce of Wilmington from 1924-1933, and from 1932-1938 (see Tables 4.1 and 4.2; The Board of Engineers for Rivers and Harbors 1935:183, 1940:66). During both periods, fertilizer materials made up the majority of foreign imports, just over 80 percent of the total foreign imports during each time frame. Foreign exports, however, varied greatly between the two periods. In the earlier time frame, the primary foreign export was cotton, composing just over 88 percent of the total foreign exports. Starting in 1932, however, 47 percent of the total foreign export consisted of scrap iron and steel while nearly 33 percent of the total foreign export consisted of tobacco. Domestically,

petroleum and petroleum product receipts increased noticeably from 69 percent in the earlier period to 80 percent in the later period. As a result of the drastic increase in petroleum receipts, domestic fertilizer receipts decreased by 10 percent from the earlier period to the later period. Not only did the percentage of petroleum products increase, but the amount of petroleum received in Wilmington experienced a dramatic increase.

Physical improvements on the shipways and associated maritime facilities in Wilmington and adjacent areas also indicated the positive changes Wilmington underwent during and after the Depression. The Army Corps of Engineers continued channel improvements in the Cape Fear River throughout the 1930s. In the summer of 1931, the newspaper reported a "Third Dredge to Arrive," from Havana to join two other, "dredges at work on the Cape Fear river 30-foot channel" (*Wilmington Morning Star* 06/17/1931:2). The Corps and contractors completed a major project in August 1932, creating a channel 400 feet wide and 30 feet deep at the bar and 300 feet wide and 30 feet deep upriver.

In addition to improving the channel from the ocean to Wilmington, the Corps and citizens advocated more improvements along the Cape Fear River from Wilmington to Fayetteville. After completion of the two locks, the citizens of Fayetteville and the governor, Furnifold Simmons, wanted a third lock. The Wilmington Division Engineer voiced concerns that the costs would be more than any generated traffic on the stream. Congress debated the construction of lock three, eventually appropriating the money for the office of the Chief of Engineers to complete the third lock, in addition to making improvements on the other locks on the way to Fayetteville. Construction was difficult,

costly, and problematic for both contractors and the government, but they finally completed the improvements and third lock in February 1935 (Hartzer 1984:53-54).

Construction of the Intracoastal Waterway was one of the most effective improvements undertaken in the Cape Fear area. Based on a congressional survey from 1909, the Rivers and Harbors act of July 1912 determined that a waterway extending from Boston to Beaufort was indeed possible. The federal government purchased state canals in the pathway of the project and purchased the dismal swamp canal. In 1930, the Atlantic Deeper Waterways Association chose Wilmington and the Intracoastal Waterway from Maine to Florida as its primary objective. The group held their 23rd annual conference in Wilmington to observe the Corps and its contractors conducting work on the site. In 1927, congress authorized the act requiring state and local interests to furnish a right of way that was 100 feet wide, the entire length of the designated canal route. The state easily fulfilled the obligation through land purchase and seizure and the expensive construction ended in December 1932. The Beaufort to Cape Fear section ran 93.5 miles long and cost and estimated $3.8 million dollars to make (Hartzer 1984:57-60).

The government highly publicized the work on the waterway, creating jobs, getting bids from public companies for construction, and taking bids for improvements once the waterway was complete (*Wilmington Morning Star* 06/06/1931, 09/04/1932). Not only did its construction provide jobs, but after its completion, the waterway transformed shipping in Wilmington. A significant part of Wilmington's re-growth as a regional distribution or trade center can be attributed to the construction of a waterway

that allowed tankers to pass safely in protected water and enter the Cape Fear River, just below Wilmington instead of waiting for conditions or tides (Hartzer 1984:107).

The opening of the waterway also led to an increased number of shipping companies in Wilmington that could conduct their business with relative ease using the waterway. A 1932 newspaper report about a new steam barge line declared with anticipation: "If perfected, the line will be the first regular barge line to operate out of Wilmington to other ports through the recently completed waterway" (*Wilmington Star* 09/02/1932). Another newspaper reported the formation of a "stock company to operate a boat offering a 10-day schedule between Wilmington and Northern ports and to extend cheap transportation service to interior North Carolina shippers." The article continued:

> It will give every incentive for Wilmington interests to build up the 'back country' which is served through this port. [T]he canal will probably be used the entire distance. [T]he company will obtain dock property at several northern ports which it will touch. Founding of the new line shortly after announcement that a group of Fayetteville men are establishing a boat line to ply between that city and Wilmington is regarded as significant of future port development (*Wilmington News* 08/07/1931).

Wilmington proved to be a central point on a variety of maritime commerce routes after improvement and construction around Wilmington and other regional waterways.

Wartime Boom and the Port City Modernizes

Commerce in Wilmington followed a consistent pattern through the latter 1930s until the United States entered World War II in December 1941. In the early years of the conflict, shipping along the Atlantic Coast suffered tremendous losses to German U-boat warfare. Wilmington experienced restricted commerce from declining water traffic.

However, the Wilmington shipping economy did not decline; again, a wartime shipbuilding boom enhanced the local maritime economy (Jackson 1996:32; Watson 1992:154). Citizens in Wilmington formed the Shipyard for Wilmington Committee in 1940 to lobby in Washington on behalf of the Port City as a serious prospect for government contracts. The Newport News Shipbuilding Company in Virginia opened a subsidiary, the North Carolina Shipbuilding Company, and leased a shipbuilding yard from the Maritime Commission. At its peak in 1943, the North Carolina Shipbuilding Company employed 25,000 workers on an annual payroll of more than $50 million (Watson 1992:154).

The Maritime Commission formally announced the first contract for twenty five Liberty Ships on March 18, 1941. Intended primarily for cargo purposes, the vessels measured 440 feet long and 56 feet in beam with potential to travel at a speed of 11 knots. The company laid the first two keels two months later and on December 6, 1941, just hours prior to the Japanese attack on Pearl Harbor, the *Zebulon B. Vance* launched off the Wilmington Shipways (Figure 4.6). After the termination of the war, the renamed vessel transported British and other war brides to the United States. In January 1942, the company received a contract for fifty three additional Liberty Ships, forcing the expansion of the already sizable shipyard. In total, 126 Liberty Ships came out of Wilmington, 27 of which were lost during service (North Carolina Shipbuilding Company 1946:8-10). In 1943, the company began producing a slightly larger, faster vessel type, the Victory Ship. The builders did not standardize the Victory Ship, but

rather constructed them to fit the individual needs of the potential owners. The yard produced 117 Victory Ships throughout the war (Watson 1992:155).

Figure 4.6: Liberty Ship *Zebulon B. Vance* in the Cape Fear River (Image courtesy of the North Carolina Underwater Archaeology Branch).

The shipyard closed after the last vessel went of the ways in April 1946. The closing of the yard left a twenty million dollar facility abandoned. Combined with the closure of other defense plants in the area and the influx of returning veterans, Wilmington experienced a veritable economic collapse. Attempts to maintain the shipyard as an operating repair and refitting facility failed. Rather, the Maritime Commission declared it a reserve shipyard, one of four in the nation and the only one on the East coast (Scott 1979:148-152). The commission chose the North Carolina yard because of its facilities and its proximity to a mothballed fleet on the Brunswick River near Wilmington. At its peak, nearly 649 vessels floated in the reserve fleet providing

local jobs and generating income which served as a stimulus for a depressed post war economy in the Port City. Vessels floated in the reserve basin until 1970 when, *Dwight W. Morrow*, the last remaining vessel, was removed (Watson 1992:155).

Commercial shipping reverted back to pre-war patterns in the five years after the conclusion of the war. Imports continued to lead exports except in the year 1957 when the two values were nearly equal. Gasoline and other petroleum products continued to dominate the import products, followed closely by fertilizer materials. Exports consisted mostly of scrap metal and steel products throughout the 1950s (Landon 1963:60-66). A portion of the commercial recovery of Wilmington's trade was a result of the creation of the North Carolina State Ports Authority. After more than a quarter century of campaigning for state aid for port and harbor development, the General Assembly passed an act to create the Authority in 1945 (Landon 1963:3). After negotiations, the State Ports Authority took over the site of the reserve shipyard in the southern part of the city in 1949. Also in that year, the state legislature authorized the issuance of $7.5 million in bonds for development of state ports, two-thirds of which was designated specifically for Wilmington. The North Carolina State Docks, built with the appropriated money, began operation in September 1952 (Figure 4.7; Watson 1992:159).

Figure 4.7: North Carolina State Port facility in Wilmington (Landon 1963).

The opening of the State Docks increased the flow of goods through the Port City. Both the State Docks and private shipping facilities saw tonnages increase in following decade. While tonnages at the State Dock went from 23, 498 tons in 1952 to 349,841 tons in 1963, private facility figures greatly exceeded those, beginning at 3,405,000 tons in 1952 and reaching 4,855,974 tons by 1963. The disparity in figures reflected the policy that the State Docks should assist private trade by encouraging relatively lightweight general cargo that private businesses were unable to handle. The state facilities actually managed nine-tenths of Wilmington's commerce other than petroleum, fertilizer, and molasses and sugar products (Randall 1965:91).

The 1950s and 1960s yielded the growth and development desired in the port of Wilmington since the decline of the export trade in the late nineteenth century. Beginning in 1954, international steamship lines began regular service to Wilmington from European, Far Eastern, and Mediterranean ports (Landon 1963:47-49). Additionally, the emergence of the State Ports Authority and the establishment of the State Docks led to the improvement in modernized facilities that Wilmington lacked from the turn of the century. Mechanized lifting equipment, railway and truck docks, and modernized storage facilities aided in drastically improving the port and allowed Wilmington, again, to be competitive with other regional ports (Landon 1963:31-38).

Conclusion

Wilmington experienced significant commercial growth and decline throughout its history. As the primary port for the state of North Carolina, the commercial climate often reflected not only the economics of Wilmington, but was symbolic of the activities of the rest of the state, the nation, and the world. A major peak in shipping after the Civil War preceded significant decline in the following decades. Wilmington benefited from both World War I and World War II when shipbuilding supplanted commerce to maintain the economy of the port, but generally, the commerce of the port remained weak during the first half of the twentieth century. The port of Wilmington represents an important part of North Carolina's historical development. The growth and change of the port of Wilmington is a direct reflection of the individual maritime commerce and industries that lined the shores of the Cape Fear River. Eagles Island was the location of a number of

those important industries. The evolution of industry on Eagles Island will be the topic of the next chapter.

CHAPTER FIVE: EAGLES ISLAND HISTORY

Introduction

The development of industry on Eagles Island was directly related to the development of Wilmington as a town. The portion of Eagles Island across the Cape Fear River from downtown Wilmington provided wharves and land for diverse business ventures that lasted, and continue to endure, through a variety of economic, social, and political climates. Use of Eagles Island dates back to the earliest days of the town of Wilmington when the Colonial Assembly ratified an act to build and maintain a road from the ferry opposite Wilmington into Brunswick County (Blake 1972:1). Over time, Eagles Island evolved into a significant industrial center for Wilmington from the production of naval stores to the development of major shipbuilding and repair facilities, and a host of other commercial and industrial endeavors. The history of industry on Eagles Island is a reflection of Wilmington as a port city.

Naval Stores Industry

In the age of sail, naval stores were as important to a vessel as the wood in the hull and the cloth in the sails. Naval Stores consisting primarily of tar, pitch, turpentine and rosin are derived from longleaf pine, which grew abundantly in North Carolina. As a colony, North Carolina catapulted to the forefront of the maritime trade industry thanks to the naval stores and wood products produced and shipped from the region. On the eve of the Revolution, North Carolina was England's largest supplier of naval stores. Because of the importance of the product and the supply in southeastern North Carolina, the port of Wilmington (Port Brunswick at the time) held a valuable position in the English Empire

(Watson 1992:12). The derivation and exportation of naval stores maintained Wilmington as a major port, in both foreign and domestic markets, through the decline of the naval stores industry.

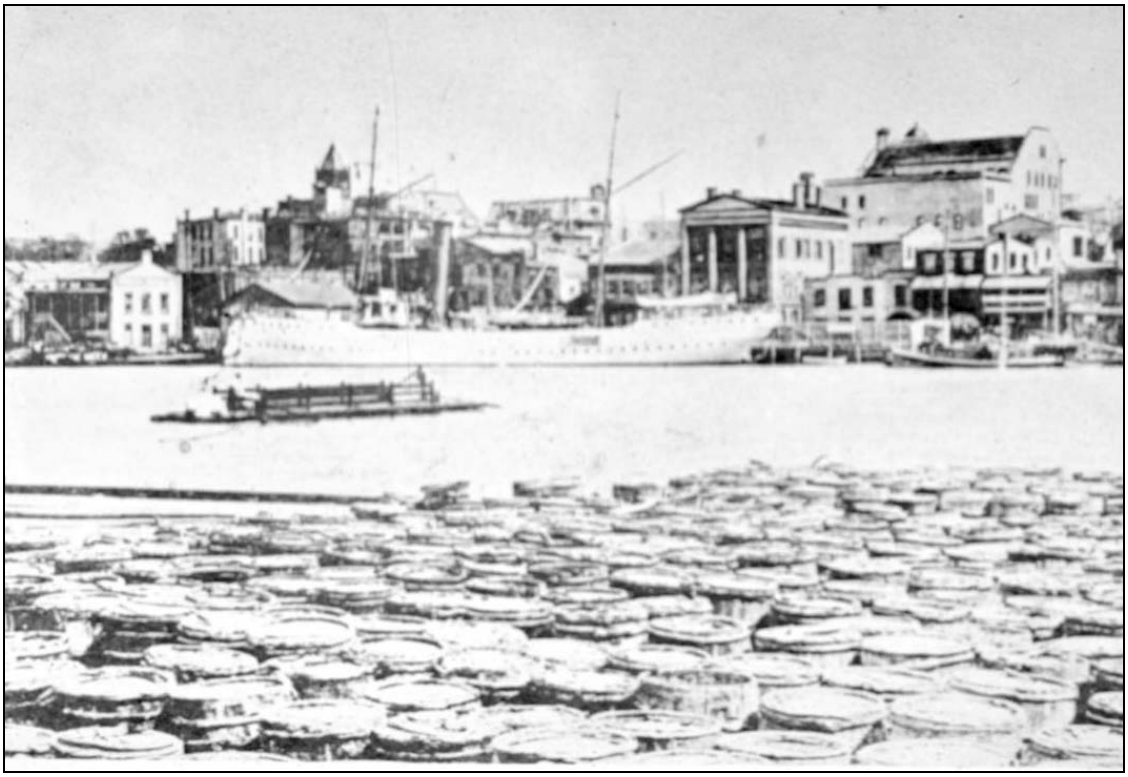


Figure 5.1: Naval Stores on Eagles Island with a view of Market Street in the background. The market street ferry appears in the river-1900 (Image courtesy of the Dr. Robert M. Fales Collection, New Hanover County Public Library).

Eagles Island provided a location for the naval stores industry to flourish along the Cape Fear River (see Figure 5.1). Early drawings show significant development of naval stores industries across from Wilmington near the ferry landing (see Figure 5.2).

Figure 5.2: Early Pencil Drawing of the Naval Stores industry on Eagles Island (Image courtesy of the Dr. Robert M. Fales Collection, New Hanover County Public Library).

For decades, newspapers advertising land for sale and rent on Eagles Island mentioned facilities and wharves suitable for storage and handling of naval stores. In 1871, reports indicated a growing concern for the inflammability of the industry on that side of the river. Merchants on the Wilmington side petitioned to have an engine sent over to the Eagles Island side of the river, citing, "There are a number of warehouses, distilleries, railroad shops and sheds, naval stores and other property on that side of the river that requires protection"(*Wilmington Star* 07/22/1871). Several weeks later, another article congratulated the island on obtaining a hand fire engine and noted, "Eagle Island, on the West side of the Cape Fear, and included within the corporate limits, is growing in importance" (*Wilmington Star* 08/10/1871). Insurance maps from the last decade of the

19th century show the location of several naval stores companies on Eagles Island near the ferry landing (see Figure 5.3).

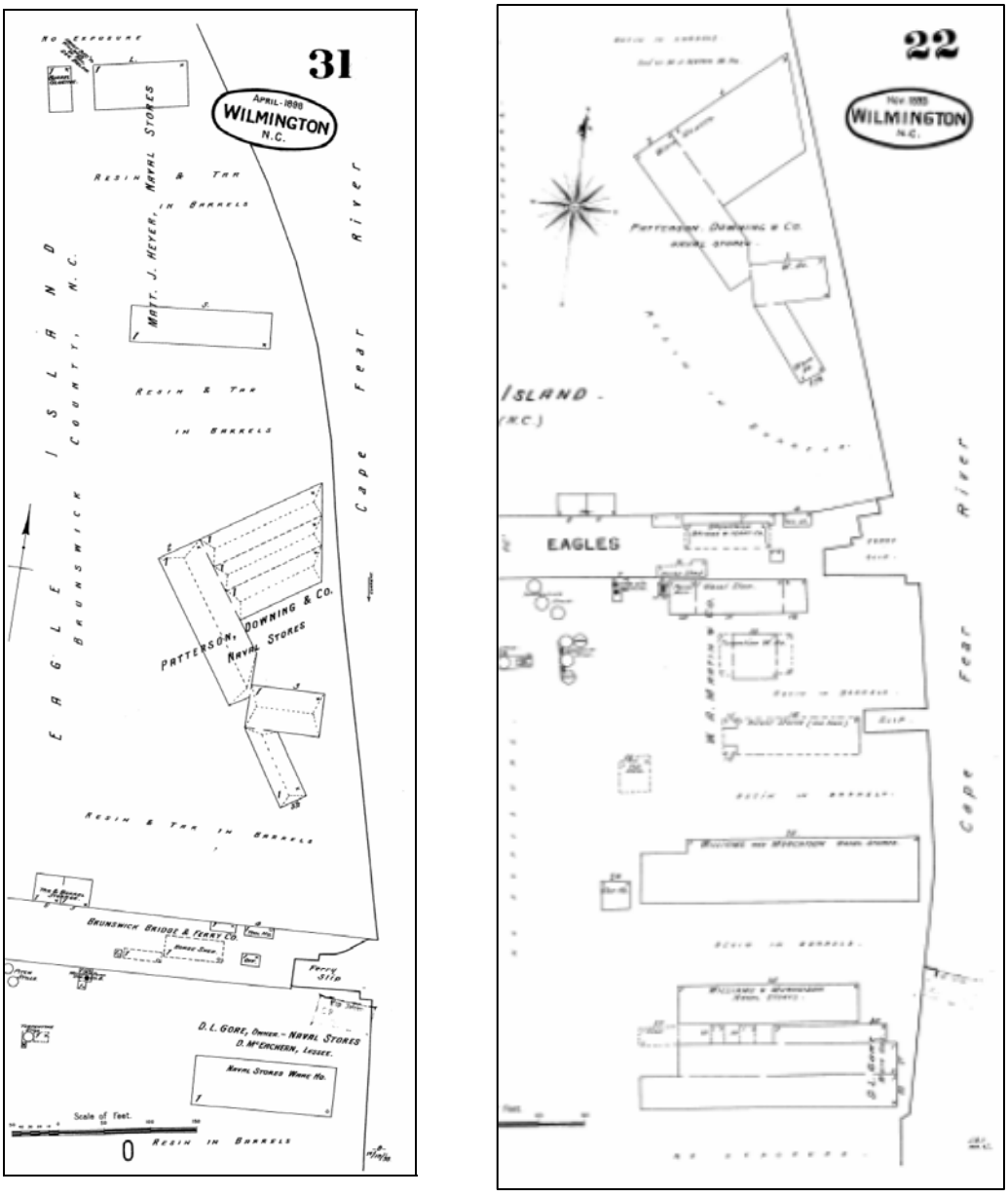


Figure 5.3: Sanborn Insurance Maps from 1893 (left) and 1898 (right) showing Naval Stores Industry lining the shore of Eagles Island both north and south of the ferry landing (SMPC 1893:22; 1898:31).

Naval stores remained a prominent industry on Eagles Island through to nearly World War I. Naval Stores still appear on Sanborn Insurance maps in 1915 and in his

senior class paper, Russell Stone (1934:1) remarked that the sharp increase in naval supplies in Wilmington necessitated the organization of the Stone Towing Company early in the twentieth century. Naval stores remained a prominent industry on Eagles Island until shipbuilding internationally shifted to iron and steel. The new technology replaced wooden ships in the maritime industry and obviated the use of tar, pitch, turpentine and rosin, closing the remaining naval stores merchants in Wilmington.

Stone Towing Company and its Antecedents

The Stone Towing Company and Marine Railway became an icon of Wilmington's maritime industry after nearly 100 years of activity on the Cape Fear River. Its longevity in Wilmington Harbor and visual presence both during operation of the company and after its closure are indicative of the major presence of the company along the banks of the Cape Fear River.

The Stone Towing Company yard on Eagles Island has a long history of use, but gained the earliest prominent recognition as the Beery Shipyard which operated on Eagles Island from 1848-1892. Samuel Beery and his two sons purchased the land on Eagles Island from Henry Savage on 20 June 1848. They called their business the Commercial Mill and Shipyard and immediately began constructing brigs and schooners on Eagles Island. In 1852, Benjamin Beery bought out his ailing father's shares of the business. Reports indicate that when he purchased his father's portion of the business, his investment included a steam sawmill, a shipyard, a railway, a blacksmith shop, and a rigging loft, all on Eagles Island (Jackson 1996:217, 219; see figure 5.4).

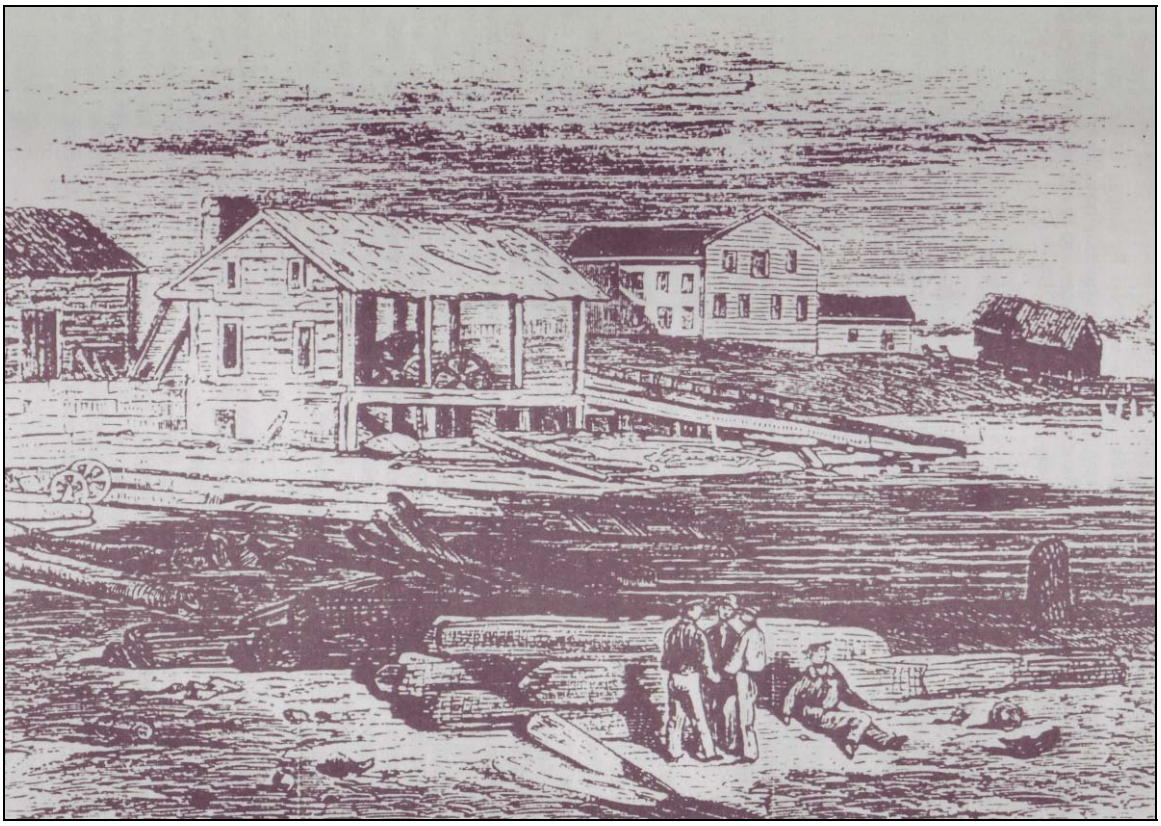


Figure 5.4: Illustration of Beery's Shipyard on Eagles Island (Jackson1996: 218).

The Beery Shipyard made major contributions to the Confederate cause during the Civil War. At the outbreak of the war, the brothers converted the steam tug *Mariner* into a privateer, which Benjamin Beery captained on orders from President Jefferson Davis. Captain Beery took four Union merchantmen as prizes and soon after relinquished command to continue shipbuilding for the war cause (*Weekly Star* 04/29/1892; *Wilmington Morning Star* 05/23/1917)

After returning to work in Wilmington, the brothers constructed the ironclad ram, CSS *North Carolina*, on the Eagles Island shipways. Constructed of heavy pine and hardwood covered with rail iron, the vessel went to into service downriver at Southport (*Journal and Sentinel* 02/07/37). After building several vessels and a rumored

submarine, Beery burnt his shipyard in 1865 to prevent its capture as Union troops invaded Wilmington. After the war, William Beery continued to work on Eagles Island and had the facilities entirely rebuilt by 1872. Newspapers indicate that the Beery brothers maintained a small shipbuilding industry through 1892 when they closed the larger of their two locations, the shipbuilding plant on the east side of the Cape Fear River (Jackson 1996:220-222).

The next major business venture in the same location was the Wilmington Marine Railway. The Wilmington Iron Works company purchased the land on Eagles Island in 1911. The land measured 730 feet by 1000 feet and the Wilmington Iron Works company built a wharf along nearly the entire length of the site (Jackson 1996:234). The incorporators of the company, R.R. Stone, B.O. Stone and E.P. Bailey filed the certificate of incorporation in September of 1911 with the principal object of establishing a marine railway. In addition, the incorporators planned dry docks, storage warehouses, wharves and docks, machine and repair shops, foundries, and the ability to build and repair all kinds of ships and machinery (*Wilmington Dispatch* 09/23/1911). The company planned a new marine railway to work in conjunction with an auxiliary plant at the site of the old Beery yard and railway (*Morning Star* 09/28/1911).

The company generated a considerable amount of excitement in Wilmington with newspapers reporting, “It will mean the spending of thousands of dollars here which now go to other points such as Charleston, Norfolk, Savannah, Brunswick, Ga., and other southern points.” R.R. Stone and E.P. Bailey went on a trip north to search for bidders to build the, “finest, most expensive, and largest marine railway to be found along the south

Atlantic coast" (*Wilmington Dispatch* 10/02/1911). The company awarded the contract the H.S. Crandall Sons & Co., an experienced railway construction firm from Boston. The railway designed for Wilmington was more technologically advanced than others in the southeast because it was built to remove vessels from the water at an even keen rather than at an angle (*Wilmington Morning Star* 10/22/11). Operation of the 48 foot wide by 405 foot long railway began in 1912. The resulting Wilmington Marine Railway Company was capable of hauling 2000 ton vessels while repairing two schooners and performing iron repair at the smaller auxiliary plant south of the launch ways (*Wilmington Star* 07/14/12).

The Wilmington Marine Railway Company built and repaired many ships during its operation. Among the contracts the company had to construct vessels was one for northern capitalists to build two, 2000 ton, four-masted schooners in July 1916 (see Figure 5.5). The company purchased more than 1,500,000 feet of lumber and planned to build the vessels on two separate launch ways simultaneously. The company built a large mold loft to cut the wood for the vessels and planned to power the machinery for cutting using an engine, "that was built more than a half century ago by the old Hart & Bailey Iron Works here and which is now in perfect condition. The engine has been in almost constant use for the past fifty years and it is said that it has not been repaired to the extent of more than $50 since it has been in use" (*Evening Dispatch* 04/11/1916). The progress went slowly and in 1917, the Naul Shipyard assumed responsibility for the construction of the four-masted schooners. The Naul builders completed the *Hoppauge* and *Commack* in June 1917 and both vessels slid off the ways to considerable acclaim for Wilmington

residents who hoped the two grand ships would symbolize the revitalization of the shipbuilding legacy of Wilmington's past.

Figure 5.5: The *Hoppauge* and *Commack* under construction at the Wilmington Marine Railway on Eagles Island (Image courtesy of the North Carolina Underwater Archaeology Branch).

In 1924, the Stone Towing Company purchased the Wilmington Marine Railway Company. The Stone Towing Company planned to make necessary repairs to the ship plant on Eagles Island to immediately begin commercial ship repair contracts. The company planned to use the yard for contracting repair work, and to repair all of their own tugs and barges there as well. At the time of the purchase, the railway on Eagles Island was the largest in the port and the owners hoped to provide competition to adjacent ports (*Wilmington Star* 01/24/24) Additionally, R.R. Stone immediately began construction on a smaller railway in order to haul several vessels at once (*Wilmington Star* 02/04/24).

R.R. Stone founded the Stone Towing Company in 1895. After running the successful towing business and a separate grocery operation, in 1916, R.R. Stone initiated what the local paper referred to as, "One of the most important business changes of recent years" (*Wilmington Dispatch* 03/06/1916). Stone sold the entire wholesale grocery stock of Stone and Co. to J.W. Brooks for nearly $30,000 after 19 years of business in Wilmington in order to devote the entirety of his time and attention to his to "his extensive maritime interests." After consolidating his business interests into the maritime industry of Wilmington and purchasing the Wilmington Marine Railway, R.R. Stone changed the name of the railway to the Stone Marine Railway (see Figure 5.6).

Figure 5.6: The Cape Fear River in 1924 with the Stone Marine Railway in the lower right-hand corner of image. There is one vessel on the southern-most railway (Image courtesy of James A. Pleasants, Jr.).

Russell Stone, son of R.R. Stone, provided a detailed description of the company and operations in his senior class paper in 1934. The primary concerns of the Stone

Towing company came from docking Wilmington vessels and general towing including lighterage towing, barge towing, raft towing, inland waterway towing, and oil tanker towing. Stone (1934:11) indicated that there was little foreign trade other than an occasional barge traveling short distances between coastal ports. He suggested that the 1920s and 1930s were an important time for the company's growth with a majority of proceeds going to the purchase of real estate to expand the operations and investments in larger, more powerful vessels to reflect the increased tonnage of ships entering and leaving Wilmington (Stone 1934: 12). Stone (1934: 13) noted that because the tug industry was constantly changing, additional equipment was always kept on hand, including unused boats which, "are sunk to preserve them for some probable future use."

In his paper, Stone discusses the special layout and land use of the Stone Marine Railway extensively, including several diagrams (see Figure 5.7). The president of the company, R.R. Stone, designed the Eagles Island yard so each warehouse, office building, and machine shop was in the most beneficial position to serve its purpose in the operation of the yard. The railway running between buildings was used to carry supplies and heavy loads from one part of the yard to another. Warehouse space enabled the Stones to consolidate all supplies on Eagles Island as opposed to maintaining goods on the east side of the river. In additional, the company dredged two slips to dock derricks and pile drivers. Stone remarks that the only defect from which the company suffered in the 1930s was having the lighter docks and barges approximately one mile from the yards because the number of barges was high and they would be troublesome around the yards.

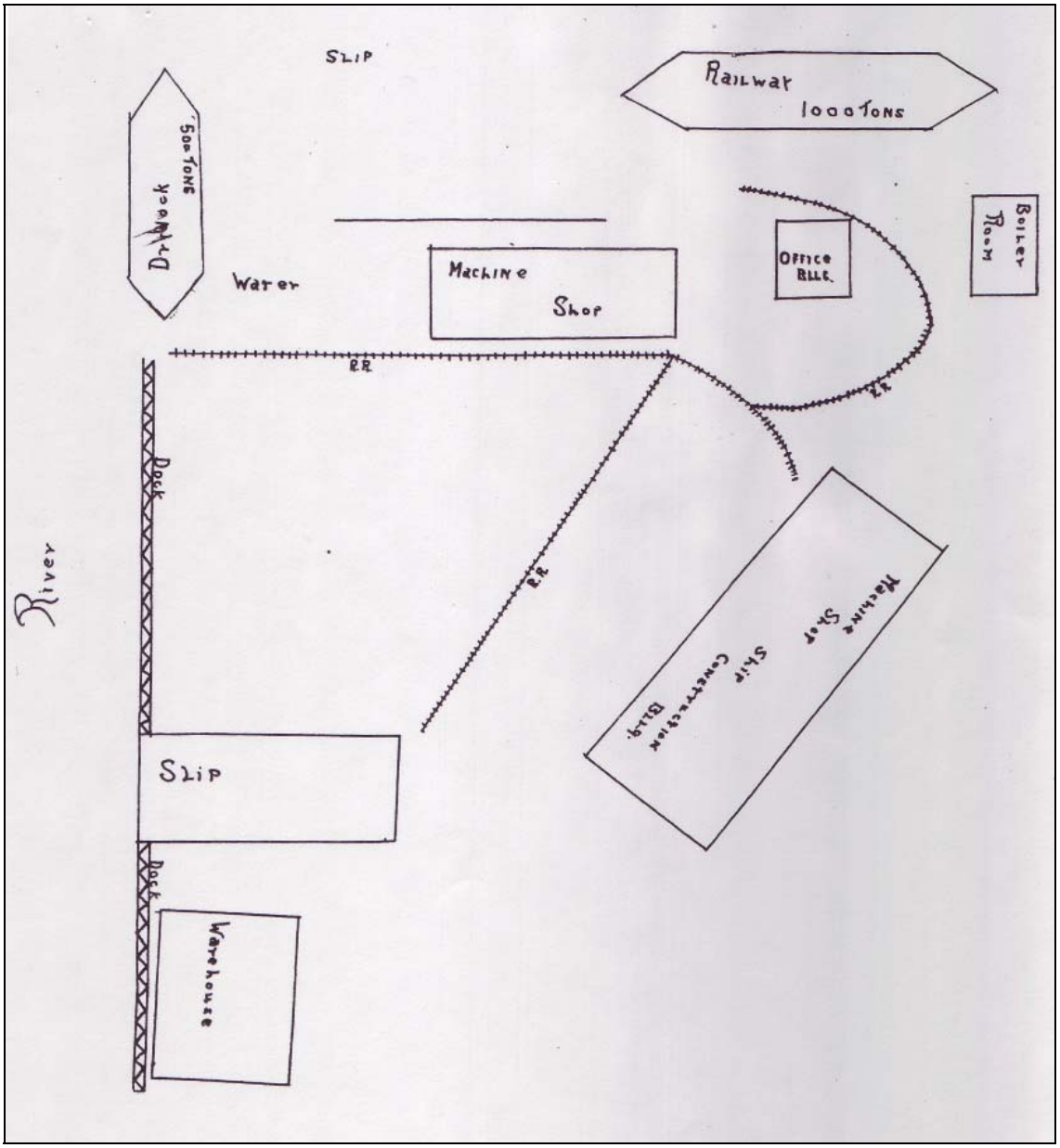


Figure 5.7: Diagram of the Stone marine railway and drydock (Stone 1934: 21).

The Stone Towing Company and Marine Railway operated successfully in Wilmington for over two decades, receiving a significant amount of press and accolades from local papers. On June 12, 1946, the success of the Stone Company was threatened when a major fire roared through the Eagles Island yard. R.R. Stone estimated that he

lost $35,000-$40,000 in a burned storehouse and he did not have insurance on the building or property contained within (*Wilmington Post* 06/13/1946). By 1948, the company was in the news again, mentioned as a thriving business with longevity in Wilmington (*Wilmington Morning Star* 12/20/1948). The railways went into disrepair with only one operating through the 1940s and 1950s. By the 1950s and early 1960s, the railway was seldom used, and put to action to haul Stone vessels exclusively. The last historical record of the Stone Railway operating on Eagles Island is in the Corps of Engineers report series which mentions the railway and additional repair facilities available on Eagles Island, in concert with the Wilmington Iron Works (The Board of Engineers for Rivers and Harbors 1961:27-28). The Stone Towing Company ceased using the Eagles Island side of the river, aside from dumping material, in the early 1960s (Richard Womack 2006, pers. comm.).

Stone Towing Company continued towing operations in the Cape Fear River until 1982 when the Stone brothers, Russell and Harris, grandsons of R.R. Stone, sold one tug still in operation and gave the other tugs to the state. Richard Womack (2006, pers. comm.), the only living descendant of the Stone Family, believes that Stone Towing docked 90% of the vessels that came into Wilmington harbor while it was in operation. Indeed, when the battleship USS *North Carolina* came to dock in Wilmington in 1961, the Stone tugs escorted the vessel into its slip on Eagles Island (see Figure 5.8).

Figure 5.8: Stone tugs pull battleship USS *North Carolina* to its slip in Wilmington (Image courtesy of the Dr. Robert M. Fales Collection, New Hanover County Public Library).

The legacy of the towing company can still be seen along the riverfront and felt from the people of Wilmington. When the Stones gave the remaining tugs to the city, the people of Wilmington were outraged at the decision to sink the tugs as an artificial reef rather than save them. One angry citizen wrote:

> Editor: I am an old lady, 65, and I am living in the age where I can act like a child on occasion if I want to. Age gives us that privilege. In my house there's an old trunk given to my grandfather when he was a 9-year-old boy. Now, grandfather was born in 1865. Things had been happening in those years. The nation had been torn with the Civil War. But I love to just look at and think of the hands that have cared for it and treasured it. After grandfather's death in 1936 it became my mother's and in 1978 at her death it became mine. Well, I felt about the old trunk like I did about the old Stone tugs. Many times I've crossed the bridge going to Wilmington and looked to see them. To me they were fascinating. They were a part of the river scene. I then found out how old they were. Anyone who loves the water loved the tugs. Then I found out that someone else loved them, too. And that in spite of all their efforts to save

> them, the guts were taken out to sea and sunk. But as I said, I can act like a child if I please and say I hope there's so much lead in the paint that fish won't go near them; I hope they never catch a fish within a mile of them; I hope the fish come south this summer and there'll be the worst season ever. I hope when those men die, everything they won will be put out on the street in a yard sale. I hope their wives will be so stingy that they will carry them out to the Stone tugs and let them ride the plank down to the old cabin and let them rest. They need no monument to mark the spot where they sleep. They have already got theirs under the deep. They'll feel at home there and enough for them. Now I've got that off my chest, I feel better. Elizabeth Davis Kinlaw (*Wilmington Morning Star* 03/15/85)

The Stone Towing Company and Marine Railway is a vital aspect of Wilmington's Maritime History.

Hamme Marine Railway

The Hamme family arrived in Wilmington in 1866 and was well known for a variety of businesses in the town. A 1984 newspaper story remembered "R.F. Hamme the Hatter and Clothier" store on Front Street. The family went on to farm for a brief period in Castle Hayne, North Carolina, but, "By 1920 they apparently had found their niche by opening Marine Railroad on Eagles Island" (*Wilmington Star* 07/09/1984).

In 1876, Wilmington papers advertised a plot of land for sale on Eagles Island, south of the Beery Shipyard. The advertisement claimed the property was, "all in Brunswick County, possessing all the advantages of City Real Estate, without being subject to city taxation" (*Wilmington Star* 04/21/1876). The land continued to sell and rent for wharves for various industries, including naval stores, until R.F. Hamme purchased the land in 1910 (*Wilmington Dispatch* 09/07/1910). In 1915, R.F. Hamme and his son R.F. Hamme Jr. constructed a small railway on Eagles Island for the repair of small vessels, a tugboat being the largest size the railway could hold. In addition to the

railway, the Hammes constructed a boathouse available for rent by the month to gasoline launches and other small boats (*Wilmington Dispatch* 07/23/1915). The railway could haul vessels up to 150 gross tons using a large, hand-powered windlass (*Wilmington Dispatch* 01/11/1916).

In 1919, the Hammes purchased 100 additional feet of waterfront adjoining their marine railway for the purpose of constructing an additional marine railway to service vessels of up to 500 tons (see Figure 5.9). The additional railway, papers reported, would be large enough to handle fishing boats and the largest schooners in the river trade. The greater capacity of the Hamme railway reflected the growth of the port of Wilmington: "The increasing number of vessels seeking to dry dock in Wilmington prompted the Hameys [*sic*] to start enlargement of their plant. For months they have been rushed with work and could not handle all the vessels offered for repair" (*Wilmington Dispatch* 04/13/1919). The Hammes constructed the railway in two sections so it would only be necessary to lower both if a vessel exceeded the dimensions of the larger section of the railway. In addition to the railway, the Hammes planned metal and wood working shops for repairs on vessels of 800 tons. Electric machinery would be installed in the shops, in addition to electricity to run the railway (*Wilmington Star* 09/05/20).

In 1923, Fred Hamme built the first modern home on Eagles Island in the vicinity of Wilmington. The $15,000 investment had eight rooms and was said to have all the modern conveniences. The house, called 'Edgewater' sat adjacent to his marine railways and machine shops close to the waterfront on land filled in from government dredging of the riverfront (*Wilmington Star* 08/30/23).

Figure 5.9: Hamme Railway in 1924 with the smaller railway vacant and one vessel pulled onto the larger railway to the south. Edgewater can be seen in the foreground (Image courtesy of James A. Pleasants, Jr.)

The Hammes successfully operated the marine railway for just over 30 years repairing some of the town's most treasured vessels, a large number of fishing vessels, and interesting vessels, such as a sea plane in 1922 (*Wilmington Star* 02/28/24; *Wilmington Dispatch* 10/26/21, 08/24/1922). On 2 June 1946, Hamme sold his yard and railway to J.P Pretlow and retired from the business. Shortly thereafter, the fire that damaged the Stone Marine Railway tore through the Hamme Railway as well, causing considerable destruction. Pretlow rebuilt his railway and resumed business in December of that year. J.P Pretlow eventually sold the company and land to Buddy Lynch who operated it for a short time and closed the yard permanently in the 1960s (Jackson 1996:237).

Army Corps of Engineers

The United States Army Corps of Engineers played a vital role in the development of Wilmington Harbor through constant improvements to make it accessible to a variety of vessels. Through the late 1800s, the Corps' role was to improve the river based on governmental mandates through dredging and closing inlets in order to make the Cape Fear River deeper and wider to increase accessibility to large merchant vessels (Watson 1992). The earliest mention of the government shipyard was in regards to a government tug hauled out of the river for repairs at the foot of Queen Street in December 1884 (*Wilmington Star* 12/24/1884). The government shipyard appears on the Sanborn Insurance map of 1898 at the same location on the riverbank between Queen Street and Wooster Street (SMPC 1898:16).

In 1910, the Corps implemented plans to move the yard across the river from Castle Street onto Eagles Island (see Figure 5.10; United States Army Corps of Engineers 1910:358). The dredge *Ajax* began dredging the river to build extensive wharves and construction of the new docks was finished September 1910 (Jackson 1996:232). Shortly thereafter, the Corps removed machinery and buildings from the Wilmington side of the river and moved them to the Eagles Island yard (*Wilmington Dispatch* 09/14/1910; United States Army Corps of Engineers 1911:1563).

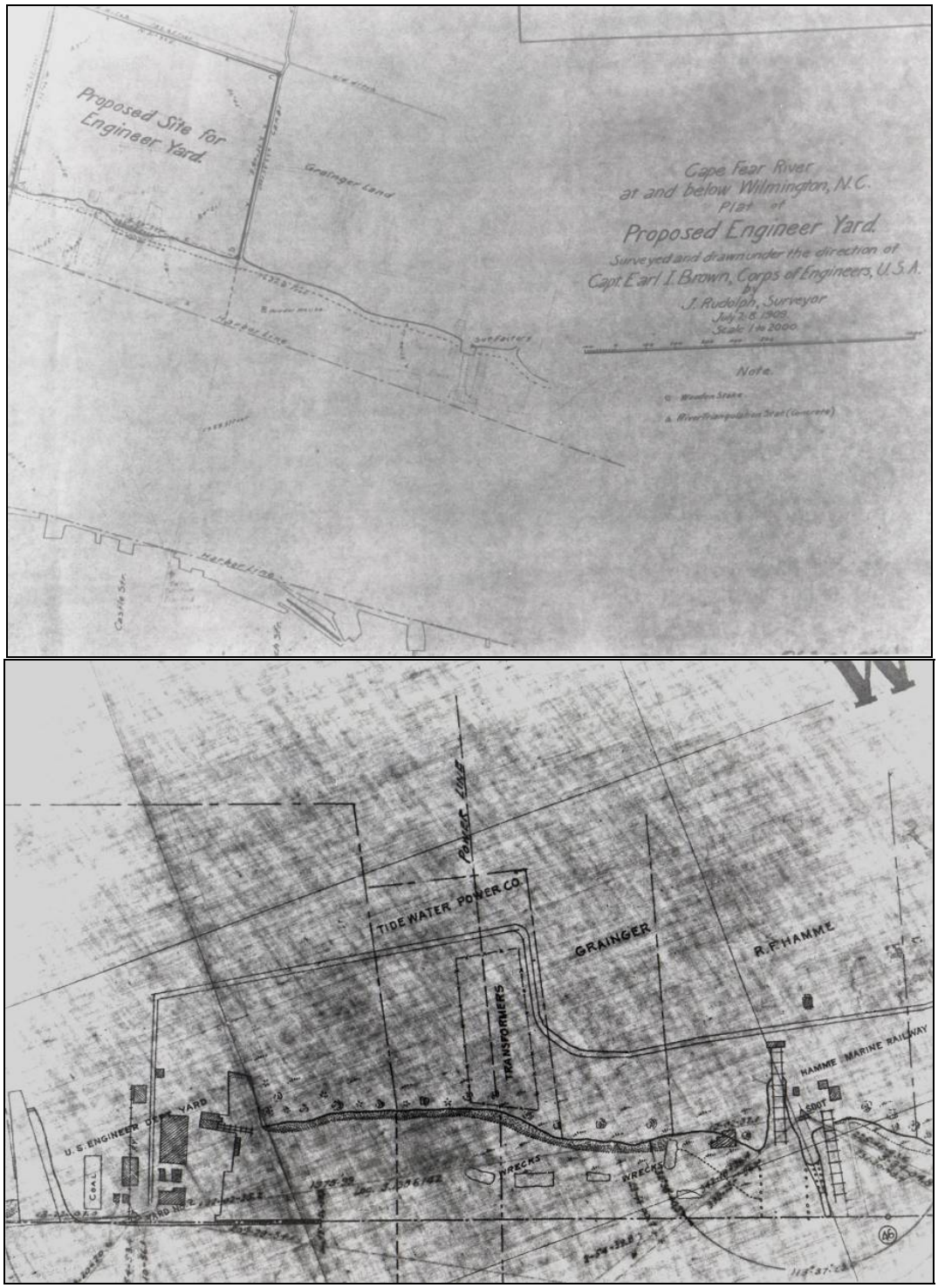


Figure 5.10: (Top) 1909 Corps of Engineers map showing proposed site of new Army Corps of Engineers Yard directly across from Castle Street on Eagles Island. (Bottom) 1922 United States Coast and Geodetic Survey map showing facilities in Wilmington Harbor. The Engineers Yard appears south of the Hamme Railway Yard (Images courtesy of the North Carolina Underwater Archaeology Branch).

The Army Corps of Engineers still maintain and operate the government yard on Eagles Island (Figure 5.11).

Figure 5.11: The Army Corps of Engineers Yard in 1933. The Hamme home, Edgewater, appears in the upper right-hand corner. (Image courtesy of James A. Pleasants, Jr.)

Other Island Industry

While Naval Stores and Marine Railways occupied most of the Eagles Island riverfront throughout the last two centuries, a number of other industries called the waterfront home at various periods through time. One of the most important of the miscellaneous endeavors on Eagles Island was the Confederate States Cotton Compress, established in 1864, which abutted the Eagles Island ferry landing. The compress was the first of its kind in Wilmington and provided blockade runners with a valuable cargo, used to maintain trade for munitions and provisions throughout the war. Residents of Wilmington burnt the compress in February of 1865, along with bales of cotton, during the evacuation of Wilmington. However, the brick chimney from the compress stood in

place on Eagles Island as a monument to the efforts of the people of Wilmington until 1916 when it was destroyed in order to construct the four-masted schooners in the same location (*Evening Dispatch* 01/10/1905; *Evening Dispatch* 07/30/1916).

Many newspaper articles from the 1870s to the 1930s indicate that a number of Wilmington merchants warehoused their goods on Eagles Island while they operated businesses from the east side of the river (see Figure 5.12). In a flood in 1874, Northrop and Cummings, businessmen with a mill in Wilmington and warehouses on Eagles Island lost a large crop of corn, turnips, and other stored goods (*Wilmington Star* 10/01/1874). In an extremely high tide over Eagle Island's swampy shoreline in 1878, "Work had to be stopped at some of the distilleries in consequence of the encroachments of the water, while at Messrs. Williams & Murchison's sheds salt, molasses, &c., had to be removed to the most elevated positions to prevent the articles from being damaged" (*Wilmington Star* 01/05/1878). In addition to naval stores, many warehouses on Eagles Island stored lumber and shingles, farmed goods, salt, and fertilizer products starting in the 1870s through the early 1900s. The wharves on Eagles Island proved to be good for storage and loading of vessels, but were especially prone to fires which occurred frequently near the distilleries, in the warehouses, and on the wharves (*Wilmington Star* various dates). Though by the turn of the century the naval store industry was dwindling on Eagles Island, the wood supply still proved to draw commercial interests.

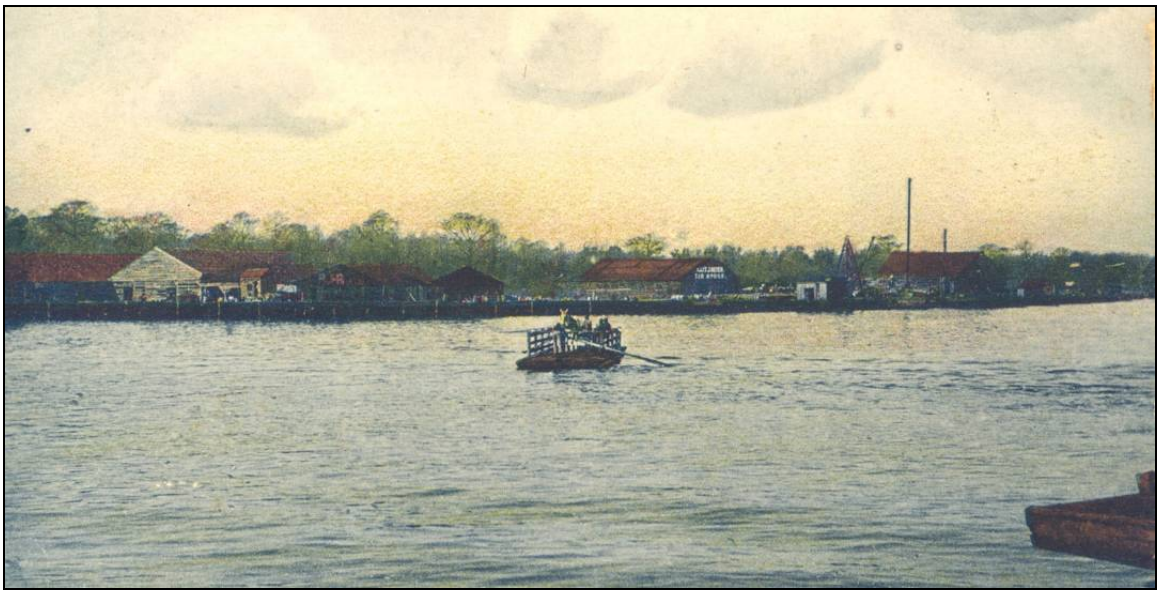


Figure 5.12: The Market Street Ferry crossing the Cape Fear River from Wilmington. The diverse industries of Eagles Island can be seen in the background (Image courtesy of New Hanover County Public Library).

In 1899, the Acme Tea Chest Company based out of Glasgow began purchasing a significant amount of property around Wilmington, including on Eagles Island. The company considered a number of ports on the Gulf and Atlantic ports and chose Wilmington for the advantage of the local wood supply and the convenient location of the harbor (*Wilmington Star* 09/08/1899). The establishment of the company in Wilmington brought an increased international market for products stored and shipped to overseas ports from the town. The 1915 Sanborn Insurance maps show the Acme Tea Chest Co. and a naval stores company north of the Eagles Island ferry landing. Just south of the ferry landing are old turpentine stills and naval stores. Additionally, there are new lumber sheds, the Dunn Brothers warehouse of imported molasses, coffee and rice, and the Wilmington Marine Railway (SMPC 1915:48). In 1931 a major fire swept through the old buildings north of the ferry slip (*Wilmington Star* 03/13/1931) and by the 1955 Sanborn map, the land contain little more than ruins. South of the ferry slip are wharves

with oil storage facilities and the expanded Stone Marine Railway (SMPC1955:48). The miscellaneous industries that occupied Eagles Island had an equally significant effect on the development of the port town as the various industries on the east side of the river.

Conclusion

The history of Eagles Island industry is intrinsically related to the history of the port of Wilmington. Its inception as the hub of a major naval stores industry was the impetus for Wilmington to develop into the largest port in North Carolina and a leading shipping center in the American southeast. The island's role in the storage and shipping of goods such as cotton and wood products boosted the commercial economy of Wilmington and, in turn, served to make Wilmington an important national and international destination for maritime trade. The evolution of Eagles Island into a center of ship construction, repair, and marine railways demonstrates the value Eagles Island to Wilmington, and the importance of Wilmington as a maritime center and chief port along the North Carolina coast. The material remains of Eagles Island's industrial past still line the shore of the Cape Fear River. Together, the history and archaeological remains of the industry and commercial development of Eagles Island mirrors the development of Wilmington as a major port city.

CHAPTER SIX: EAGLES ISLAND ARCHAEOLOGY

Introduction

The physical remains of the industrial past on Eagles Island are a testament to the history of the port of Wilmington. Residents of Wilmington, the Corps of Engineers, and cultural heritage managers all have particular interests in the archaeological remains of the various industries. Cultural heritage managers from the UAB conducted field work on several occasions throughout the years, producing a variety of published reports on the archaeology of the abandoned vessels. Other investigations conducted by contracting firms for the Army Corps of Engineers provided data to determine the impacts river improvements would have on the sites.

The collection of information produced from previous work did not provide sufficient data for the questions asked in this thesis. This necessitated a re-examination of previous results and additional archaeological work to generate data associated with archaeological themes not previously explored. Conducting additional archaeological investigations enhanced the existing database of information on Eagles Island with the addition of focused data and a means of exploring more theoretical questions that can be answered based on upon the coalescence of the historical record and archaeological remains.

Previous Archaeological Work

Several agencies previously conducted archaeological work on Eagles Island. State cultural heritage managers conducted work to investigate the historical value of the

site and for clearance projects. The Army Corps of Engineers contracted clearance investigations on several occasions.

North Carolina Underwater Archaeology Branch

Archaeological work at Eagles Island began in 1975 when the North Carolina UAB and the University of North Carolina conducted a field school in archaeology. The project consisted of a magnetometer survey and visual inspection of the remains designated 0001 CFR (Hall 2004). Following the initial survey, the UAB conducted archaeological examinations of sites in the Cape Fear River in order to nominate the sites for the National Register of Historic Places (see Chapter Three for discussion on UAB work in 1983-1985). The initial UAB investigations resulted in vessel identifications, individual site surveys, and a plan of the site in its entirety including abandoned vessels mapped in position (see Figure 3.3).

Of the thirty-seven vessels recorded, the UAB researchers identified twelve vessels (*A.P. Hurt, H.G. Wright, Stone 5, Dolphin, Stone 6, Minnesota, Stone 3, Argonauta, Stone 4, Cherokee, John Knox,* and the Stone drydock and marine railway) and ascribed descriptive names to the other vessels. The identifications, based on interviews with Wilmington residents, provided a means of further research on the vessels. The UAB corroborated the archaeological remains to the historical information about the named vessels and was able to determine the identifications with certainty (Lawrence 1985). Further historical research in the early 1990s with a middle school group led to the identification of the first vessel surveyed, 0001CFR (*Waccamaw*) (Triebe and Wilde-Ramsing 1992).

The UAB and the US Army Corps of Engineers conducted an additional study from March 1993 to October 1994 as the cultural resource component of a comprehensive study of the Cape Fear and Northeast Cape Fear Rivers (Overton and Lawrence 1996; see Jackson 1996 for Volume 1 Maritime History). The purpose of the comprehensive study was to provide recommendations to the Army Corps of Engineers on the impacts of harbor improvement projects to the maritime history and cultural resources in the area. The cultural resources component of the study consisted of remote sensing with magnetometer and side-scan sonar, GPS positioning, diver investigations, and the production of a report. The UAB designated eleven priority areas as part of the investigation, assigning the portion of Eagles Island discussed in this thesis to be priority area three for the study. Project personnel recorded positional information using State Plane Coordinates and produced an updated site plan of the area with the positional data (see Figure 3.4).

Contracted Work

In addition to the UAB, the Army Corps of Engineers contracted a series of projects to be completed on the Cape Fear River in the vicinity of Wilmington in anticipation of harbor improvement projects. One of the earliest contracted investigations took place from June 1987 to June 1988 and involved historical research, remote sensing, and diver investigations on ten vessels in the Cape Fear River including one within the auspices of the Eagles Island Ships' Graveyard project, ferry *John Knox* (0016CFR) (Watts 1988). The recommendations concerning *John Knox* suggested that, "the ferry does not appear to be likely to yield important historical information and it is equally

unlikely that the vessel can be tied to events that have made a significant contribution to broad patterns of our history" (Watts 1988:31). The invalidity of this statement according to the theoretical background of abandonment behavior indicates that the contractors (Tidewater Atlantic Research, hereafter TAR) did not consider comprehensive questions of human behavior in the recording and analysis of the vessels researched (see Figure 6.1).

Figure 6.1: The remains of *John Knox* abandoned in the Cape Fear River (Image courtesy of the North Carolina Underwater Archaeology Branch).

TAR conducted additional investigations on *John Knox* for the Army Corps of Engineers in 2000 to determine impacts of a proposed river improvement project (Watts 2000).

During dive operations on the vessel, divers conducted baseline transects and triangulation to collect data to create a site plan and record exposed interior details of the hull in order to produce a comprehensive analysis of the ferry hull design and construction. Despite the detailed drawing and analysis of the vessel remains, the contractors again suggested that, "because of the extent of damage to the vessel structure, level of archaeological documentation and the limited association with the city of Wilmington, no additional research or investigation of the *John Knox* is recommended" (Watts 2000:82). While the structural documentation and analysis contribute to the greater understanding of the vessel's significance, the results of the contractors' work did not address additional archaeological questions that can answer larger theoretical issues dealing with culture, economy, and technology in Wilmington. The exclusion of behavioral questions of abandonment and salvage necessitated the augmentation of contractors' previous fieldwork and analysis.

Another Corps of Engineers contracted report occurred in 2004. The purpose of the report was to determine impacts of harbor improvements on 65 archaeological sites in the vicinity of Wilmington harbor and to locate and investigate any additional threatened archaeological sites (Hall 2004). The contracted field work consisted of a remote sensing survey of Wilmington Harbor including the consolidation of magnetometer and side-scan sonar data overlaid onto aerial and contour maps of the harbor. The contractor (Mid-Atlantic Technology and Environmental Research, Inc.) did not conduct investigations on any of the sites included in this project. However, the contractor found that seven vessels included in the scope of this thesis could be adversely affected by improvement projects

and recommend that detailed archaeological documentation of each site should be conducted prior to impact.

ECU Surveys and Site Identification/Location

Despite the high quality and comprehensive nature of previous archaeological work , because the focus of previous projects differed from that of the Eagles Island Ships' Graveyard project, there was a significant need for additional archaeological fieldwork. Previous maps provided basic information for site identification and navigating while conducting field work, but did not provide enough information to be diagnostic. The previous site maps and positioning investigations provide general positional information but do not correlate to diagnostic details or actual site formation. Vessel sizes, shapes, and orientations on the existing maps do not directly correlate to actual sizes, shapes, and positions of the abandoned vessels. On the earliest maps (see Figure 3.3), the traditional wreck symbol is used to denote the location of vessel abandonment. On the later map (see Figure 3.4), small boat shape symbols are used. These symbols do not provide information on the type of vessel, such as a barge versus a tug boat, and do not discern between bow and stern, which is important for interpretation of the abandonment process. The inaccuracies and deficit of detail inhibit vessel identification through the correlation of previous maps to the historical record. Also, the previous maps do not provide enough detail to understand the temporal deposition of vessels. Understanding the temporality of vessel abandonment is vital for interpretation of behaviors and correlation to economy and technology.

The additional field work conducted for the Eagles Island Ships' Graveyard project was to create a larger base of current site data. More data was necessary to ascertain any possible problems with identifications. While identifications made by previous researchers seemed accurate, additional historical research correlated with archaeological work might reveal the identities of some unnamed vessels (see Table 6.1). Additional work was necessary, also, to locate and identify additional sites previously undocumented. Also, more work was necessary to recognize and document signatures and behaviors associated with abandonment and post-depositional behaviors because those areas of research remained unaddressed (to be discussed in Chapters Seven and Eight).

ECU Survey Products

ECU students and faculty produced four main products from field operations on Eagles Island. The products will contribute to the existing records at the UAB and bolster the amount of previous documentation on each abandoned site on Eagles Island.

The students from the 6820 Field Methods course each produced a report about the individual vessel on which they conducted historical research and archaeological field work. The reports had an intensive historical background of each vessel, results and observations from archaeological field work, and a plan-view site map of the assigned site. The historical backgrounds on each vessel provided valuable information on the use life of the vessels including details on construction, refittings, owners, and dates of abandonment. The reported observations from archaeological field work include details

about site formation, signatures of abandonment, and signatures of salvage. These details are important for the scope of the thesis and were previously neglected or inadequately addressed. Also, the produced site plans provide a means of critical analysis on each vessel (see Appendix B). The student reports greatly augment the existing historical and archaeological record on each of the six sites.

Another product from the fieldwork is extensive photo documentation of the site in its entirety. Previous photographic documentation of the site took place during the 1983 field work. In the 23 years since the UAB conducted the previous field work, the sites have changed considerably from both natural and cultural transformations (see Figure 6.2). The photographic documentation provides an updated database of current site conditions. Using previous site photographs and updated site photographs can aid in understanding site formation processes and salvage taking place on the sites (to be discussed in Chapters Seven and Eight).

Figure 6.2: The image on the left is 0010 CFR (*Stone 5*) in 1983 and the image on the right is the same vessel in 2006. Natural and cultural transforms dramatically altered the site during the 23 years between the photographs (Image on the left courtesy of the North Carolina Underwater Archaeology Branch; Image on the right by Tricia Dodds).

The GIS project is a third product from the fieldwork. Incorporating historic maps, previous site maps and data, modern aerial images, and newly acquired creates a

means to conduct the most comprehensive site analysis to date with all collected data in a single location (see Figure 6.3).

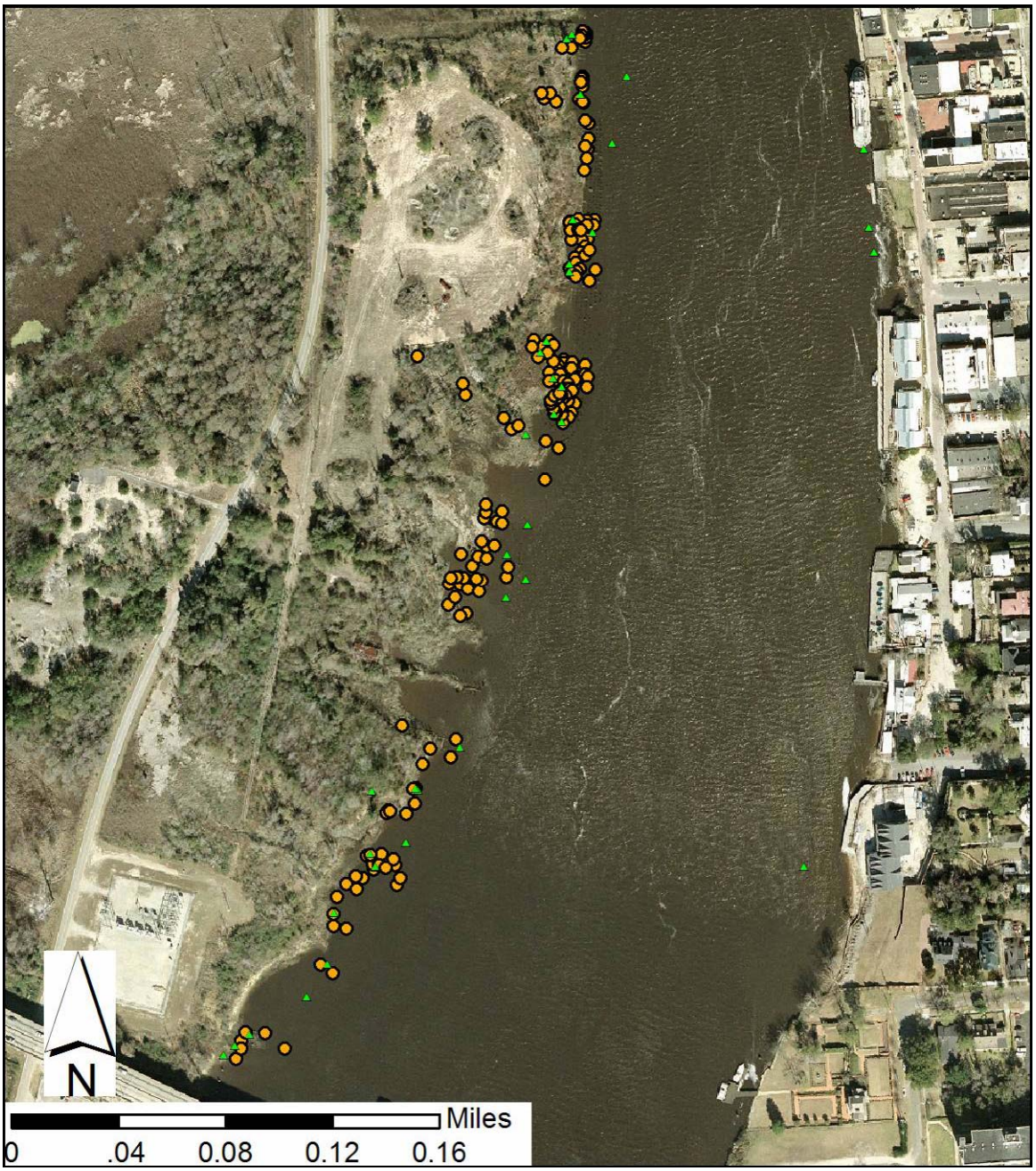


Figure 6.3: This image, a product from the GIS, shows the aerial image of Eagles Island and the Cape Fear River. Overlayed onto the aerial image are the GPS locations taken on the abandoned sites. The green dots represent locations taken during the 1996 field surveys and the orange dots represent positions captured during the 2006 survey. The GIS allows both sets of data to be viewed concurrently (Image by author).

The final product from the field which will aid in further analysis of the behaviors associated with abandonment and salvage are the site documentation forms (see appendix A).

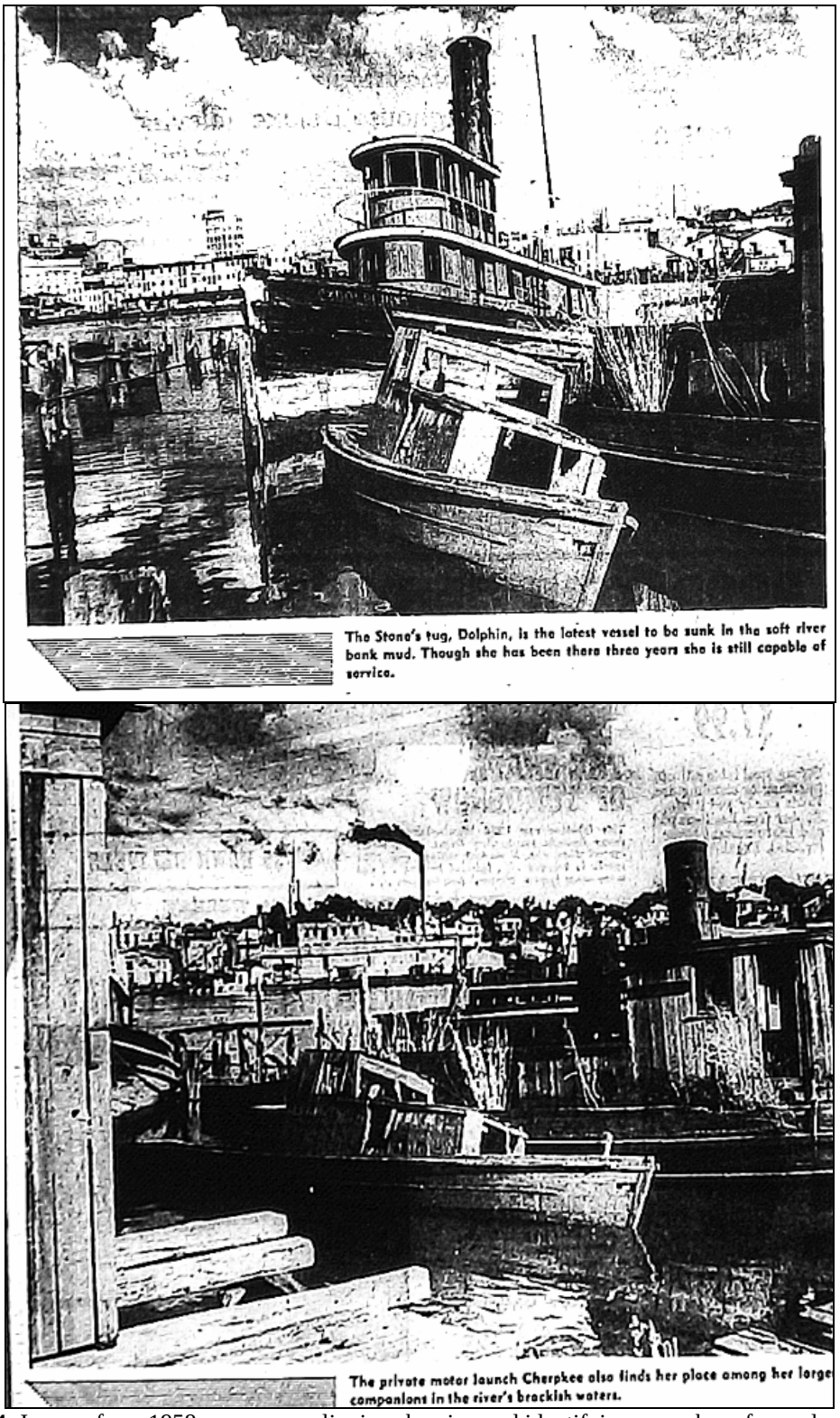
Results of Additional Archaeological Work-Identifications

The following table describes the identifications of vessels within this project:

UAB NO	Assigned Name	UAB Identification	Additional Identification
0001	Eagles Island Sidewheel Steamer	*Waccamaw*	none
0004	Barge 1	none	none
0005	Barge 2	none	none
0006	Bulkhead Tugboat	none	none
0007	Barge 3	none	none
0008	Barge 4	none	none
0009	Steam Crane Barge 1	none	none
0010	none	*Stone 5/ Sadie E. Culver*	none
0011	none	*Dolphin*	none
0012	none	*Stone 6/ Atlantic City*	none
0013	none	*Minnesota/ Bonheur*	none
0014	none	*Stone 3/ Isabel*	none
0015	none	*Argonauta*	none
0016	none	*John Knox*	none
0017	E.I. Skiff 1	none	Shove Skiff
0018	Last One Wreck	none	none
0019	E.I. Launch	none	Possibly *Rosalie*
0020	Bulkhead Barge	none	none
0021	none	Stone Dry Dock	none
0024	Sanded Barge	none	none
0025	Little Barge	none	none
0026	Government Barge	none	none
0027	none	*H.G. Wright*	none
0028	none	*Stone 4/ Eva*	none
0029	Iron Rudder Wreck	none	none
0030	Splayed Wreck	none	none
0031	Argonauta Barge	none	none
0032	Wright Barge	none	none
0033	none	*Cherokee*	none
0034	E.I. Other Skiff	none	none
0041	Intact Tug	*Iscoe*	*Captain Tuck/Isco*
0042	Steam Crane Barge 2	none	none

Table 6.1: Previously Recorded Vessel Identifications (Lawrence 1985; Wilde-Ramsing 1986; Overton and Lawrence 1996; Hall 2004; The Board of Engineers for Rivers and Harbors 1935; *Wilmington Morning Star* 1958).

A majority of the previously identified sites retained their identifications after further research (see Table 6.1). Of the thirty-two previously identified sites that fall into the scope of this project, previous researchers determined the identity of fourteen vessels and those identities were substantiated with additional research. The remaining eighteen vessels were not previously identified. The difficulty with identification can be attributed to the utilitarian value of the vessels, such as the large number of barges used only as workboats. Many of the tug names, identified through oral histories, were substantiated in the historical record. Newspaper clippings from 1958 (*Wilmington Morning Star* 1958) provide photographic evidence to support assertions from Stone Towing Line company records (Stone Towing Line Records 1973-1960) and oral histories that specific Tugs including *Dolphin, Stone 4, Stone5, Argonauta, Minnesota* and private launch *Cherokee* were abandoned in their current location by the Stones by 1958 (See Figure 6.4). The correlation between photographs and historical evidence supports the identifications of the vessels.



The Stone's tug, Dolphin, is the latest vessel to be sunk in the soft river bank mud. Though she has been there three years she is still capable of service.

The private motor launch Cherokee also finds her place among her large companions in the river's brackish waters.

Figure 6.4: Images from 1958 newspaper clipping showing and identifying a number of vessels abandoned on Eagles Island (*Wilmington Morning Star* 1958).

While all of the identifications were substantiated, there was some speculation about the identification of one vessel, 0041 CFR (*Intact Tug*, *Iscoe*, *Isco*). The UAB researchers called the vessel *Intact Tug* until they were able to obtain evidence of the identification. Upon discovering the name of the tug in interviews, the UAB assigned the name *Iscoe* to the vessel. However, a newspaper article from the 1980s declared the tug was actually *Captain Tuck*, an entirely different vessel that operated on the Cape Fear River (see Figure 6.5).

Figure 6.5: Newspaper clipping declaring identity of Tug as *Captain Tuck* and modern image of Tug *Isco*. The images actually display the same vessel (Newspaper clipping courtesy of the Cape Fear Museum; Image of *Isco* by Amy Leuchtmann).

Investigations into historical and archaeological records proved that the vessel designated 0041 CFR was not *Captain Tuck*. The latter was of steel construction and the remains on

Eagle Island are wooden, proving the intact tug could not be *Captain Tuck*, and the image from the paper was, in fact, likely the tug *Isco* (Ray Bordeaux 2007, pers. comm.). Further investigation into merchant ships' registers revealed the vessel was *Isco* as opposed to the previously determined *Iscoe* (Leuchtmann 2006:6,9).

Another vessel that was not previously identified was 0019 CFR (Eagles Island Launch). The UAB reported that the vessel was likely a gas or diesel powered launch with a heavy build and iron strapping (Overton and Lawrence 1996:160; Hall 2004:39). Consultation with the historical record revealed a gas powered launch that operated for the Stone Towing Line and Marine Railway in the 1930s. The vessel, *Rosalie*, had dimensions matching those of the archaeological remains of the Eagles Island Launch, indicating a possible match between the historical and archaeological record (The Board of Engineers for Rivers and Harbors 1935:161).

Investigations at the Cape Fear Museum provided evidence to clarify the identity of a third vessel from previous investigations. Previous investigations described 0017 CFR (Eagles Island Skiff) with little information other than the dimensions, sharp bow, and square transom (Overton and Lawrence 1996:158). The Cape Fear Museum maintains an outdoor boat pavilion in order to showcase a variety of local craft. One displayed craft, the "shove skiff, matches the dimensions, shape, and construction techniques visible in the remains of 0017 CFR (see Figures 6.6 and 6.7). The correlation between the two supplies additional descriptive information about the abandoned vessel and provides information about the role of the vessel in the local technological and economic climate.

Figure 6.6: Shove skiff on display at the Cape Fear Museum, Wilmington, North Carolina (Image by author).

Figure 6.7: UAB designated 0017 (Eagles Island Skiff) matches the construction of the Shove Skiff from the Cape Fear Museum. The pointed bow of the skiff is visible (Image by Tiffany Pecoraro).

The museum exhibit reports that shove skiffs were of local construction and were usually shoved with a long pole or paddled in the river. They were commonly used to travel into town and for oystering or tending nets. The abandoned shove skiff indicates that Eagles Island is the final resting place for both major workboats including tugs and barges and smaller local craft, built and operated by locals on a small scale to transport people, goods, and accomplish tasks on the water. The vessels 0041 CFR, 0019 CFR, and 0017 CFR all required additional analysis in the historical and archaeological records to clarify or identify the vessels accurately. Regardless, a majority of the previous identifications proved to be accurate and the problems identifying work boats persisted during additional research.

Results of Additional Archaeological Work-Newly Located Sites and Descriptions

While conducting additional field work, researchers located and recorded several additional abandoned vessels and associated material not noted in previous work (see Table 6.2).

New UAB Number	Assigned Name/ Identification
1001 CFR	Stockpile 1/*Stone 20*
1002 CFR	Stockpile 2
1003 CFR	Lifeboat 3
1004 CFR	Barrel Boat
1005 CFR	Shove Skiff 3
1006 CFR	Barge
1007 CFR	Steam Crane Barge 3
1008 CFR	Lifeboat 1
1009 CFR	Lifeboat 2

Table 6.2: Newly located and recorded sites on Eagles Island

1001 CFR: Stockpile 1/*Stone 20*

Stockpile 1/*Stone 20* is located along the waterfront in the Stone Towing and marine railway yard, north of the majority of abandoned vessels in that area. The stockpile consists of a large metal feature measuring about 110 feet long and 32 feet wide filled with a significant amount and variety of metal materials (see Figures 6.8 and 6.9). Originally the large metal feature was thought to be a rectangular boiler, however, a Stone family descendant and marine railway worker suggested it was a metal barge used into the 1960s (Richard Womack 2006, pers. comm.). The historical record proved to support the later identification of the metal feature because the Stone Towing Company and Marine Railway operated a steel barge, *Stone 20*, from the late 1950s through the 1960s (Stone Towing Line Records 1957:679.5.a; The Board of Engineers for Rivers and Harbors 1961: 21; Richard Womack, 2006 pers. comm.). The visible remains of the metal feature match the historical dimensions of *Stone 20*.

Figure 6.8: Stockpile 1/*Stone 20* (Image by Nathan Richards).

The archaeological remains indicate that additional materials in the stockpile were deposited within the remains of the steel barge. The miscellaneous metal materials deposited within the barge are spread throughout the barge remains and are not concentrated in a specific location. The additional materials include: an excess of four dredge buckets, a belt winch, a metal cable, two vertical boilers, a metal davit, a metal ladder, and a significant amount of metal sheeting which could be from the barge itself or from additional stockpiled materials.

Figure 6.9: (clockwise from top left) Metal sheeting, possibly collapsed structure from steel barge; belt winch; vertical boilers, steel cable (Images by Nathan Richards).

1002 CFR: Stockpile 2

Stockpile 2 is also located in the Stone Towing and Marine Railway yard. Unlike the waterfront location of Stockpile 1, Stockpile 2 is inland of abandoned vessels and dock remains, north of the railway. The descendent of the Stone family reported that the location of the stockpile is in the immediate vicinity of the collapsed carpentry shop used

by the Stone Towing and Marine Railway workers up to and after the cessation of railway use (see Figure 6.11, Richard Womack 2006, pers. comm.). In addition to location, the formation of Stockpile 2 varies greatly from that of Stockpile 1. The inland site consists of a complex pile in which one object sits directly on top of another, creating a berm of metal materials (see Figure 6.10). Objects in Stockpile 2 include: a hose reel, engine pumps, a rudder, anchor chain, several anchors, a windlass with intact chain, a pile hammer, a prop shaft with couple for the eccentric, a winch, a crank shaft, an engine block, and bitts.

Figure 6.10: (clockwise from top left) Engine pumps; hose reel; prop shaft with eccentric coupling, bitts, winch with chain, iron rudder (Images by Nathan Richards and Joe Hoyt).

It is possible that a large number of the items in Stockpile 2 were stored or used in association with the carpentry shop. However, the remains of the carpentry shop were in excess of 30 feet to 95 feet north of the stockpile and deposition of all stockpiled objects in the current location can not be attributed entirely to the collapse of the structure.

Figure 6.11: Collapsed Carpentry Shop in the Stone Towing and Marine Railway yard, north of Stockpile 2 (Images by author).

1003 CFR: Lifeboat 3, 1008 CFR: Lifeboat 1, 1009 CFR: Lifeboat 2

Lifeboat 3 sits on the remains of the Stone Marine Railway within the Stone yard. The vessel is slightly warped, but otherwise in good condition. It is of steel construction and measures nearly 19 feet long and 5’5” wide. The vessel has a bluff bow and bench seats throughout (see Figure 6.12).

Figure 6.12: Lifeboat 3 located on the remains of the Stone marine railway (Image by author).

Lifeboat 1 and Lifeboat 2 are located on the remains of a distillery and tar shipping wharf, north of the Stone railway and immediately south of the old ferry landing. Lifeboat 1 measures 20 feet by 8 feet and is positioned upside down. Lifeboat 2 measures 25 feet by 9 feet and is in an advanced state of decay. Both are built out of steel (see Figure 6.13).

Figure 6.13: Lifeboat 1 (left) and Lifeboat 2 (right) are located approximately 110 feet apart on distillery and wharf remains (Images by author and Tiffany Pecoraro).

Richard Womack (2006, pers. comm.) remembers pulling lifeboats off tug *Estelle Stone* and a Liberty ship in the 1960s and placing one on the railway after it was no longer in use. He also recalls pulling a lifeboat off the tug *Stone Brothers* at high tide and placing it north of the Railway Yard. Womack recalled that the tugs used by Stone Towing in the 1960s all came with unneeded lifeboats and workers had to remove them from the boats and deposit them on shore.

1004 CFR: Barrel Boat

The Barrel Boat, so named because of its contents, is a small wooden boat located between Lifeboat 1 and Lifeboat 2 on the remains of the distillery and tar distributors wharf. The vessel measures 21 feet by 7 feet 3 inches and is carvel built with outer hull planking still intact. The vessel is fastened with iron fasteners and constructed with chicken wire between the pins and planking. The small boat was carrying a quantity of barrels storing tar, five were visible, but most appear ruptured. The vessel is in a state of considerable disrepair with the sides collapsing and the wood dry-cycling in its exposed location (see Figure 6.14).

Figure 6.14: (left) The starboard hull of the barrel boat can be seen with iron pins sticking out of the top remaining strake. (right) Several barrels sit inside the vessel supported by chicken wire and the wooden hull (Images by Matthew DeFelice).

The boat is an obvious remnant of the industry that took place in that location. The metal barrels indicate that the boat was abandoned in the latter era of the naval stores industry when distillers no longer used wooden barrels for storage and transport.

1005 CFR: Shove Skiff

The previously unknown Shove Skiff is located amongst a large span of piling remains north of the Stone Towing Line and Marine Railway yard (see Figure 6.15). The vessel is situated between the other abandoned skiffs, 0017 CFR and 0034 CFR. 1005 CFR is nearly identical to abandoned skiff 0017 CFR. Both have the same construction style including a transom stern and pointed bow, and measure 16 feet in length, however, 1005 has an additional foot in breadth over 0017 CFR. The Shove Skiff has single, thin frames, a bulkhead just forward of the stern, and a visible inner and outer hull. The fact that there are at least two (possibly more not yet located) of this type of craft indicates the value of this locally built, vernacular vessel to the society and economy of Wilmington.

Figure 6.15: The author takes a GPS point at the bow of 1005 CFR (Shove Skiff) which is nearly identical to 0017 CFR (Image by Tiffany Pecoraro).

1006 CFR: *Barge*

Below the Stone Yard, there seemed to be a proliferation of unrecorded barges along the shore line. Barges seemed to make up a significant portion of the shoreline surrounding the Hamme Marine Railway, both the north and south of the railway. Marsh grass and mud, however, made it difficult to determine the orientations, configurations, and dimensions of the possible barge remains. The physical environment made it too difficult to declare with certainty that the filled remains of wooden structures were indeed recycled barges. There was, however, a small feature that was without a doubt a previously undocumented wooden barge. Located perpendicular to and immediately

north of Steam Crane Barge 1 were the remains of a small wooden barge (see Figure 6.16). The barge measures 38 feet by 20 feet and has a simple construction compared to some of the more robust, larger barges abandoned on the island. The barge is a smaller addition to a cluster of three larger barges, including two that still possess steam crane machinery, just south of the Stone railway.

Figure 6.16: Remains of a previously unrecorded 1006 CFR Barge. (left) The northwest corner of the barge leads to land just south of the Stone Marine Railway. (right) South of the barge in the foreground are the remains of Steam Crane Barge 1 and in the background are pilings indicating the previous location of a dock structure (Images by Tiffany Pecoraro).

1007 CFR: Steam Crane Barge 3

The third steam crane barge abandoned on Eagles Island sits in the Hamme Railway Yard, immediately south of *Isco*. The barge is comparatively smaller than the other two steam crane barges, measuring 38 feet 5 inches long by 17 feet 4 inches wide. It is the most intact of all barges on the site with decking still in place, though the wood is weak from waterlog and degradation and can not hold a significant amount of weight. The crane is a gantry type crane and is almost fully intact including the boom, seat, mechanism, and controls (see Figure 6.17). The crane is missing the engine which was cut out of its position aft of the seat. Oral histories revealed that Steam Crane Barge 3,

which is a derrick, was owned by Ed Bordeaux of the Bordeaux salvage company. He purchased the barge and operated it for a short time before abandoning it on Eagles Island in the mid 1960s because the wooden structure was too difficult to maintain (Ray Bordeaux 2007, pers. comm.)

Figure 6.17: Steam Crane Barge 3 with intact derrick machinery (Image by Tiffany Pecoraro).

Results of Additional Archaeological Work-Site Plan

The additional field work resulted in a large amount of highly accurate GPS data which was integrated into GIS. The product of the GPS data and the GIS integration is an updated site map that shows the actual size, shape, and position of the abandoned vessels, providing diagnostics for site formation (see Figure 6.18).

Figure 6.18: 2006 site plan of the Eagles Island Ships' Graveyard (Map by author).

Conclusion

The previous work conducted at Eagles Island provided a strong foundation of data upon which to build additional field work. Results from previous work proved useful in creating the historic framework for Eagles Island and individual abandoned sites on the island. Previous identifications were generally accurate and previous researchers recorded nearly all abandoned sites, on some level, through their work. The existing collection of data, however, was not sufficient for the purposes of this thesis. Additional work was necessary for a more complete analysis of the behaviors associated with the archaeological remains on Eagles Island. The additional data provides stronger evidence to understand the temporal and spatial aspects of abandonment along with specific patterned behavior associated with abandoning vessels and materials on Eagles Island. Also, the 2006 data contains evidence of salvage and reuse behaviors. Understanding the abandonment and salvage of the vessels on Eagles Island will create correlates to the culture of Wilmington including social, economic, and technological developments and changes through time.

CHAPTER SEVEN: USE AND DEPOSITION

Introduction

Previous chapters outlined the history of Wilmington, providing the cultural, economic, and technological development of the town, and presented the maritime history of Eagles Island in the context of the role the commercial industry of the island played in the development of Wilmington. The last chapter presented the results of previous and recent archaeological investigations on Eagles Island. This chapter is concerned with reading use and depositional patterns from the archaeological record and correlating them to the historical record. Use and depositional patterns in the archaeological and historical record correlate to human decision making. Using the theoretical framework, this chapter will identify the behaviors associated with the use and deposition of the remains on Eagles Island, and explore those behaviors to understand their correlation to conditions in Wilmington.

The analysis in this chapter will explore the use-life of the vessels based on historical records and the archaeological context. Richards (2002:287) perceived,

> Use and modification processes are important because they have direct influences on discard processes and can be seen to influence the time and nature of the transformation of a vessel from systemic context to an archaeological context.

Identification, quantification, and analysis of the use, modification, and reuse of vessels will demonstrate a correlation to the eventual deposition of those vessels into the archaeological context.

A deconstruction of depositional characteristics is also important because it directly reflects the conditions that led to that deposition. Using Schiffer's (1996:15-19) dimensions of variability provides a guide to asses the temporal, spatial, and relational variables evident in the archaeological remains. Recognizing and understanding those variables provides a framework to correlate the material remains to related historical records, and, thereafter, to the cultural, economic, and technological conditions both locally and on a larger scale, that influenced deposition.

Vessel Use-life Processes

Modification and reuse are the most important use-life processes to assess in the context of this research. Modifications made to vessels directly impact the end of use-life of that vessel, and ultimately deposition. Reuse either moves a vessel from one use to another or transforms a vessel from inactivity back into the systemic context. The modifications performed on a vessel during its use-life are difficult to recognize in the archaeological record and will be assessed primarily from the historical context. Evidence of reuse, however, permeates the archeological record at Eagles Island and will be a primary area of inquiry for analysis.

Modification

Conversion and modifications on vessels in the systemic context occur in primary and secondary phases. Primary phase conversions or modifications take place while the vessel is still operating its intended function. Secondary phase modifications take place before physical abandonment of a vessels, but likely after the original function of a vessel changes. Vessel modifications are essentially indicators of economic change. Updating a

vessel to be more efficient with new technology or design is a means of augmenting a vessel to prevent having to replace it. Common primary phase modifications include propulsion modification or replacing the propulsion to be more efficient. Another primary phase modification is hull dimension changes, or less commonly, hull material changes. Converting a vessel completely for a different function represents an entirely different type of behavior in which a vessel takes on a support role, rather than continuing in a primary use role, in order to avoid costly repairs or prevent scrapping a vessel altogether (Richards 2002:290-304).

At Eagles Island use-life modifications are difficult to discern in the archaeological record based on the visible remains. Therefore, the historical record is vital to determining the probability of such modifications. However, because the material remains at Eagles Island consist of a large number of unknown vessels, the historical record does not provide significant insight into the life of the vessels while operating the intended use function, including physical alterations to the vessels. Use-life modifications occurred on 20% of the vessels, did not occur on 22% of the vessels, and are unknown for 58% of the 41 vessels in the statistical sample. This does not mean that vessels in the unknown category did not undergo such modifications; rather, it is likely that many did but specific evidence is not available. Newspaper accounts from Wilmington describe incidents when locals performed modifications to barges, the most prominent vessel type exhibited among the unknown vessels. In 1921, the Stones reported adding engines, boilers, and tanks to a barge for hauling coal up and down the Cape Fear River (*Wilmington Dispatch* 10/17/1921). In 1925, the Stones purchased the

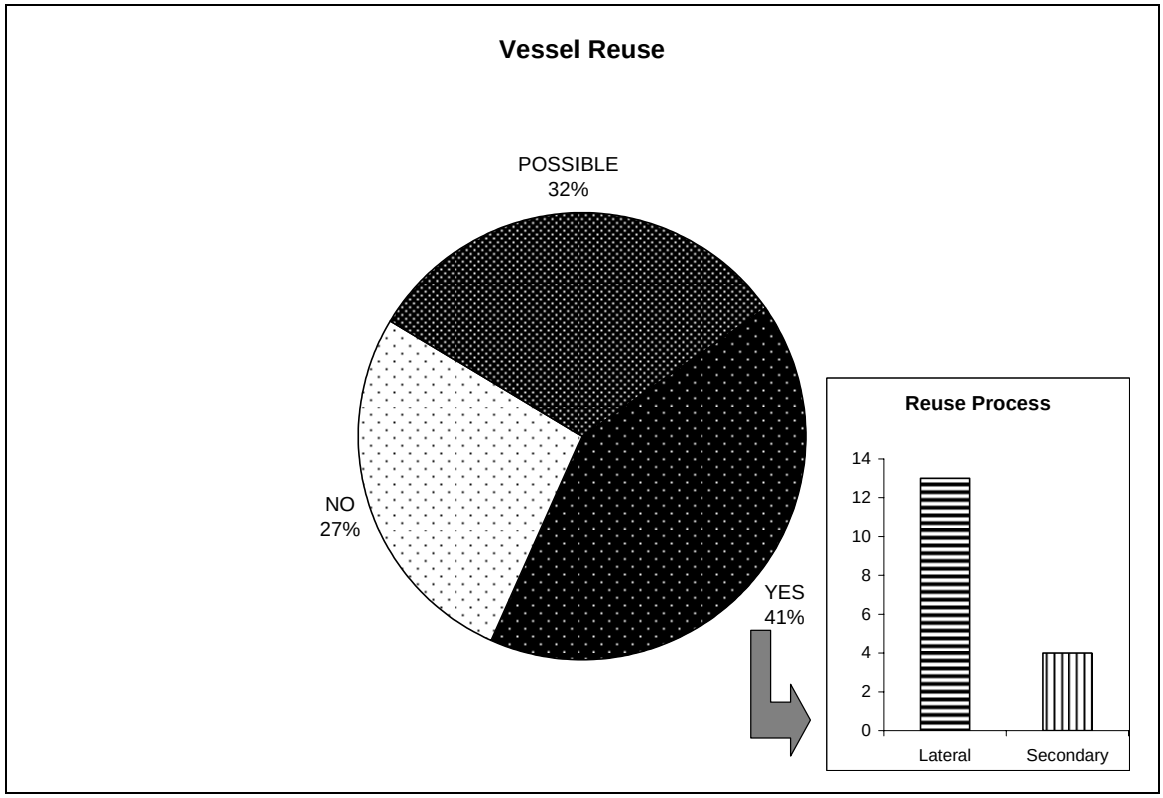
wrecked remains of barkentine *S.G. Wilder* and cut it down for use as a barge (*Wilmington Dispatch* 02/16/1925). It is probable that a number of the vessels that fall into the unknown category did, indeed, undergo modifications, which suggests that the 20% of vessels with documented primary function modifications should be higher, and likely higher than the 22% of vessels that did not have any modifications during their intended function use-life.

Propulsion modification was the most common alteration performed to the vessels on Eagles Island. Many older tugs went from steam engines to gas, or gas engines to diesel (Tock 2006:8; Damian 2006:6; Friedman 2006:5-6; Dodds 2006:6-9). Changing the propulsion was a means of increasing the efficiency of the vessel. The more technologically advanced vessels performed better. The Corps of Engineers modified the snag boat, *H.G. Wright*, several times during its primary use-life. Like the tugs, the propulsion on *H.G. Wright* changed from side paddlewheel to stern paddlewheel to increase the ability of the vessel to remove snags. The hull was modified on at least three occasions, including lengthening it from 60 feet to 102 feet and later reducing it to 89 feet. The Corps of Engineers replaced the hull on one occasion to reduce the draft of the vessel so it could go farther up river towards Fayetteville, and on another occasion to strengthen it to hold stronger, more powerful machinery. In addition, newspaper sources indicate the vessel was contracted to receive a metal hull in 1924, but the archaeological record indicates that alteration was not made (Hoyt 2006:4-7). Of the unmodified vessels, several were smaller, locally built skiffs or the unused lifeboats, vessels which were not known for their contributions to the commercial industry of Eagles Island and

Wilmington. The site sampling and historical record suggest that, despite the large percentage of unknowns, modifications to tugs and barges were common along the Cape Fear River. The number and type of modifications suggest that modification was important to increase the efficiency and expand the life span of vessels operating in the vicinity of Wilmington.

Reuse

Reuse of a vessel before physical abandonment but after the vessel is no longer serving the original intended function is typical behavior found in the systemic context. Graph 7.1 illustrates the amount of reuse at Eagles Island.



Graph 7.1: Vessel Reuse prior to physical abandonment at Eagles Island, N=41. The inset Graph shows the breakdown of reuse type, N=17.

Archaeological remains indicate definite reuse occurred with 41% of the vessels at Eagles Island. Among the abandoned watercraft at Eagles Island, the processes of lateral cycling and secondary reuse are the two types of reuse behaviors exhibited. Richards (2002:288) suggests that converting a vessel for a new role in a different trade is movement from primary phase use to secondary phase use. The lateral cycling of vessels at Eagles Island demonstrates secondary phase use. At least 13 vessels at Eagles Island had previous owners prior to ownership and use by industries on Eagles Island (see Figure 7.1). The change in the user and original use of the vessel is an example of lateral reuse.

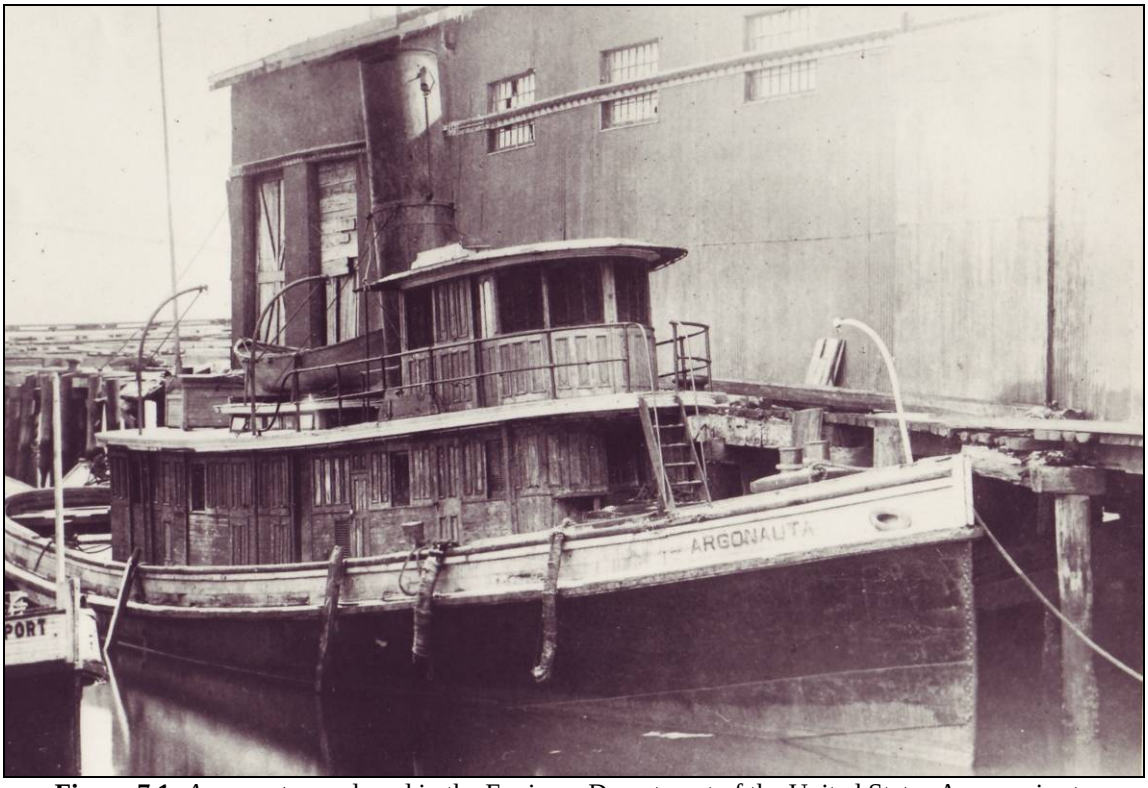


Figure 7.1: *Argonauta* employed in the Engineer Department of the United States Army, prior to ownership by Stone Towing (Image courtesy of the North Carolina Underwater Archaeology Branch).

In addition to lateral cycling among vessels, material on the island also exhibits the process. The Wilmington Iron Works purchased land for the Wilmington Marine

Railway which included the railway used by the Beery Shipyard. The Wilmington Marine Railway reused the original railway as an auxiliary to the newly constructed railway on Eagles Island (*Wilmington Morning Star* 09/28/1911).

Four vessels among the sample underwent minimal physical changes, but took on an entirely different function, demonstrating secondary reuse processes. Archaeological remains indicate that a cluster of two barges and a tugboat immediately south of the Hamme Railway demonstrate secondary reuse behavior, likely as a bulkhead for the railway yard to the north. The Bulkhead Tug sits parallel to shore, is filled with rock and brick debris, and the bow abuts the Bulkhead Barge to the north (see Figure 7.2).

Figure 7.2: (Foreground) Bow of Bulkhead Tug, which is filled with brick and rock debris, abuts the Bulkhead Barge, creating a bulkhead for the railway to the north (Image by author).

The Bulkhead Barge sits parallel to shore crossed on the north by Barge 3 which sits perpendicular to shore. The barges form a T-shape barrier and have a concrete wall built between them. The concrete wall connects the barges and is built directly into the wood fabric (see Figure 7.3). Also, piles line the north side of Barge 3 suggesting it was used in the structure of a dock, in addition to its role as a bulkhead (see Figure 7.4).

Figure 7.3: A concrete wall connects two barges, creating a bulkhead. (Left) The concrete wall built into the structure and fabric of the Bulkhead Barge and (Right) the concrete wall extending north out of the Bulkhead Barge towards Barge 3 (Images by author).

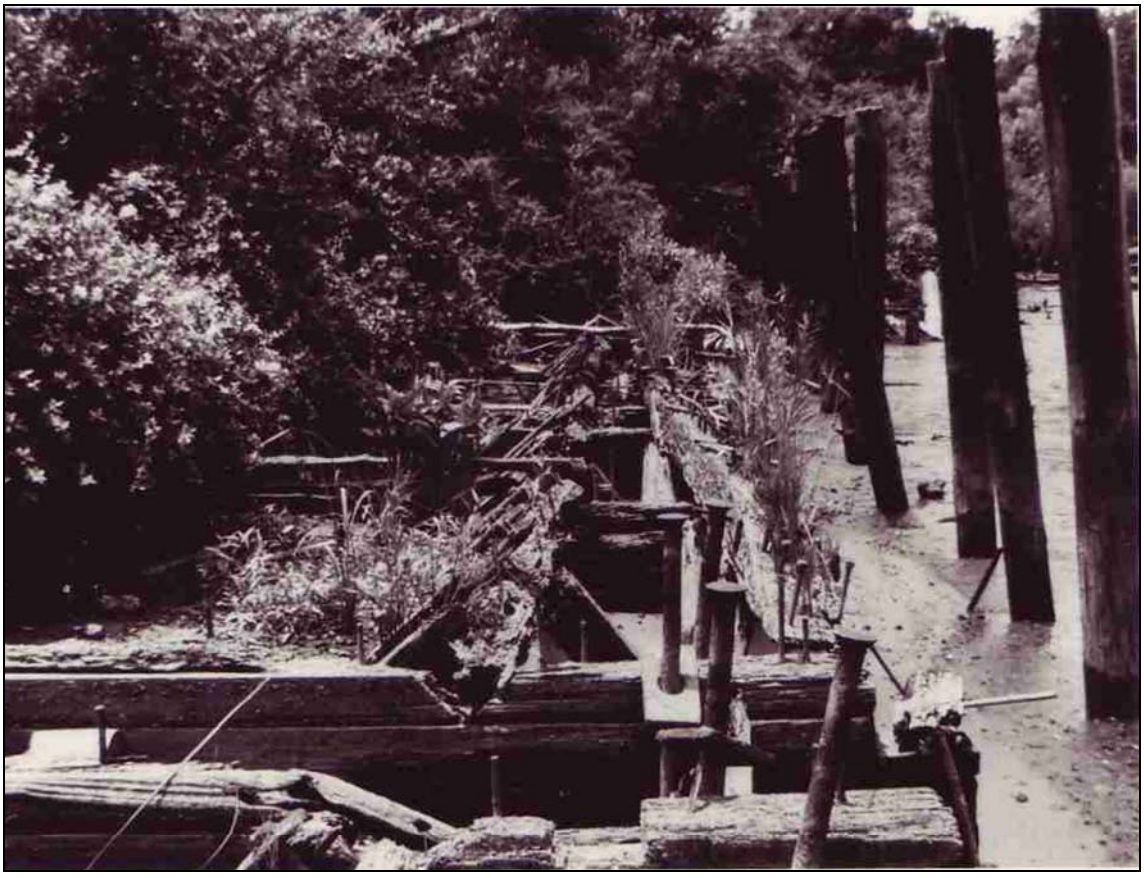


Figure 7.4: Piles line the north side of Barge 3, indicating the reuse process of secondary use behavior (Image courtesy of the North Carolina Underwater Archaeology Branch).

The fourth vessel, *H.G. Wright*, was used as a dining hall for the Stone Towing Company workers. Archaeological evidence through the years suggests the Stones left the main structural features of the vessel (such as the A-frame, boiler, engines, and paddlewheel) and simply pulled it onto shore in the railway yard (Jackson 1996:164; See Figure 7.5)

Figure 7.5: Remains of A-frame *in situ* on the snag boat *H.G. Wright* (Image by Joe Hoyt).

Assessment of the archaeological context indicates that reuse likely occurred with an additional 32% of the vessel remains on the island (see Graph 7.2). Of the 32% of vessels that were likely reused, lateral reuse is uncertain, but location and association with other remains suggest that 100% of the 13 vessels exhibit behavior associated with secondary reuse (as bulkheads, dock structures, platforms). An example is the cluster of barges directly south of the Stone Marine Railway (see Figures 7.6 and 7.7). Though there were no noticeable physical changes to the barges themselves (like the bricks and

concrete wall in the vessels south of the Hamme Railway), the eastern side of cluster is lined with piles, suggesting use in a dock structure (see Figure 7.6).

Figure 7.6: The cluster of four barges is lined, on the river side (east) with piles indicating likely reuse in association with a dock structure (Image by Amy Leuchtmann).

Also, the cluster pattern and location immediately south of the Stone yard mimic the behavior observed south of the Hamme yard and suggest secondary use for land reclamation and protection for the railway to the north. There is also a third cluster of barges in the southernmost portion of the site with a similar spatial layout to the other two clusters.

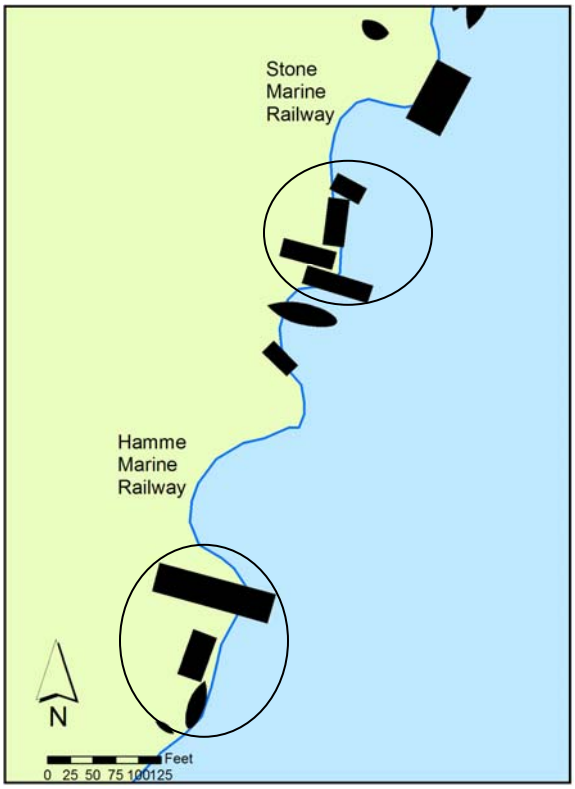
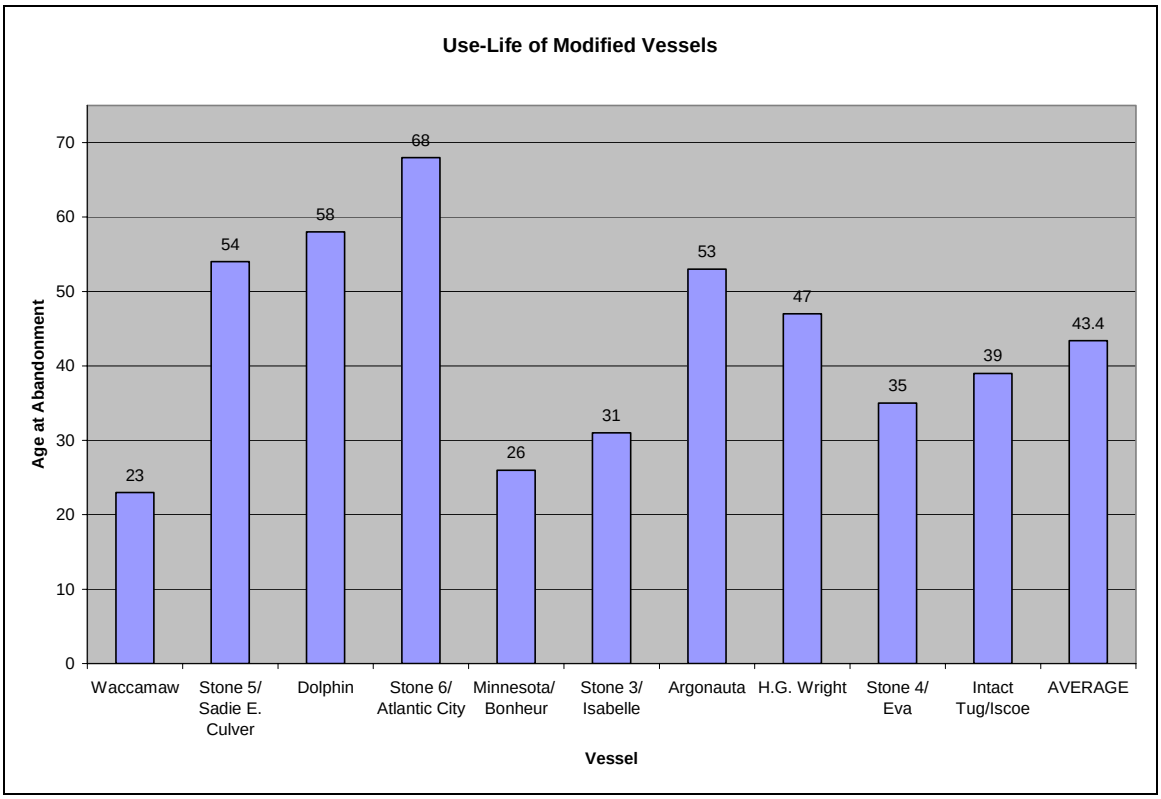


Figure 7.7: Barge clusters south of each marine railway yard, likely used to create bulkheads and protect the approaches to the railways (Map by author).

This behavior relates to what Schiffer (1996:19) described as recurrent associations of artifacts in the relational dimension of variability. The recurring barge clusters spread throughout the site with similar spatial dimensions (configuration and association with shore features) suggests that this type of secondary use behavior was typical at Eagles Island. Two conditions existed to provoke the behavior illustrated with this process. Primarily, there was an abundance of barges in Wilmington that were no longer useful for their primary function. This could reflect the changing trade of the region (reduction or cessation of hauling certain products such as wood, cotton, or tobacco when those industries declined), or the active role of the Army Corps of Engineers in the Cape Fear River (for improvement projects throughout southeastern

North Carolina). Also the process illustrates that the environment (swampy marsh) of Eagles Island challenged the ability of the industries to operate to the best of their ability. As a result, they had to create structural resources to offset the effects of the environment and reusing materials was cost effective and efficient.

Richards (2002:302) suggests that the conversion of a vessel to a secondary role occurs for a range of economic reasons. According to his analysis, vessels modified during primary and secondary uses benefited significantly from modifications (Richards 2002:315). This hypothesis proves true at Eagles Island. Vessels cycled into secondary uses had life-spans beyond the generally accepted 20 years (Culliton 1974:5; see Graph 7.2). From a site at Garden Island, Australia, Richards showed that the average age of vessels abandoned after secondary use was 51.41 years while the average age of vessels abandoned after primary use was 36.5 years. The average age of abandonment at Eagles Island for reused vessels is 43.4 years, almost exactly in the middle of the Richards sample. The difference could be a result of variation in sample size, could reflect different types of modification processes, or could reflect the difference in hull material (mostly ferrous in Australia, mostly wooden at Eagles Island). Nonetheless, the evidence from Australia and Eagles Island shows that modifications extended vessel use-life. The vessel operators chose to make modifications and reuse vessels for the economic benefit of increased efficiency.



Graph 7.2: Age of modified and laterally cycled vessels at time of abandonment (averaged from range when exact year unknown).

Secondary reuse for the purposes of breakwaters is one of the most common types of reuse behaviors exhibited at Eagles Island which corresponds to results from research in Australia (Richards 2002:317). The reuse of vessels as breakwaters and buildings at Eagles Island eliminated costs associated with purchasing materials and labor to construct structures for the intended purposes. Therefore, the secondary reuse is an example of behavior that directly reflected economic benefit to the users.

Deposition

An important characteristic of watercraft abandonment processes is the temporality of abandonment. This is important because of the significance of economic and historical events and trends associated with the abandonment of vessels (Richards

2002:177-178). Understanding significant events or trends in association with vessel abandonment at Eagles Island provides another means of interpreting behaviors linked to the systemic context by explaining the factors that led to the deposition. In order to recognize patterns in the temporality of abandonment on Eagles Island, the date or range of dates of abandonment had to be determined for each vessel. These determinations were based on the historical record, aerial photographs, and the spatial position of vessels in association with other material remains on the island. The beginning date for the abandonment ranges comes from the deposition of *Waccamaw* because newspapers indicate that it was the earliest vessel abandoned along the shore of Eagles Island (*Wilmington Star* 09/07/1886, 04/08/1887; *Wilmington Messenger* 04/06/1888).

Of the 41 vessels sampled for analysis, only four can be isolated to the exact year of deposition. Several have short ranges (two to three years) while a majority of the vessels assessed maintain a range between eight and 14 years. Large ranges occur only with the smaller local and vernacular craft because there are no references in the historical record and those vessels are too small to see on aerial photographs.

Table 7.1 (in three parts) shows the ranges of abandonment and the justifications for establishing those ranges from the historical record, aerial photos, interviews, and spatial analysis from the 2006 site plan.

UAB NO	UAB NAME	START	START-WHY	END	END-WHY
0001 CFR	*Waccamaw*	1884	reported in Newspaper (*Wilmington Star* 9/7/1886)	1884	reported in Newspaper (*Wilmington Star* 9/7/1886)
0004 CFR	*Barge 1*	1925	not yet abandoned on 1924 aerial photograph (Pleasants 2005)	1937	appears abandoned on 1937 Army Corps of Engineers Map (Corps of Engineers 1937)
0005 CFR	*Barge 2*	1884	after first deposition to graveyard, *Waccamaw* (*Wilmington Messenger* 7/6/1888)	1909	appears abandoned on 1909 Corps of Engineers yard proposal map (Corps of Engineers 1909)
0006 CFR	*Bulkhead Tugboat*	1910	does not appear on 1909 Corps of Engineers yard proposal map (Corps of Engineers 1909)	1924	appears abandoned on 1924 aerial photograph (Pleasants 2005)
0007 CFR	*Barge 3*	1910	pilings to the north of barge appear in location on 1909 map (Corps of Engineers Map 1909)	1924	appears abandoned on 1924 aerial photograph (Pleasants 2005)
0008 CFR	*Barge 4*	1910	does not appear on 1909 Corps of Engineers yard proposal map (Corps of Engineers 1909)	1924	appears abandoned on 1924 aerial photograph (Pleasants 2005)
0009 CFR	*Steam Crane Barge 1*	1910	does not appear on 1909 Corps of Engineers yard proposal map (Corps of Engineers 1909)	1922	appears abandoned on 1922 USCGS map (United States Coast and Geodetic Survey 1922)
0010 CFR	*Stone 5/ Sadie E. Culver*	1946	assisted in tugging SS *Bennington* into port (Stone Towing Line Records 1946:679.4b)	1954	abandoned prior to tug *Dolphin* in 1954 (*Wilmington Morning Star* 2/7/58)
0011 CFR	*Dolphin*	1954	year for deposition given in article (*Wilmington Morning Star* 2/7/58)	1954	year for deposition given in article (*Wilmington Morning Star* 2/7/58)
0012 CFR	*Stone 6/ Atlantic City*	1958	not yet abandoned in newspaper images (*Wilmington Morning Star* 2/7/58)	1958	reported abandoned by Richard Womack (2006 pers. comm) and listed as "foundered" (Berman 1973)
0013 CFR	*Minnesota/ formally Bonheur*	1925	Stone paper in 1934 suggests vessel stored for reactivation with other vessels in close proximity (Stone 1934:13); placement suggests abandonment prior to *Stone 3*/*Isabel*	1948	not listed to be in operation (*Wilmington Morning Star* 12/20/48)
0014 CFR	*Stone 3/ Isabel*	1925	Stone paper in 1934 suggests vessel stored for reactivation with other vessels in close proximity (Stone 1934:13)	1948	not listed to be in operation (*Wilmington Morning Star* 12/20/48)
0015 CFR	*Argonauta*	1925	not yet abandoned on 1924 aerial photograph (Pleasants 2005)	1933	appears abandoned on 1933 aerial photograph (Pleasants 2005)

Table 7.1a: Part 1-The range of vessel deposition and the justification for that range for vessels 0001 CFR-0015 CFR.

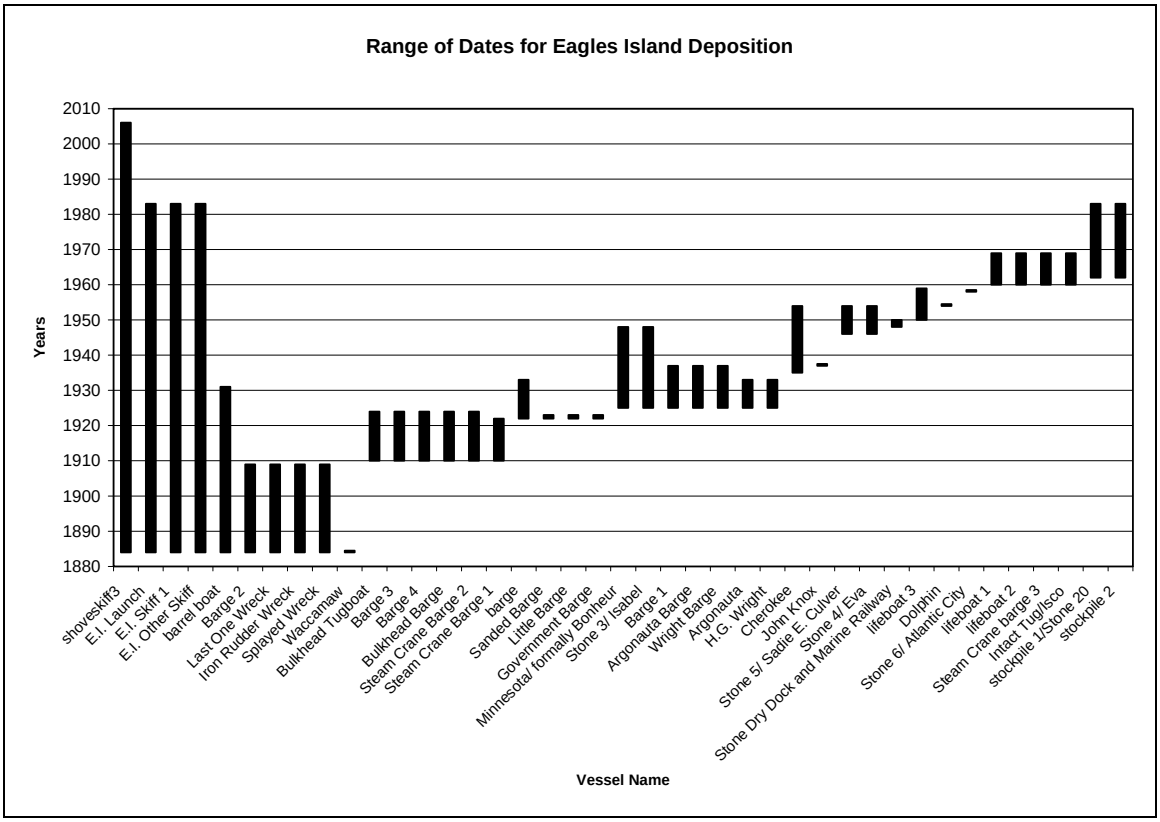
UAB NO	*UAB NAME*	START	START-WHY	END	END-WHY
0016 CFR	*John Knox*	1937	sank June 1937 (Hall 2004)	1937	sank June 1937 (Hall 2004)
0017 CFR	*E.I. Skiff 1*	1884	after first deposition to graveyard, *Waccamaw* (*Wilmington Messenger* 7/6/1888)	1983	recorded for UAB national register nomination (Lawrence 1985)
0018 CFR	*Last One Wreck*	1884	after first deposition to graveyard, *Waccamaw* (*Wilmington Messenger* 7/6/1888)	1909	appears abandoned on 1909 Corps of Engineers yard proposal map (Corps of Engineers 1909)
0019 CFR	*E.I. Launch*	1884	after first deposition to graveyard, *Waccamaw* (*Wilmington Messenger* 7/6/1888)	1983	recorded for UAB national register nomination (Lawrence 1985)
0020 CFR	*Bulkhead Barge*	1910	does not appear on 1909 Corps of Engineers yard proposal map (Corps of Engineers 1909)	1924	appears abandoned on 1924 aerial photograph (Pleasants 2005)
0021 CFR	*Stone Dry Dock and Marine Railway*	1948	reported still operational in a 1947 letter to the United States Maritime Commission(Stone Towing Line Records 1947:679.4c)	1950	"Our 1000 ton Crandall Marine Railway is not in first class condition. The 500 ton floating drydock located in the same yard is in a state of disrepair, and incapable of use at this time" (Stone Towing Line Records 1950:679.4e)
0024 CFR	*Sanded Barge*	1922	does not appear on 1922 USCGS map (United States Coast and Geodetic Survey 1922)	1923	abandoned in 1923 aerial photograph (Board of Engineers for Rivers and Harbors 1935)
0025 CFR	*Little Barge*	1922	does not appear on 1922 USCGS map (United States Coast and Geodetic Survey 1922)	1923	abandoned in 1923 aerial photograph (Board of Engineers for Rivers and Harbors 1935)
0026 CFR	*Government Barge*	1922	does not appear on 1922 USCGS map (United States Coast and Geodetic Survey 1922)	1923	abandoned in 1923 aerial photograph (Board of Engineers for Rivers and Harbors 1935)
0027 CFR	*H.G. Wright*	1925	not yet abandoned on 1924 aerial photograph (Pleasants 2005)	1933	appears abandoned on 1933 aerial photograph (Pleasants 2005)
0028 CFR	*Stone 4/ Eva*	1946	placement suggests abandonment prior to *Stone 5*/*Sadie E. Culver*	1954	abandoned prior to tug *Dolphin* in 1954(*Wilmington Morning Star* 2/7/58)
0029 CFR	*Iron Rudder Wreck*	1884	after first deposition to graveyard, *Waccamaw* (*Wilmington Messenger* 7/6/1888)	1909	appears abandoned on 1909 Corps of Engineers yard proposal map (Corps of Engineers 1909)
0030 CFR	*Splayed Wreck*	1884	after first deposition to graveyard, *Waccamaw* (*Wilmington Messenger* 7/6/1888)	1909	appears abandoned on 1909 Corps of Engineers yard proposal map (Corps of Engineers 1909)
0031 CFR	*Argonauta Barge*	1925	not yet abandoned on 1924 aerial photograph (Pleasants 2005)	1937	abandoned on Army Corps Map in 1937 (Corps of Engineers 1937)

Table 7.1b: Part 2-The range of vessel deposition and the justification for that range for vessels 00016 CFR-0031 CFR.

UAB NO	UAB NAME	START	START-WHY	END	END-WHY
0032 CFR	Wright Barge	1925	not yet abandoned on 1924 aerial photograph (Pleasants 2005)	1937	abandoned on Army Corps Map in 1937 (Corps of Engineers 1937)
0033 CFR	Cherokee	1935	does not appear on aerial in Corps Report (The Board of Engineers for Rivers and Harbors 1935)	1954	abandoned prior to tug Dolphin in 1954 (*Wilmington Morning Star* 2/7/58)
0034 CFR	E.I. Other Skiff	1884	after first deposition to graveyard, Waccamaw (*Wilmington Messenger* 7/6/1888)	1983	recorded for UAB national register nomination (Lawrence 1985)
0041 CFR	Intact Tug/Isco	1960	abandoned some time in the 1960s (Womack 2006; Bordeaux 2007; Register 2007)	1969	abandoned some time in the 1960s (Womack 2006; Bordeaux 2007; Register 2007)
0042 CFR	Steam Crane Barge 2	1910	does not appear on 1909 Corps of Engineers yard proposal map (Corps of Engineers 1909)	1924	appears abandoned on 1924 aerial photograph (Pleasants 2005)
1001 CFR	stockpile 1/Stone 20	1962	listed in use in 1961 (The Board of Engineers for Rivers and Harbors 1961)	1983	material in stockpile mentioned in UAB report (Lawrence 1985)
1002 CFR	stockpile 2	1962	associated building mentioned still in use (The Board of Engineers for Rivers and Harbors)	1983	material in stockpile mentioned in UAB report (Lawrence 1985)
1008 CFR	lifeboat 1	1960	not needed on a tug purchased from army and pushed on land at high tide (Womack 2006)	1969	not needed on a tug purchased from army and pushed on land at high tide (Womack 2006)
1009 CFR	lifeboat 2	1960	not needed on a tug purchased from army and pushed on land at high tide (Womack 2006)	1969	not needed on a tug purchased from army and pushed on land at high tide (Womack 2006)
1003 CFR	lifeboat 3	1950	not needed on a tug purchased from army and pushed on railway (Womack 2006)	1959	not needed on a tug purchased from army and pushed railway (Womack 2006)
1004 CFR	barrel boat	1884	after first deposition to graveyard, Waccamaw (*Wilmington Messenger* 7/6/1888)	1931	barrels of tar indicate abandonment remains from closure of naval stores industry on Eagles Island (Board of Engineers for Rivers and Harbors 1935)
1005 CFR	shoveskiff3	1884	after first deposition to graveyard, Waccamaw (*Wilmington Messenger* 7/6/1888)	2006	recorded by author
1006 CFR	barge	1922	placement suggests abandonment after Steam Barge 1	1933	appears abandoned on 1933 aerial photograph (Pleasants 2005)
1007 CFR	Steam Crane barge 3	1960	abandoned some time in the 1960s (Bordeaux 2007; Register 2007)	1969	abandoned some time in the 1960s (Bordeaux 2007; Register 2007)

Table 7.1c: Part 3-The range of vessel deposition and the justification for that range for vessels 0031 CFR-1007 CFR

Graphic form of the data shows that vessel abandonment at Eagles Island occurred in noticeable stages, resulting in vessel groupings in recognizable phases of abandonment (see Graph 7.3). The groupings illustrate that the temporality of abandonment behavior is a direct result of the cultural climate of Wilmington.



Graph 7.3: Range of dates for deposition of vessels at Eagles Island

Phases of Deposition

Using the abandonment phases generated from the Graph, temporalities of abandonment at Eagles Island can be split into six eras from 1884 through the 1963. Mapping the eras in sequence provides a means of dual analysis. The maps illustrate temporality of abandonment in association with the economic and cultural conditions prompting the abandonment behavior. Also, the maps show the spatial dimension of

variability in association with commercial activities on Eagles Island. The following maps (Figures 7.8-7.13) show the evolution of the Eagles Island Ships' Graveyard in the six recognizable phases derived from positional data in the site plan and temporal data from Table 7.1. The chronology of vessel abandonment represented on the following maps is based on the *earliest* year from the range of abandonment for each vessel when the exact year is unknown.

Phase 1: 1884-1909

The earliest abandoned vessels are clustered in the northern portion of the graveyard and the southern portion of the graveyard (see Figure 7.8). The collection of vessels in the northern section consists of small, vernacular craft often built locally and used for transportation of residents and goods in the Wilmington area (see Figure 6.4 and the accompanying explanation of shove skiffs). The cluster of vessels abandoned in that particular location can be attributed to number of conditions. First, in that location, the river bottom is flat and the water remains relatively shallow through tidal variation making it easier to see the bottom there than at other, deeper portions of the shore along the island. It is possible that additional, similarly typed vessels are abandoned within the graveyard, but are difficult to locate through visual inspection or remote sensing. The location of the cluster also suggests an association to the naval stores companies and grocers that operated in that location and maintained a large dock structure (*Wilmington Star* 07/22/1871; SMPC 1893:22, 1898:31). It is likely that residents conducted trade through transport in those vessels, including delivering locally produced goods to the

storage and shipping warehouses located there. Also, the barrel boat, among the cluster, is a direct correlate to the naval stores operations in that location.

The abandonment behavior associated with the vessels in the southern section is unclear. Though the final vocation of *Waccamaw* is unknown, in the years preceding the deposition of the vessel, newspapers indicate it was used for excursions down the river and for towing other vessels. The identifications of Barge 2 and the Iron Rudder wreck are unknown, making it difficult to discern the function of those vessels. A newspaper article indicates that the corresponding shore activity in that location was a shipyard in 1888 (*Wilmington Messenger* 04/06/1888). It is possible that the vessel owners abandoned in that location in order to salvage them at the shipyard, but this assumption can not be verified. Regardless, the clustering process reiterates Schiffer's (1996:62) refuse distribution characteristic indicating that people tend to dump trash where others previously dumped trash.

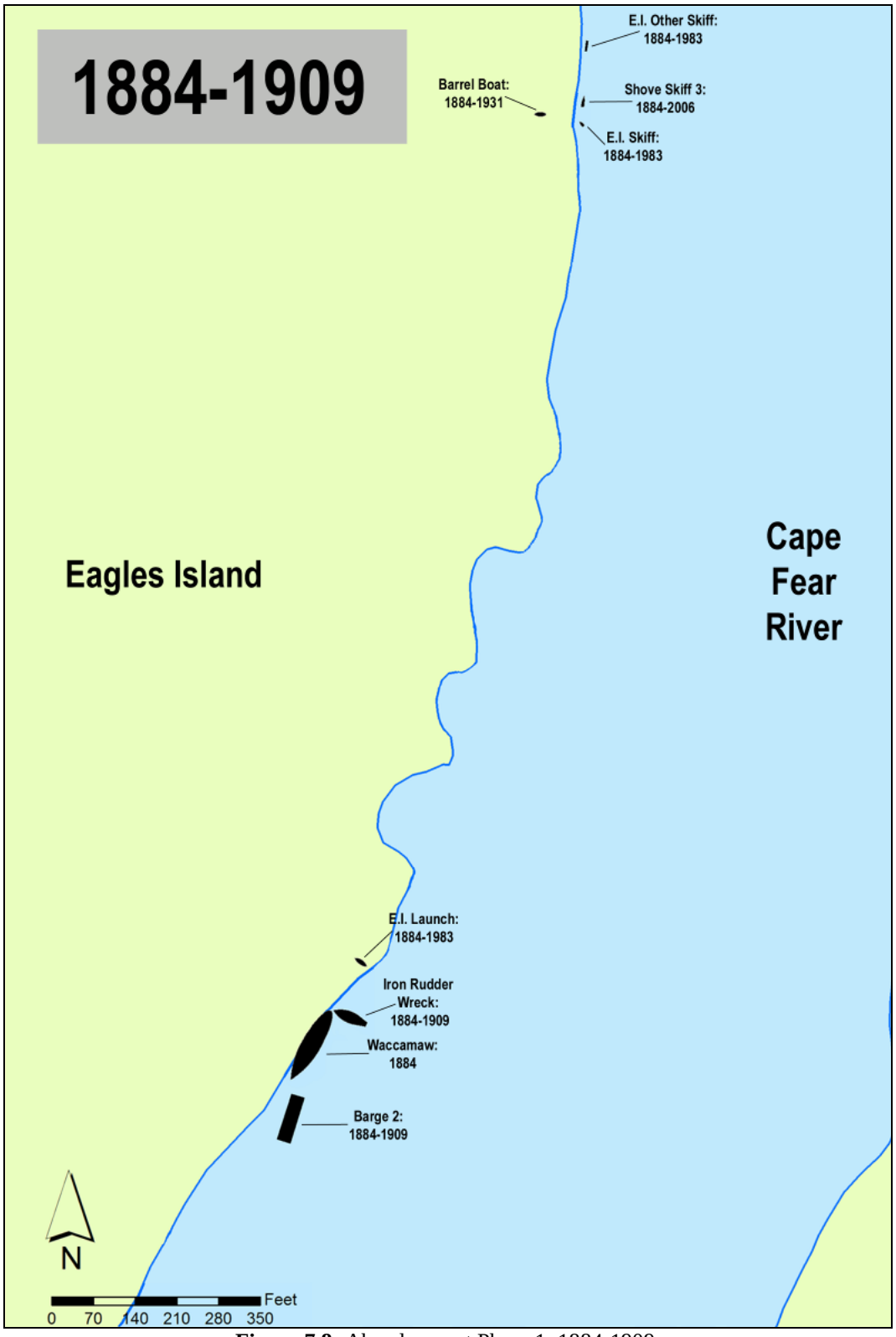


Figure 7.8: Abandonment Phase 1: 1884-1909.

Phase 2: 1910-1921

The next phase of abandonment in the sequence correlates temporally to the establishment and growth of the Hamme and Stone Marine Railways (see Figure 7.9). As previously mentioned, the clusters of vessels immediately south of each railway served secondary use functions as bulkheads and breakwaters to protect and maintain the waterways near the railways. The temporal correlation of the abandoned vessels bolsters that claim of secondary use function. The Wilmington Marine Railway began operation immediately north of the upper cluster of barges in 1912 (*Wilmington Star* 07/14/12). In 1924, the Stones purchased the property and constructed an additional railway, operating two in that location (*Wilmington Star* 02/04/24). The formation and subsequent growth of successful railway operations coincides precisely with the range of abandonment for the associated cluster of abandoned vessels.

The same is true near the Hamme Railway. Hamme purchased the land in 1910, began operating a railway there in 1915, and began building the second railway in 1919 in order to meet demand for the growing business (*Wilmington Dispatch* 09/07/1910, 07/23/1915, 04/13/1919). Again, the deposition of the barges and tug, which archaeological evidence shows were used as a bulkhead, corresponds temporally to the growth of maritime commerce in that location. The temporal and spatial correlations of abandonment during phase 2 directly relate to economic growth of industry on Eagles Island.

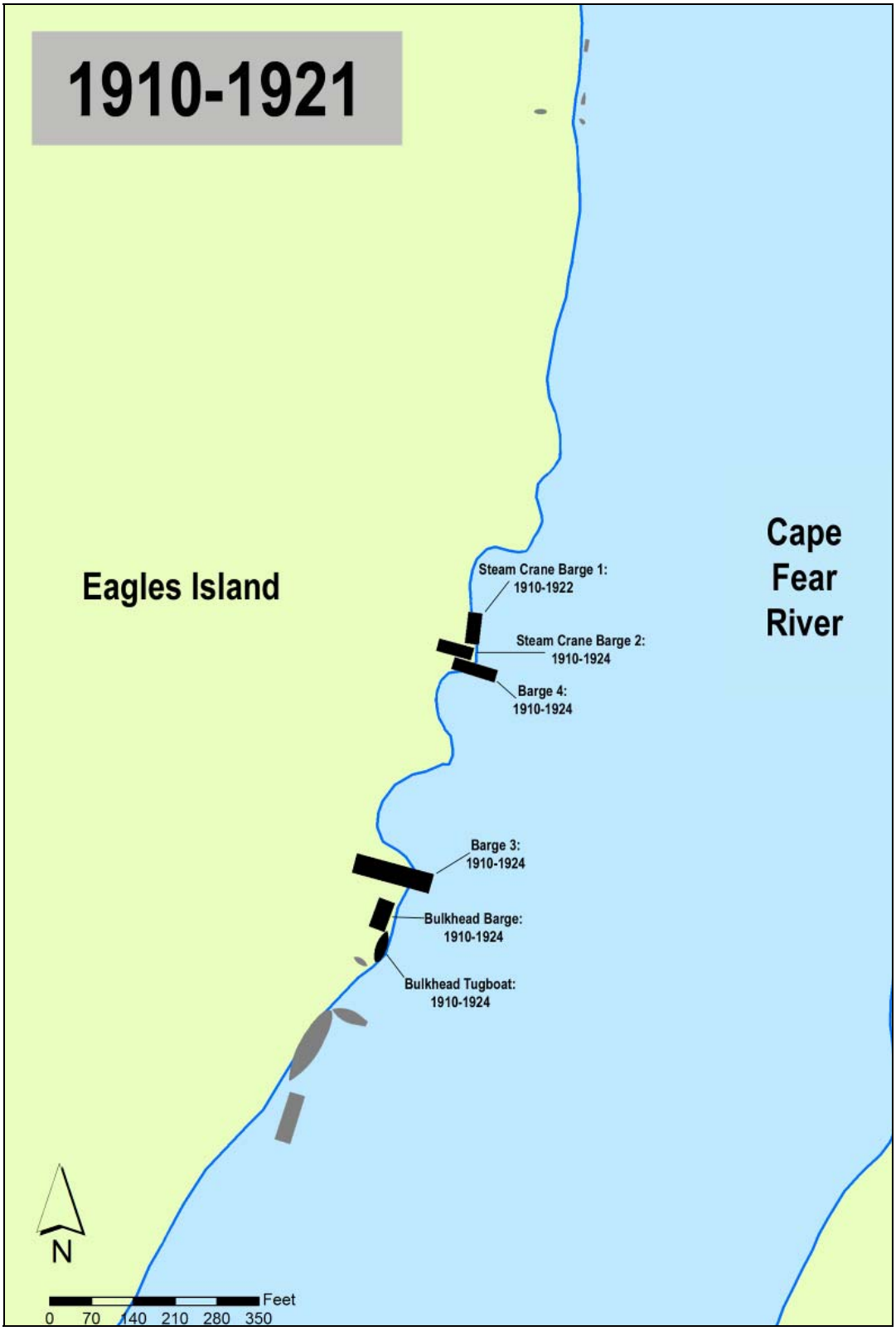


Figure 7.9: Abandonment Phase 2: 1910-1921.

Phase 3: 1922-1934

In 1934, Russell Stone (1934: 12) wrote that Stone Railway grew significantly in the1920s and 1930s resulting in the purchase of real estate and more efficient tugs for the growth of Stone Towing and Marine Railway. The larger and more powerful vessels replaced older equipment with the growth of the business, and that is apparent from the abandoned vessels surrounding the railway yard in Phase 3 (see Figure 7.10). Also, Stone (1934: 13) mentioned sinking older vessels to keep extra equipment available for the constantly developing tug industry. Deposition of the older tugs is a direct result of economic growth for the business.

The other vessels abandoned during the phase were all barges or government workboats, including a cluster in the southernmost section of the railway. The type of abandoned watercraft in association with the temporal characteristics of abandonment provides direct correlations to the events occurring in Wilmington. The location of the cluster is immediately north of the Government Yard on Eagles Island. In the 1920s and 1930s, the Corps of Engineers in Wilmington conducted and completed three significant projects: the improvement of the channel from the bar to Wilmington, the construction of three locks from Wilmington to Fayetteville, and the completion of the heavily anticipated Intracoastal Waterway through the state of North Carolina (Hartzer 1984:53-54, 57-60). The abandonment of eight barges (the largest quantity of one type of vessel abandoned during any phase) simultaneous to the laboring and completion of three major Corps projects suggests a direct correlation. The projects, all major undertakings,

required vessels to labor under hard conditions that would expedite use-life of the vessels, leading to the deposition of heavily warn vessels and their replacement with newer vessels. The events in the Wilmington district during Phase 3 precipitated the technological and economic conditions that provided an impetus for the abandonment barges.

Richards (2002:213) suggests that the Great Depression was, "the single most important event in the history of the abandonment of vessels in Australia," noting that the discard trend peak during the Great Depression is a direct result of a decline in trade from before the Depression and running through about 1939. Richards indicates that during the Depression period, expenses associated with carrying out trade could not be met. This was not the case locally in Wilmington (see Chapter Four) and the maritime industry of Wilmington grew, rather than declined during the depression. Richards (2002:381) also says that the tendency to dispose of watercraft often occurs when economic and technological circumstances are rapidly changing. This was indeed the case at Wilmington during Phase 3 when local industry experienced growth and the region developed to enhance maritime trade; but the local economic and technological circumstances contrast to those of the same period in Australia.

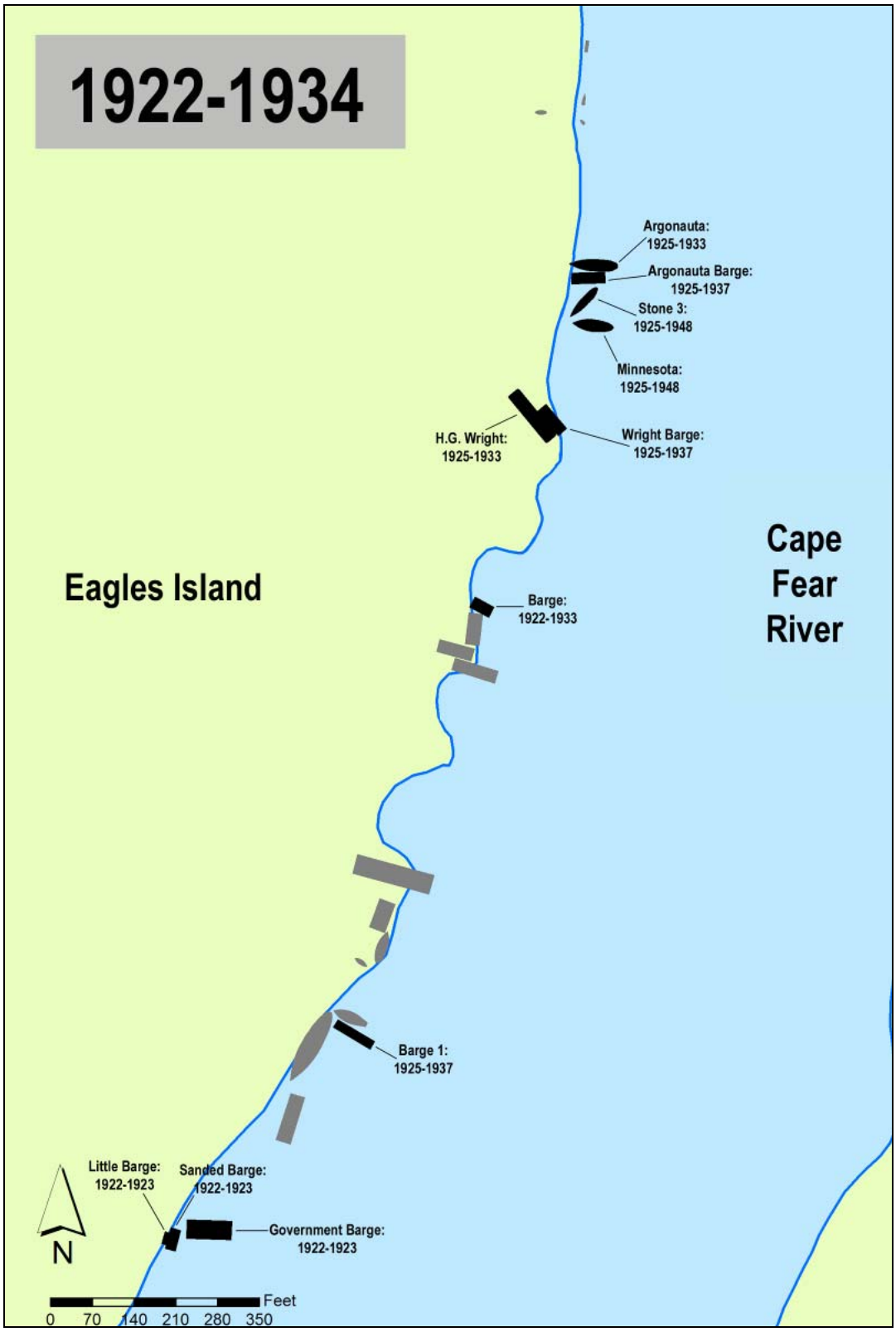


Figure 7.10: Abandonment Phase 3: 1922-1934.

Phase 4: 1935-1945

Phase 4 coincides with the World War II period. In addition to *Cherokee, John Knox,* for which there is no positional data from the 2006 field work, was lost in 1937 through a wrecking event. The pattern of *non-deposition* for the period is indicative of the economic and cultural climate at that time (see Figure 7.11). American shipping went up from 16% to 62% of the total world shipping during World War II (Culliton 1974:9). Specifically in Wilmington, the maritime industry boomed as a result of the establishment of the North Carolina Shipbuilding Company and the production of Liberty and Victory ships along the Cape Fear River (Watson 1992:154). The rapid expansion of the maritime industry and decline of abandonment during Phase 4 on Eagles Island corresponds to Richards's (2002:216-218) findings in Australia that, during World War II, there was no appreciable increase in the discard trend and Australia's economy expanded, experiencing accelerated growth in the industrial sector during that time. The pattern of abandonment at Eagles Island during Phase 4 reflects a local, national, and possibly international shipping boom and the prosperity of the shipping industry during that period.

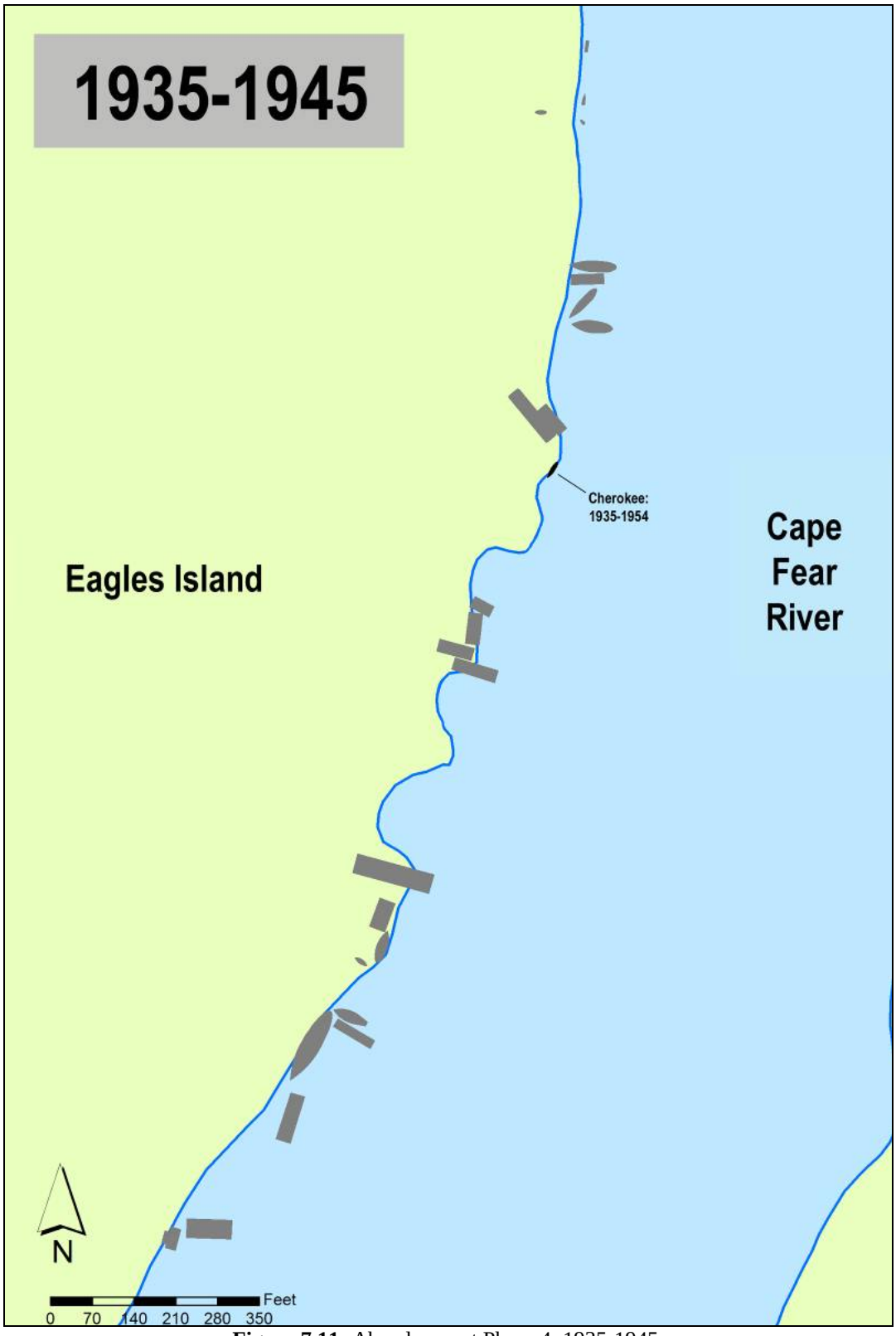


Figure 7.11: Abandonment Phase 4: 1935-1945.

Phase 5: 1946-1959

Abandonment trends in Phase 5 reflect both localized and national changes in the economic and technological climates associate with the maritime industry. Phase 5 abandonment is spatially associated explicitly with the Stone Marine Railway yard (see Figure 7.12). On a local level this reflects major changes to the Stone Towing and Marine Railway business. During the summer of 1946, a fire ripped through the Stone Yard on Eagles Island, causing nearly $40,000 worth the damage (*Wilmington Post* 06/13/1946). The beginning year for the range of abandonment for at least two vessels in Phase 5 is 1946 suggesting a correlation to the abandonment of those vessels and the debilitating fire. Also during Phase 5, the Stones stopped using the railway and drydock and, in 1952, indicated that they had not operated the railway commercially for five or six years, the cessation of which also coincides with the year of the fire (Stone Towing Line Records 1950:679.4e, 1952:679.4h).

Despite the decline in the railway aspect of the Stone business, company records indicate they purchased a number of vessels, including Army tugs and barges, from the government throughout Phase 5 (Stone Towing Line Records). From a local perspective, the abandonment of older tugs on Eagles Island coincides with both the cessation of use of the Eagles Island property as a result of the decline of the railway side of business, and an increased fleet of more efficient, modern vessels resulting from the growth of the tug side of the business. In addition, newspapers and company records indicate that the Stone Towing Company continued to insure the laid up tugs, possibly for future use with the anticipated development of their tugging business after the closure of the railway

(*Wilmington Morning Star* 1958, Stone Towing Line Records). From a national perspective, the abandonment of the older tugs on Eagles Island coincides with a national surplus of military vessels mass-produced during the war (Culliton 1974:9-11). Civilian maritime industries benefited from surpluses of war built ships at low costs (Hutchins 1974:55). The Eagles Island abandonment trends in Phase 5 reflect Richards's (2002:222, 380) findings that war creates incentives for industrial expansion, increases ship construction, and surpluses in vessels which precipitates the disposal of older, obsolete vessels.

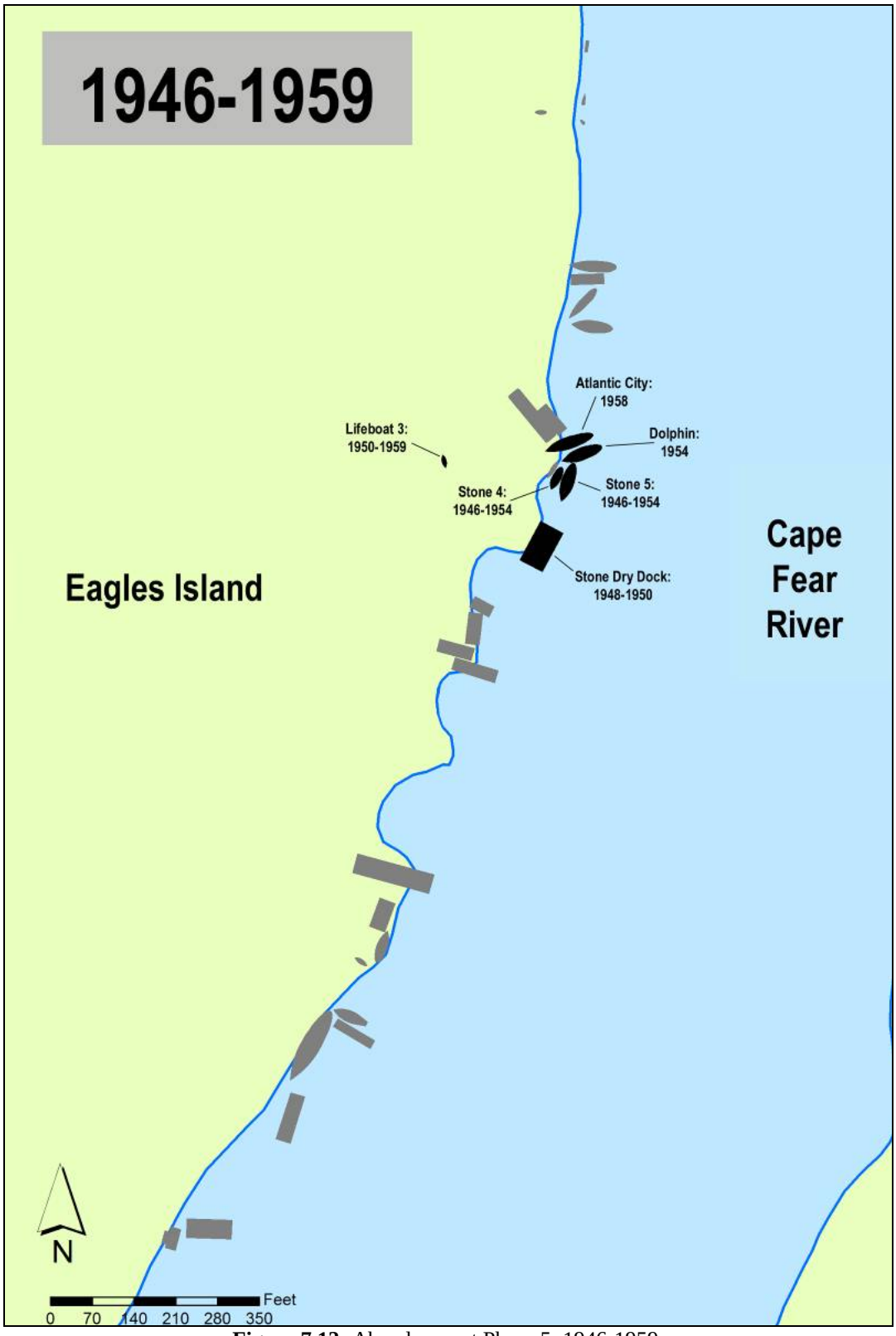


Figure 7.12: Abandonment Phase 5: 1946-1959.

Phase 6: 1960-1963

Phase 6 represents a pivotal point in the establishment of the Eagles Island Ships' Graveyard because it is the point at which deposition ceased. The conclusion of abandonment behavior on Eagles Island corresponds temporally with the establishment and subsequent growth of the State Port Authority and State Docks in the southern part of town. The State Docks opened in 1952 and grew in importance throughout the following decade, moving the heart of Wilmington's maritime industry downstream, away from downtown Wilmington and the Eagles Island Ships' Graveyard. Marine repair facilities and towing companies today operate south of the bridge and Corps of Engineers yard, closer to the state port facilities.

In addition to indicating the end of abandonment activities, Phase 6 shows evidence of processes not seen previously in other phases of abandonment that correlate to the complete abandonment of the activity area (see Figure 7.13). Stockpiles of materials accumulated in the remains of the Stone yard during Phase 6 of abandonment and consist of materials used for commercial activities in which the Stones no longer participated. The stockpiling, an example of curate behavior, suggests that the Stones intended to return to the site to salvage that material under the right conditions. The majority of material abandoned during Phase 6 is *de facto* refuse which the abandoner had no intention of reusing. The Stones abandoned the lifeboats north of the railway yard because they did not need them on the tugs they purchased form the military (Richard Womack 2006, pers. comm.). The wooden vessels abandoned north of the Hamme yard

(*Isco* and Steam Crane Barge 3) were abandoned because of their wooden construction and difficulty to maintain (Ray Bordeaux 2007 pers. comm.). The accumulation of *de facto* refuse during Phase 6 is indicative of the abandonment of the entire area due to the closure of commercial operations in that part of Eagles Island.

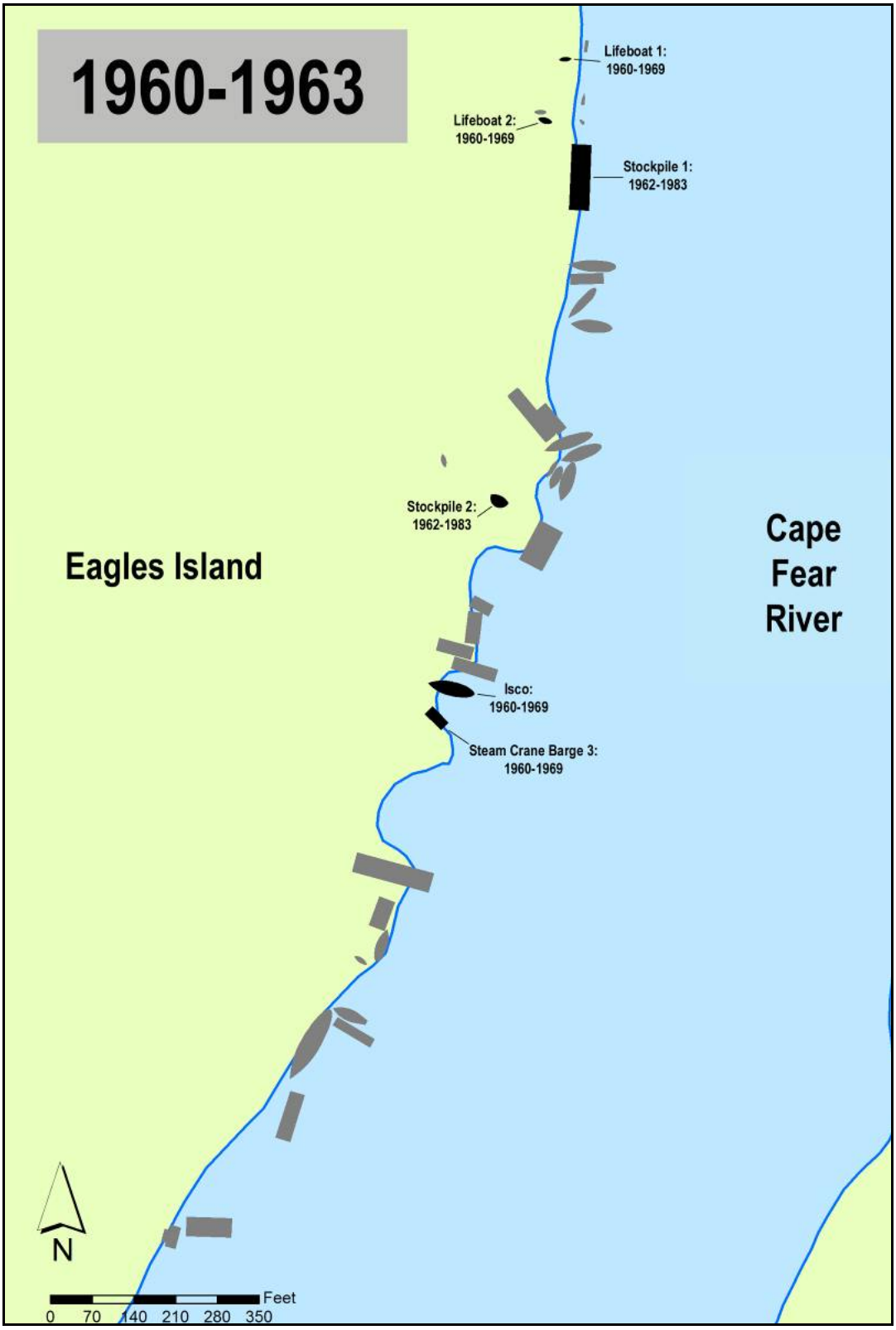


Figure 7.13: Abandonment Phase 6: 1960-1963.

Spatial Dimension of Variability

Analysis of the relational dimension of the archaeological record in association with the spatial dimension of variability shows that the locations of abandonment provide behaviorally significant divisions of space. Seven out of the nine tugs abandoned at Eagles Island are located near the Stone Towing and Marine Railway Yard (see Figure 7.14). This is a direct reflection of the behavior associated with the abandonment of the tugs. Stone Towing operated from the Wilmington side of the river where the Stones maintained an office through the life of the company (Stone Towing Line Records). The Stones abandoned tugs in locations where they were visible for monitoring, accessible for parts, and would not inhibit operations on Eagles Island.

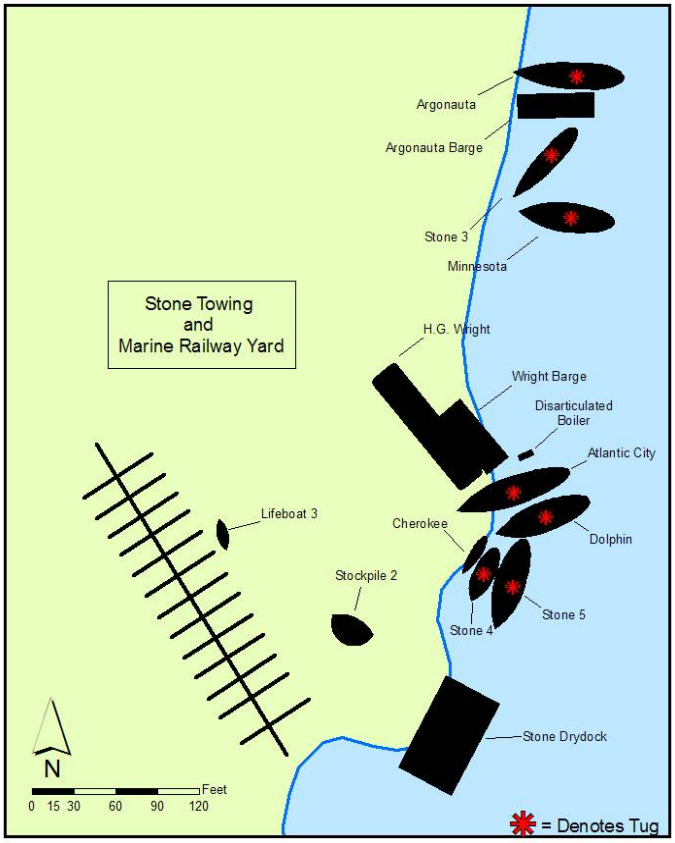


Figure 7.14: Spatial association of abandoned tugs to the Stone Marine Railway yard

The other noticeable spatial association occurs with barges (see Figure 7.15). As with tugs, the majority of abandoned barges are clustered in the southern part of the graveyard near the Army Corps of Engineers yard. The barges in that area, mostly abandoned in the earlier years of the graveyard, are a direct correlate to the activities of the Corps of Engineers in the Wilmington district. The barges represent a major era in the development of Wilmington and their abandonment in association with an activity area suggest a significant behavioral association.

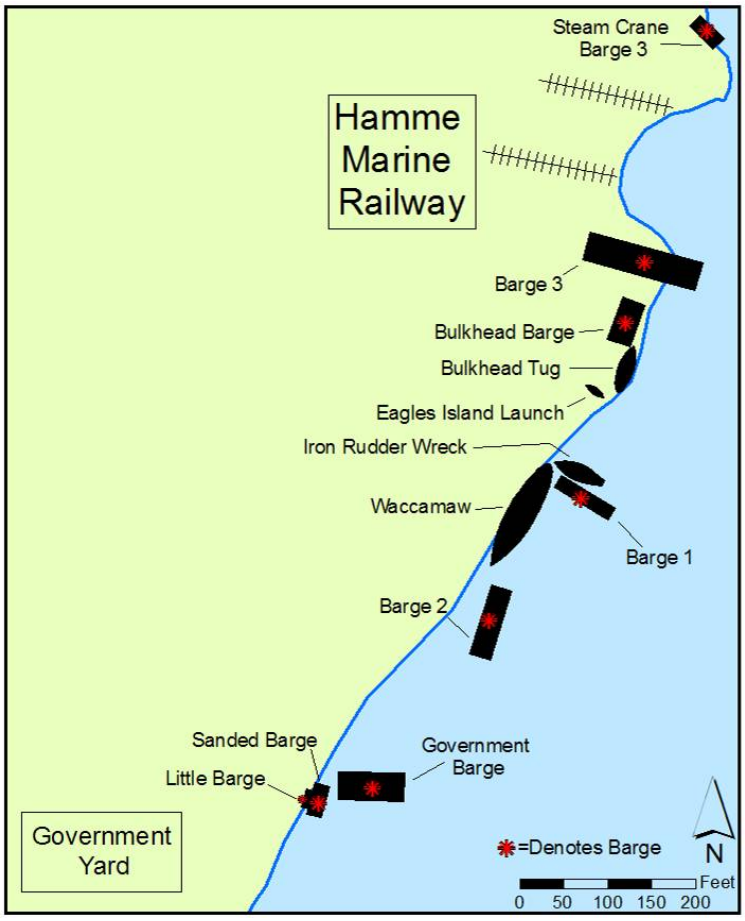


Figure 7.15: Spatial association of abandoned barges to the Army Corps of Engineers yard

Conclusion

Understanding the site formation processes occurring on Eagles Island lends itself to detailed inspection of signatures of use-life and deposition among the remains. The thorough inventory of the processes elucidates the behaviors associated with those stages of the abandoned vessels' life cycle. Comparing the behaviors to the contemporaneous historical conditions allows for a deeper understanding of the incentives and local, regional, national and international forces driving human decision making. It is clear that economic conditions, technological changes, and cultural circumstances influenced abandonment. The next chapter inspects post abandonment signatures and processes.

CHAPTER EIGHT: ADDITIVE AND REDUCTIVE PROCESSES

Introduction

The post-depositional processes that act on materials are equal in importance to the processes of use and deposition for determining cultural conditions. This chapter is an investigation of the additive and reductive activities that can be read from the archaeological signatures at Eagles Island. A number of processes take place on discarded material that change the original deposition, either by adding to it, or subtracting from it. These processes exhibit particular behaviors that reflect human decision making. After ultimate deposition is complete and material is considered refuse, there are important characteristics that can be read for additional analysis of the behaviors and decision making associated with deposition.

Reductive activities on Eagles Island consist of activities that deplete the archaeological record. Reductive activity occurs in association with abandonment processes and reuse processes and the distinction is important for understanding the motivation behind the reductive activity. In association with abandonment, reductive processes are those that assist in assuring the condition of a vessel, ultimately, to be discarded. These activities consist of removal of archaeological materials, despite the fact and to ensure, that the materials left behind are unwanted refuse. In association with reuse, reductive activities remove materials from the archaeological context for the express purpose of using those materials in some way.

Additive activities add materials to the archaeological context for the same two processes as reductive activities, abandonment processes and reuse processes. Additive

activities for abandonment, like reductive activities for abandonment, aid in the assurance that the ultimate disposition of the materials is refuse. Additive processes associated with reuse are those that incorporate more material into the archaeological record in order to transfer deposited items from the archaeological context to the systemic context.

The disposition of material as refuse, though it is the final stage in the process of the life-cycle of an artifact, maintains valuable interpretive characteristics. The characteristics are indicative of the behaviors that led to the ultimate transformation of materials into refuse. All the post-depositional signatures and characteristics are valuable for their contribution to the interpretation of the behaviors associated with the material remains and the conditions motivation those behaviors.

Reclamation Processes

Reclamation processes are the post-depositional transformations that take place on material remains. There are three types of noticeable reclamation processes on Eagles Island: salvage, scavenge,[1] and conservatory processes. Each process is apparent in the archaeological record, but signatures do not necessarily provide the evidence to distinguish between the types of processes evident in the material remains.

[1] The terminology associated with this behavior is not clear in the theoretical framework used for this thesis. Schiffer (1996:103) defines salvage as reclaiming artifacts from occupations by earlier peoples at a site, while scavenge is defined as activities carried out by inhabitants of the settlement from which the materials are reclaimed. Richards defines salvage in three phases (see Chapter 2 of this thesis; 2002:345) which relate temporally to the time of abandonment as opposed to the person or group conducting the salvage. For the sake of this thesis, the phases proposed by Richards will be used in accordance with salvage, or sanctioned/professional reclamation of materials from the site. Scavenge will refer specifically to unsanctioned removal of materials.

Salvage

Though it is difficult to differentiate between salvage behavior and scavenge behavior from the material remains on Eagles Island, it is apparent that both types of activities occurred or continue to occur. In several cases, there is archaeological evidence of salvage that indicates it was either professionally or semi-professionally done. The engines from both *Isco* and Steam Crane Barge 3 are no longer on site. Evidence from the Steam Crane Barge suggests the engine was salvaged using metal cutting instruments (see Figure 8.1). The fact that the vessels were abandoned adjacent to one another and approximately at the same time suggests that similar salvage processes occurred on both abandoned vessels.

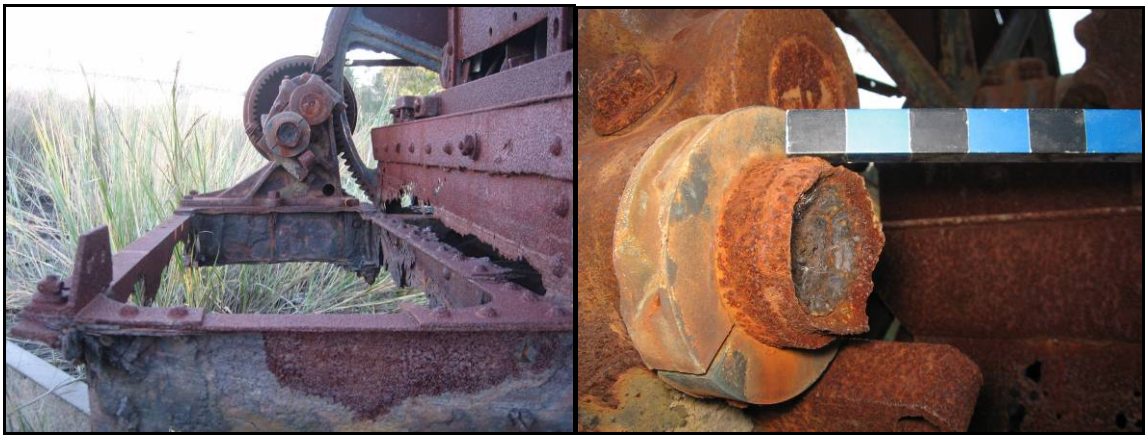


Figure 8.1: Signatures of salvage on Steam Crane Barge 3. (Left) An empty engine mount and (Right) evidence of cutting on the crankshaft (Images by author).

Iron cutting appears in several other locations throughout the site where there are concentrations of sheeted iron. There is evidence of cutting on *Argonauta*, the only known metal-hulled vessel on the site (see Figure 8.2) and on Stockpile 1, which might be the metal barge *Stone 20* (see Figure 8.3).

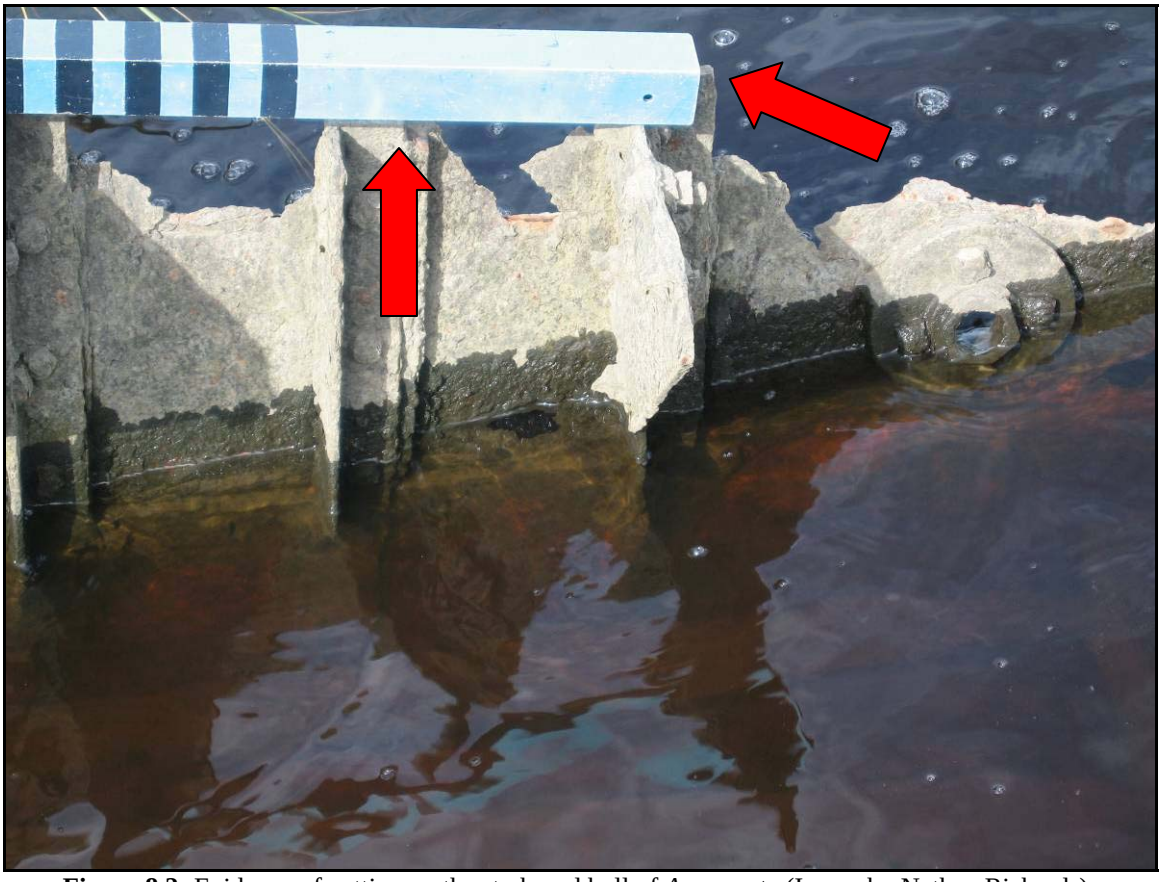


Figure 8.2: Evidence of cutting on the starboard hull of *Argonauta* (Image by Nathan Richards).

The position of cut marks on both *Argonauta* and Stockpile 1 suggest that significant amounts of iron were not being salvaged, but rather smaller sections compared to what was available to take. Both vessels, located in the Stone yard, sat under the watchful eyes of the Stones until 1982 when they stopped occupying the building across the river (Richard Womack, 2006 pers. comm.). Therefore, it is likely that any salvage was done either by them, or with their consent for the purposes of reusing small sections of sheet metal for repair.

Figure 8.3: Evidence of cutting on a bulkhead and at the top of the structure of Stockpile 1/*Stone 20* (Image by Nathan Richards).

There is also evidence of wood removal in several locations throughout the graveyard. Evidence of cutting wood from the archaeological context appears on at least two vessels, *Stone 3* and *Waccamaw* (see Figure 8.4).

Figure 8.4: Evidence of cutting from wooden vessels. (Left) Cut marks along the starboard side frames of *Stone 3* (Right) and cut marks at the bow of *Waccamaw* (Images by Nathan Richards).

These watercraft, cut to the waterline, show more significant salvage occurred on the many wooden vessels in comparison to the one (possibly two) metal vessels. Salvage also occurred on wooden barges using crowbars. Evidence of prying wooden decking appears on Barge 2 where an alignment of fasteners is bent in the same direction while the next alignment is bent in the opposite direction (see Figure 8.5).

The signatures of salvage of wood materials provide evidence that salvage on Eagles Island was likely post, rather than pre-depositional salvage. The location of vessels indicates that they were floated to their positions, or in the case of barges, deposited in those positions at the end of their use-life. To get in those positions, vessels needed to maintain flotation capability, or at least the structural integrity to be moved and

deposited. Therefore, the salvage of materials from the remains at Eagles Island had to occur after the vessels were already in their current discard locations. This is not to say that major structural or operational components of vessels were not removed before discard, but the evidence of that behavior does not appear in the archaeological record. The indication that salvage on Eagles Island is primarily post-depositional is important because it reflects cultural conditions at the time of discard. The salvage of material prior to deposition is only undertaken when the economic benefit outweighs the effort and cost to conduct the salvage. The fact that this type of salvage is non-existent or minimal compared to post-depositional salvage indicates that the economic impetus was not there.

Figure 8.5: Evidence of crow bar utilization on wooden decking on Barge 2 (Image by Nathan Richards).

Scavenging

Scavenging also occurs on Eagles Island. Historical scavenging is noted in historical records, such as the newspaper article from 1887 which says:

> James Johnson, colored, charged with stealing iron work from the old steamer *Waccamaw* on the west side of the river, was examined before Justice Hall yesterday and in default of $50 bail was committed to jail to answer the charge of larceny at the next term of the Criminal Court (*Wilmington Star* 04/08/1887).

The boiler and machinery from *Waccamaw* were still in place when boys started a fire on the vessel two years after the owner laid it up on Eagles Island. A newspaper indicates, "The boiler and machinery, regarded as valuable, may not be seriously injured" (*Wilmington Star* 09/07/1886). Archaeological evidence shows that, at some point, a salvor or scavenger recognized the value of the machinery and removed the engine, which was easily accessible and cut the boilers (see Figure 8.6). The salvor or scavenger did not take the boilers immediately, but rather the amount of sediment inside the remains of the boiler and hull indicate the vessel was in the archaeological context for a considerable amount of time before salvage/scavenge. As previously suggested, the economic benefit to remove the ferrous material was not present at the time of discard, and only developed after the deposition of the vessel.

Figure 8.6: The remains of the cut and salvaged boilers on *Waccamaw*. The sediment level indicates salvage of the machinery did not take place immediately after deposition, but rather after the vessel had been *in situ* for a considerable amount of time (Image by author).

In addition, unsanctioned scavenging of the graveyard is known to have occurred and continues to occur today. A former attendee of the University of North Carolina-Wilmington remembers visiting the island in 1975 and 1976 when the Stone buildings (a machine shop and office) were still intact. He remembers walking along the decks of two intact tugs and going into the buildings which still had broken furniture and company papers scattered throughout. He recalls that none of the heavy machinery was still in the machine shop, but smaller pieces like the leather belts and shafts were still there (Robert Browning, 2007 pers. comm.). The visibility of the site from downtown Wilmington, the accessibility to the site, and the sheer amount of material remains provide incentive to

scavenge the site, or at least affect the cultural remains on the site through interacting with them. Richard Womack (2006, pers. comm.) recalls a number of materials disappearing from the Stone yard in the 1960s including a large propeller and a Mark V diving suit. He also frequently sees material taken from the vessels on Eagles Island on display in various Wilmington restaurants. While conducting this research, other instances of people removing visiting the remains, and in some cases removing material, have been brought the attention of the author. In one such instance, a Wilmington local admitted he takes wood from the vessels on Eagles Island to make and sell wooden furniture and flooring. This type of scavenging is entirely opportunistic. People gain satisfaction from collecting pieces of history. Also, scavenging is related to economic circumstances because people are able to sell materials they retrieve from Eagles Island. Scavenging represents a different type of behavior than salvaging for reuse. Though the economic motivation is similar, the circumstances under which the removal of material takes place are different.

Conservatory Processes

Conservatory processes of reclamation also occur at Eagles Island. The evidence of these types of processes can not be found on Eagles Island, but rather throughout the town of Wilmington. The UAB removed the paddlewheel and engines from *H.G. Wright*, restored them, and moved them to a new permanent home at the Cape Fear Museum in Wilmington (Figure 8.7). In their new environment, the machinery from *H.G. Wright* take on a new function in the systemic context to teach or inform on Wilmington's maritime past. Other examples of conservatory processes exist in public

and private collections around town. Richard Womack, descendent of the Stone family has a veritable museum of Stone memorabilia in his home near Wilmington (see Figure 8.8).

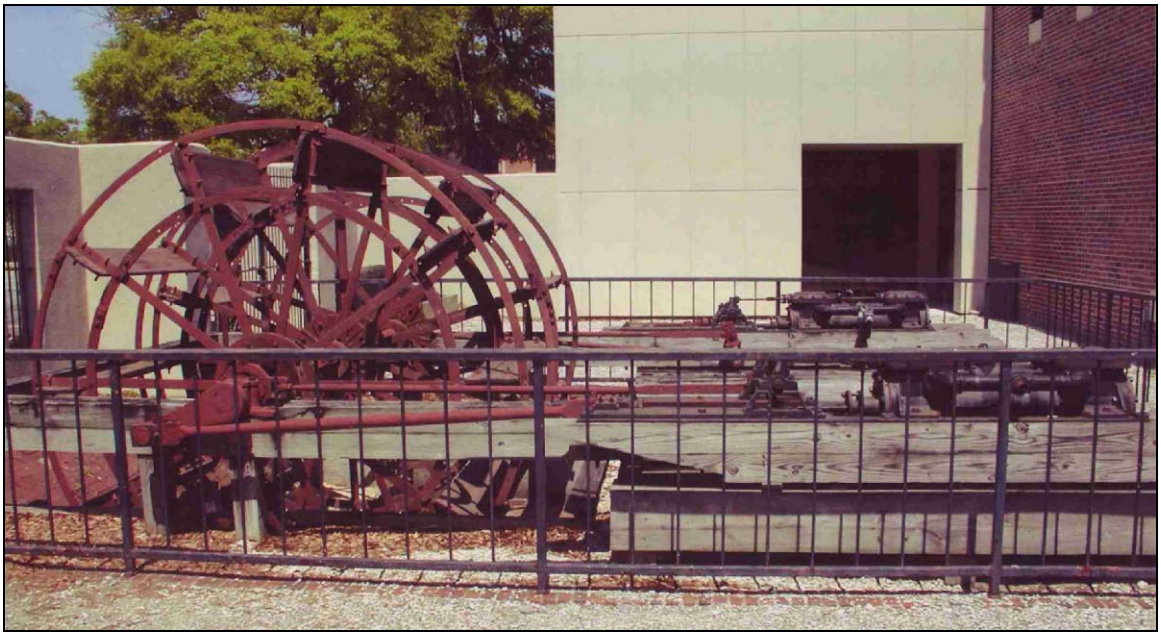


Figure 8.7: Paddlewheel and engines from *H.G. Wright* on display at the Cape Fear Museum after being salvaged from Eagles Island (Image by Joe Hoyt).

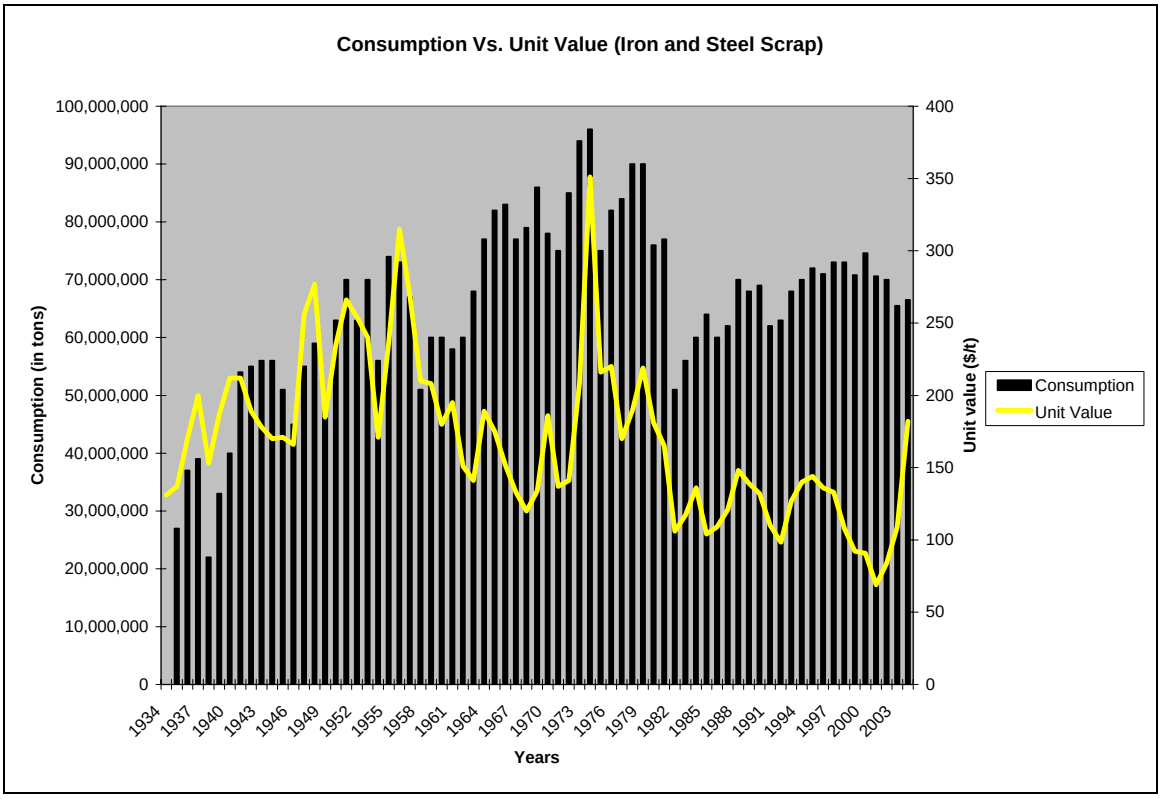
Conservatory processes show a unique type of reclamation behavior. The conservation of materials from an abandoned site for posterity shows a level of human intrigue or emotion associated with those materials. The Cape Fear Museum uses the paddlewheel and engines as a tool to demonstrate the importance of the maritime industry in Wilmington. Richard Womack preserves his extensive private collection because of the personal connection he maintains with the material culture of the Stone Towing and Marine Railway company.

Figure 8.8: Objects from Stone tugs in the home of Richard Womack (Top Left) Wheel from *Stone 6*; (bottom left) Bell from *Mohawk*; (right) "S" from smokestack on *R.R. Stone* (Images by author, courtesy of Richard Womack).

Absent Reclamation Processes

There was one type of reclamation process noticeably absent from the archaeological context, the salvage of most of the major iron machinery from many of the vessels and stockpiles. Richards (2002:335) says, "It is common to find abandoned vessels that have no masts, or evidence of rigging and it is even more common to find these vessels without *in situ* boilers, engines, prop shafts, or propellers." Dismantling and salvage of metal from discarded or abandoned vessels can often result in a lucrative return (Richards 2002:335). The salvage of metals is driven by the price of scrap and is directly related to the economic climate at the time. Scrap metal data from the United

States indicates that from the 1930s through the early 1970s, the consumption of scrap metal rose relatively steadily, except for a small decline in consumption through the 1960s (see Graph 8.1). The unit value cost reflected the high demand through World War II and in the immediate era following the war until 1956 when the unit value began to drop.



Graph 8.1: The consumption and unit value of scrap metal from 1934 to 2006 (USGS 2006).

At Eagles Island, a majority of the Stone tugs and the barges immediately south of the Stone yard still have salvageable machinery. Deposition of nearly all the vessels that have machinery was prior to, during or in the decade after World War II when the consumption of scrap metal was high and the unit value peaking. However, the Stones were not salvaging the machinery or allowing others to salvage it. This behavior reflects indications throughout the historical record indicating that the Stones laid up vessels to

keep for spare parts or for the prospect of reactivation and reuse (Stone 1934:12-13; The Wilmington Morning Star 1958; Stone Towing Line Records; Richard Womack 2006, pers. comm.). The tendency to "save" the machinery and vessels surrounding the Stone yard is a clear example curate behavior. Rather than dispose of the material and transform it into *de facto* refuse, the Stone's kept the materials nearby, easily accessible, and often continued to register vessels after their initial deposition (Stone Towing Line Records). Richards Womack (2006, pers. comm.) remembered that the Stones did not like to sell their equipment because they did not want to see their old vessels competing for business on the Cape Fear River. That is an indication that the Stones did not need the money from salvage or sale and therefore were not economically driven to salvage their machinery, and rather, had the economic ability to curate.

Addition and Reduction

One important aspect of the cultural behaviors that occur in the archaeological record in relation to discard is placement assurance. The mode of disposal is enhanced through the processes used to ensure the vessel remains abandoned. The methods used to ensure deposition leave signatures that relate to behavior associated with abandonment and other contexts, such as reuse. Richards (2002:358-375) found that Australians generally accomplished placement assurance through hull treatments or proper environment selection. There is significant archaeological evidence at Eagles Island of placement assurance trends of various types.

Hull Treatments

According to Richards' (2002:359) analysis, hull treatments include fire, explosives (hull breaching), filling, and pile utilization. Richards (2002:360) found that the use of explosives was twofold in abandonment; it was used both to loosen pieces of the vessel for salvage, and to compromise the watertightness of a vessel so it would sink. Explosive use does not appear in the record at Eagles Island. The absence of the signature is a product of the material composition of the abandoned watercraft in Australia versus that of Eagles Island. The hull fabric is integral to seeing effects of explosives in an archaeological context. Exploded wood hulls and structures would be destroyed whereas explosions in ferrous-hulled structures leave an indelible impression as an archaeological signature. In addition to explosives not appearing in the archaeological record, conditions suggest it was not used. Salvage activity was insignificant at Eagles Island compared to the magnitude with which it occurred in Australia, therefore eliminating the necessity of use. Also, in the case of the Stone vessels, owners wanted vessels to maintain integrity for the possibility of future use, making explosives impracticable for use. However, it is possible that hull breaking did occur after it was determined that vessels would no longer be reactivated (see Figures 8.9 and 8.10). Figure 8.9 shows three vessels, *Argonauta*, *Minnesota,* and *Stone 3* in 1961 while Figure 8.10 shows them again in 2006. The images demonstrate that all three vessels underwent major hull minimization after 1961. The archaeological record shows signatures of cutting on all three vessels (see above), an indication of a type of hull treatment used at Eagles Island.

Figure 8.9: *Argonauta*, *Minnesota*, and *Stone 3* in 1961 (Image courtesy of the North Carolina Underwater Archaeology Branch).

Figure 8.10: *Argonauta*, *Minnesota*, and *Stone 3* again in 2006 (taken from inside *Stone* 3) illustrating effects of hull minimization, a process used for placement assurance (Image by Mathew De Felice).

Another hull treatment for placement assurance is through-hull attachment to the substrate. The frequency of this behavior at Eagles Island is difficult to gauge with varying water levels, but at least one example exists in the archeological record (see Figure 8.11).

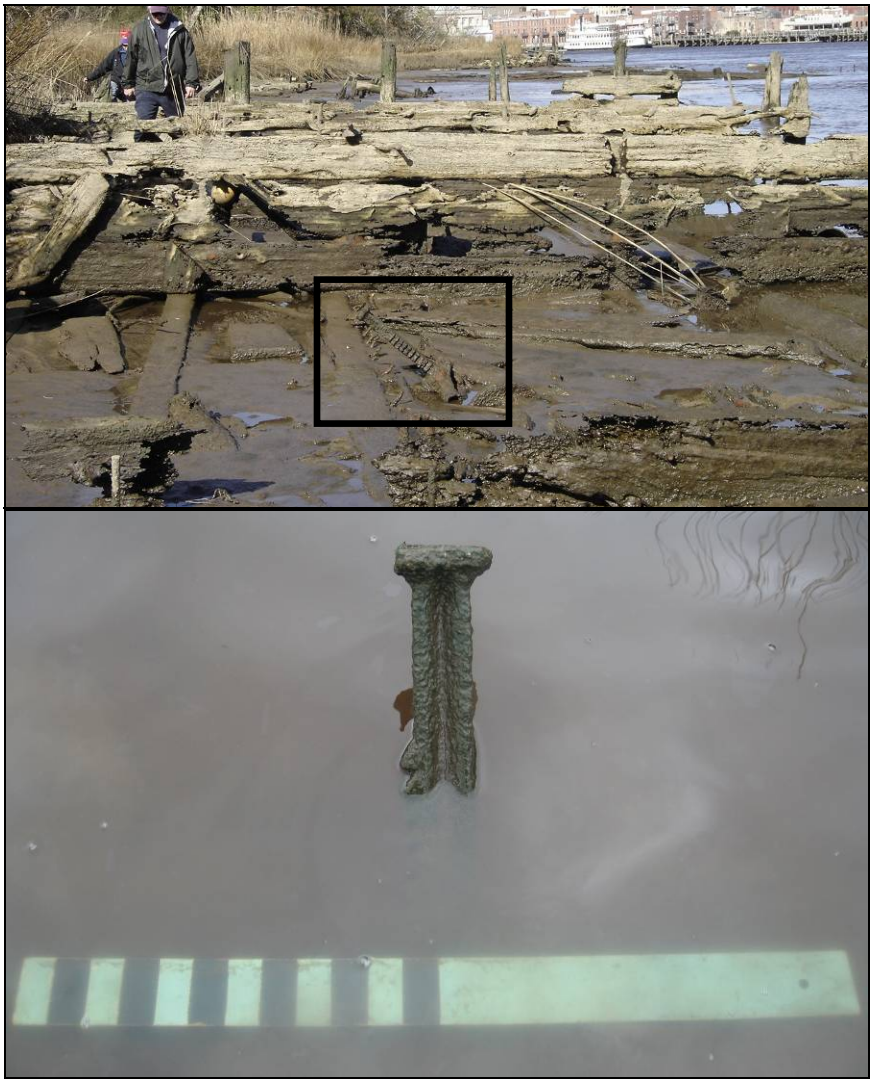


Figure 8.11: A heavy duty spike attaches Barge 2 to the substrate (Images by author).

A large iron spike, the type of which is not seen anywhere else on the barge, attaches the hull of Barge 2 to the substrate. Another hull treatment that appeared was hull fill. Richards (2002:364) and Shomette (1996:283) noticed filling as a common placement

assurance technique in the archaeological and historic records in Australia and Mallows Bay. A considerable amount of rock and brick debris filled the Bulkhead Tug. Also, the Army Corps of Engineers frequently deposited dredge spoil onto Eagles Island. Several of the barges reused for bulkheads and reclamation have accumulated sedimentation inside. Though this could be from natural processes, it is likely a placement assurance process in which dredge boats deposited spoils into reused barges to ensure placement (see Figure 8.12).

Figure 8.12: Examples of placement assurance. (Left) Bulkhead tug filled with rock and brick debris and (right) Bulkhead Barge, likely filled with dredge spoil (Images by author).

The most common type of placement assurance visible on the island is pile utilization. Throughout the entire graveyard, there are many instances where an abandoned vessel is surrounded on one or more sides by piles. The Stone tugs, for example, are literally "penned in" by piles. Figure 8.13 shows a series of piles just north of the Stone tug cluster which pen in both clusters of tugs (*Minnesota* and *Stone 3* to the north, *Stone 6* and *Dolphin* to the south) and the Wright Barge on the shore. It is likely that the piles formed a dock structure in that location, but whether or not the dock was in use at the time of abandonment is unknown.

Figure 8.13: Series of piles indicating placement assurance for abandoned Stone vessels (Image by Tiffany Pecoraro).

Immediately south of the vessels pictured in Figure 8.13, *Dolphin*, *Stone 4*, and *Stone 5* are also surrounded by piles (see Figure 8.14). Piles extended from shore, along the bow of *Stone 4* and *Stone 5* (south of the vessels) and continued along the port side of *Stone 5* (east of the vessels, nearest to the river channel) leading nearly to the *Dolphin* to the north. This series of piles remain from a dock structure that the Stones used in association with the drydock and railway to the south. There is also a singular pile immediately astern of *Stone 4* and *Cherokee*.

Figure 8.14: Piles run along the bows of *Stone 5* (left) and *Stone 4* (right) and continue to run north along the port side of *Stone 5* on the left side of the image. The singular pile on the right side of the image sits astern of both *Stone 4* and *Cherokee* (Image by Tiffany Pecoraro).

In addition to the archaeological record indication of piles used for placement assurance, a newspaper article from 1958 shows both *Dolphin* and *Minnesota* tied onto the piles surrounding them with rope (*Wilmington Star* 1958). In another instance of placement assurance, concrete piles were used in association with the Government Barge (see Figure 8.15). The concrete appears similar to the concrete used to make the bulkhead wall between the Bulkhead Barge and Barge 3, suggesting that the same person assured the placement of Government Barge and built the wall, possibly for reuse in both cases.

Figure 8.15: Concrete piles (one has fallen) on the north side of the Government Barge might be a signature of placement assurance (Image by author).

The evidence at Eagles Island indicating the use of piles is similar to behaviors exhibited in Australia. Richards (2002:366) found piles used both for placement assurance and as associated dock structures, like at Eagles Island, but he also found piles delineating disposal areas. This is not the case in the Cape Fear River, probably because Eagles Island is not a legislated ships' graveyard, but rather became a graveyard by default after abandoned vessels began accumulating.

Environmental Conditions

The placement of vessels can often be influenced by environmental conditions, and signatures at Eagles Island indicate that the appropriate environment was a

consideration in placement assurance behavior. Environmental selection to ensure placement includes evaluating for the proper substrate and tidal conditions (Richards 2002:370-375). Richards (2002:371) found wooden vessels run onto rocky shores to inflict damage to the vessels to affect the seaworthiness. Because reuse and curate behavior was so common with the wooden vessels on Eagles Island, this was not a typical behavior exhibited. The muddy substrate at Eagles Island worked to the advantage of those abandoning vessels. Richard Womack (2006, pers. comm.) remembers his great-grandfather and uncles telling him that they left the vessels in the mud so that it would preserve the wood. The substrate was a definite consideration in abandoning the vessels along the island. The Stones also accounted for tides. The three lifeboats pulled off the ex-army tugs in the 1950s and 1960s are abandoned high on shore and on the remains of the railway. The placement of the lifeboats reflects the thought process and decision making of the Stone workers that the vessels needed to be far enough away from water to preclude them from floating away.

Value of Placement Assurance

The placement assurance processes at Eagles Island are especially important because they were twofold in purpose. In addition to ensuring a vessel will remain in a particular spot, placement assurance processes reflect intended reuse processes associated with the abandoned vessels. The filling of the bulkhead vessels with rock, brick and dredge spoil both ensured the vessels would not float away from their location, but also facilitated the construction of the bulkhead there for the Hamme Railway. The locations of abandoned vessels next to barges (such as *Argonauta*) or dock features (such as the

Stone tugs) provided structure both to keep the vessels in place and conduct salvage from the vessels if the Stones deemed it necessary. Also, Barge 3 and the Wright Barge appear to be both set in place by pilings, but also incorporated into dock structures using those pilings. The process of placement assurance reflects both the decision making associated with ensuring the actual abandonment of vessels, and the possible reuse of those vessels. Therefore placement assurance on Eagles Island is both a reflection of economic processes in the systemic context (the reuse through placement assurance mechanisms) and the discard process in the life-cycle of artifacts.

Refuse

After construction, use, reuse, and deposition, refuse is the ultimate phase in the life-cycle of an artifact. Refuse is often transformed from the archaeological context to the systemic context when cultural processes act upon it, changing it to reused material. However, refuse itself is defined by characteristics, rather than processes, that classify it.

Primary vs. Secondary Refuse

Schiffer (1996:58) explained that artifacts discarded at the place of use are considered primary refuse while artifacts discarded adjacent to or away from the activity area are secondary refuse. In the context of watercraft abandonment and salvage, Richards (2002: 237-241) noticed specific characteristics dealing with inner harbor functions in association with abandonment. He postulated that there is a link between ship breaking and shipbuilding, making it efficient and economic for them to occur in the same area. The abandonment of vessels after salvage, however, was often removed from the area of building and breaking in order to keep vessels away from major activity areas.

Richards (2002:237) noted, “Ships’ Graveyards in harbor contexts are isolated from trade routes, as well as areas of commercial activity, although their location, being within a harbor are still accessible,” and he suggested that because of the process, logistically, graveyards are mostly secondary refuse sites.

The abandonment behavior at Eagles Island contradicts both Schiffer’s and Richards’s expectations of primary and secondary refuse sites. The deposition of vessels surrounds the locations of what were active railways, docks, and wharfs on Eagles Island, indicating that the discard behavior exhibits signatures of primary refuse. Also, abandoned vessels and material maintain direct association with what was a major activity area, the river channel. In addition, the commercial operations and river traffic continued despite the accumulation of abandoned materials throughout the years. Even today, the area is still an active waterway for harbor functions. Also, Schiffer (1996:62) describes clustering as a characteristic of secondary refuse sites, but Eagles Island, clearly a primary refuse site, exhibits a significant amount of clustering behavior, again disputing Schiffer’s claims about secondary refuse sites.

Refuse Typology

Many abandonment sites from studies around the world exhibit the *de facto* refuse properties of discard in the archaeological context. Some ships in the graveyard in the middle of Thunder Bay were re-floated from their original point of deposition and moved out to the final destination intact (Harris and Laroche 2005:61). At Mallows Bay, vessels remained intact enough to be salvaged significantly in the late 1930s, and then still maintained enough integrity after salvage that there was a severe problem of vessels

floating into the channel (Shomette 1996:268-269). As stated in Chapter Two, understanding the type of refuse produced on an abandonment site is related to understanding the conditions that correlate to the creation of that site. In both Thunder Bay and Mallows Bay, vessel abandonment was for the purpose of permanent discard.

Eagles Island presents different conditions of abandonment, making it an interesting case for refuse type analysis. As stated in the previous chapter, historical and archaeological evidence indicates that the Stones did not plan on permanent abandonment of their vessels, but rather abandoned them in locations with easy access and preservative conditions. Those conditions demonstrate true curate behavior at Eagles Island as opposed to overwhelming accumulation of *de facto* refuse. However, the southern portion of the graveyard is an example of pure *de facto* refuse conditions in the archaeological record. After the reuse of vessels, the transformation from the systemic context to the archaeological context left them abandoned as *de facto* refuse with no intention of future reuse. Eventually, as the Stone vessels fell into disrepair and the curate conditions suffered from depletion through salvage and scavenge, the vessels morphed from examples of curate behavior, to definitive *de facto* refuse.

As Stevenson (1982) showed, the mode or conditions of site abandonment are the determinants of refuse typology. When conditions of abandonment were gradual with anticipated return, such as the in the area surrounding the Stone yard, Stevenson suggested there should be a clustering of valuables away form the activity area and there should be a small accumulation of *de facto* refuse in the activity area. This is not the case at Eagle Island. The Stones clustered their valuables directly in the activity area. That

behavior correlates to Lightfoot's (1993:167-168) hypothesis that the condition of easy access encourages more curate behavior. The distance to the "new location" or the office across the river in Wilmington from which Stones operated the towing company after the cessation of use of the marine railway facilitated the curate behavior of the tugs surrounding their yard on Eagles Island.

When conditions of abandonment were gradual with no anticipated return, such as at the Hamme railway yard, Stevenson suggests there should be no caching of valuables, but there should be abundant trash and evidence of dismantling through planned salvage. These characteristics are partially represented in the archaeological record. In the southern part of the graveyard there was, indeed, limited salvage such as the engines from *Isco* and Steam Crane Barge 3 or the wooden decking from Barge 2 (see above). But there is not an abundant amount of trash, as Stevenson suggests there should be. Structures still remain standing, even today, the railways are still relatively intact, and the reused vessels were not garbage at the time of their abandonment, but rather were important aspects of the systemic context prior to the abandonment of the activity area. The conditions at Eagles Island resoundingly indicate that curate behavior outstripped reuse behavior in the geographic top half of the graveyard while reuse and *de facto* refuse conditions dominate the geographic bottom half of the graveyard.

The conditions of the creation of the Eagles Island Ships' Graveyard call into question some of Schiffer's suppositions. He suggests that, "The abandonment of places sets in motion another set of processes that deposits artifacts" (Schiffer 1996:89). Facilities on Eagles Island continued to be used despite ongoing deposition. The

deposition of artifacts, it seems, set in motion the series of processes that led to the abandonment of the places or activity areas, a supposition directly opposite from Schiffer's suggestion.

Conclusion

The post-deposition processes exhibit patterns and characteristics that reveal information about the conditions that prompted that behavior. Reclamation occurred through several different processes, but all had the same depleting effect on the material remains in the archaeological record. Though the behavior associated with salvaging and scavenging are different, both reflect a similar motivation to act, and that is an economic gain from the activity. Conservatory processes, however, are not conducted based on economic motivation, but rather for personal contentment. Additions and reductions to the archaeological record are motivated through both an intended physical restraint of the material remains and economic returns on the reuse of materials removed from or added to the archaeological record. The characteristics of refuse, thought not explicit in their archaeological signature, indicate that the characteristics at Eagles Island differ from those found at previous watercraft abandonment sites, and abandonment sites in general. The post-depositional processes at Eagles Island provide a means for conducting critical analysis of local conditions and create a conduit to assess the Eagles Island conditions on a broader national and international level.

CHAPTER NINE: CONCLUSION

In July of 1888, a resident of Wilmington North Carolina complained in the local paper, "the sunken steamboat at the ship yard on the west side of the river is not an attractive addition to the scenery of our port; on the contrary it is an eyesore and some little risk to navigation, and somebody ought to be made to remove it" (*Wilmington Messenger* 07/06/1888). Historians and archaeologists can be grateful that no one removed that "eyesore," the sidewheel steamer *Waccamaw*. From the single abandoned vessel, grew a collection of discarded watercraft, representative of a segment of Wilmington's commercial maritime industry. The abandoned vessels and associated maritime materials that line the shore of Eagles Island on the Cape Fear River provide a valuable resource for the study and analysis of the history of Wilmington.

Correlating the historical record with the material remains on Eagles Island provided a means to assess how the abandoned watercraft that form the Eagles Island Ships' Graveyard represent the culture, economy, and technology of Wilmington. Resource analysis concentrated on identifying and understanding the behaviors represented in the archaeological remains and determining the conditions driving those behaviors using the historical record.

The research for this thesis was heavily grounded in a theoretical framework built from a number of sources from the archaeological and anthropological worlds. Chapter Two outlines the theoretical framework and presents a structure for the analysis of the data accumulated from the archaeological record to be correlated to additional historical information. The crucial aspect of conducting the work using the acquired theoretical

framework was recognizing the formation process present in the archaeological record and determining the behaviors associated with those processes in order to ascertain the cultural, economic, and technological conditions that motivated that behavior. The theoretical basis of this thesis broadened the scope from a localized, particularistic study to an exploration of site formation processes and behavioral analysis.

The project methodology, as described in chapter three, consisted of three stages. A strong historical background was necessary to provide the basis for comparative analysis. Chapter Four outlined the history of Wilmington from the era just after the Civil War through the development and growth of the State Port facilities in the 1950s and 1960s. Chapter Five provided a more detailed historical overview of the commercial and maritime industries on Eagles Island. The second part of the methodology consisted of conducting archaeological field work to generate positional data and a descriptive inventory of the archeological remains on Eagles Island. Chapter three outlines the methods used in the field while Chapter Six presents the results of the archaeological field work including the recording of previously unrecorded sites and an updated site plan of the project area. Chapters Seven and Eight present the correlative analysis of the accumulated data from the historical and archaeological records in the context of the theoretical basis presented at the beginning of the thesis.

Observations

The correlation of the historical and archaeological records provided a means of demonstrating how the material remains on Eagles Island represent a microcosm of the cultural, economic, and technological development of Wilmington and southeastern

North Carolina. Investigation of the material remains at each stage the artifact life-cycle generated a comprehensive analysis corresponding to the theoretical framework set forward as the basis of this thesis.

Recognition and analysis of the use-life processes associated with the remains on Eagles Island are a critical aspect of answering the ultimate question of this research. Use-life modifications likely occurred on a majority of the vessels within the Eagles Island Ships' Graveyard and are a significant indicator of economic conditions. Vessel modification extended the use-life of vessels and provided an economic benefit to the vessel owners and users. Regardless of the type of modification, the goal of undertaking such work was to increase economic efficiency through design and technological advancement.

Reuse at Eagles Island appeared in the historical and archaeological records in the form of lateral cycling and secondary reuse. Lateral cycling was a common behavior type at Eagles Island and was found to occur both with vessels such as tugs and barges and with associated materials on the island such as marine railways and structures. It is likely that 73% of the remains on Eagles Island were secondarily reused in functions including bulkheads, dock and wharf structures, and platforms for activity. Both lateral cycling and secondary reuse behaviors relate to cultural conditions. Lateral cycling provides a cost effective means of maintaining a business through the purchase, use, and modification of previously owned or used vessels. Secondary reuse demonstrates that the abundance of materials that surpassed their originally intended function can continue to serve in the systemic context. At Eagles Island, the need for infrastructure to aid

commercial operations and maximize efficiency of those operations provided a secondary function for a variety of materials. Analysis of lateral cycling and secondary reuse shows that reuse was the most cost effective means to accomplish efficient operations and maintenance of commercial industries on Eagles Island.

The examination of deposition, the next stage of the life-cycle of an artifact, provided a means to analyze the temporality and spatial association of abandonment on Eagles Island. Based on ranges of abandonment established using a variety of sources, there are six clear phases of abandonment with direct and highly specific correlations to conditions of the cultural climate. The first phase exhibited clear discard behavior and began the trend for disposal on Eagles Island, providing clear to support Schiffer's (1996:62) claim that there exists a tendency to dump materials where others have previously dumped materials.

Phase 2, as opposed to Phase 1 was a reuse phase instead of a discard phase and is a precise reflection of the conditions of the time. Phase 2 corresponds to a period of growth for Wilmington's maritime industry in respect to maritime commerce in the southeastern United States. The growth of maritime commercial industries, reflected in the abandoned remains that contributed to the development of those industries on Eagles Island, was indicative of economic prosperity which stimulated the development and growth of Wilmington as a port city.

Phase 3 corresponds to the era of the Great Depression and specifically reflects activities on a regional level. Archaeological remains support the suggestion that

Wilmington, despite global economic conditions, was able to maintain growth thanks to positive conditions locally and regionally.

The fourth phase coincides with World War II and reflects international shipping trends of increased use and decreased deposition. Locally, the phase is indicative of the wartime economic surge for the port of Wilmington in respect to the boost in commercial maritime activities. Abandonment in Phase 5 represents both specific local and general global conditions. Locally, a fire on Eagles Island dramatically changed the face of the industry operating there and the deposition of vessels is a clear indicator of that change. On a national level, wartime industrial expansion leading to material surpluses influenced disposal of older, less technologically advanced vessels. The final phase of abandonment marks the end of deposition and reflects the cessation of accumulation of materials. On a larger scale, the phase coincides with the shifting nature of the port and the resulting changes in local cultural, economic, and technological conditions from the establishment and growth of the State Port in Wilmington.

Investigation into the spatial dimension of variability revealed that the locations of abandonment indicate distinct behavioral divisions in the layout of the Graveyard. The abandonment of tugs near the Stone yard and barges farther south suggests a direct correlation between activity and associated maritime commerce development on land.

The analysis of post-depositional processes also provides insight into the cultural conditions associated with the abandonment of vessels. Salvage, scavenging, and conservatory processes are three types of reclamation known to exist in the archaeological and historical records associated with Eagles Island. Reclamation

processes can be seen as refuse depletion and are important because of the behaviors associated with transforming materials from the archaeological context back into the systemic context. Signatures of salvage in the archaeological record at Eagles Island are important because they dispute the established claim that abandonment is a result of salvage and demonstrate that, in this case, salvage is a result of abandonment. Scavenging behavior is different from salvaging behavior, but the effects on the archaeological record and the ultimate goal of economic benefit is the same in both types of reclamation. Conservatory processes, however, exhibit entirely different behavior and reflect a motivation of human intrigue and emotion rather than an exclusively economic motivation. Also, the absence of certain types of salvage is an indicator of curate behavior not typically found on watercraft abandonment sites. The materials on Eagles Island that were neither discarded nor salvaged reflect localized conditions of economic stability.

The evidence of placement assurance present in the archaeological record is indicative of both physical motivations and economic motivations. Physically, the motivation behind placement assurance behavior is to ensure the discard location of a vessel. The economic motivation of placement assurance is the reuse value of selecting and maintaining a discard location to build island infrastructure and facilitate post-depositional salvage.

Analysis of refuse characteristics reveals that Eagles Island varies from most other graveyards or watercraft abandonment sites on a number of levels. Primarily, it disputes theoretical suggestions and archaeological evidence from other sites that

graveyards are typically secondary refuse sites because it is purely a primary refuse site. In addition, analysis of refuse typology indicates that characteristics on Eagles Island vary from established models of abandonment conditions. In the area of the Stone yard where abandonment was gradual and there was anticipation of return to the materials, there was abundant curate behavior and no significant accumulation of *de facto* refuse until the area transitioned into complete abandonment. In the lower geographic half of the graveyard, abandonment was gradual with no anticipation of return. There was no accumulation of trash and materials remained in relatively usable conditions at the time of abandonment.

Limitations and Potential Related Research

This thesis faced limitations on a number of levels. Primarily, because of the nature of the vessels on Eagles Island, positive identification was not possible for a majority of the vessels abandoned in the graveyard. Having positive identification would have provided means to create a more detailed record of each vessel individually and would have elevated the historical database of information, allowing for a more comprehensive analysis of the site. In addition, the small number of known vessel histories led to a small sample size for analytical purposes. The sample consisted of 41 vessels total with only 11 vessels identifiable enough to generate a vessel history and only four known years of abandonment. Another limitation in the project was environmental. The conditions of the site made it difficult, and sometimes hazardous to conduct archaeological field work. The tides and daylight limited the amount of time available to spend on the site. The water levels also inhibited data collection, making it

difficult to identify and capture positional points on submerged portions of vessels. Also, water levels often obscured important archaeological signatures making "the right place at the right time" a motto to live by in conducting fieldwork on the site.

Ships' graveyards are an underdeveloped and under-researched area of the sub-discipline of maritime archaeology. This thesis, and the few related studies, should be a springboard for additional research in this, and topically related areas. At Eagles Island specifically, there are countless areas of inquiry that remain unaddressed. For example, the material remains of the abandoned vessels represent a wide variety of technological innovation. Both the tugs and barges have specialized technological characteristics that could be the basis of a study of technological development on the Cape Fear River. On a broader level, another possible research topic not addressed by this thesis is how natural site formation processes affected the Eagles Island Ships' Graveyard. A comparative analysis of natural transforms and cultural transforms would provide a better indication of the amount of salvage and scavenge on the site compared to the amount of natural damage incurred on the material remains and would contribute to the study of site formation processes for the discipline as a whole.

Regionally, the research could be expanded to incorporate other accumulations of abandoned watercraft. Specifically in the Cape Fear River, in the vicinity of Wilmington, there are at least two other potential graveyards that deserve attention. One site is located south of the bridge on the Wilmington side of the river, slightly north of the location of the state docks. The other site is a horseshoe shaped waterway that loops off the Cape Fear River in which there are a multitude of abandoned vessels. Both locations would

allow future researchers to test the regional conclusions drawn from this research. Additionally, the research topic of ships' graveyards should be expanded nationally and internationally because of the value of the resource for analysis and interpretation on many levels.

Conclusion

This thesis demonstrated that the Eagles Island Ships' Graveyard is, indeed, a microcosm of the cultural, economic, and technological development of Wilmington and southeastern North Carolina. The thesis was grounded in a theoretical framework based on the importance of recognizing behaviors associated with specific site formation processes and characteristics in order to correlate those behaviors to the conditions which motivate them. The conditions that motivate behavior were assessed based on the correlation of the archaeological record to the historical record. In the course of conducting research for this thesis, it became apparent that this site is a valuable resource and a tangible connection to the past for the people of Wilmington. Unfortunately, it is under threat of development and soon, there may an "eyesore" of a different type across the river. Until then, the Eagles Island Ships' Graveyard remains as a testament to Wilmington's historic past and bright future as a commercial maritime center for the state of North Carolina.

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1986 Vessel Remains in Wilmington Harbor: Urban Eyesores of the Richest Kind. Paper presented at the 1986 Conference on Underwater Archaeology, Sacramento, CA.

Maps

Corps of Engineers
1909 *Cape Fear River at and Below Wilmington, N.C. Plat of Proposed Engineer Yard*. North Carolina Underwater Archaeology Branch, Kure Beach, NC. (USED FOR VESSEL ID)

1937 *Cape Fear River, N.C., at and Below Wilmington, Wilmington Harbor*. North Carolina Underwater Archaeology Branch, Kure Beach, NC. (USED FOR VESSEL ID)

1943 *Cape Fear River, N.C., at and Below Wilmington, Wilmington Harbor*. North Carolina Underwater Archaeology Branch, Kure Beach, NC. (USED FOR VESSEL ID)

United States Coast and Geodetic Survey
1922 *Cape Fear River Showing Waterfront at Wilmington, NC*. North Carolina Underwater Archaeology Branch, Kure Beach, NC. (USED FOR VESSEL ID)

APPENDIX A: SITE FORMS

Eagles Island Abandoned Ships' Form						CFR #	1	
Site:	Waccamaw					Form #:		
Name(s):						Date:		
						Times:	-	
Position:					- E		- Datum	
					- N		- Acc (+/-)	
Dim.(m):	- L				- B		- D	
Class:	SB	BO	BA	SH	Type:			
Hull:	Clinker	Carvel	Unknown:	Other:				
Material:								
Propuls.:	Powered		Sail		Towed		Unknown	
Prop Feat:	Engine		Boiler		Maststeps #		Masts #	
Engine Type:	Steam		Gasoline		Diesel		Unknown	
Engine Desc.:			Boiler Desc.:		Primary		Secondary	
Notes:			Square		Circular		Other	
→engine was inclined, inclined block still remains			18-1.5 - L		- B		9-6 - Diam.	
→engine salvaged			Notes: extensively cut					

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:	Danger:		Low Tide:			
				High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:	Desc::							
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:	grown				cut			
Frames								
Insitu frames		Port(left)		S/board(right)		Spacing (c to c)		
Orient. (bow to stern)	°	Fastenings:		Treenail	Ferrous	Cupric	Other:	
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
	Desc:	Desc:	Desc:	Desc:
Fill Description:				
Salvage:	Cut	Oxy-acet.	Salvage Desc.:	
Additional Observations:				
→most extensively salvaged in entire collection →built enbakement over vessel			Comments/Identification marks:	
			Checked:	

Eagles Island Abandoned Ships' Form							CFR #	0.004
Site:	Barge 1						Form #:	
Name(s):							Date:	
							Times:	-
Position:						- E		- Datum
						- N		- Acc (+/-)
Dim.(m):	72-0 (UAB) - L				15-0 (UAB) - B			- D
Class:	*SB*	*BO*	*BA*	*SH*	**Type:**			
Hull:	*Clinker*	*Carvel*	*Unknown:*	Other:				
Material:	wooden							
Propuls.:	*Powered*		*Sail*		*Towed*		*Unknown*	
Prop Feat:	*Engine*		*Boiler*		*Maststeps* #		*Masts* #	
Engine Type:	*Steam*		*Gasoline*		*Diesel*		*Unknown*	
Engine Desc.:			**Boiler Desc.:**		*Primary*		*Secondary*	
Notes:			*Square*		*Circular*		*Other*	
			- L		- B		- Diam.	
			Notes					

Inund.:	*Dry*	*Intertidal*	*Sub.*	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	*Bow*	*Stern*	*Port*	*S/board*	Scantlings (m):	*Length*	*Depth*	*Width*
Keel:	Desc::							
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:	*grown*				*cut*			
Frames								
Insitu frames		Port(left)			S/board(right)		Spacing (c to c)	
Orient. (bow to stern)	120°	**Fastenings:**		*Treenail*	*Ferrous*	*Cupric*	*Other:*	
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	*Profile*	*Elevation*	*Section*	*Plan*
Aband. Signatures:	*Burnt*	*Explosion*	*Gunfire*	*Modification*
	Desc:	Desc:	Desc:	Desc:
Fill Description:				
Salvage:	*Cut*	*Oxy-acet.*	Salvage Desc.:	

Additional Observations:

Approximate measurement today consistent with previous. Actual length hard to determine because covered by sediment and far into channel. Vessel's centerline is still discernable as well as a number of frames (2) and floor keelsons (3). Both lateral margins are also there (bilge keelsons) timbers are small throughout vessel and pilings appear to have been driven through at midships. There are also 3 larger pilings adjacent to the southern edge, one of those also appears to be driven into waccamaw

significant wood loss, but doesn't look salvaged.

Comments/Identification marks:

Checked:

Eagles Island Abandoned Ships' Form

CFR #	0.005								
Site:	Barge 2						Form #:		
Name(s):							Date:		
							Times:	-	
Position:	- E						- Datum		
	- N						- Acc (+/-)		
Dim.(m):	80-6 - L			23-1 - B			- D		
Class:	SB	BO	BA	SH	Type:	hopper barge-4 compartments			
Hull:	Clinker	Carvel	Unknown:	Other:					
Material:									
Propuls.:	Powered		Sail		Towed		Unknown		
Prop Feat:	Engine		Boiler		Maststeps #		Masts #		
Engine Type:	Steam		Gasoline		Diesel		Unknown		
Engine Desc.:			Boiler Desc.:		Primary		Secondary		
Notes:			Square		Circular		Other		
			- L		- B		- Diam.		
			Notes scotch boiler						
Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:			Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:			Low Tide:			
						High Tide			
	silt/mud					Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:	Desc::							
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:	grown			cut				
Frames								
Insitu frames		Port(left)		S/board(right)			Spacing (c to c)	
Orient. (bow to stern)	°	Fastenings:		Treenail	Ferrous	Cupric	Other:	wire
Caulking Desc:								
Toolmarks:	crow bar salvage-no evidence of cutting							
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
	Desc:	Desc:	Desc:	Desc:
Fill Description:				
Salvage:	Cut	Oxy-acet.	Salvage Desc.:	

Additional Observations:

→things inside
- →wood-lots of decking
- →steel barrel
- →concrete pipe

→extremely solid build
→spiked into ground!!
- →spike 1-10 out of wood, corregations on side, flat head, heavy duty,
- →spike 1 3/4 X 1 3/4, head 3 x 3

→turn buckle attached , like ratchet

→fasteners bent in specific direction
→southern end salvaged

Comments/Identification marks:

Checked:

Eagles Island Abandoned Ships' Form

CFR #	0.006								
Site:	bulkhead tug							Form #:	
Name(s):								Date:	
								Times:	-
Position:	- E							- Datum	
	- N							- Acc (+/-)	
Dim.(m):	55-0 - L			9-5 (x 2) - B				- D	
Class:	SB	BO	BA	SH	Type:				
Hull:	Clinker	Carvel	Unknown:	Other:					
Material:									
Propuls.:	Powered		Sail		Towed		Unknown		
Prop Feat:	Engine		Boiler		Maststeps #		Masts #		
Engine Type:	Steam		Gasoline		Diesel		Unknown		
Engine Desc.:			Boiler Desc.:		Primary		Secondary		
Notes:			Square		Circular		Other		
			- L		- B		- Diam.		
			Notes scotch boiler						

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:	Desc::							
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:	grown			cut				
Frames								
Insitu frames		Port(left)		S/board(right)			Spacing (c to c)	
Orient. (bow to stern)	°	Fastenings:		Treenail	Ferrous	Cupric	Other: wire	
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
	Desc:	Desc:	Desc:	Desc:

Fill Description:			
Salvage:	Cut	Oxy-acet.	Salvage Desc.:

Additional Observations:

→reuse-reclamation/makeshift wharf
→vessel gave way-fell out into river--rocks and bricks weighed out on side of vessel
→Reused for reclamation with bulkhead barge and EI launch
→breakwater for hamme slip
→boiler in stern with significant rocks and bricks inside, including aggregated concrete seen elsewhere
→possible cement mold of stern

Comments/Identification marks:

Checked:

Eagles Island Abandoned Ships' Form							CFR #	0.007 .
Site:	Barge 3						Form #:	
Name(s):							Date:	
							Times:	-
Position:	- E							- Datum
	- N							- Acc (+/-)
Dim.(m):	- L			- B				- D
Class:	SB	BO	BA	SH	Type:			
Hull:	Clinker	Carvel	Unknown:	Other:				
Material:								
Propuls.:	Powered		Sail		Towed		Unknown	
Prop Feat:	Engine		Boiler		Maststeps #		Masts #	
Engine Type:	Steam		Gasoline		Diesel		Unknown	
Engine Desc.:			Boiler Desc.:		Primary		Secondary	
Notes:			Square		Circular		Other	
			- L		- B		- Diam.	
			Notes					

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:		Desc::						
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:		grown			cut			
Frames								
Insitu frames			Port(left)		S/board(right)		Spacing (c to c)	
Orient. (bow to stern)	°	Fastenings:		Treenail	Ferrous	Cupric	Other:	
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
	Desc:	Desc:	Desc:	Desc:
Fill Description:				
Salvage:	Cut	Oxy-acet.	Salvage Desc.:	

Additional Observations:	Comments/Identification marks:
→hopper barge →use for substantial machinery/ substantial weight load-heavy timbers →most remains left--decking salvaged →concrete wall built into barge-substantially built with wall over it	Checked:

Eagles Island Abandoned Ships' Form						CFR #	0.008 .
Site:	Barge 4					Form #:	
Name(s):						Date:	
						Times:	-
Position:					- E		- Datum
					- N		- Acc (+/-)
Dim.(m):			76-0 - L		19-7 - B		- D
Class:	SB	BO	BA	SH	Type:		
Hull:	Clinker	Carvel	Unknown:	Other:			
Material:	wooden						
Propuls.:	Powered		Sail		Towed	Unknown	
Prop Feat:	Engine		Boiler		Maststeps #	Masts #	
Engine Type:	Steam		Gasoline		Diesel	Unknown	
Engine Desc.:			Boiler Desc.:		Primary	Secondary	
Notes:			Square		Circular	Other	
			- L		- B	- Diam.	
			Notes				

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:	Desc::							
Keelson:	7 bilge keelsons are extant (5 stringers, two on outside)							
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:	grown			cut				
Frames								
Insitu frames	2 extant	Port(left)		S/board(right)		Spacing (c to c)		
Orient. (bow to stern)	116°	Fastenings:		Treenail	Ferrous	Cupric	Other:	
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
	Desc:	Desc:	Desc:	Desc:

Fill Description:			
Salvage:	Cut	Oxy-acet.	Salvage Desc.:

Additional Observations:

rectangular barge. One unique construction features is that the deck stanchions are rabbited against the exterior bilge keelsons. The deck stanchions are 0-6 x 0-8. Fasteners are bent over on the bilge keelsons. 5 interior bilge stringers are extant with 2 main bilge keelsons and 2 extant frames are visible

no signs

Comments/Identification marks:

Checked:

Eagles Island Abandoned Ships' Form							CFR #	0.009
Site:	Steam Crane Barge 1						Form #:	
Name(s):							Date:	11/4/2006
							Times:	-
Position:					- E			- Datum
					- N			- Acc (+/-)
Dim.(m):			48-6 - L			19-10 - B		- D
Class:	SB	BO	BA	SH	Type:			
Hull:	Clinker	Carvel	Unknown:	Other:				
Material:	wooden							
Propuls.:	Powered		Sail		Towed		Unknown	
Prop Feat:	Engine		Boiler		Maststeps #		Masts #	
Engine Type:	Steam		Gasoline		Diesel		Unknown	
Engine Desc.:			Boiler Desc.:		Primary		Secondary	
Notes:			Square		Circular		Other	
			- L		- B		- Diam.	
			Notes					

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:		Desc::						
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:		grown			cut			
Frames								
Insitu frames			Port(left)		S/board(right)		Spacing (c to c)	
Orient. (bow to stern)		°	Fastenings:		Treenail	Ferrous	Cupric	Other:
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
	Desc:	Desc:	Desc:	Desc:
Fill Description:				
Salvage:	Cut	Oxy-acet.	Salvage Desc.:	

Additional Observations:	
The site is a steam crane barge with pilings located along eastern margin** running almost the entire length of the barge. Butting up against northern terminus is another previously unrecorded barge. The steam crane machinery is still intact on this vessel. While some of the frames are visible, the bilge stringers are covered by muck/sediment. 6 are apparent when counting barge knees, 4 stringers, 2 outside.	none apparent
	Comments/Identification marks:
	Checked:

Eagles Island Abandoned Ships' Form

CFR #	10								
Site:	Stone 5						Form #:		
Name(s):							Date:	3/25/2006	
							Times:	-	
Position:	- E						- Datum		
	- N						- Acc (+/-)		
Dim.(m):	70' - L			9' - B			- D		
Class:	SB	BO	BA	SH	Type:	schooner-tug			
Hull:	Clinker	Carvel	Unknown:	Other:					
Material:									
Propuls.:	Powered		Sail		Towed		Unknown		
Prop Feat:	Engine		Boiler		Maststeps #		Masts #		
Engine Type:	Steam		Gasoline		Diesel		Unknown		
Engine Desc.:			Boiler Desc.:		Primary		Secondary		
Notes:			Square		Circular		Other		
			- L		- B		- Diam.		
			Notes most of site underwater						
Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:		Time:	Height:	%exp:	
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:					
				High Tide					
				Notes:					

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:	Desc::							
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:	grown				cut			
Frames								
Insitu frames		Port(left)		S/board(right)			Spacing (c to c)	
Orient. (bow to stern)	°	Fastenings:		Treenail	Ferrous	Cupric	Other:	
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
placement assurance of other vessels and piles at bow	Desc:	Desc:	Desc:	Desc:
Fill Description:				
Salvage:	Cut	Oxy-acet.	Salvage Desc.:	

Additional Observations:

vessel is penned into current location wih a vessel to starboard, a vessel to stern, and piles to port and bow

salvage since 83 work
→rudder is now missing
→port side fuel tank missing
→sections of hull missing
→decling toward bow missing

Comments/Identification marks:

Checked:

Eagles Island Abandoned Ships' Form						CFR #	11 -
Site:	Dolphin					Form #:	
Name(s):						Date:	
						Times:	-
Position:				- E			- Datum
				- N			- Acc (+/-)
Dim.(m):		- L			- B		- D
Class:	SB	BO	BA	SH	Type:		
Hull:	Clinker	Carvel	Unknown:	Other:			
Material:							
Propuls.:	Powered		Sail		Towed	Unknown	
Prop Feat:	Engine		Boiler		Maststeps #	Masts #	
Engine Type:	Steam		Gasoline		Diesel	Unknown	
Engine Desc.:			Boiler Desc.:		Primary	Secondary	
Notes:			Square		Circular	Other	
			- L		- B	- Diam.	
			Notes scotch boiler				

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:		Desc::						
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:		grown			cut			
Frames								
Insitu frames			Port(left)		S/board(right)		Spacing (c to c)	
Orient. (bow to stern)		°	Fastenings:		Treenail	Ferrous	Cupric	Other: wire
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
	Desc:	Desc:	Desc:	Desc:
Fill Description:				
Salvage:	Cut	Oxy-acet.	Salvage Desc.:	
Additional Observations:				
			Comments/Identification marks:	
→still intact decking, some salvage-tertiary salvage evident			Checked:	

Eagles Island Abandoned Ships' Form							CFR #	0.0012	
Site:	Stone 6/ Atlantic City						Form #:		
Name(s):							Date:		
							Times:	-	
Position:	- E						- Datum		
	- N						- Acc (+/-)		
Dim.(m):	bow to bulkhead 48-2 - L			21-1 - B			- D		
Class:	SB	BO	BA	SH	Type:				
Hull:	Clinker	Carvel	Unknown:	Other:					
Material:									
Propuls.:	Powered		Sail		Towed		Unknown		
Prop Feat:	Engine		Boiler		Maststeps #		Masts #		
Engine Type:	Steam		Gasoline		Diesel		Unknown		
Engine Desc.:			Boiler Desc.:		Primary		Secondary		
Notes:			Square		Circular		Other		
			- L		- B		- Diam.		
			Notes scotch boiler						
Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:			Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:			Low Tide:			
						High Tide			
						Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:	Desc::							
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:	grown			cut				
Frames	paired							
Insitu frames		Port(left)		S/board(right)			Spacing (c to c)	
Orient. (bow to stern)	250°	Fastenings:		Treenail	Ferrous	Cupric	Other: wire	
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
	Desc:	Desc:	Desc:	Desc:
Fill Description:				
Salvage:	Cut	Oxy-acet.	Salvage Desc.:	

Additional Observations:

→two water ballast tanks at midships
→still significant wood-late abandonment, wood not salvaged
→submerged boiler
→electircal conduit
→660 w, 600 v
→CROUSE-HINDS
→duct tape inside
→tie rod for hogging

No Salvage-natural deterioration
→primary stage salvage
→no secondary
→likely tertiary

Comments/Identification marks:

Checked:

Eagles Island Abandoned Ships' Form						CFR #	13 -
Site:	Minnesota					Form #:	
Name(s):						Date:	
						Times:	-
Position:	- E					- Datum	
	- N					- Acc (+/-)	
Dim.(m):	- L			17-5 - B		- D	
Class:	SB	BO	BA	SH	Type:		
Hull:	Clinker	Carvel	Unknown:	Other:			
Material:							
Propuls.:	Powered		Sail	Towed		Unknown	
Prop Feat:	Engine		Boiler	Maststeps #		Masts #	
Engine Type:	Steam		Gasoline	Diesel		Unknown	
Engine Desc.:			Boiler Desc.:	Primary		Secondary	
Notes:			Square	Circular		Other	
			- L	- B		- Diam.	
			Notes scotch boiler				

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:		Desc::						
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:		grown			cut			
Frames								
Insitu frames			Port(left)		S/board(right)		Spacing (c to c)	
Orient. (bow to stern)	°	Fastenings:		Treenail	Ferrous	Cupric	Other:	wire
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
	Desc:	Desc:	Desc:	Desc:
Fill Description:				
Salvage:	Cut	Oxy-acet.	Salvage Desc.:	
Additional Observations:				
			Comments/Identification marks:	
			Checked:	

Eagles Island Abandoned Ships' Form						CFR #	14	
Site:	Stone 3/ Isabelle					Form #:		
Name(s):						Date:		
						Times:	-	
Position:	- E					- Datum		
	- N					- Acc (+/-)		
Dim.(m):	- L		- B			- D		
Class:	SB	BO	BA	SH	Type:			
Hull:	Clinker	Carvel	Unknown:	Other:				
Material:								
Propuls.:	Powered		Sail		Towed	Unknown		
Prop Feat:	Engine		Boiler		Maststeps #	Masts #		
Engine Type:	Steam		Gasoline		Diesel	Unknown		
Engine Desc.:			Boiler Desc.:		Primary	Secondary		
Notes:			Square		Circular	Other		
			- L		- B	- Diam.		
			Notes					
Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:		Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:			Low Tide:		
						High Tide		
						Notes:		

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:	Desc::							
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:	grown			cut				
Frames								
Insitu frames		Port(left)		S/board(right)			Spacing (c to c)	
Orient. (bow to stern)	°	Fastenings:		Treenail	Ferrous	Cupric	Other:	
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								
Drawn:	Profile		Elevation		Section		Plan	
Aband. Signatures:	Burnt		Explosion		Gunfire		Modification	
	Desc:		Desc:		Desc:		Desc:	
Fill Description:								
Salvage:	Cut		Oxy-acet.		Salvage Desc.:			
Additional Observations:								
→no salvage on diesel engine →if any, it was before deposition					→cut straight across frames →crow barred planking			
					Comments/Identification marks:			
					Checked:			

Eagles Island Abandoned Ships' Form						CFR #	15
Site:	Argonauta					Form #:	
Name(s):	Adam Friedman, Michelle Damian					Date:	3/25/2006
						Times:	-
Position:	- E					- Datum	
	- N					- Acc (+/-)	
Dim.(m):	- L			- B		- D	
Class:	SB	BO	BA	SH	Type:		
Hull:	Clinker	Carvel	Unknown:	Other: in and out clinker, iron rivited			
Material:	steel (possibly iron as well-notes indicate iron)						
Propuls.:	Powered		Sail	Towed		Unknown	
Prop Feat:	Engine		Boiler	Maststeps #		Masts #	
Engine Type:	Steam		Gasoline	Diesel		Unknown	
Engine Desc.:			Boiler Desc.:	Primary		Secondary	
Notes:			Square	Circular		Other	
			- L	- B		- Diam.	
			Notes: Boiler sas "LONERGAN" "PHILA PA" on steam out take				

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:	Desc::							
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:	throughout and show evidence of salvage					2.4'	2.2'	.05'
Timber Knee:	grown				cut			
Frames	L-frames (single)						.3'	.3'
Insitu frames	12	Port(left)	29	S/board(right)		1.3-1.8	Spacing (c to c)	
Orient. (bow to stern)	°	Fastenings:		Treenail	Ferrous	Cupric	Other:	
Caulking Desc:								
Toolmarks:								
Surface treatment:	rust							
Artifact contents:	disarticulated scantlings							
Drawn:	Profile		Elevation		Section		Plan	
Aband. Signatures:	Burnt		Explosion		Gunfire		Modification	
	Desc:		Desc:		Desc:		Desc:	
Fill Description:								
Salvage:	Cut		Oxy-acet.		Salvage Desc.:			

Additional Observations:	
	→hammering to remove metal plates on starboard bow →wood is salvaged
	Comments/Identification marks:
→Bow: triangle still standing--no market for use/reuse, abandoned for scrap value →piles to the north of vessel--Argonauta placed in location next to jetty for salvage "assurance placement" →cut line across hull is next to jetty remains	Checked:

Eagles Island Abandoned Ships' Form

CFR #	17								
Site:	Eagles Island Skiff							Form #:	
Name(s):								Date:	
								Times:	-
Position:	- E							- Datum	
	- N							- Acc (+/-)	
Dim.(m):	- L			- B				- D	
Class:	SB	BO	BA	SH	Type:	skiff			
Hull:	Clinker	Carvel	Unknown:	Other:					
Material:	wood with piles nearby, posibly associated								
Propuls.:	Powered		Sail		Towed	Unknown: likely poled (shoved)			
Prop Feat:	Engine		Boiler		Maststeps #	Masts #			
Engine Type:	Steam		Gasoline		Diesel	Unknown			
Engine Desc.:	Boiler Desc.:		Primary		Secondary				
Notes:	Square		Circular		Other				
	- L		- B		- Diam.				
	Notes								

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
	silt			Notes: submerged about two feet at time of analysis			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:	Desc::							
Keelson:	keelson is rounded on edges						0-3/4	0-4
Ext. planking:	outer plankingon skiff						0-3/4	0-8 1/4
Av. Strake:								
Metal Knee:								
Timber Knee:	grown			cut				
Frames								
Insitu frames		Port(left)		S/board(right)			Spacing (c to c)	
Orient. (bow to stern)	146°	Fastenings:		Treenail	Ferrous	Cupric	Other:	wire nails
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
	Desc:	Desc:	Desc:	Desc:
Fill Description:				
Salvage:	Cut	Oxy-acet.	Salvage Desc.:	

Additional Observations:

→tree/piling (looks like tree) through bow of vessel
→could be abutted
→looks like tree/pile has bark on it
→barrel hoop inside skiff
→sitting on top of pile
→placement potentially associated with piles, more likely than other skiff

→obviously removed wood

Comments/Identification marks:

Checked:

Eagles Island Abandoned Ships' Form						CFR #	20
Site:	bulkead barge					Form #:	
Name(s):						Date:	
						Times:	-
Position:					- E		- Datum
					- N		- Acc (+/-)
Dim.(m):	50 feet to cement block - L				- B		- D
Class:	SB	BO	BA	SH	Type:		
Hull:	Clinker	Carvel	Unknown:	Other:			
Material:							
Propuls.:	Powered		Sail		Towed	Unknown	
Prop Feat:	Engine		Boiler		Maststeps #	Masts #	
Engine Type:		Steam		Gasoline	Diesel	Unknown	
Engine Desc.:				Boiler Desc.:	Primary	Secondary	
Notes:				Square	Circular	Other	
				- L	- B	- Diam.	
				Notes			

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:		Desc::						
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:		grown			cut			
Frames								
Insitu frames			Port(left)		S/board(right)		Spacing (c to c)	
Orient. (bow to stern)		°	Fastenings:		Treenail	Ferrous	Cupric	Other:
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
	Desc:	Desc:	Desc:	Desc:
Fill Description:				
Salvage:	Cut	Oxy-acet.	Salvage Desc.:	

Additional Observations:

→sits just forward of bulkhead tug and just aft and perpendicular to barge 3, parallel to river front
→built into concrete wall connected to barge 3
→likely used as Hamme breakwater
→has metal pipe running inside

Comments/Identification marks:

Checked:

Eagles Island Abandoned Ships' Form

CFR #	21 -								
Site:	Stone Drydock						Form #:		
Name(s):							Date:	11/2/2006	
							Times:	-	
Position:	- E						- Datum		
	- N						- Acc (+/-)		
Dim.(m):	74-4 - L			21-2 (X2)= 42-4 - B			- D		
Class:	SB	BO	BA	SH	Type:	floating drydock			
Hull:	Clinker	Carvel	Unknown:	Other:					
Material:	wood								
Propuls.:	Powered		Sail		Towed		Unknown		
Prop Feat:	Engine		Boiler		Maststeps #		Masts #		
Engine Type:	Steam		Gasoline		Diesel		Unknown		
Engine Desc.:	Boiler Desc.:		Primary		Secondary				
Notes:	Square		Circular		Other				
	- L		- B		- Diam.				
	Notes scotch boiler								

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:	Desc::							
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:	grown			cut				
Frames								
Insitu frames		Port(left)		S/board(right)		Spacing (c to c)		
Orient. (bow to stern)	34°	Fastenings:		Treenail	Ferrous	Cupric	Other: wire	
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								
Drawn:	Profile		Elevation		Section		Plan	
Aband. Signatures:	Burnt		Explosion		Gunfire		Modification	
	Desc:		Desc:		Desc:		Desc:	
Fill Description:								
Salvage:	Cut		Oxy-acet.		Salvage Desc.:			

Additional Observations:	
→centerline feature measures 4-0 (four timbers measuring 1-0 wide) →metal strapping (not sure if associated)	→Sides of dock are no longer there (large wood salvage) →wood planking from inside dock is gone, does not look salvaged
	Comments/Identification marks:
	Checked:

Eagles Island Abandoned Ships' Form

CFR #	26 -								
Site:	Government Barge						Form #:		
Name(s):							Date:		
							Times:	-	
Position:	- E						- Datum		
	- N						- Acc (+/-)		
Dim.(m):	75 - L			31-10 - B			- D		
Class:	*SB*	*BO*	*BA*	*SH*	**Type:**				
Hull:	*Clinker*	*Carvel*	*Unknown:*	Other:					
Material:	substantial timbers, wooden								
Propuls.:	*Powered*		*Sail*		*Towed*		*Unknown*		
Prop Feat:	*Engine*		*Boiler*		*Maststeps* #		*Masts* #		
Engine Type:	*Steam*		*Gasoline*		*Diesel*		*Unknown*		
Engine Desc.:			**Boiler Desc.:**		*Primary*		*Secondary*		
Notes:			*Square*		*Circular*		*Other*		
			- L		- B		- Diam.		
			Notes scotch boiler						

Inund.:	*Dry*	*Intertidal*	*Sub.*	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	*Bow*	*Stern*	*Port*	*S/board*	**Scantlings (m):**	*Length*	*Depth*	*Width*
Keel:	Desc::							
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:	*grown*			*cut*				
Frames								
Insitu frames		Port(left)		S/board(right)		Spacing (c to c)		
Orient. (bow to stern)	°	**Fastenings:**	*Treenail*	*Ferrous*	*Cupric*	*Other:* wire		
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	*Profile*	*Elevation*	*Section*	*Plan*
Aband. Signatures:	*Burnt*	*Explosion*	*Gunfire*	*Modification*
	Desc:	Desc:	Desc:	Desc:
Fill Description:				
Salvage:	*Cut*	*Oxy-acet.*	Salvage Desc.:	

Additional Observations:

→hopper door or hatch of some sort still intact with chain
→carried heavy machinery-tensioning device pulled from deck salvage
→notched timebers-substantial
→sacrificial planking on exterior
→50 % of barge is removed (at least)
→diverse fasteners (wrought and cast)
→extensively nailed (possibly two cases of sacrificial planking)

→tensioning devices and fasteners bent from crow/baring salvage

Comments/Identification marks:

Checked:

Eagles Island Abandoned Ships' Form

CFR #	27								
Site:	General H.G. Wright						Form #:		
Name(s):							Date:	3/25/2006	
							Times:	-	
Position:	0228109 - E						WGS 84 - Datum		
	379185 - N						20.6 - Acc (+/-)		
Dim.(m):	78' (visible), 89' actual - L				23' - B		- D		
Class:	SB	BO	BA	SH	Type:	stern paddlewheeler			
Hull:	Clinker	Carvel	Unknown:	Other:					
Material:									
Propuls.:	Powered		Sail		Towed		Unknown		
Prop Feat:	Engine		Boiler		Maststeps #		Masts #		
Engine Type:	Steam		Gasoline		Diesel		Unknown		
Engine Desc.:			Boiler Desc.:		Primary		Secondary		
Notes:			Square		Circular		Other		
			- L		- B		- Diam.		
			Notes						
Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:			Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:			Low Tide:			
						High Tide			
						Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:		Desc::						
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:		grown			cut			
Frames								
Insitu frames			Port(left)		S/board(right)		Spacing (c to c)	
Orient. (bow to stern)	°	Fastenings:		Treenail	Ferrous	Cupric	Other:	
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								
Drawn:	Profile		Elevation		Section		Plan	
Aband. Signatures:	Burnt		Explosion		Gunfire		Modification	
	Desc:		Desc:		Desc:		Desc:	
Fill Description:								
Salvage:	Cut		Oxy-acet.		Salvage Desc.:			

Additional Observations:

deck beams still present
-four frame ends visible
-longitudinal timbers still visible
-base of an a-frame still visible on starboard side

Comments/Identification marks:

Checked:

Eagles Island Abandoned Ships' Form

CFR #	28 .								
Site:	Stone 4/ Eva							Form #:	
Name(s):								Date:	
								Times:	-
Position:	- E							- Datum	
	- N							- Acc (+/-)	
Dim.(m):	47 - L				12 - B			6 - D	
Class:	*SB*	*BO*	*BA*	*SH*	**Type:**				
Hull:	*Clinker*	*Carvel*	*Unknown:*	Other:					
Material:									
Propuls.:	*Powered*		*Sail*		*Towed*		*Unknown*		
Prop Feat:	*Engine*		*Boiler*		*Maststeps* #		*Masts* #		
Engine Type:	*Steam*		*Gasoline*		*Diesel*		*Unknown*		
Engine Desc.:			**Boiler Desc.:**		*Primary*		*Secondary*		
Notes:			*Square*		*Circular*		*Other*		
CF-A 117F (or E)			- L		- B		- Diam.		
			Notes scotch boiler						

Inund.:	*Dry*	*Intertidal*	*Sub.*	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	*Bow*	*Stern*	*Port*	*S/board*	**Scantlings (m):**	*Length*	*Depth*	*Width*
Keel:	Desc::							
Keelson:								
Ext. planking:	*wood*						.2'	
Av. Strake:								
Metal Knee:								
Timber Knee:	*grown*				*cut*			
Frames								
Insitu frames		Port(left)			S/board(right)		Spacing (c to c)	
Orient. (bow to stern)	°	**Fastenings:**		*Treenail*	*Ferrous*	*Cupric*	*Other:*	wire
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	*Profile*	*Elevation*	*Section*	*Plan*
Aband. Signatures:	*Burnt*	*Explosion*	*Gunfire*	*Modification*
	Desc:	Desc:	Desc:	Desc:
Fill Description:				
Salvage:	*Cut*	*Oxy-acet.*	Salvage Desc.:	

Additional Observations:

→metal box in bow, trapezoidal shaped, approximately 3 feet long and 1-2feet deep
→wooden bulkhead about 30' forward of stern
→still contains bitts in location
→engine and pipe fragments remain in hull

Comments/Identification marks:

Checked:

Eagles Island Abandoned Ships' Form

CFR #	29								
Site:	Iron Rudder Wreck						Form #:		
Name(s):							Date:		
							Times:	-	
Position:	- E						- Datum		
	- N						- Acc (+/-)		
Dim.(m):	- L			- B			- D		
Class:	SB	BO	BA	SH	Type:				
Hull:	Clinker	Carvel	Unknown:	Other:					
Material:									
Propuls.:	Powered		Sail		Towed		Unknown		
Prop Feat:	Engine		Boiler		Maststeps #		Masts	# 2-3 stanchions	
Engine Type:	Steam		Gasoline		Diesel		Unknown		
Engine Desc.:	Boiler Desc.:		Primary		Secondary				
Notes:	Square		Circular		Other				
	- L		- B		- Diam.				
	Notes scotch boiler								

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:	Desc::							
Keelson:	Paired							1-3.5
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:	grown			cut				
Frames	very small							3
Insitu frames		Port(left)		S/board(right)		Spacing (c to c)		
Orient. (bow to stern)	°	Fastenings:		Treenail	Ferrous	Cupric	Other:	wire
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
	Desc:	Desc:	Desc:	Desc:

Fill Description:			
Salvage:	Cut	Oxy-acet.	Salvage Desc.:

Additional Observations:

→partial decking-very poor condition, soft wood, breaks to touch
→extensive salvage

→extensive salvage
→no fasteners to tell method of salvage
→possibly cut

Comments/Identification marks:

Checked:

Eagles Island Abandoned Ships' Form						CFR #	32
Site:	wright barge					Form #:	
Name(s):						Date:	
						Times:	-
Position:					- E		- Datum
					- N		- Acc (+/-)
Dim.(m):			60-8 - L			18-2 - B	- D
Class:	SB	BO	BA	SH	Type:	barge	
Hull:	Clinker	Carvel	Unknown:	Other:			
Material:							
Propuls.:	Powered		Sail		Towed	Unknown	
Prop Feat:	Engine		Boiler		Maststeps #	Masts #	
Engine Type:	Steam		Gasoline		Diesel	Unknown	
Engine Desc.:			Boiler Desc.:		Primary	Secondary	
Notes:			Square		Circular	Other	
			- L		- B	- Diam.	
			Notes				

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:		Desc::						
Keelson:							0-7	0-8
Ext. planking:						long	0-2	0-6
Av. Strake:								
Metal Knee:								
Timber Knee:		grown			cut			
Frames								
Insitu frames			Port(left)		S/board(right)		Spacing (c to c)	
Orient. (bow to stern)		°	Fastenings:		Treenail	Ferrous	Cupric	Other:
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
	Desc:	Desc:	Desc:	Desc:
Fill Description:				
Salvage:	Cut	Oxy-acet.	Salvage Desc.:	

Additional Observations:

→thin deck (possibly for easy replacement due to rugged work)
→large bilge keelsons, 3
→5 barge knees at stern
→inland of large disassociated boiler (17-1.5 x 5-5.5)
→south of dock, likely deposited after dock construction

→wood crow barred off

Comments/Identification marks:

Checked:

Eagles Island Abandoned Ships' Form

CFR #	33								
Site:	Cherokee						Form #:		
Name(s):							Date:	11/3/2006	
							Times:	-	
Position:	- E						- Datum		
	- N						- Acc (+/-)		
Dim.(m):	- L			- B			- D		
Class:	SB	BO	BA	SH	Type:				
Hull:	Clinker	Carvel	Unknown:	Other:					
Material:									
Propuls.:	Powered		Sail		Towed		Unknown		
Prop Feat:	Engine		Boiler		Maststeps #		Masts #		
Engine Type:	Steam		Gasoline		Diesel		Unknown		
Engine Desc.:			Boiler Desc.:		Primary		Secondary		
Notes:			Square		Circular		Other		
			- L		- B		- Diam.		
			Notes						

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:	2:00		25%
	coastal wetlands, fine grain sediment			High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:		Desc::						
Keelson:								
Ext. planking:		visible						
Av. Strake:								
Metal Knee:								
Timber Knee:		grown			cut			
Frames								
Insitu frames			Port(left)		S/board(right)		Spacing (c to c)	
Orient. (bow to stern)	°	Fastenings:		Treenail	Ferrous	Cupric	Other:	
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
Placement is key--piles in front and piles behind, also adject to stone 4 and coast on other side	Desc:	Desc:	Desc:	Desc:

Salvage:	Cut	Oxy-acet.	Salvage Desc.:
			→no visible signatures of salvage for wood →engine no longer on site, possibly salvaged

Additional Observations:

the vessel is burried deep in the sediment but there appears to be significant amount of remains left subsurface. Visible is relatively intact exterior planking outlineing the hull and ceiling. Some intact decking is extant and the deck beams are still intact for the majority of the exposed remains. The rudder post is also stll in situ adn there are two large, upright features @ midships adn @ the portside stern

Comments/Identification marks:

Checked:

Eagles Island Abandoned Ships' Form							CFR #	34 -
Site:	Eagles Island other Skiff						Form #:	
Name(s):							Date:	
							Times:	-
Position:						- E		- Datum
						- N		- Acc (+/-)
Dim.(m):			17-0 - L			4.5-0 - B		- D
Class:	SB	BO	BA	SH	Type:	skiff		
Hull:	Clinker	Carvel	Unknown:	Other:				
Material:	wood							
Propuls.:	Powered		Sail		Towed		Unknown: shoved	
Prop Feat:	Engine		Boiler		Maststeps #		Masts #	
Engine Type:		Steam		Gasoline		Diesel		Unknown
Engine Desc.:				Boiler Desc.:		Primary		Secondary
Notes:				Square		Circular		Other
				- L		- B		- Diam.
				Notes				

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:	Desc::							
Keelson:	visible-exactly down centerline					?	0-1/2	0-7
Ext. planking:	possible planking on east side					4-0		0-6
Av. Strake:								
Metal Knee:								
Timber Knee:	grown				cut			
Frames	n/a							
Insitu frames		Port(left)		S/board(right)			Spacing (c to c)	
Orient. (bow to stern)	26°	Fastenings:		Treenail	Ferrous	Cupric	Other: wire	
Caulking Desc:	none							
Toolmarks:								
Surface treatment:								
Artifact contents:	none							
Drawn:	Profile		Elevation		Section		Plan	
Aband. Signatures:	Burnt		Explosion		Gunfire		Modification	
	Desc:		Desc:		Desc:		Desc:	
Fill Description:								
Salvage:	Cut		Oxy-acet.		Salvage Desc.:			

Additional Observations:

→brick and other detritus in hull-likely subsequent deposition
→just west of a set of pilings
→cribing just east of vessel--vessel sitting in gap
→late 19th cent to early 20th cent based on nails
→parallel to shore--flat bottom parallel to shore to stick to bottom--assurance placement
→maybe thrown off dock, maybe used as ramp (does not look likely according to photos)
→surrounded by cable (ballast, terracotta pipe, bricks)

→wood salvaged

Comments/Identification marks:

Checked:

Eagles Island Abandoned Ships' Form							CFR #	42	
Site:	Steam Crane Barge 2						Form #:		
Name(s):							Date:	11/4/2006	
							Times:	-	
Position:						- E		- Datum	
						- N		- Acc (+/-)	
Dim.(m):	51-0 appx - L			19-0 appx - B				- D	
Class:	SB	BO	BA	SH	Type:				
Hull:	Clinker	Carvel	Unknown:	Other:					
Material:									
Propuls.:	Powered		Sail		Towed		Unknown		
Prop Feat:	Engine		Boiler		Maststeps #		Masts #		
Engine Type:	Steam		Gasoline		Diesel		Unknown		
Engine Desc.:			Boiler Desc.:		Primary		Secondary		
Notes:			Square		Circular		Other		
			- L		- B		- Diam.		
			Notes						
Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:			Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:			Low Tide:			
						High Tide			
						Notes:			
al wetland in fine grain sediment,									
Elements:	Bow	Stern	Port	S/board	Scantlings (m):		Length	Depth	Width
Keel:	Desc::								
Keelson:									
Ext. planking:									
Av. Strake:									
Metal Knee:									
Timber Knee:	grown			cut					
Frames									
Insitu frames	2	Port(left)		S/board(right)				Spacing (c to c)	
Orient. (bow to stern)	284°	Fastenings:		Treenail	Ferrous	Cupric	Other:		
Caulking Desc:									
Toolmarks:									
Surface treatment:									
Artifact contents:									
Drawn:	Profile		Elevation		Section		Plan		
Aband. Signatures:	Burnt		Explosion		Gunfire		Modification		
	Desc:		Desc:		Desc:		Desc:		
Fill Description:									
Salvage:	Cut		Oxy-acet.		Salvage Desc.:				
Additional Observations:					one boiler from gearing of steam crane is missing				
→the barge has two sets of machinery on it, one intact with gearing but missing boiler, one with gearing fallen over and boiler from gearing fallen over, one large tank/rectangular boiler that seems dissassociated and deposited					one crane is there, the other is gone				
→the site consits of a steam crane barge with machinery extant. The existing remains are consistant with the previously recorded. The stern with 2 barge knees is still visible as well as 6 possible 7 bilge stringers, 2 bilge keelsons. The wooden a-frame for the crane is also on sight as well as the metal boom with pil and wire rope					Comments/Identification marks:				
					Checked:				

Eagles Island Abandoned Ships' Form						CFR #	1001
Site:	stock pile					Form #:	
Name(s):						Date:	
						Times:	-
Position:	3791988 (n edge of pile of debris) - E						- Datum
	0228133 - N						- Acc (+/-)
Dim.(m):	- L			- B			- D
Class:	SB	BO	BA	SH	Type:		
Hull:	Clinker	Carvel	Unknown:	Other:			
Material:	steel, iron, reinforced beams						
Propuls.:	Powered		Sail	Towed		Unknown	
Prop Feat:	Engine		Boiler	Maststeps #		Masts #	
Engine Type:	Steam		Gasoline	Diesel		Unknown	
Engine Desc.:			Boiler Desc.:	Primary		Secondary	
Notes:			Square	Circular		Other	
			- L	- B		- Diam.	
			Notes possible rectangular boilers, 2 vertical tube boilers				

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:	Desc::							
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:	grown			cut				
Frames								
Insitu frames		Port(left)		S/board(right)		Spacing (c to c)		
Orient. (bow to stern)	°	Fastenings:		Treenail	Ferrous	Cupric	Other:	pan head
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								
Drawn:	Profile		Elevation		Section		Plan	
Aband. Signatures:	Burnt		Explosion		Gunfire		Modification	
→site pegged in (piles out outside to keep metal structure in)	Desc:		Desc:		Desc:		Desc:	
Fill Description:								
Salvage:	Cut		Oxy-acet.		Salvage Desc.:			

Additional Observations:	
→excess of four dredge buckets →possible belt winch →pile of cable →rectangular boilers →2 vertical boilers deposited after rectangular boilers →possible donkey boilers →continues significant way south to deposition of large boiler remains, some metal sheeting, davit, ladder →cribbing below stockpile →temporally important (early for site (mid/late 20th)	→Rec boiler: jagged from saw, rounded cut with oxy-acetelyn →vertical boilers could have been salvaged, could have blown up Comments/Identification marks: Checked:

Eagles Island Abandoned Ships' Form

CFR #	1002								
Site:	Stockpile 2						Form #:		
Name(s):							Date:		
							Times:	-	
Position:	3791824 - E							- Datum	
	0228091 - N							- Acc (+/-)	
Dim.(m):	- L			- B				- D	
Class:	SB	BO	BA	SH	Type:				
Hull:	Clinker	Carvel	Unknown:	Other:					
Material:									
Propuls.:	Powered		Sail		Towed		Unknown		
Prop Feat:	Engine		Boiler		Maststeps #		Masts #		
Engine Type:		Steam		Gasoline		Diesel		Unknown	
Engine Desc.:			Boiler Desc.:			Primary		Secondary	
Notes:				Square		Circular		Other	
				- L		- B		- Diam.	
			Notes						

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:	Desc::							
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:	grown			cut				
Frames								
Insitu frames		Port(left)		S/board(right)			Spacing (c to c)	
Orient. (bow to stern)	°	Fastenings:		Treenail	Ferrous	Cupric	Other:	
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
	Desc:	Desc:	Desc:	Desc:
Fill Description:				
Salvage:	Cut	Oxy-acet.	Salvage Desc.:	

Additional Observations:

→hose reel (womack interview discussed rinsing ships on railway with large hose before working on them)
→engine pumps (fire/water pump)
→rudder →anchor chain
→several anchors →windlass with chain on it
→pile hammer that says: "National Pile Hammer;Pattened;Size no 2;shop no -; NATL HOIST ENG. CO; HARRISON N.J. U.S.A."
→prop shaft with couple for eccentric and possible with thrust bering
→winch →crank shaft →engine block →bollard

→womack interview revealed stockpile near site of Stone Carpentry Shop

Comments/Identification marks:

Checked:

Eagles Island Abandoned Ships' Form						CFR #	1003	
Site:	lifeboat 3					Form #:		
Name(s):						Date:		
						Times:	-	
Position:	3791841 - E						- Datum	
	0228065 - N						- Acc (+/-)	
Dim.(m):	18-7 - L			warped 5-5 - B			- D	
Class:	SB	BO	BA	SH	Type:			
Hull:	Clinker	Carvel	Unknown:	Other:				
Material:	alluminum							
Propuls.:	Powered		Sail		Towed		Unknown	
Prop Feat:	Engine		Boiler		Maststeps #		Masts #	
Engine Type:		Steam		Gasoline		Diesel		Unknown
Engine Desc.:				Boiler Desc.:		Primary		Secondary
Notes:				Square		Circular		Other
				- L		- B		- Diam.
rudder mount				Notes				

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
	reeds			High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:	Desc::							
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:	grown				cut			
Frames								
Insitu frames		Port(left)		S/board(right)			Spacing (c to c)	
Orient. (bow to stern)	°	Fastenings:		Treenail	Ferrous	Cupric	Other:	slot head screws
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
	Desc:	Desc:	Desc:	Desc:
Fill Description:				
Salvage:	Cut	Oxy-acet.	Salvage Desc.:	

Additional Observations:	Comments/Identification marks:
→bluff bow →lifeboat →womack interview revealed was pulled off estelle stone or rr stone and put in unused location	

Eagles Island Abandoned Ships' Form						CFR #	1004 -
Site:	Barrel boat					Form #:	
Name(s):						Date:	1/1/2006
						Times:	-
Position:	- E						- Datum
	- N						- Acc (+/-)
Dim.(m):	21-0 - L			7-8 - B			- D
Class:	SB	BO	BA	SH	Type:		
Hull:	Clinker	Carvel	Unknown:	Other:			
Material:	wooden with iron fasteners and metal (galvanized) chicken wire						
Propuls.:	Powered		Sail		Towed	Unknown	
Prop Feat:	Engine		Boiler		Maststeps #	Masts #	

Engine Type:	Steam	Gasoline	Diesel	Unknown
Engine Desc.:		Boiler Desc.:	Primary	Secondary
Notes:		Square	Circular	Other
		- L	- B	- Diam.
		Notes		

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:	Desc::							
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:	grown			cut				
Frames								
Insitu frames		Port(left)		S/board(right)			Spacing (c to c)	
Orient. (bow to stern)	274°	Fastenings:		Treenail	Ferrous	Cupric	Other:	
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
	Desc:	Desc:	Desc:	Desc:

Fill Description:			
Salvage:	Cut	Oxy-acet.	Salvage Desc.:

Additional Observations:

→intact outer hull planking
→iron fasteners (about 0-12 x 0-.5) with chicken wire between pins and planking
→pins set at 2-0 apart
→7 pins on north side
→looks to have had a lot of barrels carrying tar-at least 5
→sides collapsed out

Comments/Identification marks:

Checked:

Eagles Island Abandoned Ships' Form						CFR #	1005
Site:	Shove Skiff 3					Form #:	
Name(s):						Date:	11/1/2006
						Times:	-
Position:					- E		- Datum
					- N		- Acc (+/-)
Dim.(m):			16 - L		4.5 - B		- D
Class:	SB	BO	BA	SH	Type:		
Hull:	Clinker	Carvel	Unknown:	Other:			
Material:							
Propuls.:	Powered		Sail		Towed	Unknown - shoved	
Prop Feat:	Engine		Boiler		Maststeps #	Masts #	
Engine Type:		Steam		Gasoline	Diesel	Unknown	
Engine Desc.:				Boiler Desc.:	Primary	Secondary	
Notes:				Square	Circular	Other	
				- L	- B	- Diam.	
outboard				Notes			

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
				Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:		Desc::						
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:		grown			cut			
Frames		single, very thin						
Insitu frames			Port(left)		S/board(right)	4-Feb	Spacing (c to c)	
Orient. (bow to stern)		°	Fastenings:		Treenail	Ferrous	Cupric	Other:
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband Signatures:	Burnt	Explosion	Gunfire	Modification
none	Desc:	Desc:	Desc:	Desc:
Fill Description:				
Salvage:	Cut	Oxy-acet.	Salvage Desc.:	

Additional Observations:	no evidence of salvage
	Comments/Identification marks:
→inner and outer hull visible →transom stern with bulkhead forward of transom →pointed bow →pilings along starboard side	Checked:

Eagles Island Abandoned Ships' Form

CFR #	1007								
Site:	Steam Crane Barge 3							Form #:	
Name(s):								Date:	11/4/2006
								Times:	-
Position:	- E								- Datum
	- N								- Acc (+/-)
Dim.(m):	38-5 - L					17-4 - B			- D
Class:	SB	BO	BA	SH	Type:				
Hull:	Clinker	Carvel	Unknown:	Other:					
Material:	wooden								
Propuls.:	Powered		Sail		Towed		Unknown		
Prop Feat:	Engine		Boiler		Maststeps #		Masts #		
Engine Type:	Steam		Gasoline		Diesel		Unknown		
Engine Desc.:			Boiler Desc.:		Primary		Secondary		
Notes:			Square		Circular		Other		
			- L		- B		- Diam.		
			Notes						

Inund.:	Dry	Intertidal	Sub.	Tides and Exposure:	Time:	Height:	%exp:
Site Desc.:	Surround. Matrix:		Danger:	Low Tide:			
				High Tide			
	wetland in fine sand/mud			Notes:			

Elements:	Bow	Stern	Port	S/board	Scantlings (m):	Length	Depth	Width
Keel:	Desc::							
Keelson:								
Ext. planking:								
Av. Strake:								
Metal Knee:								
Timber Knee:	grown				cut			
Frames								
Insitu frames		Port(left)			S/board(right)		Spacing (c to c)	
Orient. (bow to stern)	326°	Fastenings:		Treenail	Ferrous	Cupric	Other:	
Caulking Desc:								
Toolmarks:								
Surface treatment:								
Artifact contents:								

Drawn:	Profile	Elevation	Section	Plan
Aband. Signatures:	Burnt	Explosion	Gunfire	Modification
	Desc:	Desc:	Desc:	Desc:
Fill Description:				
Salvage:	Cut	Oxy-acet.	Salvage Desc.:	

Additional Observations:

→most intact steam barge in cluster, sits adjacent to (south of) Isco
→has actual crane in original mounting, boom has collapsed but still intact
→seat is still intact and in position
→metal crane mounting is constructed of 2-0 I-beams w/ 1-0 cross I beams creating a ladder matrix
→The barge has 7 deck beams, intact dcking and angle iron support stanchions. Fasteners are threaded bolts with nuts, a square plate also fortifies corner of deck beam and angle iron/ and extra L iron under crane

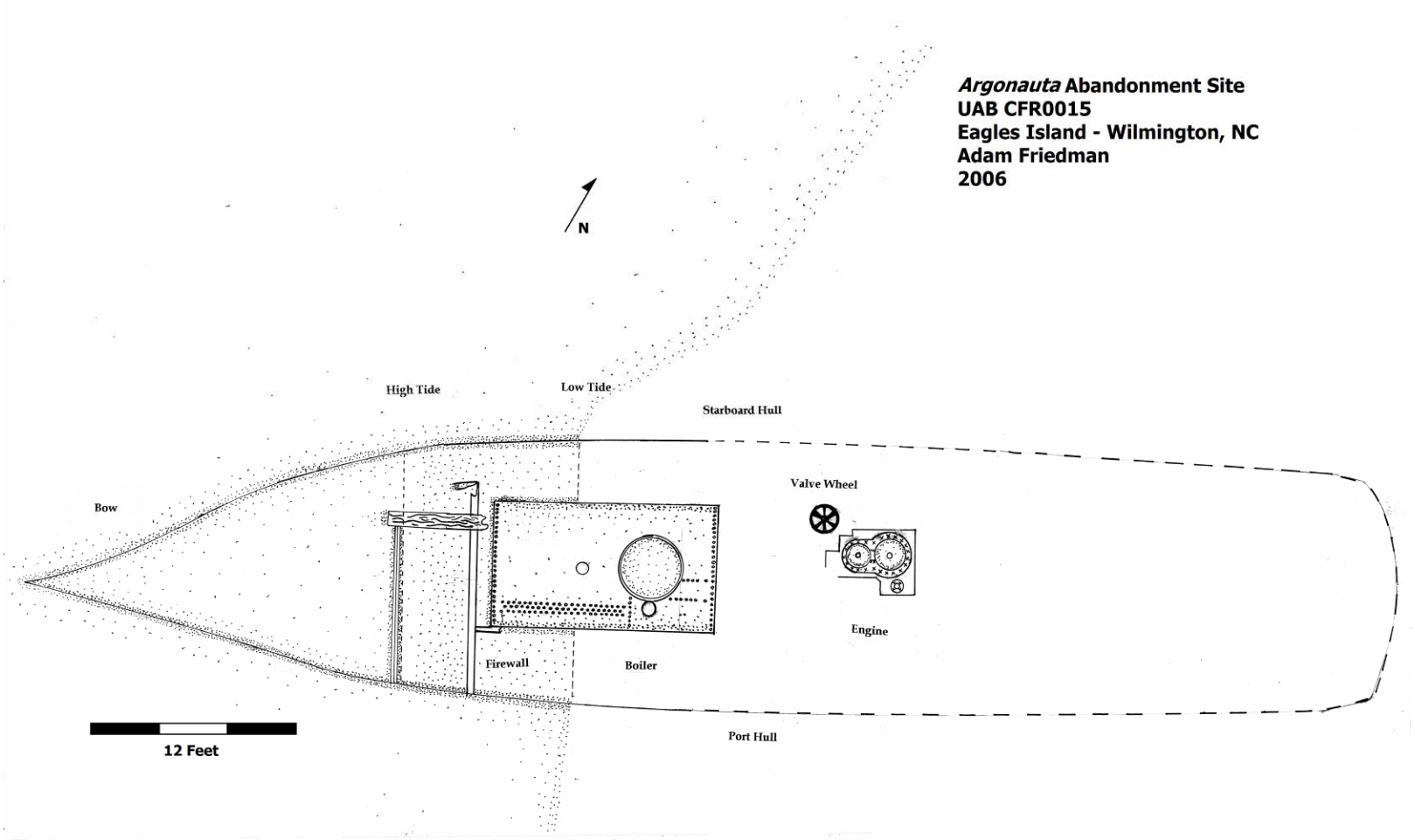
→no significant salvage apparent, wire rope still intact on spool of crane winch, etc
→no engine attached to crane; there is a spot for the engine and signs of cutting at the crank shaft in back of crane

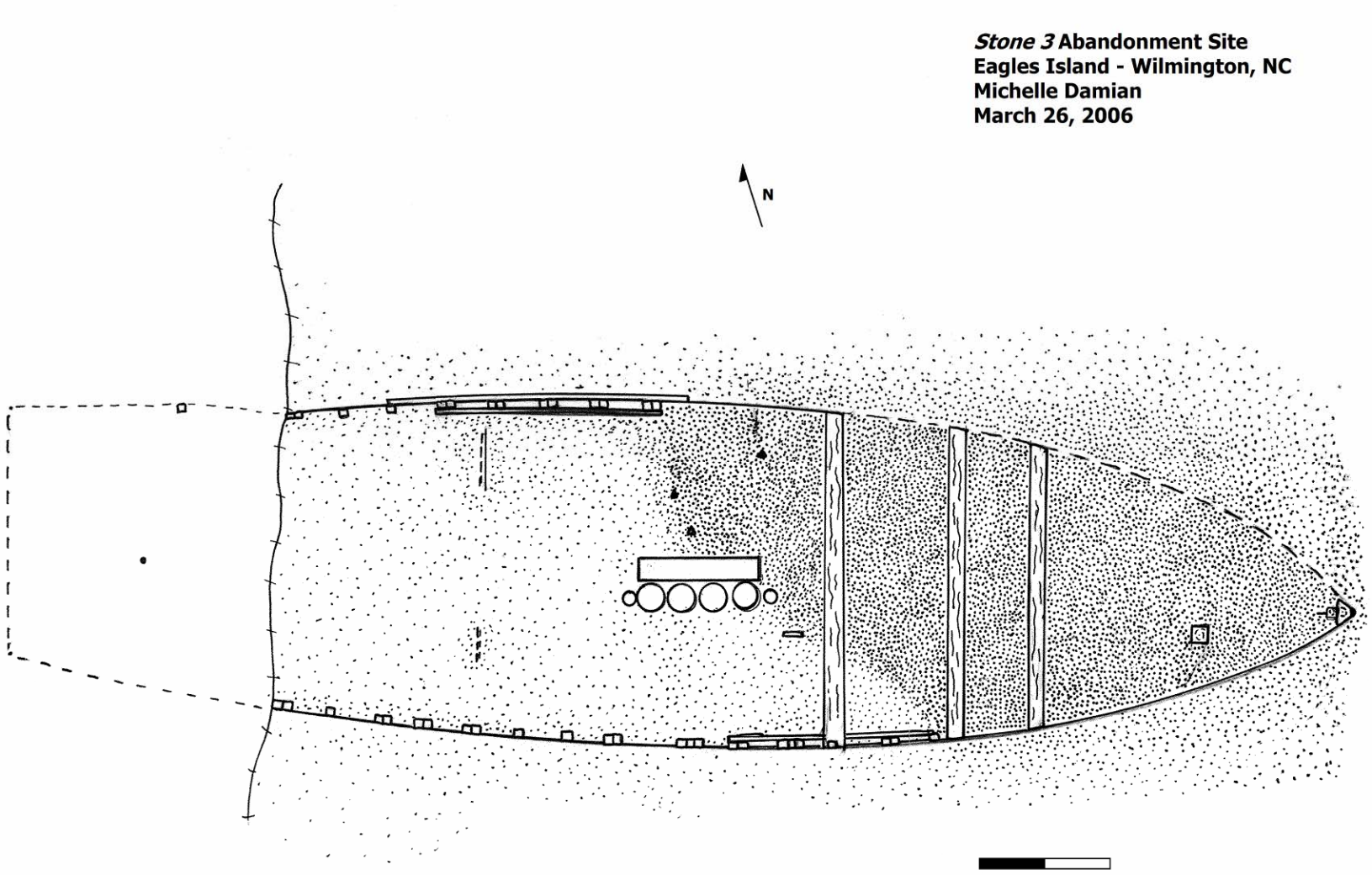
Comments/Identification marks:

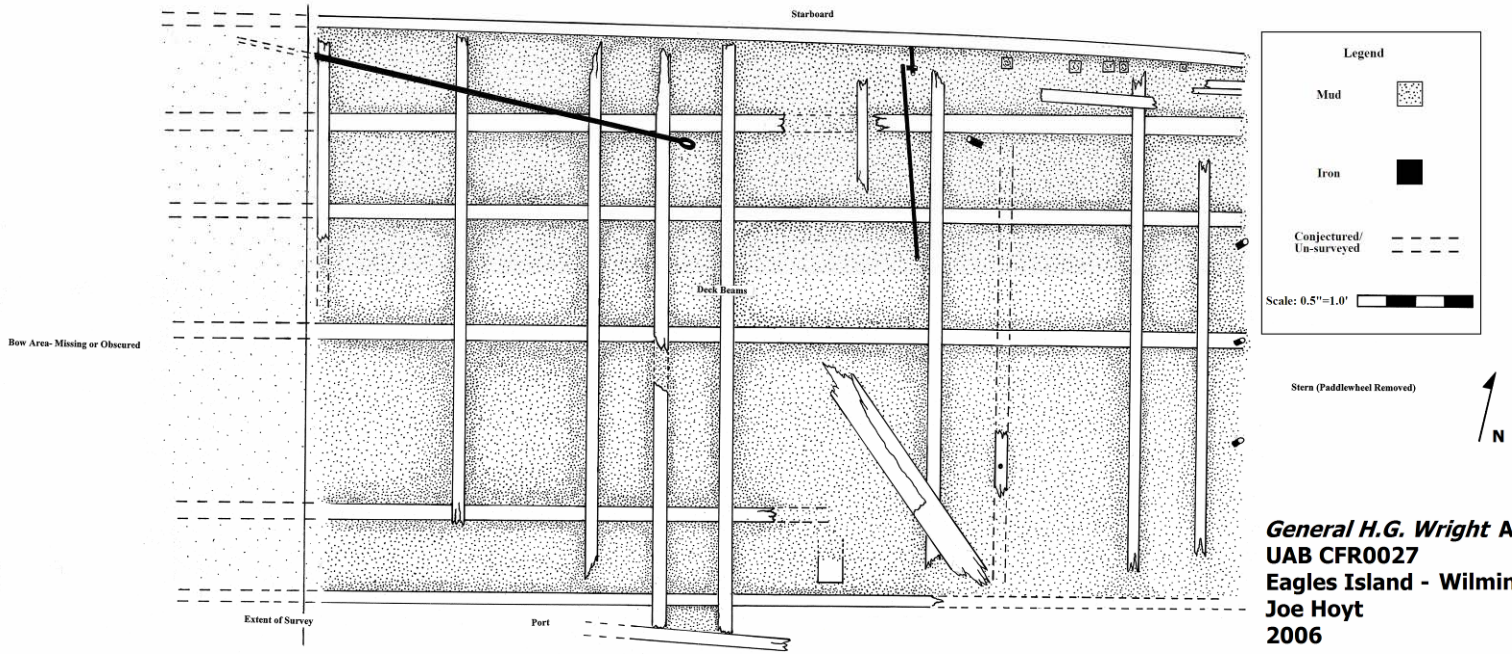
see paper form for additional drawings

Checked:

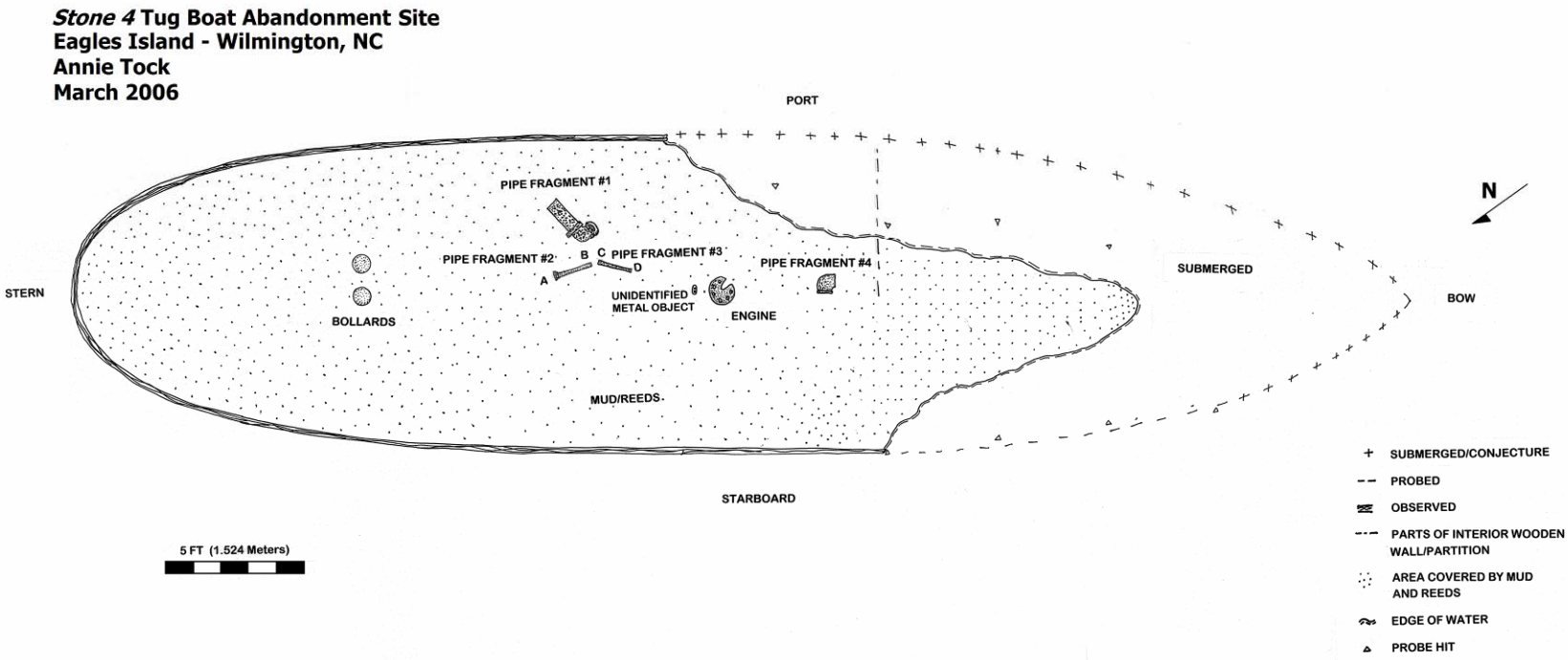
APPENDIX B: FIELD METHODS 6820 SITE PLANS

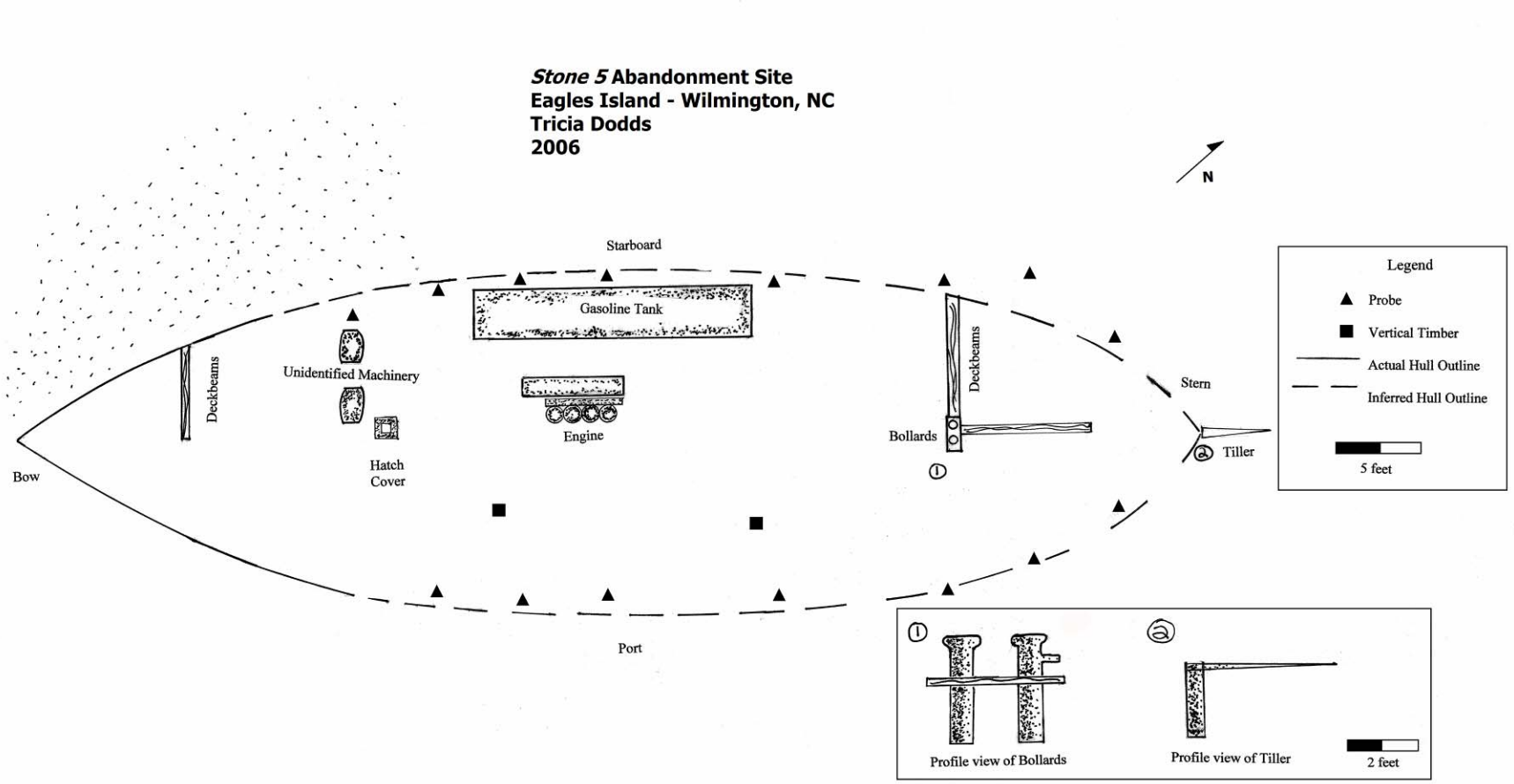


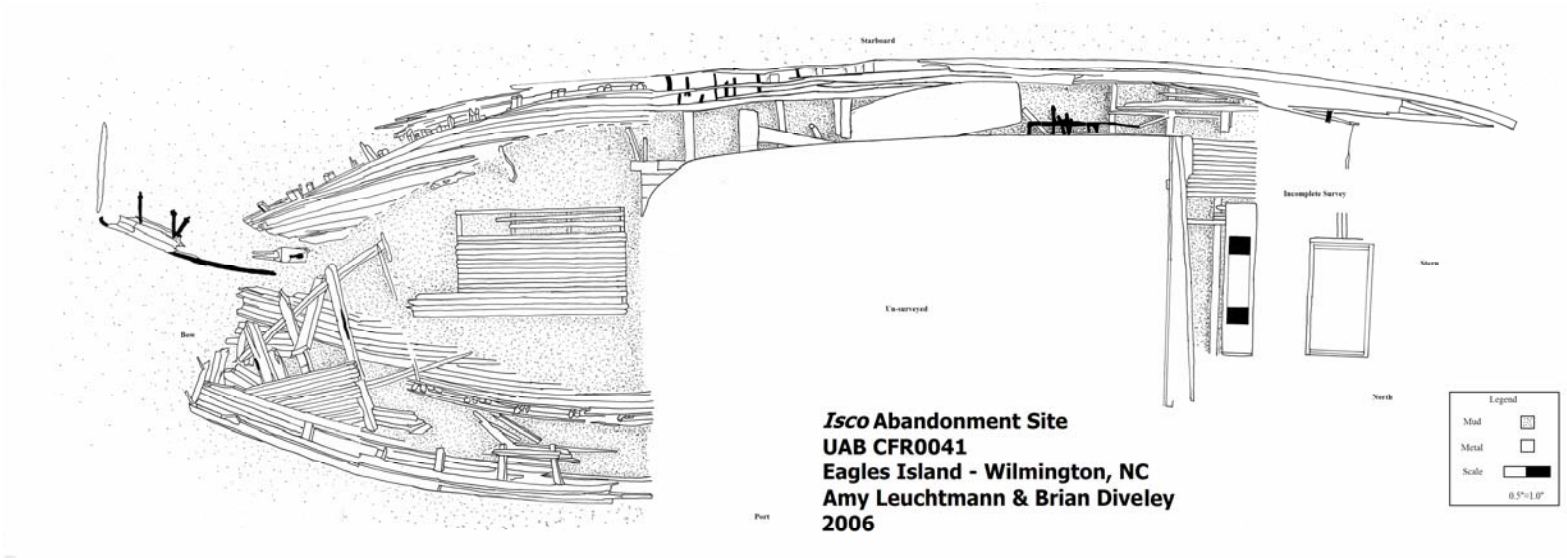

Stone 3 Abandonment Site
Eagles Island - Wilmington, NC
Michelle Damian
March 26, 2006
N



General H.G. Wright **Abandonment Site**
UAB CFR0027
Eagles Island - Wilmington, NC
Joe Hoyt
2006


Stone 4 Tug Boat Abandonment Site
Eagles Island - Wilmington, NC
Annie Tock
March 2006
PORT
PIPE FRAGMENT #1
PIPE FRAGMENT #2
B
C
PIPE FRAGMENT #3
A
D
PIPE FRAGMENT #4
UNIDENTIFIED METAL OBJECT
ENGINE
BOLLARDS
STERN
SUBMERGED
BOW
N
MUD/REEDS
STARBOARD
5 FT (1.524 Meters)
SUBMERGED/CONJECTURE
PROBED
OBSERVED
PARTS OF INTERIOR WOODEN WALL/PARTITION
AREA COVERED BY MUD AND REEDS
EDGE OF WATER
PROBE HIT


Stone 5 Abandonment Site
Eagles Island - Wilmington, NC
Tricia Dodds
2006
N
Starboard
Gasoline Tank
Deckbeams
Unidentified Machinery
Engine
Hatch Cover
Bow
Bollards
Deckbeams
Stern
Tiller
Port
Legend
Probe
Vertical Timber
Actual Hull Outline
Inferred Hull Outline
5 feet
Profile view of Bollards
Profile view of Tiller
2 feet


Starboard
Incomplete Survey
Stern
Un-surveyed
Bow
North
Port
Legend
Mud
Metal
Scale
0.5"=1.0"
Isco Abandonment Site
UAB CFR0041
Eagles Island - Wilmington, NC
Amy Leuchtmann & Brian Diveley
2006