APR 1 1993
Florida Coastal Management Program

SUBMERGED HISTORICAL RESOURCES OF PENSACOLA BAY, FLORIDA PHASE TWO

Submerged Cultural Resource Management Report

Contract CM-320
Year One

James D. Spirek
Della A. Scott
Michael Williamson
Charles Hughson
Roger C. Smith, Ph. D.

Florida Bureau of Archaeological Research
Division of Historical Resources
Florida Department of State
Jim Smith, Secretary of State

Financial support for this project was provided by the Florida Department of Environmental Regulation, Office of Coastal Zone Management, and Department of Community Affairs, using funds made available through the National Oceanic and Atmospheric Administration under the Coastal Zone Management Act of 1972, as amended.

REPORT DOCUMENTATION PAGE

1. REPORT NO.

2.

3. Recipient's Accession No.

4. Title and Subtitle

Submerged Historical Resources of Pensacola Bay, Florida
Phase Two Contract CM-320, Year One

5. Report Date
1993

6.

7. Author(s) James D. Spirek, Della A. Scott, Michael Williamson, Charles Hughson, Roger C. Smith, Ph.D.

8. Performing Organization Rept. No.
CM -

9. Performing Organization Name and Address
Florida Division of Historical Resources
Bureau of Archaeological Research
500 South Bronough Street
Tallahasee, Florida 32399-0250

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G) NA17OZ0501

12. Sponsoring Organization Name and Address
U.S. Dept. of Commerce/NOAA
OCRM
1825 Connecticut A., N.W.
Washington D.C. 20235

Dept. of Env. Reg.
Coastal Management
2600 Blair Stone Rd.
Tallahassee, FL 32399

13. Type of Report & Period Covered
Final

14.

15. Supplementary Notes

to be published in Florida Archaeology Reports

16. Abstract (Limit: 200 words)

The second phase of a submerged cultural resource survey in the waters of Pensacola was conducted in 1992, based on recommendations made during an initial phase of shipwreck location, identification, and analysis. Increased public education and participation in this continuing management model included a public conference, a workshop for sport divers, a public proposal to establish Florida's fourth Underwater Archaeological Preserve, and a maritime atlas of Florida. Continuing remote sensing of Pensacola Bay further refined the model's proactive tools, resulting in the addition of early shipwreck sites to complete a classification matrix which includes various management options for future trial and implementation statewide, based on the Pensacola model.

17. Document Analysis a. Descriptors

b. Identifiers/Open-Ended Terms
Coastal zone management/ Submerged Cultural Resources / Historic Preservation / Public Archaeology / Shipwreck Archaeology /

c. COSATI Field/Group

18. Availability Statement:

19. Security Class (This Report)
Unclassified

21. No. of Pages
i-xi, 1-152

20. Security Class (This Page)

22. Price

(See ANSI-Z39.18) See Instructions on Reverse OPTIONAL FORM 272 (4-77) (Formerly NTIS-35)

SUBMERGED HISTORICAL RESOURCES OF PENSACOLA BAY, FLORIDA PHASE TWO

Submerged Cultural Resource Management Report

Contract CM-320
Year One

James D. Spirek
Della A. Scott
Michael Williamson
Charles Hughson
Roger C. Smith, Ph. D.

Florida Bureau of Archaeological Research
Division of Historical Resources
Florida Department of State
Jim Smith, Secretary of State

VK 1273 S65 F6 1993

Financial support for this project was provided by the Florida Department of Environmental Regulation, Office of Coastal Zone Management, and Department of Community Affairs, using funds made available through the National Oceanic and Atmospheric Administration under the Coastal Zone Management Act of 1972, as amended.

EXECUTIVE SUMMARY

Florida contains a vast number of submerged cultural resources, which include all types of archaeological and historical sites--from prehistoric occupational zones to historic shipwrecks--representing tangible but irreplaceable elements of the state's past. They are fragile and finite, since, unlike natural resources, they cannot be regenerated once they are disturbed or destroyed. Today, many of these sites are being threatened statewide by beach erosion, coastal development, dredging, and illegal collecting or salvage activities.

At present, the State of Florida lacks a comprehensive research and management plan for submerged cultural resources within its jurisdiction. A lack of regional and site-specific data, poor inventories, outdated management policies, and limited interagency coordination have restricted the state's ability to protect, preserve, and promote these unique state-owned resources for the public benefit. Very few surveys and assessments of the resource base have been conducted for the sake of management and protection. Consequently, data about submerged cultural resources are marginal. Nonconsumptive data collection strategies have been nonexistent, and the public lacks knowledge of and appreciation for its underwater cultural resources.

In compliance with the U. S. Secretary of the Interior's guidelines for the Abandoned Shipwreck Act of 1987, the Florida Division of Historical Resources has begun to focus on inventory, evaluation, protection, and interpretation of shipwreck sites, which remain the most threatened segment of the resource base. In 1990 and 1991, the Division was awarded Coastal Zone funding to develop a regional model for resource management based on a survey and inventory of sites in Pensacola Bay. With a long history of maritime activities in a broad range of site environments, the bay was considered an ideal location in which to develop preliminary classifications of sites and potential management options. The project was designed as a pilot program in which research strategies for the compilation of resource data, and management tools for resource protection and interpretation could be developed and tested at a regional level, and then applied as a model to other locations in Florida.

The Pensacola Shipwreck Survey, as the project came to be called, established its headquarters in the Pensacola Historical District in January 1991. Core staff included Dr. Roger C. Smith, Billy Ray Morris, and Marianne Franklin, working with a number of local volunteers and students. From archival and published materials, oral interviews, and preliminary remote sensing using magnetometry and sonar, 162 possible target sites were gathered into a computer data base and filing system. The chronological range of possible sites in Pensacola was divided into eight time periods: The First Spanish Period (1513-1763), The British Period (1763-1783), The Second Spanish Period (1783-1821), The Early American Period (1821-1861), The Civil War Period (1861-1865), The Maritime Expansion Period (1865-1906), The Early 20th-Century Period (1906-1945), and The Later 20th-Century Period (1945-Present). These periods generally follow the historical development of Florida, but were refined to reflect maritime phases of Pensacola's past.

Research strategy centered on four geographical areas in the Pensacola Bay system that were known to be associated with past maritime activities, and to contain accumulations of wrecked or abandoned vessels. These areas included the bay itself, the Gulf Breeze peninsula, the bayous, and Blackwater River. Within these areas, 33 significant sites were located, primarily through local informants, for study and assessment. Each site was recorded and evaluated on criteria such as extent and condition of structural remains, hull type and construction methods, historical significance, and environmental and cultural impacts to the site. The 33 sites ranged in size from a 16-foot punt to the 350-foot-long remains of an American battleship, and in age from the second half of the 18th century to the first half of the 20th century. Their condition also varied from extremely well preserved to badly deteriorated and disturbed. The majority of the study sites were associated with the Maritime Expansion and Early 20th-Century Periods; none were identified from the First and Second Spanish Periods, and no sites from the Late 20th Century were studied.

The first phase of the Pensacola Shipwreck Survey sought to build a shipwreck classification matrix from the limited 33-site sample base. Data derived from the study were arranged into site

categories by age and by integrity. Within the matrix, the sites were assigned priority ratings to determine the range of proposed resource management options viable for each site. These options ranged from restricted public access at a site at one end of the spectrum, to commercial salvage for the sale of artifacts at the other. Management options in between these two extremes included archaeological reserve status, public preserve status, professional research utilization, amateur research permitting, etc.

The results of this 1991 study were compiled into a report which explored the natural, environmental, and maritime industrial history of Pensacola Bay, outlined previous research work, and detailed the methodology, assessments, and conclusions of the project. Circulated for review and input among various federal, state, and local agencies, the report was published in 1992 (Franklin, Morris, and Smith, "Submerged Historical Resources of Pensacola Bay, Florida. The Pensacola Shipwreck Survey, Phase One, 1991," *Florida Archaeological Reports 25*, Tallahassee: Florida Bureau of Archaeological Research, 1992). The report made several specific recommendations for future work in Pensacola, which included additional remote sensing to locate sites from periods not represented in the 1991 study, continuation and expansion of public education toward resource protection and preservation, establishment of the battleship USS *Massachusetts* as a State Underwater Archaeological Preserve, and formulation of an amateur underwater archaeology workshop for sport divers interested in the resources.

With continued funding from the Florida Coastal Zone Management Program, the second phase of the Pensacola Shipwreck Survey commenced in 1992. Aside from Dr. Smith, staff included James Spirek, Della Scott, Michael Williamson, and Charles Hughson, assisted by a number of volunteers. This phase sought to address the recommendations for further work in Pensacola to construct a regional model for site investigation, assessment, and public participation in the long-term management of submerged cultural resources. Specific tasks in this strategy included an increased program of public outreach, education, and participation, a formal public proposal for the *Massachusetts* preserve, a sport diver workshop, and a more systematic and intensive remote sensing survey to locate additional submerged sites in selected portions of the bay.

The program of public outreach began with the organization of a Conference on Maritime History and Archaeology that was held in May 1992 at a local county recreational center. The purpose of the conference was to gather speakers and sponsors from various organizations and businesses in order to host a public event that focused on Pensacola's submerged cultural resources. Aside from formal presentations, display booths representing various sponsoring groups encouraged informal exchanges of information and fostered new acquaintances. The conference proved a successful tool with which to explore Pensacola's maritime past, while at the same time it helped to identify those people interested in working together to preserve it.

At the conference, a formal presentation and written proposal to establish the USS *Massachusetts* as a state Underwater Archaeological Preserve was delivered to the public. As the oldest surviving American battleship (BB-2), the shipwreck site had been nominated in 1990 by a local diver to be considered for this designation. As with the previous preserves, *Urca de Lima*, *San Pedro*, and *City of Hawkinsville*, the proposal called for active public participation in the establishment, interpretation, management, and maintenance of the site for the public benefit. Based on response to the proposal, it became immediately apparent that this approach to cooperative management of submerged historical sites was quite appropriate for the sunken battleship, since the site was already popular with divers and fishermen, and would become even more so, given increased interpretation and accessibility.

Along with a detailed history of the ship, old photographs and other memorabilia, the preserve proposal contained a set of comparative plans comprised of measured site drawings of the remains of the ship that were scaled to actual 1910 refit plans of the ship while it was in commission. The refit plans had been obtained from the National Archives, and the site plans had been produced from hundreds of underwater hours spent measuring features of the ship's remains. These materials served not only to document the site's transformation and present configuration, but would become useful for future interpretation of the preserve to its visitors.

In response to the proposal, a community support organization calling itself Friends of the Massachusetts (BB-2) was formed to help establish the preserve. Comprised of interested individuals from

Pensacola's waterfront, historical, archaeological, and recreational communities, the non-profit organization elected officers and established committees to oversee fund-raising, production of interpretive materials, fabrication of an underwater plaque, design of a museum display, and the dedication and opening of the preserve, which is scheduled for the spring of 1993.

Another public-oriented management tool developed for the Pensacola model was a one-week educational workshop to orient sport divers to underwater archaeology and historic preservation. Because sport divers often encounter and may unknowingly disturb submerged sites, the workshop was designed to provide training in the identification, recording, and reporting of new sites, and in the monitoring and protection of previously recorded sites. The outline for the workshop was written by staff of the Shipwreck Survey in accordance with national scuba certification agencies, and a workbook was prepared with emphasis on the Pensacola region. A week-long pilot program, conducted through a local dive shop, was divided into classroom, confined water (swimming pool) sessions, and open water dives on selected sites. The cost of the workshop was minimal, and included the workbook, two charter boat dives, a state certificate of participation, a national dive specialty card, and a tee shirt.

As another tool to engage public participation in resource protection and preservation, the pilot workshop was successful; integration of local dive businesses is an important ingredient, since dive shops are dedicated to teaching and depend on return customers to stay in business. They also can help to set standards for sporting behavior and recreational etiquette by fostering productive rather than destructive attitudes.

Additional avenues of public outreach during the second phase of the Shipwreck Survey included routine public presentation and lectures to civic groups, schools, and avocational organizations. Survey staff responded to every invitation as an opportunity to inform the public about the goals and progress of the Pensacola project. Aside from periodic interviews in local and national newspapers and magazines, Survey team members appeared on several popular television and radio shows to present the research and to answer questions.

To address the 1991 recommendations for more extensive remote sensing operations in Pensacola Bay, the Division of Historical Resources purchased a marine magnetometer and contracted the services of a side-scan sonar instrument and operator. Armed with these archaeological prospecting tools, a strategy for systematic survey of areas associated with past maritime activities, with good maritime geographical configurations, and reported to contain shipwreck sites was adopted. Magnetometry was employed on the western shore of the Gulf Breeze peninsula, Old Navy Cove, the southern side of the peninsula in Santa Rosa Sound, along Emanuel Point in Escambia Bay, and in selected areas of the Pensacola waterfront. Sonar was employed along the north side of Santa Rosa Island, the western side of Gulf Breeze, Old Navy Cove, and along the Naval Air Station waterfront.

Remote sensing targets identified by both instruments were pinpointed using LORAN-C coordinates, evaluated by amplitude, duration, and configuration, and chosen for diving investigation to determine the nature of each target. Of the hundreds of magnetic and acoustical anomalies encountered during the survey, fifty-two were chosen for ground-truthing by divers. Following identification and evaluation, the targets were classified into several descriptive categories: Disposal, intentional and accidental (with subheadings of fishing, dredging, military, and construction); Natural Feature; Geologic Feature; Buried Object; Ballast Dump; Shipwreck; Historical Material; Anchorage; and Active Structure.

The predominant category of ground-truthed anomalies was accidental or intentional disposal of recent material, which accounted for 48% of all investigated targets. Natural Features comprised 23% of the anomalies; Buried Objects, 10%; Ballast Dump, 6%; Shipwrecks, 4%; Geological Features, 4%; and 2% each for Anchorages, Historic Materials, and Active Structures. Some 27% of the ground-truthed targets proved of no historical significance, which would be expected in a highly active and heavily trafficked bay.

Three targets, in particular, were found to represent significant discoveries; Santa Rosa Island Wreck, which tentatively dates from the Second Spanish Period; Emanuel Point Wreck, dated to the First Spanish Period; and Wayside Park Ballast Pile, which has not yet been confirmed as a shipwreck. These

sites warrant further investigation, in order to confirm their origin, nationality, and date, and to assign them a classification in the Pensacola Shipwreck Matrix.

The Pensacola pilot project refined and tested a series of data collection and management tools ranging from traditional archival research and archaeological field work to experiments with public participation at all levels of resource identification and protection. To date, the project has accomplished a number of important goals. Assessment, in a variety of aquatic environments, of over 40 submerged sites, ranging from one of the nation's first battleships (USS *Massachusetts* BB-2) to a possible 16th-century Spanish vessel (perhaps the earliest shipwreck in the state), helped to formulate a resource classification matrix based on age and integrity to which various management options could be applied. To explore management effectiveness and public response to these options, tools that were tested in Pensacola included formal public conferences, lectures, exhibits, and newsletters, regional print and visual media exposure, personal interaction with divers and fishermen, interagency coordination of management agreements and law enforcement, and sportdiver training workshops in resource identification and protection. Highly visible events in Pensacola helped to gauge the effectiveness of the tools; vandalism to a colonial wrecksite; interruption of homeport dredging by discovery of a bronze howitzer; the costly mitigation of a large buried navy cofferdam; the discovery and protection of an early Spanish shipwreck; and the creation of a new public preserve at the *Massachusetts*. Aside from interaction between government and private sectors, it is clear that public education and participation were key elements in the development and success of the Pensacola model.

Building on the Pensacola project, a statewide compilation of environmental, archaeological, and historical data about Florida's submerged cultural resources has been undertaken to produce a maritime atlas. The atlas is divided by regions and time periods, and addresses topics such as the geography of inundated prehistoric river channels and shorelines, historic shipping routes, navigational hazards, known ship losses, reported and recorded sites, classification of sites by age and type, and predictive models for expected site locations. As a tool for understanding the breadth and scope of the state's resources, the atlas is being used to identify other regions of Florida in which test the Pensacola model to a smaller scale to determine its usefulness in the creation of a comprehensive statewide management plan.

TABLE OF CONTENTS

EXECUTIVE SUMMARY iii

TABLE OF CONTENTS vii

LIST OF FIGURES ix

ACKNOWLEDGMENTS x

CHAPTER 1. INTRODUCTION 1

CHAPTER 2. PUBLIC EDUCATION AND AWARENESS 7
- Conference on Maritime History and Archaeology 7
- Sport Diver Workshops 7
- Public Presentations 11
- Media Coverage 12
- Volunteers 12
- Law Enforcement 12
- Conclusions 13

CHAPTER 3. USS *MASSACHUSETTS* 15
- Introduction 15
- Background of Florida Underwater Preserves 15
- Nominations of Wrecks as Potential Preserves 15
- Historical Research 15
- Ship History 16
- Archaeological Documentation 19
- Biological Documentation 19
- Public Proposal 20
- Public Support Organization 20
- Grand Opening 20
- Conclusions 29

CHAPTER 4. METHODOLOGY OF REMOTE SENSING SURVEYS 31
- Introduction 31
- Magnetometer Survey 31
  - Magnetometer Specifications 31
  - Magnetometry and the Bay 32
  - Positioning System 35
  - Magnetometry Survey Methods 36
  - Ground-Truthing Operations 36
  - Magnetometer Survey Locations 37
- Side-Scan Sonar Survey 37
  - Introduction 37
  - Side-Scan Sonar Principles 38
  - Side-Scan Sonar and Positioning System Specifications 38
  - Side-Scan Sonar Survey Methods 38
  - Ground-Truthing Operations 39
  - Side-Scan Sonar Survey Locations 39

CHAPTER 5. REMOTE SENSING SURVEY RESULTS 47
- Magnetometer Survey Areas 47
  - West Side of Gulf Breeze 47
  - Old Navy Cove 48
  - Butcherpen Cove 49
  - Santa Rosa Sound 50

Emanuel Point 50
Pensacola Waterfront 53
Side-Scan Sonar Survey Areas 53
Santa Rosa Island-Pensacola Bay Side 53
Pensacola Naval Air Station Waterfront 54
West Side of Gulf Breeze 55
Old Navy Cove 55
Santa Rosa Sound 55

CHAPTER 6. INTERVIEWS 63
Introduction 63
Mr. Howard Bernard 63
Captain Jeff Clopton 64
Mr. Ray Manuel 65
Captain Morris Bagleo 66
Mr. Ray Smith 67
Mr. Robert Duncan 67
Dr. William Bennett 67
Captain Fred Kelly 68
Conclusions 68

CHAPTER 7. WRECK INVENTORY AND DESCRIPTIONS 69
Emanuel Point Wreck 69
Wayside Park Site 71
Old Navy Cove Barge 72
B Street Schooner 72
B Street Barge 76
Santa Rosa Island Wreck 76

CHAPTER 8. CONCLUSIONS 89
Public Awareness and Education 89
Remote Sensing Surveys 90

CHAPTER 9. RECOMMENDATIONS 93
Public Awareness and Education 93
Remote Sensing Survey 93

APPENDIX 1. Maritime Conference Flyer 95

APPENDIX 2. Underwater Archaeology Class Workbook 97

APPENDIX 3. Remote Sensing Survey Ground-Truthed Targets 99

REFERENCES 109

LIST OF FIGURES

Figure 1. Map of Survey Location 5

Figure 2. Site Plan of Kruse Site 9

Figure 3. Photo of USS *Massachusetts* 17

Figure 4. Site Plan-USS *Massachusetts* 21

Figure 5. Composite Plan of USS *Massachusetts* 23

Figure 6. Profile Plan of USS *Massachusetts* 25

Figure 7. Original 1910 Profile Plan-USS *Massachusetts* 27

Figure 8. Map of Remote Sensing Areas in Bay 33

Figure 9. French Historic Map 41

Figure 10. French Historic Map 43

Figure 11. French Historic Map 45

Figure 12. Side Scan Sonograph of Fair Point Anomaly 51

Figure 13. Side Scan Sonograph of Anomaly #111, Santa Rosa Island Wreck 57

Figure 14. Side Scan Sonograph of Anomaly #470, Steampipes at Naval Air Station 59

Figure 15. Side Scan Sonograph of Anomaly #554 61

Figure 16. Map of Wreck Locations 73

Figure 17. Site Plan of Wayside Park Site 77

Figure 18. Site Plan of Old Navy Cove Barge 79

Figure 19. Site Plan of B Street Schooner 81

Figure 20. Site Plan of B Street Barge 83

Figure 21. Site Plan of Santa Rosa Island Wreck 85

ACKNOWLEDGMENTS

The Pensacola Shipwreck Survey is indebted to a number of individuals and organizations. Without the help of these concerned and cooperative citizens the Survey would not have accomplished the goals set for 1992. Support from the citizens of Pensacola made the efforts of the Survey worthwhile. Special thanks are offered to a number of individuals and organizations. We apologize for any omissions.

A&A Research: Alan Drouin and Dave Marsh brought their side-scan sonar equipment and experience to the project.

Boat Captains: Captains Jeff Clopton, Fred Kelly, Ron Kruz, Doug Melanak, and Roger Rockwell donated their time, and often their vessels, to help the Survey staff locate known wrecks.

Conference Speakers: The speakers donated their time and expertise to make the conference a success. Special thanks to Dr. William Still of East Carolina University, Dr. Keith Holland of St. Johns Archaeological Expeditions Inc., Dr. Judy Bense of the University of West Florida, Captain Robert Rassmussen of the National Museum of Naval Aviation, Kevin Freeland of Gulf Coast Pro Dive, Eilene Beard of the Pensacola Charter Boat Association, Tom Muir of the Historic Pensacola Preservation Board, Sandra Johnson of the Pensacola Historical Museum, and Pat D'Asaro of the Santa Rosa Historical Society.

Conference Sponsors: The Maritime History and Archaeology Conference would not have been possible without the help and support of a number of area organizations. The success of the conference was due, in part, to their donations of goods, services, and money. Thanks to Gulf Coast Pro Dive, Gulf Breeze Pro Dive, Scuba Shack, Southwind Dive Shop, PSI Diving Company, and Dive Mart for supporting and advertising the conference. The Gulf Breeze Historical Society helped to organize the conference and provided refreshments. Pensacola Historical Society and Pensacola Archaeological Society both helped to defray the cost of the conference, handled funding, and provided audio/visual equipment. Santa Rosa Historical Society ensured publicity through the northern parts of Santa Rosa and Escambia counties. The Port of Pensacola donated funds; the Bayou Chico Business Association donated the use of their yacht to lodge conference speakers, and Seville Park Inn donated accommodations at greatly reduced rates to traveling speakers and others who came to Pensacola to help the Survey. University of West Florida's Archaeology Institute also provided support, equipment, and advertisement through the university. The Historic Pensacola Preservation Board offered support and advice.

Dive Shops: All Pensacola area dive shops supported the Survey and helped to sponsor the Maritime History conference. Kevin and Kerry Freeland, Dick Carson, Chris Mitchell, and Jeff Lockwood of Gulf Coast Pro Dive supplied the Survey with volunteers, advertising, and emergency equipment repairs. Gulf Coast Pro Dive also hosted the first Underwater Archaeology for Sport Divers workshop. Eilene Beard and Gene Ferguson at Scuba Shack were a pleasure to work with. Scuba Shack also provided diving gear for a raffle to benefit the Friends of the *Massachusetts*.

Dolphin Bait & Tackle: Dale Minnick helped to procure boat parts and supplies as well as local information.

Florida Bureau of Archaeological Research: Without the help and support of the Bureau office in Tallahassee the project would not have been possible. A very special thanks to Mable Revell and Carolyn Moore who cheerfully provided assistance and administrative support. Hope Kurtz once again helped in formatting, laying out, and proofreading this report.

Florida Department of Natural Resources: Elaine Martin of the Division of State Lands, Bureau of Submerged Lands and Preserves, helped to coordinate the Ft. Pickens Aquatic Preserve with the new USS *Massachusetts* Underwater Archaeological Preserve.

Florida Marine Patrol, District 11: Major Calvin Dixon provided support and space at the FMP boat yard to store the Survey boat over the winter. A special thanks to Officer Mike Killery and to Officer David Bullard for providing assistance with the survey boat. Thank you to Officer Randy Webb for assisting in halting unauthorized excavation activities on Deadman's Island.

Friends of the *Massachusetts*: Connie Franklin and Jim Coleman organized a non-profit organization to support the establishment of Florida's fourth Underwater Archaeological Preserve. This group of concerned citizens will continue to help preserve the "Old Mass" as an important part of the history of Pensacola and the Navy.

Gulf Breeze: The Gulf Breeze Historical Society helped organize and sponsor the Maritime Conference; City Manager George Maiberger provided the South Santa Rosa County Recreation Center at no cost for the conference. Mayor Ed Gray provided the community meeting room in the downtown AmSouth Bank building to the Friends of the *Massachusetts* for their monthly meetings.

Harbor Village at Pitt Slip Marina: Fulton Hampton III again donated slips for the Survey boats. A special thanks to Bill Carson and Jeff Miller for taking care of the boats.

Historic Pensacola Preservation Board: Thanks to John Daniels, Tom Muir, and the staff of the Preservation Board for the use of office equipment and headquarters maintenance.

Interviews: The following local captains and fishermen agreed to be interviewed by the Survey staff and imparted much local history and information about shipwreck sites: Morris Bagleo, Howard Bernard, Jeff Clopton, Robert Duncan, Ray Manuel, and Ray Smith.

Killinger Marine: Gene Killinger again helped with boat repairs and supplies and hosted a "Rage Rally," a chance for the public to test drive a new boat from Boston Whaler, the "Rage," with proceeds to benefit the Friends of the *Massachusetts*.

National Park Service: A special thanks to Larry Murphy of the Submerged Cultural Resources Unit for his help and ideas (developed during his work on the USS *Arizona*) which assisted in the recording of the remains of the USS *Massachusetts*. Jeff Parsons at Gulf Islands National Seashore helped coordinate our efforts with the NPS to record shipwrecks within joint federal and state jurisdiction.

Pensacola: The citizens of Pensacola continued to support the Survey throughout the second phase. Earl Bowden and the Pensacola *News Journal* helped keep the Survey and its findings in the news. The Pensacola Historical Society and Pensacola Archaeological Society provided continuous support of the project. The Pensacola Historical Museum at Old Christ Church helped with numerous tasks, including supplying photographs for the report, providing historical data, and identifying ceramics. A special thanks to the staff and especially Sandra Johnson, Peggy Krohn, and Tom Garner. The Institute of West Florida Archaeology loaned equipment and provided space at the university for the Survey boat during Hurricane Andrew. Caleb Curren of the Pensacola Archaeological Laboratory provided support and historical data. The staff of Pensacola Hardware helped the Survey with repairs and even supplied information on shipwreck sites.

CHAPTER 1. INTRODUCTION

Pensacola has a long and rich maritime tradition; today evidence of this tradition lies at the bottom of Pensacola Bay. The mission of the Pensacola Shipwreck Survey was to identify and to assess this evidence, and to build public awareness and appreciation of these submerged cultural resources. The 1992 season is a continuation of the work of the 1991 season with a stronger focus on public education.

The history of Pensacola begins with shipwrecks. In 1559 Don Tristán de Luna y Arellano sailed into Pensacola Bay to establish the first Spanish colony in present-day United States. Although there had been a few reports of the great bay called Ochuse by Spanish explorers, this was the first attempt at colonization. However, less than a month after their arrival, a hurricane destroyed eight of the twelve vessels, as well as the hope for a permanent colony (Priestly 1928). Homeless and hungry, the settlers finally returned to New Spain in 1561 and Pensacola was forgotten.

More than a century later the site of Pensacola was once again considered for colonization by the Spanish, in response to British and French forays into North America. The colony was a success and Pensacola remained populated, although the garrison changed nationality several times. Evidence of the occupation of Pensacola by the Spanish, British, and French lies on the bottom of Pensacola Bay in the form of shipwrecks and the remains of maritime industry particular to those cultures.

Over the years Pensacola became a major port facility. The lumber boom during the 1800s through the early 1900s contributed to Pensacola's growth, as the harbor filled with schooners and barges transporting timber from the interior to all points foreign and domestic. The red snapper fishing industry also grew during this time from a sailor's pastime while waiting to assist ships across the bar to a full-fledged industry. Pensacola grew not only economically but geographically during this era of maritime industrial expansion through the early 20th century. Offloaded ballast from many ships caused the shoreline of Pensacola to extend southward nearly 3000 feet from Main Street (Bense 1989:17). With expansion of the Naval Air Station and the homeporting of the Navy's only training carrier, the city of Pensacola still depends on the bay and associated activities as an economic mainstay.

The mission of the multi-year Pensacola project includes not only the investigation of shipwrecks in Pensacola Bay, but also the development of a model for submerged cultural resource management that can be tested in other regions of the state. A second aspect is the preparation of a maritime atlas of Florida that will clarify relationships between the historical and geographic contexts of shipwrecks, piers, docks, and other maritime-related sites. The atlas will also provide a state-wide perspective for investigating, assessing, and managing underwater sites of historical importance. The research design of the project called for a public-oriented program with a broad scope of work to include a review of all previous investigations, collection of archival and oral information on potential sites, underwater field research with local divers and fishermen, and electronic remote sensing to detect new sites. Development of an inventory and assessment system for targets and verified sites, establishment of a classification scheme for sites studied, and proposals for appropriate management options for the sites were addressed as well (Franklin et al. 1992:225-231). In order to accomplish the mission, specific goals were set for each phase of the project.

The goal of the 1991 Shipwreck Survey, Phase I, was to initiate the inventory of known shipwreck sites in Pensacola Bay, examine these wrecks, assess the identity and function of the vessels, and make recommendations to protect their remains. These tasks were completed and the information was disseminated with the publication of a report entitled "Submerged Cultural Resources of Pensacola Bay, Florida: The Pensacola Shipwreck Survey, Phase One, 1991" (Franklin et al. 1992), outlining in detail each vessel encountered during the 1991 season. Also in 1991, public education was begun by printing newsletters and speaking to numerous groups and organizations about the project. The progress of the project was featured several times in local newspaper, magazine, radio, and television reports. Construction of a regional model for site investigation, assessment, and long term management of submerged cultural resources in Pensacola Bay also was completed. This model was developed by gathering data on shipwrecks to create an inventory of historic sites. An assessment of these sites in terms of date, construction, state of preservation, and possible threats also was part of the model.

During the first field season in 1991, 33 sites, out of 169 historically documented shipwrecks in Pensacola Bay, were identified and assessed using this model. The majority of the sites dated from the Maritime Expansion (1865-1906) and Early 20th Century (1906-1945) periods in Pensacola's history, as was expected due to increased maritime activity during those periods. Types of vessels located and identified included lumber schooners, barges, a punt, a battleship, fishing vessels, Civil War era vessels, and a British colonial ship. Most of these vessels appear to have been abandoned rather than wrecked, as was evidenced by their intact condition and their association with the locations of past maritime activities (Franklin et al. 1992:224).

All 33 identified sites were integrated into a matrix of management options. This was accomplished by classifying the sites by time periods and by structural and site integrity, such as condition of hull remains and amount and type of artifactual material. These criteria helped to determine archaeological significance and to assign appropriate management options for each site. Management options ranged from restricting public access by assigning reserve, preserve, or historic marker status, to granting professional research or amateur research permits, to entering into exploration or salvage contracts (Franklin et al. 1992:226-228).

Based on the 1991 results, the following proposals were made to local, state, and federal agencies. First, the report recommended that an underwater archaeological preserve be established in the Pensacola area. The nomination in 1990 of the USS *Massachusetts* for this status was the first step toward the preserve. A second recommendation was that an amateur underwater archaeology workshop be conducted to foster the growing interest of local sport divers in helping to investigate and preserve submerged cultural resources in Pensacola. Third, the report recommended the establishment of an amateur permit program which would sanction amateur non-disturbing investigation and reporting and would encourage organized groups of sport divers to gather data on shipwrecks in cooperation with the State of Florida. Other recommendations included establishing an historic marker program for certain sites of regional and state-wide importance, and creation of a new Florida Site File form specifically for shipwrecks. Finally, increased interagency cooperation was recommended between the Pensacola Shipwreck Survey and agencies such as the City of Gulf Breeze, the Historic Pensacola Preservation Board, Florida Department of Natural Resources, Florida Marine Patrol, National Oceanic and Atmospheric Administration, National Park Service, and the State University System.

Recommendations for the 1992 Pensacola Shipwreck Survey season stemmed from research areas that could not be addressed during the 1991 season due to time constraints and lack of equipment. The most pressing recommendation was to conduct more in-depth remote sensing surveys. The procurement of a sub-bottom profiling system and a more accurate positioning system was stressed. A search for the 1559 fleet of Tristán de Luna, with survey work concentrated in high probability locations, was assigned as a high priority in the 1992 season. Recommendations were made to survey certain areas of Pensacola Bay, such as the western side of the Gulf Breeze peninsula, Bayou Chico, and the deep-water central sections of the bay. It was suggested that efforts be directed toward finding the HMS *Mentor* and a Civil War-era gun boat that were burned in the Blackwater River. Finally, the report noted that the wrecks in the Gulf of Mexico south of Santa Rosa Island, recorded by Louis Tesar in 1973 in his archaeological survey of Gulf Islands National Seashore, could have become more exposed due to the shifting of the sand covering them. The report recommended attempts be made to locate and record these wrecks in order to better understand how the environment has affected site preservation.

The goals of the Pensacola Shipwreck Survey in 1992, Phase II, included continuation of the previous year's work, as well as completion of remote sensing surveys of portions of the bay with a magnetometer and side-scan sonar (Figure 1), and expansion of the public awareness program. Specific tasks included presenting the second Maritime History and Archaeology Conference, evaluating the USS *Massachusetts* for inclusion in Florida's underwater archaeology preserve system, preparing and presenting an Orientation to Underwater Archaeology for Sport Divers workshop, adding wreck sites to the maritime atlas, and continuing the refinement of the Pensacola model for shipwreck management for application to other regions of the state.

The first and foremost task of the Survey was to find and document shipwrecks, with special emphasis on locating colonial wrecks, such as ships from the Luna expedition of 1559. No examples

of ships from the First and Second Spanish Periods were discovered during the 1991 field season, and information was needed concerning those periods in Pensacola's shipwreck matrix.

All of these tasks are outlined in detail in the following chapters. Chapter Two deals with public education and awareness efforts. Chapter Three details the establishment of the USS *Massachusetts* as an underwater archaeology preserve. Chapter Four and Five discuss remote sensing methodology and results, respectively. Interviews with local watermen and captains are the subject of Chapter Six. The descriptions of all wrecks assessed during Phase II are in Chapter Seven. Chapters Eight and Nine present the conclusions and recommendations, respectively.

The 1992 crew of the Pensacola Shipwreck Survey included the following people. Dr. Roger C. Smith, Florida's State Underwater Archaeologist, was the project director. James D. Spirek, a graduate of the East Carolina University master's program in Maritime History and Underwater Research, was project field director. Della A. Scott, a NAUI instructor and graduate of the University of West Florida and Troy State University, held the position of field supervisor. The positions of field technician were held by Michael Hoyt Williamson, a student at the University of West Florida, and Charles Hughson, a student at Florida State University.

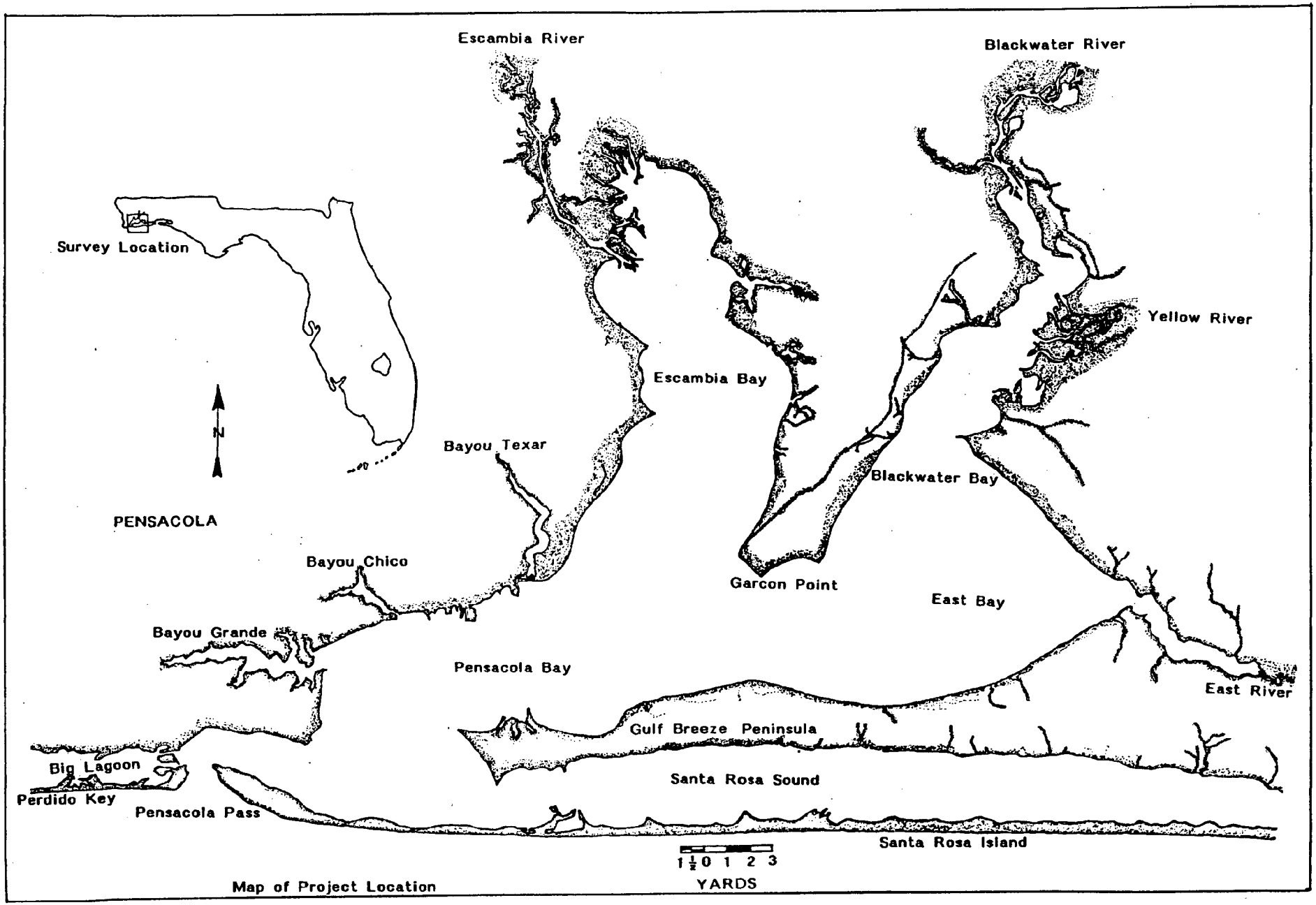


Figure 1. Map of Survey Location.

CHAPTER 2. PUBLIC EDUCATION AND AWARENESS

One important aspect of the Pensacola Shipwreck Survey in 1992 was to bring the survey and its findings to the attention of the people of Pensacola. Due to the efforts of archaeologists from the University of West Florida, the importance of Pensacola's terrestrial past is frequently emphasized and publicized. The Pensacola Shipwreck Survey wanted to promote interest in the city's maritime past and to bring information about it to people of Pensacola in as many ways as possible.

Conference on Maritime History and Archaeology

The process of informing the public about their submerged cultural heritage really began in 1988 with the first Conference on Maritime History and Marine Archaeology. The conference, held on May 21, 1988 at The Wright Place in downtown Pensacola, was open to anyone interested. Over the course of the six-hour conference many aspects of underwater archaeology were addressed. Speakers included representatives from the Florida Division of Historical Resources, the University of West Florida, the National Park Service, and the Historic Pensacola Preservation Board, as well as local historians and divers. Topics ranged from conservation to shipwrecks in Pensacola and other parts of Florida, to cultural resource management, to underwater archaeological techniques.

The first conference produced an increased awareness of Pensacola's maritime past and the importance of preserving this heritage. As a result of this conference, UWF decided to sponsor an undergraduate field school in conjunction with the City of Gulf Breeze to excavate the remains of a colonial British ship located on Deadman's Island. The field school took place in the summer of 1989. Due to increased interest in Pensacola's historic shipwrecks, especially those found and recorded in 1991, the Survey decided to organize another conference.

The second Conference on Maritime History and Archaeology was held May 16, 1992, at the South Santa Rosa County Recreational Center in Gulf Breeze. Once again many organizations and businesses in the community agreed to sponsor the conference and help defray costs. Speakers represented the underwater archaeological community from Florida to North Carolina, the sport diving community, and those involved with historic preservation and cultural resource management. (For a list of sponsors, speakers, and their topics, see Appendix 1).

A formal proposal was made at the second conference to establish the USS *Massachusetts* as the fourth Florida State Underwater Archaeological Preserve. The conference also increased support for the Shipwreck Survey, and interested parties contacted the Survey to volunteer for the USS *Massachusetts* Preserve Project. The conference also increased awareness of underwater archaeological projects in other parts of the state and nation.

Over 100 people attended the second Conference on Maritime History and Archaeology. The large attendance demonstrated the latent interest in Pensacola's maritime past among the residents of the area. Many attendees suggested a conference be held every year to keep the public interest high and to keep the public informed about the archaeological projects going on in Pensacola Bay and around the state.

Sport Diver Workshops

Because sport divers often find and may unknowingly disturb historic shipwrecks, a formal workshop was organized by the Survey staff to educate the sport divers about the submerged cultural resources in Pensacola Bay and the Gulf of Mexico. The week-long intensive workshop was not intended to be a field school nor to present underwater archaeological theory, but simply to train sport divers in techniques of non-disturbance observation and the rudiments of recording and reporting shipwreck sites. With this training, it was hoped, the divers would become actively involved in identifying and protecting underwater cultural resources in Pensacola.

The need for this type of instruction had been demonstrated on several occasions in Pensacola. For example, the Deadman's Island Wreck was vandalized in the summer of 1991 by unknown persons looking for artifacts. Many timbers were disarticulated and thrown on shore in a vain attempt to find "goodies." In another instance, a bronze howitzer dating from the colonial period was encountered by a private dredging company when it became caught in the dredge pump. The incident was discovered only when one of the dredge vessel's crewmen, fearing a shipwreck had been discovered and damaged, alerted the local media.

The outline for a workshop entitled "Orientation to Underwater Archaeology for Sport Divers" was written by Pensacola Shipwreck Survey staff, in accordance with national certifying agency training standards and underwater archaeology educational standards, and was sent to various dive instruction agencies in the United States and abroad for their review. Agencies included the International Dive Educators Association (IDEA), International Scuba Educators Association (ISEA), National Association of Scuba Diving Schools (NASDS), National Association of Scuba Educators (NASE), National Association of Underwater Instructors (NAUI), Professional Association of Diving Instructors (PADI), Professional Scuba Instructors Corporation (PSIC), Scuba Schools International (SSI), and Young Mens Christian Association (YMCA). A cover letter enclosed with the outline explained the purpose of the Pensacola Shipwreck Survey and the expectations of the workshop. Advice and comments were solicited from each agency's director of training and education, and input on the course was requested.

The completed outline was the main component of the workbook written for the class. The workbook was created to accompany lectures and exercises during the class and to provide students with resource material information to aid them should they find an undocumented historic shipwreck. The workbook included essays, regulation information, glossaries, and bibliographies. Also included in the workbook were illustrations of ship construction, diagrams of ship features and their nautical terms, and site plans of Pensacola wrecks. (See Appendix 2 for contents of workbook).

The orientation workshop was designed to be co-sponsored by local dive shops. Dive shops are dedicated to teaching and depend on students to be return customers in order to stay in business. Specialty classes, such as underwater archaeology, are beginning to be in demand and offer dive shops another opportunity to attract people. Additionally, the shop made considerable profit by residual sales such as gloves, hoods, lights, air, and equipment rentals. Such incentives make it easy to convince other dive shops to host workshops. Most shop owners realize the strong public interest in underwater archaeology, but do not have qualified personnel to teach the class. The State-sponsored workshop offers not only well-qualified instructors but a chance for the dive shop to make money as well.

The workshop was divided into three stages: classroom instruction, confined water or pool training sessions, and open water dives. Classroom topics included the purpose of archaeology, ethics, conservation and preservation, laws pertaining to Florida shipwrecks, types of sites, ship construction, local history, and research, survey, and recording techniques. Additionally, the maritime history of Pensacola, including known ship losses, was discussed. Slides depicting various techniques and video of the Deadman's Wreck excavation were shown in class as teaching aids. The pool session focused on recording a mock shipwreck set up on the bottom of the dive shop pool. This wreck was designed by the field technicians, and included artifacts and ship-related items, including a simulated cannon.

Open water dives were made on local historic shipwrecks. The first dive was an exercise in recording the features of a shipwreck exposed above sand level. Dive number two was an exercise in the completion of a Florida shipwreck site form, and in non-disturbance observation techniques. The third and fourth dives were made on a previously undocumented site known as the Kruse Site after the charter boat captain, Ron Kruse, who suggested the site as an alternative to the USS *Massachusetts* because the seas were too rough to go out into the Gulf.

Divers were divided into teams with the tasks of recording prominent features, making an overall sketch, and measuring length and width dimensions. The site plan compiled by the students for this previously undocumented site is included (Figure 2). After the last dive, a final class session was held to review the class and to discuss additional ways for the students to continue to work together to record and protect historic shipwrecks in Pensacola Bay.

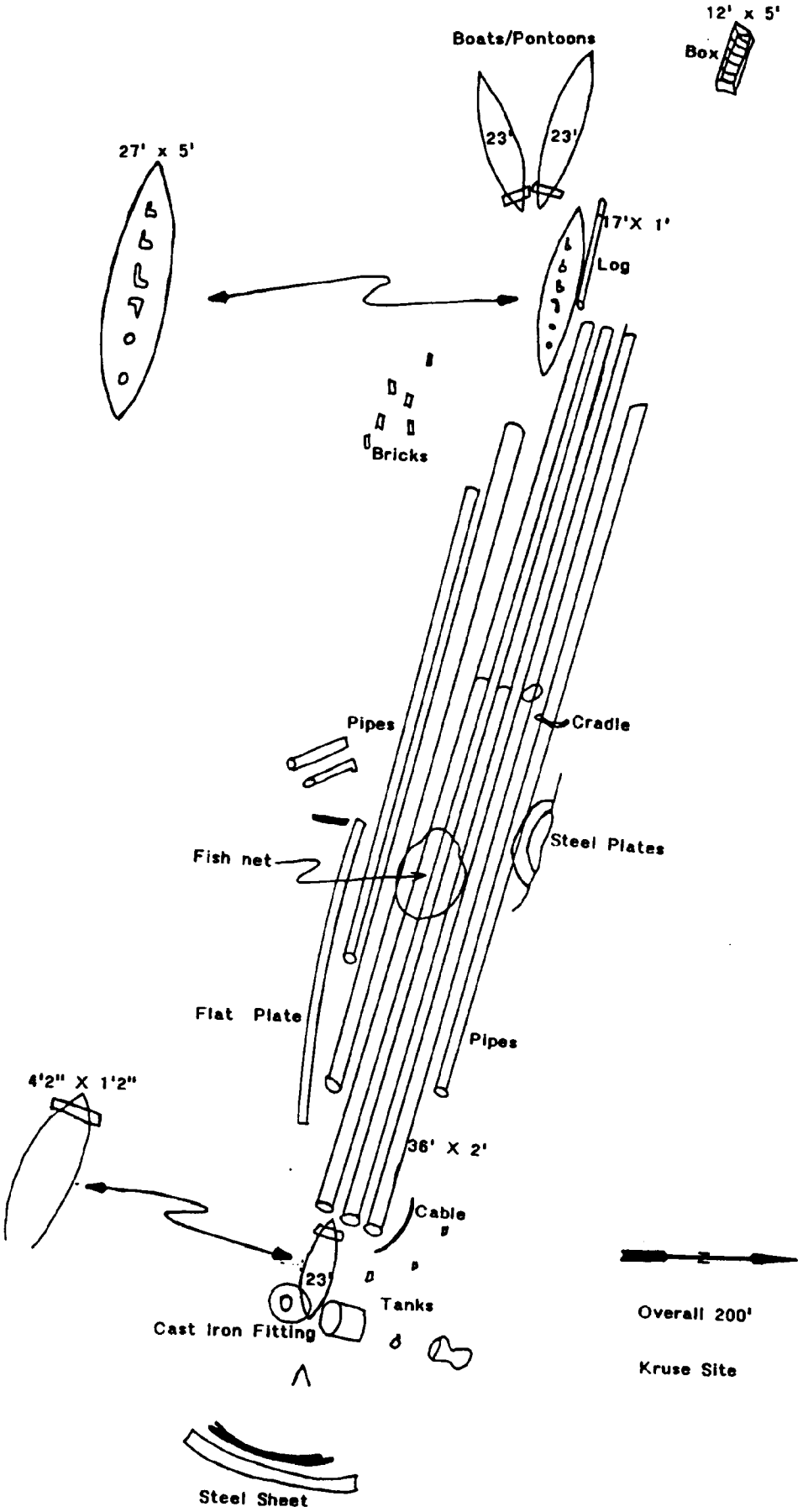


Figure 2. Site Plan of Kruse Site.

The Gulf Coast Pro Dive Shop was the cosponsor of the first workshop. A total of nine students enrolled with backgrounds varying from neural surgeon to bail bondsman to professional photographer. The cost was $150.00 and included two charter boat trips to local historic shipwreck sites, the workbook, a State of Florida certificate of participation, a NAUI or PADI specialty card, and a Pensacola Shipwreck Survey T-shirt. The remainder of the tuition went to the dive shop owners to help defray their costs.

The workshop resulted in the students' gaining an increased interest and understanding of why submerged cultural resources should be preserved. The students enjoyed the class and requested the creation of an advanced class that would deal with more in-depth theory and techniques. The class as a whole was very interested in Pensacola's maritime heritage and expressed surprise at the long history of shipping in the area; many were unaware of the number of ship losses in Pensacola Bay. Questions were asked pertaining to the Abandoned Shipwreck Act and shipwreck laws in Florida. Most of the students were surprised to learn of Florida's leniency in allowing treasure hunters to keep up to 80% of what they find. The students were also quite interested in the tools used by underwater archaeologists and were surprised the tools are so simple. The students requested more information on ship construction and terminology, artifacts that might be encountered in shipwrecks, and how to use the artifacts to date the wreck and determine the origin of the ship. Many of the students asked to volunteer with the Pensacola Shipwreck Survey and requested information on other underwater archaeological projects that need volunteers.

A final questionnaire, with questions such as "I learned..." and "I liked..." and "I would recommend...," was answered by each student. Recommendations from students included holding the class in warmer weather and providing more information on ship construction and artifact typology. Some important lessons were learned by the Survey staff and will affect the way future workshops are taught. For instance, the mock shipwreck must be modified to ensure all features and artifacts are heavy enough to stay where they are placed on the pool bottom. Additionally, an alternate wreck location is essential in case the seas are too rough to allow the planned trip to the USS *Massachusetts*, as occurred during the first class. An additional class session dealing with ship construction, nautical archaeology, and artifact typology and identification is also planned for the next class, as per the recommendations of the students in the first class. All of the students were pleased with the class and felt they had received their money's worth.

As an experiment in public awareness, the sport diver workshop was one of the most successful attempts to educate the public about their submerged cultural heritage. The class was straightforward and delivered information to that group of people who are inherently interested in what lies under the waters--divers. The students were highly motivated and responded favorably to a suggestion to start a "Historic Shipwreck Club" in Pensacola to locate and preserve historic wrecks. By extending this model to other regions of Florida, sport divers around the state can contribute to the preservation of important historical resources that are submerged.

Public Presentations

Efforts to inform the public about the Pensacola Shipwreck Survey included giving lectures and presentations to various organizations and groups. Each member of the staff participated. All presentations had the common goals of informing interested parties about the work of the Pensacola Shipwreck Survey and promoting the USS *Massachusetts* Park, in addition to covering the specific topic of the presentation. Organizations included the Pensacola Archaeological Society, Pensacola Historical Society, Sertoma Club, Pensacola Charter Boat Association, Gadsden Street Methodist Church, Naval Air Station Historical Society, University of West Florida Scuba Club, and Pleasant Grove Elementary School. Most groups wanted to hear about the work being done on the USS *Massachusetts* and how it would compare to other shipwreck preserves around the state. Some groups were interested more in specific topics. The NAS Historical Society was specifically interested in the military wrecks in the bay, and the Pleasant Grove Elementary School children wanted to learn about underwater archaeology in general.

Media Coverage

The citizens of Pensacola are very interested in Pensacola Bay, and several popular local television shows focus on the water and water activities. Hosts of these shows contacted the Shipwreck Survey to request the participation of the staff. For instance, a local cable channel, BLAB-TV, featured staff members on several of its shows. "On The Water," "NAS Live," "The Flack Logan Show," and "Gulf Coast Outdoors" all focused on the Survey's work and especially on the USS *Massachusetts* Park.

Additionally, radio stations in the Pensacola area featured the Pensacola Shipwreck Survey on talk shows. WCOA and WKGT both hosted Survey and Friends of the *Massachusetts* representatives to talk about the Underwater Preserve and to generate support and volunteers.

Local newspapers ran numerous articles on the Shipwreck Survey and the USS *Massachusetts* Park. The Pensacola *News Journal* advertised the Maritime History and Archaeology Conference and featured several articles on the proposed *Massachusetts* Park. *Gosport*, the Naval Air Station newspaper, ran an entire series of articles on the USS *Massachusetts*. The history of the ship, how it came to be in Pensacola, and the efforts to make the wreck a preserve were discussed in a series of three articles. Other articles also appeared in publications like the Gulf Breeze *Sentinel*; Associated Press sent articles on the USS *Massachusetts* across the country. One unexpected source of publicity came from a national scuba diving magazine. Rodale's *Scuba Diving* featured a two-page article on the USS *Massachusetts* as a prime dive site in the Florida Panhandle. *Florida Scuba Times* also mentioned the *Massachusetts* in an article about wreck dives in Florida. Media-generated publicity coincided with the other efforts to expand public knowledge and perhaps reached some people that the other avenues would not have. Local dive shops reported that charter trips to the USS *Massachusetts* increased since articles appeared in newspapers and Rodale's *Scuba Diving*. The media has continued to publicize on-going work of the Survey and the efforts of the Friends of the *Massachusetts* to have the battleship officially declared a preserve.

Volunteers

Throughout the field season the Pensacola Shipwreck Survey was assisted by a small but dedicated crew of volunteers. Many others wanted to help but personal commitments and work schedules kept them away. At times the Survey did not need volunteers; for example, during magnetometer operations the boat was filled with equipment and the Survey team. However, when volunteers were needed they were always ready to assist. For a short time the Survey had two boats in operation and there were always volunteers to fill them. In order to obtain the most experienced divers available, the Survey placed volunteer application forms in all the dive shops in the city. In addition to name and address, applicants were also asked to give information about their diving, such as date certified and number of dives annually. The volunteers not only helped the ground truthing of underwater targets go more quickly, but also provided a better dive rotation among the Survey crew.

Volunteers on the 1992 phase of the Pensacola Shipwreck Survey ranged from college students, to lifetime natives of Pensacola, to more transient Navy personnel. In order to accommodate volunteers who, due to work schedules, could not work with the Survey during the week, the Survey crew occasionally worked on weekends.

To make the best use of volunteers some simple guidelines were followed. The Survey staff found it helpful to always give the volunteer a thorough briefing about the task at hand and what to expect in terms of visibility, currents, bottom consistency, and target expectations. Furthermore, the Survey crew ensured that the volunteer dived with at least one project member. If a volunteer became uncomfortable with the diving conditions, he or she was not allowed to begin or continue the dive.

Law Enforcement

One other incident should be noted in this chapter, although it is not the method of choice with which to educate the public. In late October, the PSS headquarters received a report from a resident

of Gulf Breeze stating that possible vandalism had occurred at Deadman's Island at the location of Deadman's Wreck and Town Point Wreck. Several days later on a Saturday afternoon, Survey staff proceeded to Old Navy Cove, where they discovered a man in shallow water who appeared to be digging. Staff radioed the Coast Guard, who transferred them to the Florida Marine Patrol. Upon hearing of the situation, the Marine Patrol offered to send one of their officers, Randy Webb, back to Old Navy Cove with the staff. Officer Webb then questioned the man, who had in his possession a metal detector and a metal screen. The man stated he was aware of state laws pertaining to submerged cultural resources and knew he could be arrested for disturbing such deposits. Because the man had only fragments of glass and metal in his screen and was well away from the known shipwrecks, he was released with only a verbal warning from Officer Webb, who also took the man's name and address. A cursory examination of the contents of the man's boat proved he had not taken any larger artifacts.

Though the Pensacola Shipwreck Survey has dedicated a large portion of the 1992 field season to educating the public about their submerged cultural heritage, there are still a few people who do not realize the importance of these fragile resources. These people continue to damage and disturb wreck sites, even though some are fully aware of the laws protecting shipwrecks. Only through the cooperative efforts of concerned citizens who report such offenses, and the Florida law enforcement community who enforce the laws, can these vandals be stopped.

Conclusions

The results of these intensive efforts to publicize the work of the Pensacola Shipwreck Survey and to educate the public about the importance of preserving submerged cultural resources are still becoming apparent. The Maritime History and Archaeology Conference was the starting point for public education and brought many facets of underwater archaeology to the attention of the people of Pensacola and Gulf Breeze. Local dive shops reported people calling from as far away as Canada, Guam, Maine, and Australia to find out more about the USS *Massachusetts* and to arrange charter trips specifically to dive the old ship. The entire community is aware of the efforts to make the *Massachusetts* a Florida State Underwater Archaeological Preserve. Organizations have donated hundreds of dollars to this end. The workshops encouraged a new kind of sport divers, who are more interested in preserving what they see rather than taking trophies home to put on the mantle, and who understand the importance of shipwrecks as "time capsules" of history to be studied rather than looted. Local organizations that asked for presentations helped to support the Survey and allowed the goal of education to be realized. The media in Pensacola supported the project by writing articles and featuring the Survey on television shows. The attention of national magazines also has helped to reach locals as well as people around the country. Finally, the volunteers proved that the message was reaching people.

CHAPTER 3. USS *MASSACHUSETTS*

Introduction

A successful blend of preservation and recreation in the United States involves the establishment of underwater parks on shipwreck sites. Michigan, Vermont, North Carolina, Florida, and some Federal agencies (namely the National Oceanic and Atmospheric Administration and the National Park Service) subscribe to the notion of protecting submerged historical resources by promoting them as educational and recreational attractions. Underwater parks allow the visitor to enjoy a controlled multi-faceted experience not normally found at other dive sites. Interpretation of both cultural and natural features at a site combines an educational flavor with a recreational pursuit--"Education through Recreation"--and promotes the need for preserving historical resources. Over the past five years, Florida has adopted this submerged cultural resource management strategy and has developed an underwater archaeological preserve system unmatched in the country. This chapter discusses the creation of the earlier Florida underwater parks, and the process of developing a fourth underwater archaeological preserve, USS *Massachusetts*.

Background of Florida Underwater Preserves

The first preserve was created in response to public concern in Fort Pierce for preserving a Spanish treasure ship for sport divers. In 1987, the Florida Bureau of Archaeological Research, with support from local businesses and private citizens, designated the *Urca de Lima* as the first Florida Underwater Archaeological Preserve. Interpretive materials produced and distributed by the Bureau detailed the ill-fated journey of the ship, which was sunk, along with the rest of the 1715 treasure fleet, by a devastating hurricane. In addition, several land exhibits in various parts of the state provided shore visitors a chance to read about the vessel's history. Following the successful creation of this park through the combination of state and public resources, another treasure wreck site was nominated, the *San Pedro* of the 1733 fleet sunk off Indian Key, and designated in 1989 as the second Florida Archaeological Underwater Preserve. Again, state and local cooperation created a public recreation site without a large commitment of public funds.

Nominations of Wrecks as Potential Preserves

Impressed by the public desire to preserve submerged historical resources by these means in Fort Pierce and in the Keys, the Bureau produced and circulated a flyer to dive shops, businesses, and local governments throughout the state to nominate popular wreck sites as potential preserves. The flyers elicited many nominations. Additional research by the Bureau determined that some of the sites varied in degrees of archaeological and historical importance, and did not meet basic requirements set forth by the Bureau. The criteria took into account the physical condition of the wreck, whether articulated or disarticulated, historical background, danger to divers, low visibility, strong currents and surge, among other guidelines for selecting a future preserve. After reviewing many nominations, the Bureau chose the *City of Hawkinsville*, a steamboat built in 1896 and located in the Suwannee River near Old Town, as the third underwater preserve in Florida. The park was officially opened for sport divers in 1992.

In addition to receiving the nomination for the *City of Hawkinsville* in response to the flyer, the Bureau also received a nomination for the USS *Massachusetts* by a Pensacola diver. Reconnaissance of the site by the Bureau in 1991 determined the site met the requirements for inclusion in the Florida system of underwater archaeological preserves. Several preliminary steps were necessary before the vessel could be designated as a new preserve.

Historical Research

The first step was to accumulate as much historical data as possible about the site. This data would educate the public about the history of the old hulk and would be used to develop a shore-based exhibit.

Several national and local repositories contained relevant research material. The National Archives supplied photocopies of the 1910 refit plans and photographs of the *Massachusetts*. The Naval Historical Center also provided photographs. The Pensacola Historical Society supplied information ranging from photos to newspaper and journal accounts. Also included in the Pensacola Historical Society archives were eyewitness accounts of the shelling of the *Massachusetts* in 1921 as part of the coastal defenses testing along Santa Rosa Island. Several books on the pre-dreadnaught era also proved useful. Additional sources of information included personal accounts of the battleship since its arrival in Pensacola.

Many local charter boat captains, fishermen, and divers who work and play in Pensacola waters have frequently visited the wreck of the *Massachusetts*. They witnessed or heard tales of the hulk as it slowly transformed into its current state. Several of these people even contributed to the present condition of the Old Mass. For example, one of the charter captains in Pensacola dynamited the wreck extensively in the 1950s to salvage brass fittings and lead counterweights.

In the course of gathering the documents and photographs of the wreck, many facts about the USS *Massachusetts*'s past came to light. Historical research endowed the derelict hulk with a much more intriguing and factual past than that given in the hearsay and popular legend about its origin, career, and demise.

Ship History

Around the turn of the century, the emphasis on developing a new all-steel navy prompted political and naval leaders to replace the obsolete monitor-class warships and the armored cruisers *Maine* and *Texas*. To effect the change, Congress appropriated funds in 1890 for the construction of the first American battleship class, the Indianas. The three vessels of the class were the *Indiana* (BB-1), *Massachusetts* (BB-2), and *Oregon* (BB-3) (Harris 1965: 21). The keel of the *Massachusetts* was laid in 1891; the ship was launched in 1893, and commissioned in 1896. Dimensions of the vessel were: length overall 350 ft.; beam 69 ft.; draft 24 ft.; overall height 35 $^1/_2$ ft.; and displacement 10,288 tons (Coleman 1991:1). The Indianas were equipped with multiple caliber guns characteristic of pre-dreadnaught warships. Their primary armament consisted of four 13-inch guns *en barbette*, a secondary armament of eight 8-inch guns *en barbette*, and a host of lesser arms. Additionally, each ship was equipped with five torpedo tubes and, for protection against incoming torpedoes, was outfitted along its waterline with a nickel-steel armor belt with a maximum thickness of 18 inches, which tapered in thickness from amidship to the bow and stern (Navy Department 1969: 264).

After its commissioning, the USS *Massachusetts* (Figure 3) joined the North Atlantic Squadron. In 1898, as part of the "Flying Squadron," the battleship was ordered to blockade Cuba at the beginning of the Spanish-American War. Along with other blockading vessels, the *Massachusetts* bombarded the fort at Santiago de Cuba and engaged in combat with the Spanish cruiser *Cristobal Colón*. While re-coaling, the *Massachusetts* missed the Battle of Santiago on 3 July 1898, but later assisted in sinking the Spanish cruiser *Reina Mercedes*. Following the war, the battleship participated in various routine tasks with the North Atlantic Squadron. To keep up with the pace of the rapidly developing Navy fleet, *Massachusetts* underwent a refit in 1910 to refurbish the vessel, to remove and replace some of the smaller caliber guns, and under the supervision of Guigliemo Marconi, to install one of the first wireless radios in the fleet (Navy Department 1969: 264).

At the onset of World War I, the technologically outdated battlewagon served primarily as a gunnery practice ship. Shortly after the war's end, *Massachusetts* was decommissioned for the final and last time, having been rendered inactive three times during its career (Navy Department: 264). The battleship's decommissioning was a timely event for Army ordnance units in need of testing outdated artillery pieces. Chosen as the target for artillery tests in Pensacola, *Massachusetts* was towed from Norfolk, Virginia in 1921. Improperly sunk east of Pensacola Pass, *Massachusetts* was re-floated and re-sunk west of the Pass in approximately 20 ft. of water. Army land batteries fired 108 rounds into the warship with the first round going straight down one of the smokestacks (Coleman 1991: 4).

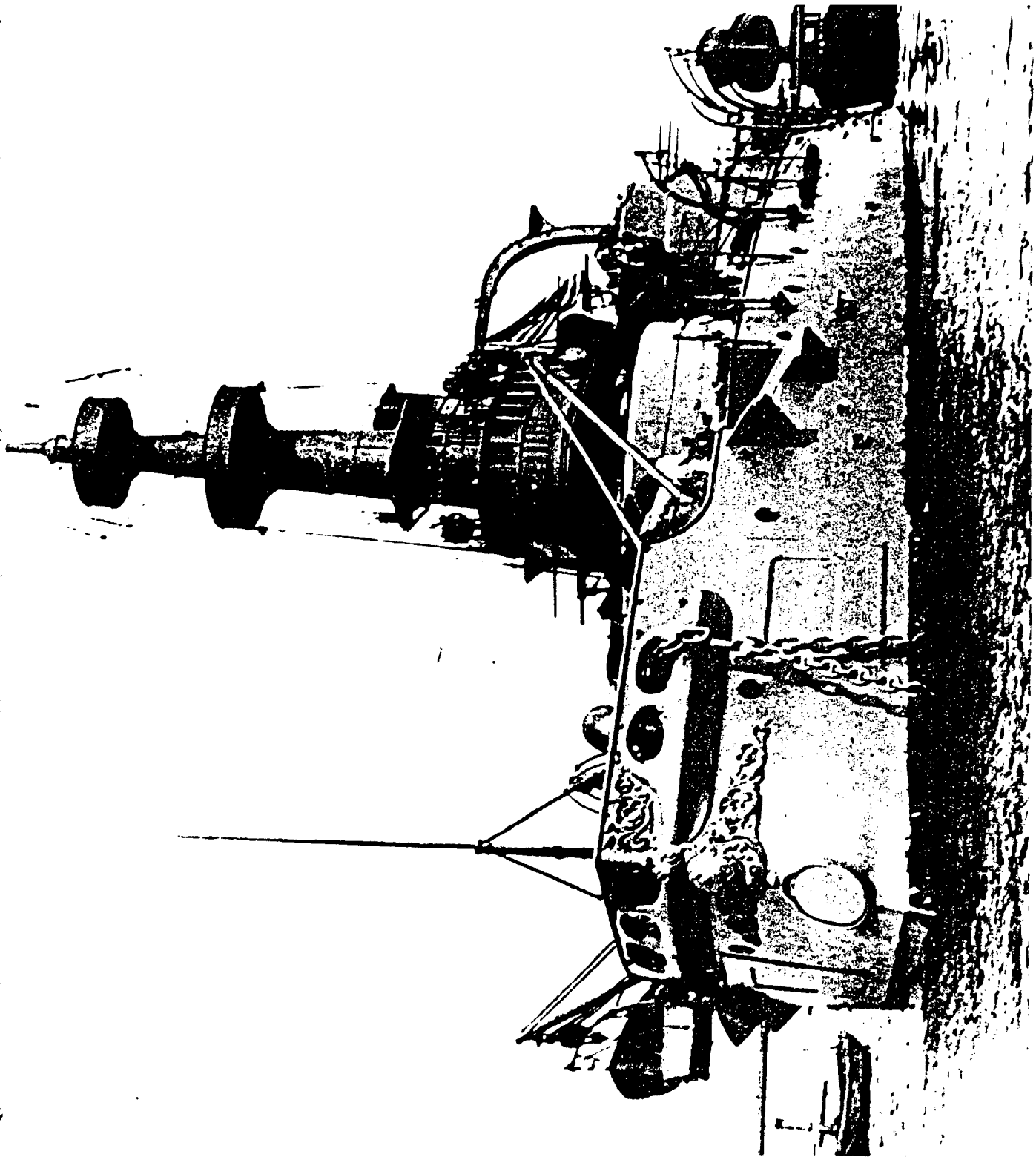


Figure 3. Photo of USS *Massachusetts*.

Forgotten by the military, the hulk soon attracted fish and subsequently fishermen, picnickers, and eventually salvors interested in obtaining rights to the valuable metals on the ship. Extensive salvaging on the site occurred during the metal drive in World War II, which reduced the ship to structure below the water surface (Coleman 1991:1). Later in the 1950s, a salvage company waged an unsuccessful attempt to begin work on the wreck. Local Pensacolians, who had adopted the hulk as a recreational site, fought the salvage efforts and filed a lawsuit. Eventually, the Florida Supreme Court decided in favor of the public and denied the company rights to salvage. The court, citing Admiralty Law, decided that the *Massachusetts* was rightfully the property of the State of Florida, since the Navy had abandoned the ship.

Archaeological Documentation

Historical information gleaned from 1910 refit plans, construction diagrams in books, local accounts of salvage, and many photos helped to record and interpret the present features of the wreck. Archaeological documentation of the *Massachusetts*'s remains, as well as a planned biological survey, were used to generate interpretive aids for those diving the site and those visiting the museum exhibit. The primary aid to interpreting the wreck was the creation of four maps--two site plans and two adaptations of the 1910 refit plans. Site maps of plan and profile views were drawn by underwater archaeological recording methods (Figures 4, 5 & 6). All work was accomplished without disturbing the site. Methods included establishing a baseline for triangulation and offset measurements. In addition, a temporary grid system was used to control video recording of the amidship sections, and an uncontrolled free swimming video was used to record features of the bow, the stern, and inside the turrets. On-site interpretation of disarticulated remains was facilitated by the 1910 refit plans, which detailed the last known alterations to the ship (Figure 7). Also, refit plans aided in drawing the hull outline and positioning the turrets.

The 1910 refit plans proved invaluable in revealing how the *Massachusetts* appeared prior to its demise. Two drawings were outlined from the plans: one is a profile view, and the other is a composite view (Figures 5 & 6). The profile view was adapted with fewer technical features in order to give a sense of the original compartments and height. The composite plan depicted how the several decks now remaining on the wreck--orlop, berth, and platform decks--looked while the ship was operable.

The purpose of the plans was to illustrate not only the remains of the wreck, but also to provide an historical context for the vessel. To achieve these goals, the maps were used in a land based exhibit along with photos and artifacts interpreting the site, and were also used in an underwater field guide. The guide aids visitors to the site, mainly divers and fisherman, by showing the size and shape of the ship, as well as the identity of the various pieces scattered about the site. It is to be hoped that those planning to dive the *Massachusetts* would visit the land based exhibit first to better understand the site and appreciate what they would encounter. Once knowledgeable about the site, the diver can relax, explore, and recognize the fragmented pieces by carrying the underwater guide and remembering the other plans. In addition to viewing the structural features as parts of a ship, the diver can also view the wreck as a complex artificial reef supporting many varieties of marine life.

Biological Documentation

The recognition and interpretation of the site as a dynamic artificial reef increases the value of the site as an ecological resource. As the one of the oldest artificial reefs in the Pensacola area, the site is inhabited by many varieties of sea life. Permanent residents of the wreck include sponges, sea urchins, soft and hard corals, cowries, barnacles, gobies, jewfish, and octopus, among many others. Seasonal visitors include cigar minnows, Spanish and northern mackerel, cobia, blue angels, butterfly fish, and many other tropical fish during the summer. In the winter, grunts and groupers appear, while year round denizens include spade fish, channel catfish, juvenile red snapper, and squirrel fish. Biological information printed on the underwater guide informs the diver, as well as the fisherman, about the types of marine life likely to be encountered on the artificial reef.

Public Proposal

Following historical, archaeological, and biological documentation, work commenced to develop a public proposal for the *Massachusetts* to become the state's fourth underwater archaeological preserve. The proposal addressed reasons why the preserve status of the wreck would benefit the public in the areas of education, recreation, and tourism. The wreck is significant, not only locally, but also nationally. The *Massachusetts* represents the only surviving Indiana-class battleship in existence, and symbolizes a young America struggling to become a preeminent world naval power and achieve its manifest destiny. Since its deposition in the Pass in 1921, the wreck has provided fishermen and divers with continuous recreational opportunities. Pensacola over the years has fostered its historic and natural resources, such as Historic Seville District, Naval Aviation Museum, Gulf Islands National Seashore, and Naval Live Oaks Reservation, among others, and has developed an important tourist industry. Presently, divers in search of a location to visit want more than a pretty dive; they want a diverse attraction, featuring historical, recreational, and ecological elements. The *Massachusetts*, as the fourth Florida underwater archaeological preserve, contains all these elements. Adding the *Massachusetts* to Pensacola's existing cultural attractions offers additional incentives to visitors, and brings economic benefits to the city.

To solicit input and support, two types of proposals for establishing a preserve were distributed. Copies of the bound 19-page proposal, with the four plans in a separate pocket, were sent to local government agencies, businesses, historical societies, and state agencies, as well as to national organizations such as the National Park Service, the U.S. Coast Guard, the U.S. Navy, and commemorative ship museums, among others. A handout of several pages was distributed to individuals requesting it, and was also made available during public presentations. The handouts ensured that those interested could read the proposal and re-discover the *Massachusetts*, not only as that old wreck in the Pass, but also as a new kind of tourist attraction. In fact, one local charter boat captain, who had previously salvaged metals from the ship, declared that he thought opportunities for making money off the *Massachusetts* had long since passed.

Over the course of several weeks after making the proposal public, many people responded to the proposal, as well as to newspaper articles in the *Pensacola News Journal* and *Gosport*, by calling and writing to state their support for the idea. To promote the growing interest, the Bureau announced a public meeting open to interested national, state, and local government agencies, and to private businesses and individuals. The public meeting discussed how the state and public could cooperate in creating the fourth underwater archaeological preserve. One of the results of the meeting was the Bureau's commitment to assume the responsibilities of protecting and overseeing the park, and to print interpretive brochures and underwater guides to the site. The public became actively involved in promoting historical preservation at the local level by volunteering to help create the preserve.

Public Support Organization

To facilitate the creation of the park, a non-profit organization, the Friends of the *Massachusetts*, was formed to help with logistics. Donations of money and materials were received by this organization. Other components of the preserve, such as fabrication and placement of an underwater plaque, were also the responsibility of the Friends. The formation of various committees within the organization facilitated the completion of the many separate tasks. These committees included Historical, responsible for collecting historical material related to the ship; Museum, responsible for handling the shore based exhibit in a local museum; Mooring Buoys, responsible for placement and maintenance of mooring buoys for dive and fishing boats (the committee subsequently decided that mooring buoys were not required at the site); Plaque, charged to design and place a plaque; Diving, in charge of handling periodic cleanup of the site; Publicity, ensuring local newspapers and magazines were kept abreast of all developments in the park; and Funding, responsible for soliciting contributions for the funds needed for the preserve.

Grand Opening

A grand opening is planned for June 10, 1993, the centennial of the ship's launching. Local and visiting dignitaries from the governments of Pensacola and the State of Florida are expected to attend.

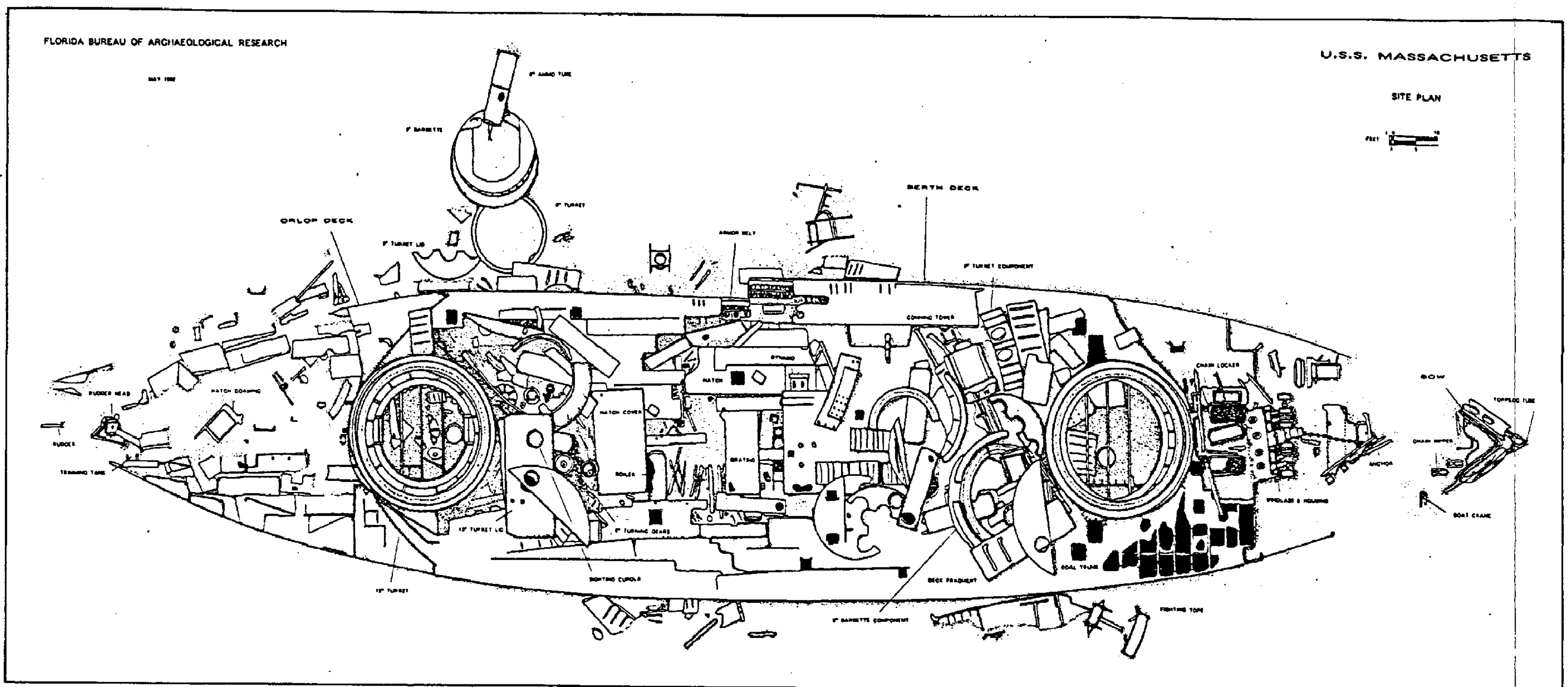


Figure 4. Site Plan-USS *Massachusetts*.

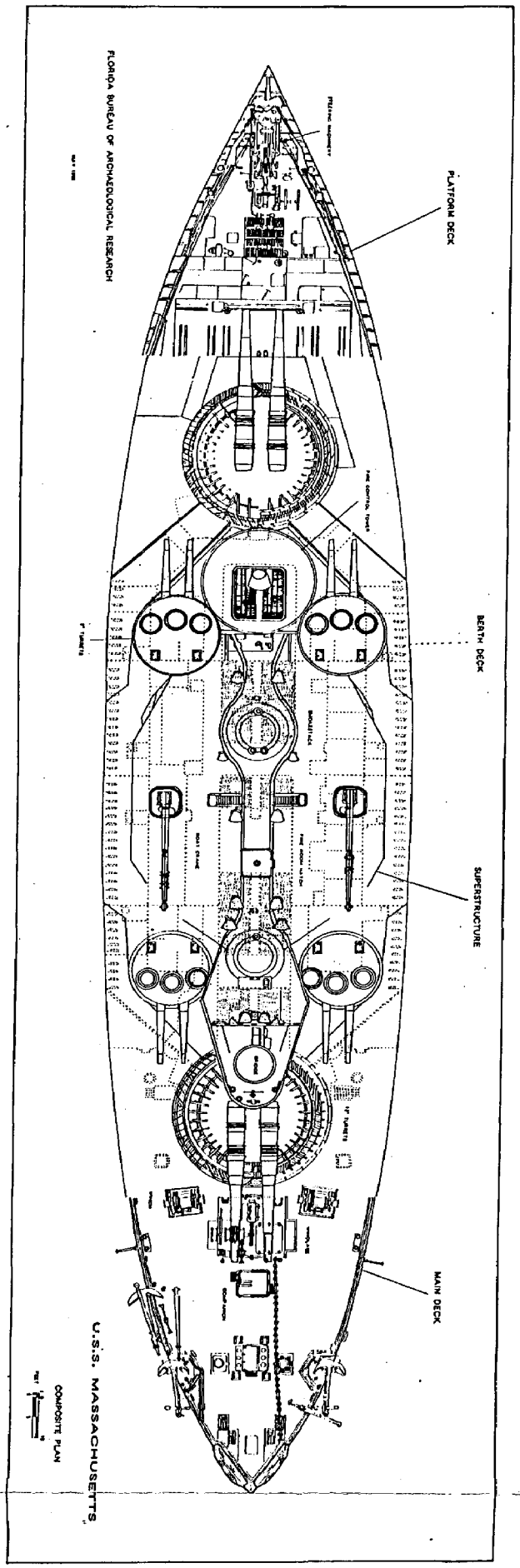


Figure 5. Composite Plan of USS *Massachusetts*.

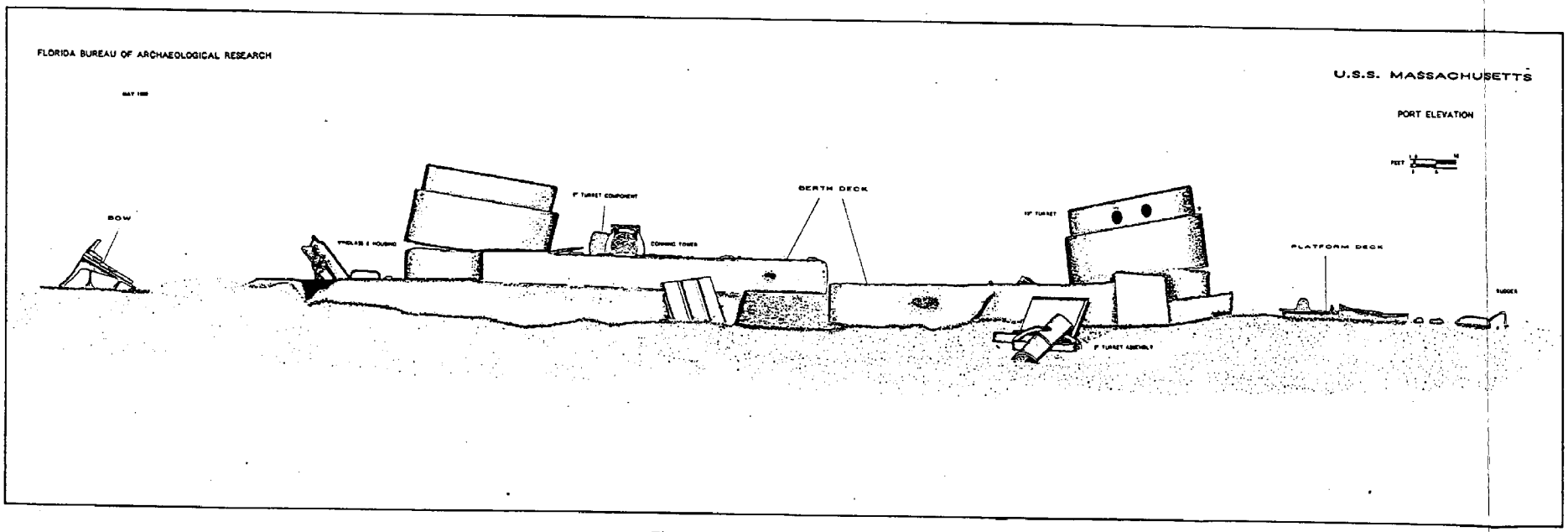


Figure 6. Profile Plan of USS *Massachusetts*.

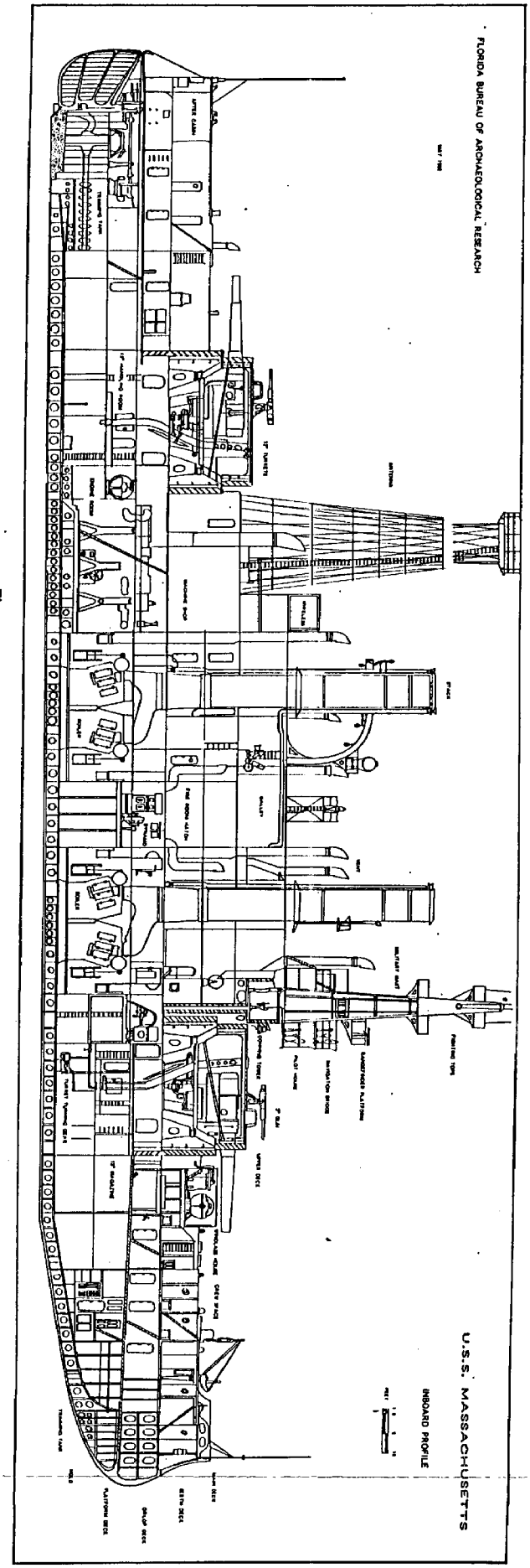


Figure 7. Original 1910 Profile Plan-USS *Massachusetts*.

Local businesses, such as dive shops, charter boat organizations, and bait and tackle shops, are planning to attend and show support. Extensive coverage by television and newspapers in the area will ensure publicity for the new park. One very special visitor will be the last surviving crew member of the *Massachusetts*, Chief Petty Officer (Ret.) Charles Brems. Although Mr. Brems is getting along in years and recovering from a stroke, his daughter states that he is excited about the designation of his old ship as a state park. Once the park is established, a local boat dealership is discussing the possibility of obtaining a glass-bottom boat to take visitors who are unable to dive to the *Massachusetts*. Already, local dive shops are reporting calls from as far away as Maine, Australia, and Guam from people who want to dive the *Massachusetts*.

Conclusions

The importance of preserving the USS *Massachusetts* as an underwater archaeological park is two-fold. First is the wreck's historical importance as the oldest, and only, surviving pre-dreadnaught battleship. It occupies a place in the history of the United States that cannot be filled by any other ship. Second is the wreck's status as one of the oldest artificial reefs in the area. The dynamic site supports a variety of sea life that draws divers and fishermen alike. Environmentally, the site is important as a spawning ground and fish hatchery.

The establishment of underwater parks in Florida will continue as a tool for managing submerged cultural resources. In areas where parks have been established, local businesses have reported an increase in revenue. The parks bring tourists who spend money--not only in dive shops but also at motels, hotels, gas stations, and stores. Most important, an irreplaceable cultural resource, as well as a natural resource, has been preserved and will be protected for the enjoyment of generations to come.

While the state may promote and assist in the establishment of an underwater archaeological preserve, the local community will determine the site's success or failure. Guidelines to effect a smooth nomination and creation process should always take into account the public attitude towards the site. Not all shipwrecks make good preserves; therefore, the state must be responsible in promoting worthy sites for inclusion in the underwater preserve system. Responsibility includes making sure the site is easily accessible, either by shore or boat, to ensure easy access for diving or snorkeling; assessing appropriate historical significance; and ensuring that enough structure remains to be recognizable as an historic site. In the *Massachusetts*' case, the state helped promote the public's acceptance of the concept by completing historical and archaeological research and initiating the first public meeting. Encouraging the public in this manner allowed those interested to support and implement the proposal and to help in creating the fourth underwater archaeological preserve in Florida.

CHAPTER 4. METHODOLOGY OF REMOTE SENSING SURVEYS

Introduction

Following the previous year's recommendations for more extensive remote sensing operations, and grant requirements for acquiring, assembling, and testing a remote sensing survey package, the Bureau of Archaeological Research purchased a magnetometer for use in Pensacola Bay. Later in the survey, the Bureau contracted for services of a side-scan sonar and operator to locate and identify sites. Armed with these archaeological prospecting tools, the Survey planned to cover promising locales for shipwreck sites. Areas chosen for investigation were selected on the basis of three kinds of criteria: past maritime activity, geographical considerations, and reported wreck sites. Past maritime activity sites include anchorages, careenage sites, and old wharves, while geographically important areas include sandbars, banks, and the shoreline. Locating reported wrecks often relied on the proverbial "X marks the spot" on nautical charts and also on individuals leading the crew to a site.

Pensacola Bay has been the focus of maritime activities for more than 400 years, from the first Spanish colonial attempt in North America by de Luna to the present day. A broad spectrum of ships and boats have plied the bay's waters during these centuries, reflecting New World colonization attempts by the Spanish, French, and British, the efforts of the Confederacy to leave the Union, and the United States' struggle to become the pre-eminent world naval power.

Fortunately, from the viewpoint of the underwater archaeologist, a vessel from each period in the historical development of Pensacola Bay is represented within the confines of the bay or adjacent waters. Also, remains of many activities associated with these vessels, including dumping debris at anchorages, anchor losses, careenages, and off-loading ballast, are strewn throughout the bay. Other related maritime sites include industrial complexes, the Quarantine Station, wharves, marine railways, and the naval station.

Geographical considerations for the possible presence of shipwrecks inside the bay are limited to the shoreline and a few sandbars and banks. In a sheltered and protected water body like Pensacola Bay, the dangers of the open Gulf, such as heavy seas, are diminished. But Pensacola Bay can be whipped into a frenzied cauldron, as evidenced by the partial destruction of the de Luna fleet in 1559 and the vast destruction of merchant vessels in 1906 by hurricanes. The entire shoreline of the bay that lies along the transition line where deep water becomes shallow is likely to contain submerged cultural resources. Evidence of noteworthy shipwrecks along this transition line were two British colonial ships, the Deadman's and Town Point wrecks, found eroding out of the shoreline. Also, submerged shoals radiating out from Gulf Breeze Peninsula and near Pensacola Pass may have caused shipwrecks.

Several reports of wrecks were received during the course of the survey. Sometimes the person reporting the shipwreck personally took Survey staff to the location or provided Loran-C coordinate numbers for the site. In some instances a notation on a nautical chart indicated the shipwreck. In these cases remote sensing equipment provided the quickest means of obtaining the vessel's precise location.

Magnetometer Survey

Magnetometer Specifications

An EG&G Geometrics Model G-866 Recording Proton Precession Magnetometer with towed array was the primary sensing tool. Essentially, the G-866 magnetometer records the earth's ambient magnetic field. The value of magnetometry to underwater archaeological survey work lies in its ability to detect disturbances in the earth's magnetic field created by objects ranging from iron pipes to rocks, and most importantly, shipwrecks. Typically, the marine magnetometer configuration involves deploying the sensor head behind the boat, while the console and readout are on board. The sensor head is towed far enough behind the boat that it is not affected by the boat's magnetic field--typically a distance two to three times the length of the survey vessel.

Inside the sensor head is a metal coil immersed in a liquid--usually water, decane, or kerosene--encased in a non-magnetic container. Left in an undisturbed state, the liquid's molecules will align themselves with the ambient magnetic field of the earth. However, when an electrical current is applied to the coil, the liquid's protons align themselves with the coil's magnetic field rather than with the earth's. Once power to the coil is shut off, the protons move away from the coil and realign with the earth's magnetic field. Before completing their realignment with the earth's field, the protons precess, or tumble around their axis. Proton precession creates a small electrical current in the coil which is measured to determine the magnetic field below the sensor head at that particular time. A digital recorder prints out a plot of the local magnetic field in gammas on electrosensitive paper (EG&G: 1-3).

The gamma reading expresses the local ambient magnetic field detected by the magnetometer, which in Pensacola Bay is around 50,000 gammas. Variations in the ambient field are called anomalies. An anomalous gamma reading, or pulse, represents two important components: the local magnetic field of the earth, and more important, a variation representing a ferrous object. Promising anomalies representing historical material, notably shipwrecks, are usually characterized by a continuous string of pulses measured in duration. Duration is measured in seconds, which is affected by sample interval, or the time between each reading. For example, if an anomaly lasted for ten pulses and the sample interval was every two seconds, the duration would be twenty seconds. Amplitude would be another consideration. This particular case would suggest an anomaly deserving further investigation.

Another important criterion for distinguishing archaeological sites includes the anomaly's polarity, or signature. Anomalies are expressed as having dipolar, negative or positive monopolar, and multi-component magnetic signatures. Polarity, intensity, and duration help determine an anomaly's character, indicating whether it could be an historical artifact or modern debris. In a developed and busy area like Pensacola Bay, the bottom is littered with historical submerged cultural resources as well as more recent rubbish, all indiscriminately detected by the magnetometer.

Magnetometry and the Bay

Many areas of the bay contain submerged historical resources detectable by the magnetometer and side-scan sonar (Figure 8). However, many activities, both historic and modern, have impeded the easy detection of significant cultural resources. Magnetometry has a proven record for locating sunken wrecks, even though the method was developed for geological surveys. One major drawback of the magnetometer is its inability to identify an object creating the magnetic anomaly. An anomaly could be a 17th century ship, or a pile of modern steel drums, especially in a heavily populated and industrial region like Pensacola Bay. There is only so much water bottom for historical resources and unwanted debris to accumulate in a restricted water body, and unfortunately, these tend to congregate in the same developed areas. A good example of this is Old Navy Cove, where several wrecks, ballast piles, rock dumps, and construction debris lie on the bottom, all within 200 yards of the shore.

An extreme juxtaposition of historical material and modern rubbish has been created by the the man-made migration of the Pensacola waterfront into the bay a distance of several hundred yards. The possibility that cultural resources, including shipwrecks, are buried beneath the artificial overburden was demonstrated during a land excavation by the West Florida Institute of Archaeology in 1990. While excavating along the relic shoreline, archaeologists found the remains of a small rowboat.

Another problem with conducting remote sensing surveys in a harbor is the intentional or accidental disposal of debris, mostly modern. Fisherman, for example, intentionally dump material ranging from refrigerators to fiberglass boats to make private artificial reefs. Local fishermen are also known to enhance certain bottom features that attract fish. These bottom features are in some cases shipwrecks, like the *Rhoda* discussed in last year's report, that are now covered by highly magnetic material such as wash tubs, washing machines, and air conditioners (Franklin et al. 1992: 208-209). In such cases, determining whether an anomaly is historic or modern is difficult. Other recent alterations that disturb the magnetic landscape are dredging operations that leave behind dredge pipes and metal cable, military disposal areas, and accidental dumping. All of these affect the magnetometer survey by clouding the ambient earth's field with magnetic noise that masks historic submerged cultural resources.

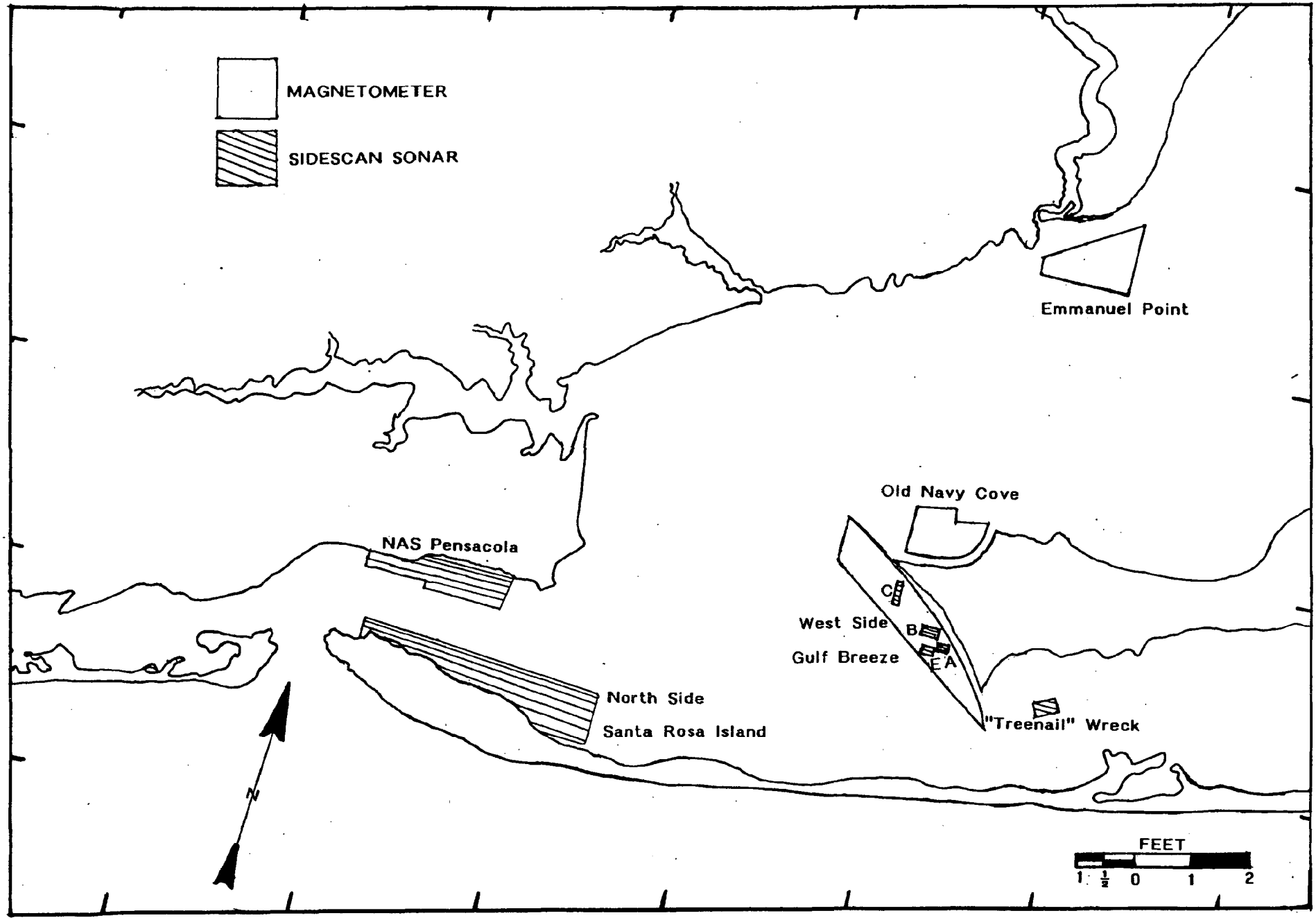


Figure 8. Map of Remote Sensing Areas in Bay.

Other less tangible sources have adverse effects on the magnetometer. Radio transmissions, diurnal variations in the earth's magnetic field, solar magnetic storms, and local geologic features can be reflected in the magnetic record. All of these causes, and others, must be factored in when determining which anomalies merit further investigation by ground-truthing with divers (Breiner 1973: 6-8).

Another factor influencing the magnetometer's ability to detect shipwrecks is the expected type, condition, and age of a shipwreck. If a survey is designed to locate late 19th-century wrecks, then a large concentration of ferromagnetic metals--iron or steel--is sought. However, when searching for a 16th-century ship, a low content of iron is expected, although 16th-century ships carried iron cannons and anchors that individually produce strong magnetic signatures. Another critical factor affecting magnetic content is the integrity, or condition, of the shipwreck. Had the ship suddenly wrecked, or had it been stripped and abandoned? Known wrecks are subject to contemporary as well as modern salvage activities that may remove large parts of the vessel and the more important iron features, such as cannons or anchors.

In Pensacola Bay a high percentage of the ships investigated last year had been abandoned and showed evidence of fire and salvaging (Franklin et al. 1992). Fire leaves metal fastenings littered throughout the site which are detected by the magnetometer, while partial salvage removes many of the ship's iron components and affects the magnetic signature of the wreck.

Environmental aspects also influence the integrity of a shipwreck and its magnetic character. In the bay, a wooden shipwreck along the shore or in shallow water would not face the same destructive forces as a wreck at the beach. A beach wreck would presumably be widely scattered due to the dynamic forces of the surf, whereas in the bay (pacific in nature when compared to the Gulf) a wreck would remain more intact.

To become more familiar with all these aspects that affect magnetic detection, a couple of known shipwreck sites in the bay were surveyed to acquire magnetic signatures for future reference and comparison to other anomalies. The first was a turn of the 20th century steamer still possessing its boilers. As expected, the ship produced a very strong magnetic signature.

The second was an eighteenth-century wooden British warship lying in shallow water that had been previously excavated, leaving only the iron-fastened timbers behind. The site produced a series of dipolar anomalies of low amplitude, but which lasted for some duration. Because of the shallow water, the sensor head was walked over the wreck at a slow speed. If the site had not already been known, several factors could have precluded its detection and recognition as a shipwreck. Water depth affects distance from the sensor head to the object, which determines the integrity of the magnetic signature. Boat speed, on the other hand, affects the duration of magnetic signature. A slow speed increases duration, while a faster speed reduces duration.

Considering all the conditions, both natural and cultural, that can affect the magnetic signature of historic submerged cultural resources, the Survey assessed magnetic anomalies by visual inspection, rather than by surface interpretation. In several instances many magnetic anomalies, both strong and weak, were discovered in a survey area, indicating the possibility of historic material and modern rubbish. To better determine the nature of the magnetic anomalies and to save dive time, a side-scan sonar was procured to try to obtain sonograms of the bottom. The side-scan sonar is discussed more fully later in this chapter.

Positioning System

A SI-TEX Model EZ-97 Loran-C receiver provided the position control for the magnetometer survey. The Loran-C operates by receiving signals from a local chain of radio transmitters, then translates these into Lines of Position or LOPS. LOPS, or coordinate numbers, run in a north-to-south and east-to-west direction. Certain factors govern the accuracy of the system--namely, the distance from the transmitters and obstacles the signals must overcome to reach the receiver. These obstacles are mainly land and water, although certain other radio transmissions, mostly military in nature, can affect the transceiver's ability to correctly reflect the vessel's true position. Loran-C is not the most accurate

positioning system available, but it does have a high degree of repeatability, between forty and sixty feet, or less. Once the numbers of a location are known, they can be used to place a vessel very near the same location again. Other means, such as visual ranges, a fathometer, or a magnetometer, can then be used to locate a site more precisely (SI-TEX Manual 1987; Franklin et al. 1992: 113).

Magnetometry Survey Methods

The main goal of the magnetometer survey was to ascertain the location of submerged cultural resources, especially colonial shipwrecks, in Pensacola Bay. To make certain that a shipwreck would not be missed, parallel survey transects were spaced 45 feet apart. While increasing the time needed to survey the area, tight lane spacing also increased the chances of locating significant sites. Past surveys were often conducted using very wide lane spacing, but it is now generally agreed that closer lane spacing sharply reduces the chances of missing archaeologically significant sites (Murphy and Saltus 1990:94; Garrison 1989:1-5). While closer lane spacing increases the likelihood of locating a shipwreck, it also improves the detection of modern magnetic debris.

Several procedures were used to increase the accuracy of the Loran-C positioning system. In order to insure proper coverage in 45-foot lane increments, land references were used to help govern the vessel's track over the water. Another procedure was the use of a series of marker buoys, in conjunction with a compass, to highlight the survey area and to ensure complete coverage.

Throughout the survey, the magnetometer was programmed to a $^{10}/_{100}$ scale and a two-second sample interval, with an accuracy of 0.2 gammas. Boat speed was usually between 5 and 6 knots during systematic survey transects, while boat speed during refining lanes was slightly slower.

Relating the boat's location to the magnetometer readout consisted of recording the Loran-C numbers each time the event mark for the magnetometer was depressed. Back on land, the Loran-C numbers were transcribed onto the magnetometer paper at the corresponding event mark, or station. Then each individual station reflecting the boat's survey track was plotted on graph paper to determine that the surveyed area was receiving full coverage. These plots, however, only depicted the location and direction of the vessel. They did not show the position of the towed sensor head which indicated where the anomaly occurred. To determine the sensor head and anomaly locations, the distance from the boat to the sensor head (about forty to fifty feet) was used as the offset. This provided an accurate location of the anomaly.

Plotting the anomaly's position was a simple operation involving several preliminary steps. First, the two stations that bracketed the anomaly were plotted. Next, all pulses, or readings, between the two stations were counted, and using a scaled ruler, the pulses were marked between the stations. Then, using the highest recorded amplitude of the anomaly, this pulse was chosen as the vessel's location when recording the anomaly. Finally, the distance from the sensor to the boat was plotted backwards from the vessel's location to show the anomaly's position. It was important, of course, to note the vessel's direction when the anomaly was recorded. Finally, Loran-C numbers of the anomaly were figured from the chart. Sometimes several anomalies represented the same target. Plotting anomaly location with this method allowed a quick determination about an anomaly's singular or plural source.

Another more traditional approach to finding submerged cultural resources is to produce a magnetic contour map. Although still done by hand at times, the maps are usually drawn by a computer using software designed for that purpose. Such maps depict the contoured anomaly, much as a topographical map represents land features, dependent on duration, amplitude, and polarity. These maps can reveal intensity, location, orientation, and size of anomalies. In the Pensacola Survey, contour maps were not prepared; instead all anomalies meeting certain criteria were immediately ground-truthed and identified.

Ground-Truthing Operations

The selection criteria used by the Survey to choose anomalies for ground-truthing depended on several aspects of magnetometry. These included an anomaly's duration and amplitude and how many

transects were affected by the anomaly. In addition, its location in either an historically or geographically important region, or in the vicinity of a reported wrecksite, was considered. Applying these guidelines to ground-truthing a magnetic anomaly resulted in diving on several rock piles, one shipwreck tentatively dated to the colonial period, and modern rubbish.

Once an anomaly's Loran-C numbers were determined by plotting, the next step was to locate and pinpoint the target in the water. A marker buoy was dropped at the location to begin the process. Usually the anomaly was located within the immediate vicinity of the buoy, although on other occasions, some time was spent searching for the anomaly. Once the anomaly area was located, transects were run along the cardinal directions to delineate the anomaly's location, which was identified by throwing marker buoys. After determining the anomaly's position, swimmers jumped overboard to float the sensor head around until it was directly above the highest or lowest amplitude, as guided by the magnetometer operator. A final buoy was then dropped to mark the spot. The method proved highly effective in pinpointing an anomaly's position prior to visual inspection. In some cases, divers landed directly on the target, and in others, ten to thirty feet from the target.

Most commonly, the magnetic target was hidden or obscured by mud or sand and poor visibility. To ensure that the anomaly was discovered, divers conducted circle searches out to approximately 50 feet from the marker buoy. While circling, the diver continually sounded the bottom with a 5-foot hand-held probe until the anomaly was found. Usually the anomaly was discovered by this method, although some were not, since they were buried deeper than the probe could reach.

During subsequent operations to relocate anomalies identified during the initial surveys, some anomalies warranted no further attention after running the survey vessel around the target several times. They were either too weak, not extensive enough, or were never found again. Their positions, however, were recorded for later reference.

Magnetometer Survey Locations

Several areas in Pensacola Bay thought likely to contain shipwrecks underwent extensive magnetometer scrutiny. These included the western shore of Gulf Breeze, Old Navy Cove, a small section on the southern side of Gulf Breeze in Santa Rosa Sound, and along Emanuel Point in Escambia Bay. Several smaller areas along the Pensacola waterfront were also surveyed with the magnetometer.

The west side of Gulf Breeze was chosen for two reasons: the report of three sunken vessels along the sandflats and the recommendation from the 1991 survey as an area deserving remote sensing examination. Old Navy Cove proved one of the most attractive locations for a magnetometer survey, since the cove was an historically important area to careen and anchor vessels, and also a possible Luna site. Also, the existence of two colonial British warships and other sunken vessels ranging from the mid-1800s to early 1900s, the remains of a marine railway, and the presence of rock piles in the confines of the cove suggested the existence of more unidentified cultural material. In Santa Rosa Sound, on the northern channel bank of the Intercoastal Waterway, a sunken vessel fastened with treenails had been reported. Emanuel Point, another possible Luna site, also merited investigation. Finally, a shrimpboat captain pointed out several targets along the Pensacola Waterfront that had snagged his nets over the years. At one snag, his nets brought up some planks which could be associated with a shipwreck. The results of the magnetometer investigations in these areas are discussed in the next chapter.

Side-Scan Sonar Survey

Introduction

The Survey acquired use of a side-scan sonar and a skilled operator to obtain sonographs of various areas in the bay. Intended objectives of the sonar survey included collection of additional information on areas previously surveyed by magnetometer, on areas of known concentrations of modern ferromagnetic debris where historically important activities took place, and on reported shipwreck sites.

Skillfully operated, a side-scan sonar can give much more useful information about a target than a magnetometer. Target size, orientation, and configuration indicated by this method allow the anomaly to be interpreted without diving. Ideally, surface identification can determine whether a target is man-made (modern or old) or natural, and whether the bottom is sand or mud. Identifying objects from the surface, while not foolproof, can save valuable dive time for other, more worthy sites. In addition, a side-scan sonar survey takes less time than a magnetometer survey--an important consideration when time is limited. It was hoped that older shipwrecks in Pensacola Bay would be more easily detected by side-scan sonar than by magnetometer.

Side-Scan Sonar Principles

A side-scan sonar device consists of two transducers located on the port and starboard side of a towfish aimed toward the sea floor. These transducers produce sound waves which bounce off the bottom (or off a target) back to the transducers; these waves are then amplified and sent to the control/display monitor to produce an image. The monitor regulates the signal output and also displays the sonograph of the bottom surface (Mazel 1985: 1-2).

The side-scan sonar device measures the time it takes sound waves to travel to the bottom and back again. Time is a function of distance, which is displayed on scaled paper. The operator watches for acoustic shadows--usually white in color on the paper--which indicate that some object is protruding above the surrounding surface. Promising targets can be investigated further by divers.

Many factors contribute to the overall picture generated by the side-scan sonar, and subsequently to its ability to be interpreted by the operator. Some of these factors include man-made noise such as engines, fathometers, and boat wakes. Natural phenomena like thermoclines, porpoises, and the sea surface also influence the readouts. Operational features can also limit the quality of sonographs, such as the range, or scale, in which the sonar is working. Longer ranges cause target clarity to diminish on the sonograph by shrinking the object's size and distinguishing features, while a lesser range results in a truer representation of size and an increased possibility of correctly identification (Mazel 1985: 3-49).

Side-Scan Sonar and Positioning System Specifications

A Klein Model 590 side-scan sonar, with dual resolution of 100 KHz and 500 KHz, provides both sub-bottom and bottom detail to better detect the extent of an anomaly. The 100 KHz resolution penetrates below the bottom's surface to some extent, with better acoustic penetration through mud than through sand. Surface representation of the anomaly, however, is not as clear when using this frequency. The 500 KHz resolution generates a much better picture of objects protruding above the bottom's surface than the 100 KHz, but provides only minor ground penetration. Combined, the two sonographs yield much more usable data to interpret the source and extent of an anomaly than would use of only one frequency.

Survey positioning was accomplished using a Trimble Global Positioning Satellite system connected directly to the side-scan monitor. The Loran-C was also used as an auxiliary positioning system.

Side-Scan Sonar Survey Methods

Side-scan sonar survey lane spacing was dictated by sonar range, generally either 25m or 150m, and by the desire to achieve a fifty-percent overlap. Survey lanes were controlled by the GPS navigating system. Two boats were used during the survey--one 21-foot Continental survey boat, which contained all of the sonar equipment, and one 24-foot Aquasport dive boat, which was used for the diving operations.

A survey method of alternating between systematic coverage and target refinement was adopted during the sonar work. The systematic approach consisted of running survey lanes over a specific area. Later in the day, targets were chosen for exact positioning and ground-truthing. To limit unnecessary diving time, the side-scan sonar was used to pinpoint site locations.

Ground-Truthing Operations

The decision to ground-truth particular targets was made by the field director in consultation with the operator. Knowing that remains of colonial ships would be low-lying on the bottom's surface, and associated with ballast rock, the survey staff ground-truthed any anomaly closely resembling this signature. Additionally, any break in the regular pattern of the bottom surface was chosen for visual inspection, as well as any feature thought to possibly represent historic material. Sonar targets with large or lengthy shadows, signifying high relief from the bottom, were usually interpreted to be modern. Unless they displayed any features indicating otherwise, these anomalies were usually not chosen for ground-truthing. After the survey crew chose targets for diver inspection, the sonar was used to pinpoint the target location.

Pinpointing consisted of replicating the initial survey run as closely as possible. A buoy placed at the boat's previous latitude/longitude located the survey lane, which was then run in the same direction as before. This increased the chances of finding the anomaly rapidly so precise positioning could begin. Once the target was detected again, several lanes were run on either side of it, and finally a buoy was dropped on the target. Then another lane was run to make sure the buoy was on or very near the target. Radio contact with the dive boat communicated where the buoy was in relation to the target, the probable water depth, and the bottom consistency. Ground-truthing then commenced on the site for positive identification. Target positioning continued until enough anomalies were refined for a day's dive, and then systematic survey coverage resumed.

Later, the Loran-C was used to locate the anomaly's position, a method requiring more steps to actually find the site. The process first called for marking with a buoy the station where the anomaly was discovered. Then, using the scaled sonograph for reference, the target's distance from this point was marked, providing the center of the circle search. Before diving on an anomaly, divers were briefed on what to look for by referring to a photocopy book containing sonographs of targets to be ground-truthed in order to note their shape, orientation, and bottom makeup. Once on the bottom, the diver could then navigate around the target area after discovering one section of the anomaly during the circle search. Geological conditions, however (mainly 3-4 foot sand ridges along the main ship channel in the bay), limited effectiveness of the circle search and required a new method of ground-truthing in this area.

The new ground-truthing operation entailed having two divers tow-board around a buoyed area marking the target site. In this way, divers avoided becoming entangled in the sand ridges and were able to cover a large area very quickly and systematically. Besides the main target, other targets were often located in the search area and periphery. Most were modern trash, although several ceramics dating to the middle to late nineteenth century were found. Following the identification of the anomaly, a buoy was placed at the site and then its Loran-C numbers were recorded.

Side-Scan Sonar Survey Locations

Several parts of the bay were chosen for sonar scrutiny. The north side of Santa Rosa Island, from Pensacola Pass to beyond the old Coast Guard station, was selected due to its historical importance. Prior events in the area included anchoring and careening, and a naval battle between the French and Spanish in the eighteenth century (Figures 9, 10, & 11). The waterfront of the Naval Air Station was chosen due to reports of several wrecks. To acquire more information about areas previously surveyed with the magnetometer off the west side of Gulf Breeze, certain areas consisting of magnetic anomalies possibly indicating shipwrecks were investigated with side-scan sonar.

Several targets in Old Navy Cove that were previously discovered with the magnetometer and then ground-truthed warranted a second look using the side-scan sonar to determine whether there were additional remains at the sites. The reported "Treenail Wreck" had escaped detection by the magnetometer, and it was a prime target for the side-scan sonar. Initial coordinates placed this wreck east of a certain channel marker, while new coordinates placed it further west. Several strong magnetic anomalies discovered near Emanuel Point also warranted further investigation and identification. Additionally, some of the sites producing magnetic signatures reported by a local shrimper were slated for a sonar sweep. Finally, a shipwreck thought to be the USS *Preble* was chosen to obtain a better picture and location of the site.

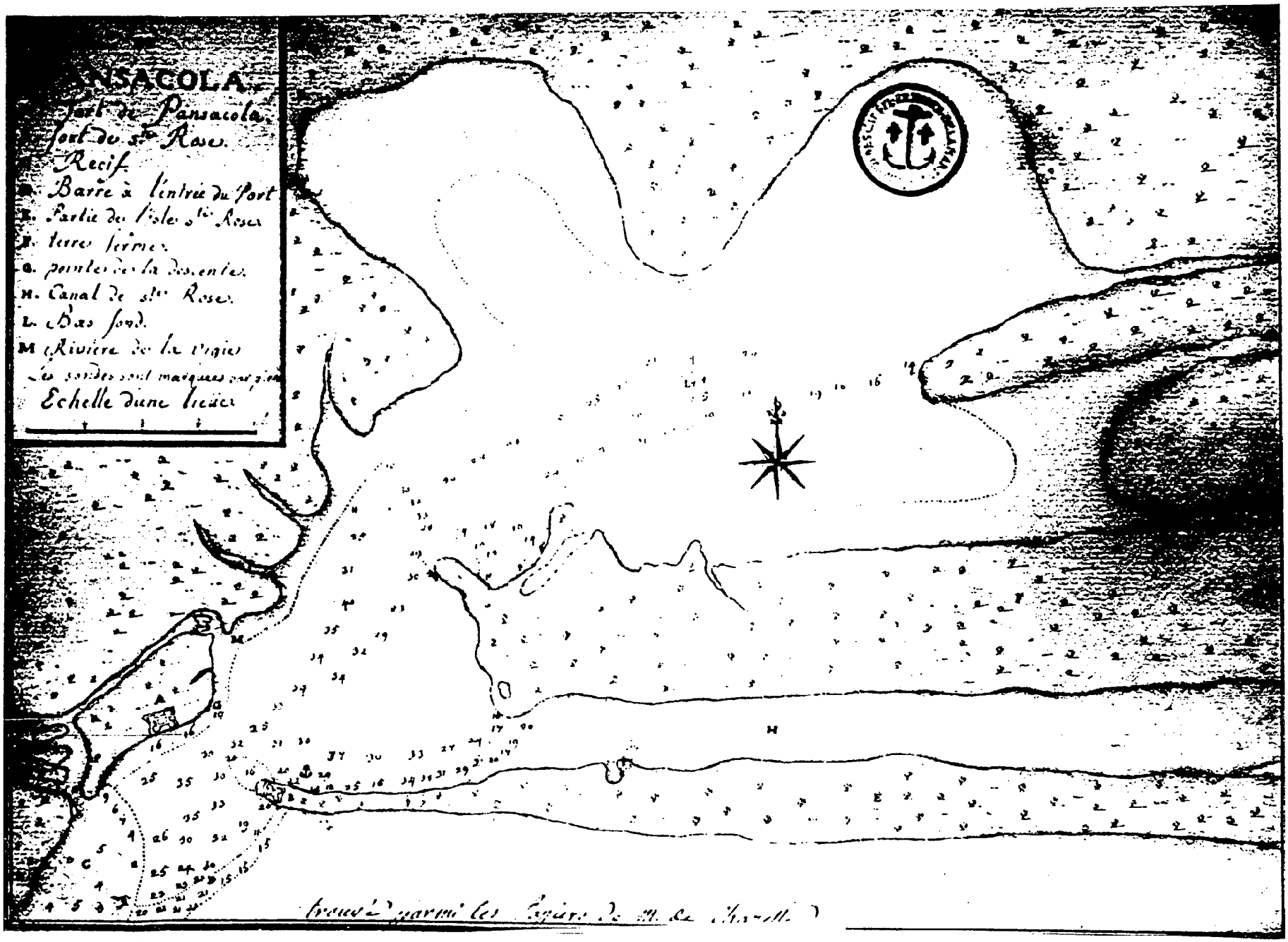


Figure 9. French Historic Map.

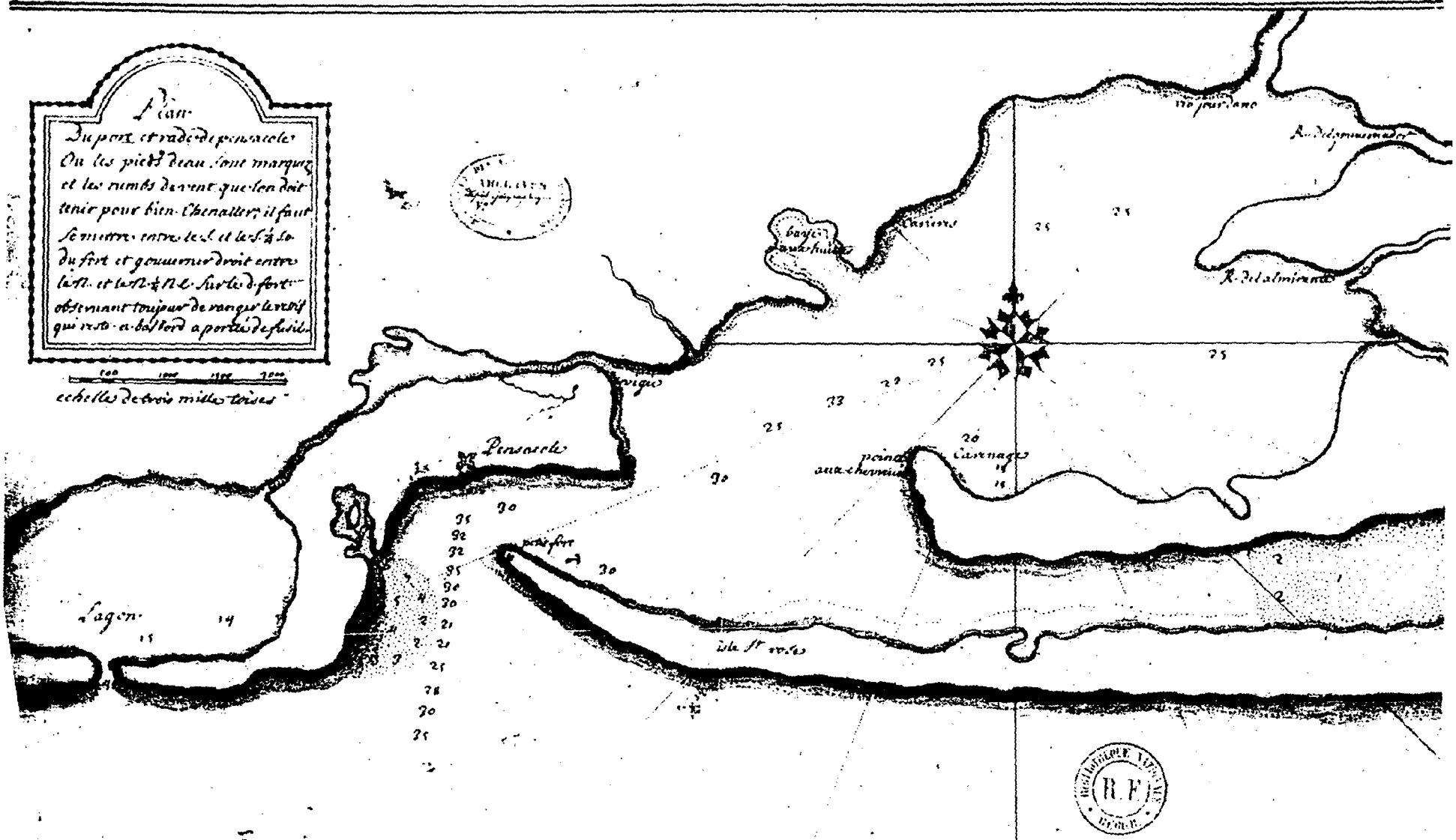


Figure 10. French Historic Map.

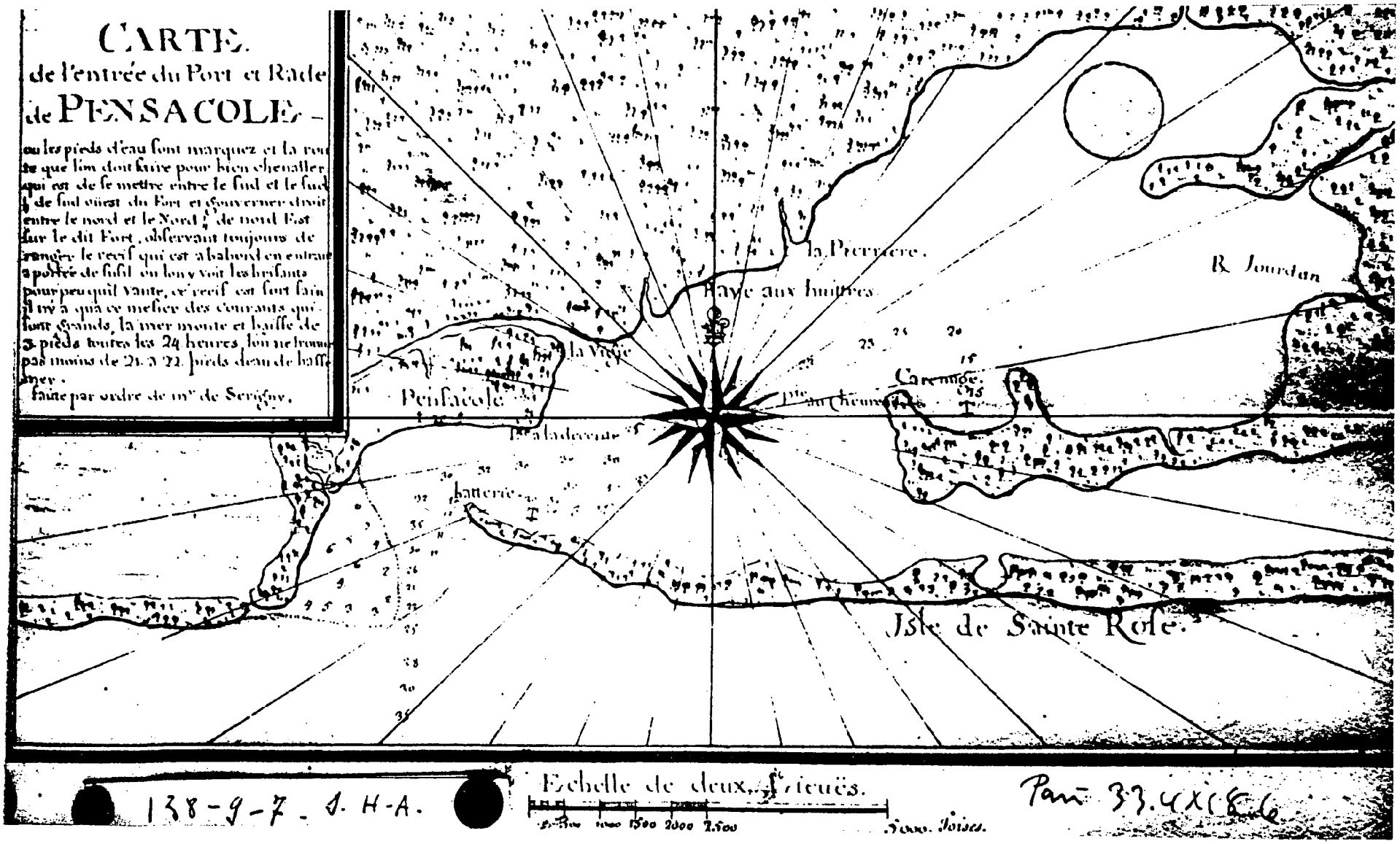


Figure 11. French Historic Map.

CHAPTER 5. REMOTE SENSING SURVEY RESULTS

Two different types of archaeological prospecting equipment was used by the survey: a magnetometer and a side-scan sonar. The magnetometer was primarily used to locate shipwrecks or other targets by their magnetic signatures, while the side-scan sonar was brought in to identify surface and subsurface targets. The sonar was employed both in previously surveyed areas to determine the sources of magnetic anomalies, and in new survey areas throughout the bay. Many anomalies were detected during the course of the remote sensing surveys, most of them of modern vintage, although some proved to be of a more historic nature. The following discussion of the survey results is divided into individual sections on the magnetometer and on the side-scan sonar. Those anomalies representing shipwrecks are discussed more fully in Chapter 7.

Magnetometer Survey Areas

West Side of Gulf Breeze

From June 5 to July 9, 1992, the west side of Gulf Breeze was subjected to an intense magnetometer survey. The survey covered the span from Deer Point to Fair Point, and outward to a distance of 1,340 yards from the shoreline. There were 279 survey lanes, spaced 45 feet apart, for a distance of 164.3 linear miles. The G-866 magnetometer was programmed on the $^{10}/_{100}$ scale with readings set for two-second sample intervals. Boat speed varied between five and six knots.

Approximately 534 magnetic anomalies were registered during the survey; of these, probably twenty percent represent duplicate anomalies. Gamma intensities ranged from as high as 10,000 gammas to approximately 7 gammas, and lasted 2 seconds to over 30 seconds. Some anomalies caused the magnetometer to default as a result of the large amount of magnetic material. Due to the nature of the built-up shoreline along the west side of Gulf Breeze, accumulation of magnetic debris over the years was anticipated. Of course, tight lane spacing contributed to the high number of anomalies recorded, since the same magnetic debris was detected more than once in other adjacent lanes. Much seemingly insignificant debris was recorded that would have not been detected in larger lane spacing.

So many anomalies were recorded in the survey area by the magnetometer that it was decided not to conduct any large scale ground-truthing operations until a sonar survey had been completed. It was hoped that only significant anomalies with surface relief, easily visible during dive operations, would be represented in the sonar record.

Two anomalies on the west side of Gulf Breeze were chosen for ground-truthing due to their intensity and duration. The first measured over 1000 gammas, had a long duration, and showed up in several adjacent lanes. Ground-truthing revealed it to be a dredge pipe resting on a mud-sand bottom. Remnants of a snagged net led the divers to the pipe, which extended several feet into the water column. The pipe angled along a northeast-southwest axis for some distance.

The next magnetic anomaly chosen for ground-truthing had shown up previously, on the 1991 side-scan sonar survey along Fair Point near the channel marker. The sonograph revealed several unidentifiable features casting shadows on the bottom, and depicted a subsurface disturbance surrounding the surface material that resembled the outlines of a wreck (Figure 12). An attempt was made that year to locate the sonar anomaly, but its source was not discovered. Magnetometer transects over the general vicinity of the sonar anomaly in 1992 revealed the presence of material causing a magnetic disturbance.

After the survey crew plotted the locations of the magnetic anomaly and the sonar anomaly, the two proved to be the same target. Magnetometer transects were undertaken after buoying the areas to determine the precise location of the anomaly. Divers found it to be someone's private fishing reef easily relocated by its proximity to the channel marker. The site consisted of a fiberglass tri-hull boat, car tires, a washing machine, and miscellaneous metal objects on a sandy bottom that slowly drifted into a thick gray mud.

Additional data about anomalies generated by the remote sensing survey and ground-truthed off the west side of Gulf Breeze are discussed in the side-scan sonar section later in this chapter.

Old Navy Cove

Between July 21 and August 18, 1992, magnetometer operations resumed off Old Navy Cove. The survey area stretched from Town Point to Fair Point; the point furthest offshore was approximately 1,530 yards. Fifty lanes covering 24.7 linear miles were run. The same scale, sample interval, and boat speed were used throughout this survey as were used in the survey off the west side of Gulf Breeze.

Many anomalies were discovered; of these, only a fraction merited visual inspection. On-surface decisions, based on selection criteria, determined that many anomalies did not warrant investigation. The majority of the ground-truthed anomalies proved to be insignificant, although a small fraction could have some historical importance. A reported wrecksite was also located during the survey.

The only magnetic anomaly that had any definite historical value was a buried footer off Town Point, probably associated with the remains of the Gulf Marine Railway. It was located near the drop-off from the sand bank into the mud bottom and in-line with the exposed remains of the railway. The anomaly was buried under approximately four feet of mud. Probing roughly outlined the rectangular object, which measured around 14 feet by 10 feet, and extended some distance in depth. Additional hand-probing down to the object's surface revealed that it was made of roughly poured concrete.

Gulf Breeze residents later reported a wreck buried beneath the footer. An unrelated report by another local resident about the same area off Town Point suggested an unidentified wooden snag. Neither account could be verified except by digging into the mud surrounding the footer.

Other anomalies in Old Navy Cove included several ballast dump sites and miscellaneous iron debris. Several magnetic targets were not located during ground-truthing operations. One ballast dump pile (T-B4-2) was investigated several times throughout the survey. The first investigation revealed a squared timber, a river cobble ballast stone, and some tree stumps. The objects were covered in a dark gray mud from one to four feet deep. Small barnacle and oyster shells attached to the objects indicated that the material had been exposed for a short period before being buried. A subsequent investigation at the site revealed a quarried rock, but the squared timber or any other material was not relocated.

Because of the presence of the squared timber and ballast stone, the area was surveyed using sonar to generate a better picture of the site's extent. The sonograph revealed a roughly oblong site about 30 feet long and 10 feet wide. Additional visual investigations to confirm whether or not the site consisted of anything besides the stones revealed no underlying wreck. Debris retrieved from the site during the last investigation included red tile and brick dating from the late eighteenth century, limestone and quartz, and other miscellaneous lithics. With no timbers below the rocks, and no magnetic or sonar anomalies indicating otherwise, the site most likely represents a ballast, or mixed content dump site, possibly related to offloading activities of the marine railway. Another possibility is that the site is the barge loaded with construction rubbish reported by Mr. Bob Duncan (see Chapter 6).

Another rock or ballast dump site (T-4-2) was detected during the survey. The fathometer indicated a protrusion above the surface where the magnetometer had indicated a weak anomaly. After locating the anomaly, divers investigated the site and discovered some lone rocks; after a couple more search line sweeps, they detected with the probe a large pile of rocks buried under one to three feet of mud. Two pieces of flat rock showing evidence of quarrying were retrieved. The stones showed very little barnacle or oyster growth, indicating little protrusion above the mud. Fishing line was entangled throughout the stones, suggesting that someone knew the location at one time. A reliable indicator of the amount of time since deposition would have been the discovery of the fisherman's beer can or bottle amid the stones. In any case, the site most likely represents a rock dump for use as a private fishing spot.

A possible wrecksite consisting of ballast covered by a bottom-enhanced dump (T-6-2) had been pointed out previously by a resident of Gulf Breeze to a local shipwreck enthusiast, who reported it to

the Survey. Once the reported location of the site was plotted, controlled magnetometer lanes were run over the area; after several lanes, a magnetic anomaly was detected near the buoy. Following further refinement of the anomaly's location, divers discovered a muddy bottom with no surface protuberances, but in probing under the mud, divers encountered several small concreted iron objects, two car windows, soda bottles, beer cans, and a copper valve scattered throughout the search area. At the 50-foot radius on the search line, a snagged shrimp net led the way to a rock pile.

The rocks were of varied shapes and sizes and had sharp edges. Lying among the rocks was miscellaneous debris, including a toilet bowl. By removing the lens of rock in the central portion of the pile, the probe easily slid thorough several feet of soft sand and mud. Absence of timber beneath the rocks showed the site was not a shipwreck. Further investigations around the perimeter confirmed the lack of any ship timbers.

Later, Mr. Duncan located the site again and related its history to the Survey crew. He stated that his ancestors had thrown debris in this particular spot because they had detected that a different species of fish dwelled in this area and not in other parts of the cove. In order to enhance the fishing prospects and attract more fish, assorted debris was thrown on this site, with the last thing dumped being a toilet discarded by his father. While the original reason behind tossing the debris is intriguing and possibly makes the site archaeologically interesting, the toilet aptly indicates its historical significance at this point.

In addition to rock piles, other types of magnetic anomalies were investigated. Probing at one anomaly (T-5-2) revealed iron sheeting and pipes. Several other anomalies were noted, possibly geological in origin. Anomaly (T-B5-2) revealed the possible relic shoreline of Old Navy Cove. A line of vertical logs, some horizontal logs, and small wood detritus was buried about a foot or so under the mud. Underneath one of the logs was a hard lens of sediment. The line of three vertical logs may have been old, as no wood preservative, such as creosote, stained any gloves, or the logs may possibly have been tree stumps. Ground-truthing of another anomaly (T-B1-2) did not reveal any artifacts, although a mud hole was discovered. The probe easily sank into the mud, but at 15 to 20 feet from the center, a hard and compact sand bottom was encountered. Either the site represents a natural phenomenon or was a man-made well, and the source generating the anomaly is further down the hole.

Two other sites (T-2-2 & T-BB-2), after ground-truthing, did not reveal any manmade magnetic sources. One of the anomalies (T-2-2) seemed promising due to its proximity to a known British wreck. Ground-truthing of the site, however, only revealed a hard concreted lens that, after repeated attempts, was penetrated by the probe. Additional investigation may be warranted on some of the sites, but would require extensive digging and dive time.

Butcherpen Cove

On October 29, 1992, a magnetometer survey was conducted to locate an anomaly tentatively identified as a barge, which had been discovered during the side-scan survey of the area (see discussion below on Butcherpen Cove under Side-Scan Sonar Survey Results). A buoy was tossed to mark the location of the barge, and magnetometer lanes were run from east to west. The whole area was riddled with magnetic anomalies. Amidst the discordant magnetic background, one magnetic anomaly stood out and was thought to possibly be the barge. It was characterized by long duration and medium amplitude, close to the marker buoy.

After pinpointing, the anomaly was ground-truthed and debris was immediately encountered just below the muddy bottom. Large chunks of quartz, other types of stones, bricks, and some wood were discovered in depths of 1 to 4 feet of mud over a concentrated area. Results of a 50-foot circle search, however, did not indicate a very large spread of rock, although during the course of the search divers found a squared post, and directly underneath it, a hand-carved 0.9 foot piece of tongue and groove plank. The location of the site corresponded with Mr. Duncan's report of some barges, called the Cuban Barges, that had been loaded with rocks and purposefully sunk by a marine contractor. No large, articulated wooden features that would suggest the presence of the barge were encountered during the search with a 4-foot probe.

While Mr. Duncan was with the survey crew on June 2, a dark spot was discovered on a sandy bottom near Wayside Park in Gulf Breeze. A snorkeling reconnaissance of the site revealed a rock pile of small river cobble heavily encrusted with dead oyster shells. Later diving investigations noted pottery sherds, glass, and pipe stems (See Chapter 7 about the Wayside Park Site for a fuller discussion).

Santa Rosa Sound

A search for the "Treenail Wreck," reported by Larry Broussard, a knowledgeable sport and wreck diver in Pensacola, was conducted on August 18 and 19, and then again on October 21. Initially, the survey in August centered on an area slightly southeast of Channel Marker 142 along the 18 foot contour of the northern bank of the Intracoastal Waterway. A large area was covered, with lane spacing of approximately 45 feet, to increase the chances of locating the reported wreck. Later, additional information positioned the wreck about 600 yards further west, and the side-scan sonar and magnetometer were used to try to locate the wreck at the new location.

In the first magnetometer survey, five anomalies warranting further investigation were discovered; two did not merit ground-truthing, based on their low intensity and short duration. Bottom conditions and visibility varied from site to site. Those items along the bank were slightly exposed above sand, while those in the channel were buried under a loose to compact layer of mud. None proved to be historical. The anomaly (T-2-5) along the sand bank was a washing machine, and another was some cable and pipe lying near the channel marker (142). Another target could not be seen due to the sediment depth. It might have represented another wreck reported and confirmed in the vicinity, the *Skiathos*, which sank in the late 1800s. Any visible traces of the vessel have probably been covered by recently deposited sediments.

The second reported position of the "Treenail Wreck" was plotted and the surrounding area was survey by sonar. Results are detailed in a subsequent section of this chapter. Several anomalies which merited further investigation were located in the sonar survey near and around the plotted location of the wreck.

On October 21, the anomalies were buoyed, along with the new reported location of the wreck, and magnetometer operations commenced. Transects were run east to west in an area large enough to encompass the buoys, and along the 18-foot contour. Only one anomaly (T-5-5) warranted further investigation. It was located about fifty yards northeast of the reported location of the wreck. Ground-truthing revealed no material either above or below the mud and silt bottom. Lack of magnetic signatures suggested the sonar anomalies were natural bottom features.

Emanuel Point

On August 28 and 31, 1992, a magnetometer survey was completed from the mouth of Bayou Texar to Emanuel Point in Escambia Bay, with the furthest distance from shore being 1360 yards. Forty-nine lanes were run covering approximately 25.4 linear miles. The standard magnetometer scale, sample interval, and boat speed were used. Refining of anomaly positions took place on October 26, and ground-truthing occurred the next day.

Three magnetic anomalies were chosen for ground-truthing. After pinpointing anomaly T-5-3 with the magnetometer, divers ground-truthed the area by a circle search. Probes penetrated about 5 feet into the soft, dark mud, and a 50-foot sweep of the target site did not reveal the anomaly's source. When the second anomaly (T-14-3) was ground-truthed, divers immediately identified a metal structure snagged with shrimp nets. The structure rose about 5 feet above the sand and oyster shell bottom in 10 feet of water. Constructed of iron tubes with bolt plates at the ends, and interspersed with steel cable and chains, the target is likely a part of shrimp net rigging (Pers. Comm. Capt. Jeff Clopton, 1992). Probing and a 20-foot circle search revealed no additional material.

The third anomaly (T-7-3 & T-8-3) was a shipwreck. During the circle search divers located a few rocks on a sandy bottom in 10 feet of water. Further investigation revealed the main pile of rocks heavily encrusted with living and dead oysters. The rocks varied in shape and size, although the majority

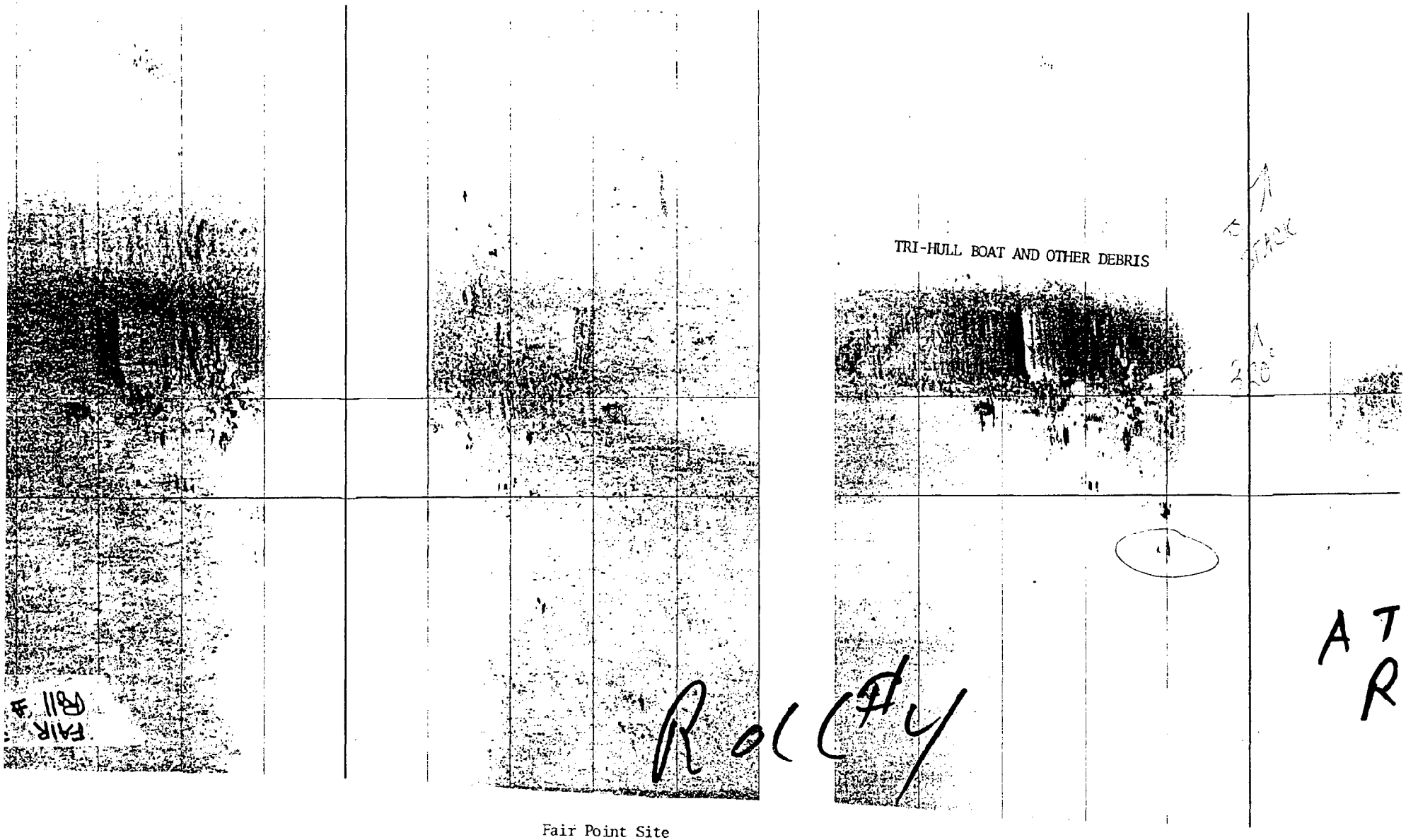


Figure 12. Side Scan Sonograph of Fair Point Anomaly.

were smooth, round river cobbles, dark gray in color. The river cobble ranged in size from a few inches to a foot. Other stones included small pieces of quartz and unidentified pieces of other minerals. No artifacts, such as pottery, pipe stems, glass, or concreted iron objects, could be found on the surface of the pile.

Removal of some of the rocks revealed wood. The roughly-surfaced piece of wood was eroded at the tip, while underneath it was smooth and flat. If it were a part of a ship, the board most likely is a ceiling plank. Additional search and probing revealed buried rock, but no wooden frameline of a ship.

To learn more about the extent of the site and its magnetic character, several magnetometer transects were run along the cardinal directions. These showed strong magnetic readings in and around the ballast pile, suggesting a ship with metal fasteners.

Later, the Survey crew dug a test pit near the middle of the ballast pile. About 2 $^1/_2$ feet below the ballast, divers encountered the dunnage, and then timbers, along with unglazed and black lead-glazed coarse earthenware sherds. The timbers were a ceiling plank and a foot wale, and below these pieces, a frame. Subsequent archaeological examinations at the site are discussed in the Emanuel Point Wreck section in Chapter 7.

Pensacola Waterfront

On June 22, 1992, a local shrimper pointed out several targets which he had snagged many years ago. Using visual ranges, magnetometer lanes were run over the specified areas. The first spot was located off the Port of Pensacola warehouse, where the shrimper had pulled up some planks in his nets. Several anomalies were discovered in the vicinity and their positions recorded. Off the Pensacola Auditorium, the second anomaly barely fell out of range of the magnetic disturbance created by the auditorium bulkhead. The shrimper stated that his nets had pulled up some concreted iron shavings; he believed they were from an anchor. The next site was off the old Muscogee Dock, to which, on this particular day, a metal barge was tied. Magnetic disturbances emanating from the barge masked the reported target in question. The targets were not visually inspected immediately, and so far only the one with reports of planks has been investigated.

Two separate days, June 26 and July 28, were spent trying to locate and pinpoint the magnetic anomaly in the area. On the first attempt, the area was pinpointed by several magnetometer lanes. Soft and deep mud hindered an effective visual search of the area. The second attempt fared no better. The site, however, remains a priority, and during the winter months another ground-truthing expedition is slated, along with a more intensive survey off the old Muscogee Dock.

Side-Scan Sonar Survey Areas

Santa Rosa Island-Pensacola Bay Side

Between September 8 and September 10, 1992, a side-scan sonar survey was conducted along the north side of Santa Rosa Island. The survey area was divided into three parts: east, middle, and west parts, to conform more closely to the navigation channel and to avoid a known disposal area. Poor weather, however, prevented completion of the east survey area. Over 200 anomalies, some of which were duplicate targets, were discovered in the combined sections. Most were interpreted on-boat as modern by the sonar operator, consistent with reports of many objects having been dumped in the area for fishing spots, military disposal, anchorages, etc. A priority list was established to ground-truth the most promising sites. No targets in the west section warranted immediate ground-truthing. Many promising anomalies, however, were located in the middle and east sections.

Ground-truthing in the middle and east sections was facilitated by using the sonar to pinpoint each location. Eight anomalies in the middle section were chosen for immediate visual inspection by divers. For the most part, these yielded no historically significant material. Three sites (#30; #114; #116),

covered by water ranging in depth from 30 to 50 feet, were found to be natural features of a barren sand bottom rippled with medium-sized sand ridges. Circle searches and probing discovered no material remains at the sites. Three sites (#30A; #91; #91E) were modern rubbish. The first site consisted of a car hood and tires, a boat steering wheel, and some metal cable. Cinder blocks and flanged iron or steel pipes littered the second site. The last target area was a group of car tires.

The remaining two anomalies (TMB; #111) contained historically significant material. A local charter boat captain reported that he had found a ballast pile some years ago and provided LOPs for the site (See Chapter 6, Captain Morris Bagleo). Sonar did not locate the site, but did show various objects adjacent to the pile that had been dumped over the years to attract fish. Persistent underwater search finally located the historic site which was most likely an anchorage. Artifacts included lumps of coal, iron scraps, glass fragments, a relish bottle, ceramic sherds, and ceramic ginger beer bottles. The reported ballast was probably the coal. No ship timbers could be found by probing, suggesting the site was an old anchorage.

The sonograph of Target #111 (Figure 13) was interpreted by the sonar operator as a stone ballast pile. Divers confirmed it to be a ballast pile and a shipwreck. A mound of river cobble, running east to west, first appeared in about 10 feet of water and extended into 22 feet of water along a sand bank. At the west end of the pile, timbers protruded from beneath the sand and stones. Several unidentified iron-encrusted objects littered the site. No other artifacts were observed. (See Chapter 7 for a full discussion and site plan of the Santa Rosa Island Wreck.)

In the eastern section of the sonar survey, several promising anomalies were ground-truthed. Visual inspections, however, showed that none of the sites were historically significant. One target (#233) was a strange thin cocoon-shaped object covered in plastic. Another (#260) was an industrial air conditioning unit and some car batteries. The presence of tires tied together and nearby metal indicated someone's fishing spot for one other anomaly (#307). The most promising sonograph anomaly (#234) in this section suggested two barges lying next to each other. Diver investigation revealed the anomaly as two car bodies. Other anomalies (#207; #214), after investigation, proved to be natural bottom features.

Pensacola Naval Air Station Waterfront

Starting on September 12, 1992, several days were spent surveying along the Naval Air Station's southern waterfront from the USS *Forrestal's* pier to the Officer's Club in the west. Many anomalies were discovered during the survey of this area, and eleven potentially significant anomalies were targeted for ground-truthing. Out of the eleven, none had any historical importance.

Visual investigations of three anomalies (#565; #592; #583) by circle searching and towboarding did not locate any material. Squared logs comprised the main object of two other anomaly sites (#558; #728). At the first site no material was found in the vicinity of the log. During the towboarding search of the second anomaly, some metal cable and a tire was found near the log. In another spot located in the search area, two ceramic bowl fragments dating to the late nineteenth century, and a few pieces of broken glass were found in a shell hash bottom surrounded by 5-foot sand dunes. Additional investigation of the bottom did not disclose any more material culture.

Two other sites (#464; #511) consisted of scattered pieces of coal interspersed with modern material. The first site contained, in addition to coal, some bricks and an airplane landing assembly, including the tire. While coal and metal cable were initially found in the circle search and present in the sonograph, the sonograph also depicted an object casting a large acoustic shadow. Divers towboarding in the area eventually located the objects--two large cement mooring blocks. Modern metal objects, cable, small engines, etc., were found in two separate target (#578; 584) locations.

Two other acoustic targets appeared to be significant sites. The shape of one target (#470) resembled a barge's athwartship members (Figure 14). Visual inspection, however, revealed a series of stanchions supporting two large intake pipes for a steam plant on the Navy base. The sonar had detected the stanchions running parallel to the towfish, but did not identify the pipes running perpendicular to the path. Another anomaly (#554) on the sonograph showed a curving dark area with a sand dune dividing

around the site (Figure 15). This anomaly was a likely candidate for a shipwreck site due to the detection of a geological change on the bottom, namely, a sand ridge parted around a low-lying area. The site suggested the presence of some anomalous feature causing the ridge to move around it. Upon visual inspection, the source of the anomaly was revealed to be a shell hash ridge partially surrounding a shrimper's net which was tangled with metal cable, a cable hook, and diverse debris, and arranged in a half-moon shape as revealed by the sonograph. Also during the towboarding search, other solitary metal debris of various sizes and shapes was encountered while searching for the main anomaly.

West Side of Gulf Breeze

Since they had been previously surveyed with the magnetometer, several large and small areas of promising magnetic anomalies were chosen for side-scan verification. Sections A, B, C, and E were surveyed on September 12-13 and on September 16. Several significant anomalies were produced by the sonar, five of which were ground-truthed on October 31, with the others slated for later visual investigation. Examination of four targets produced no remains, while the fifth was a rock pile.

The sonograph showed a group of large anomalies at one location (#851), also masked by a rise in elevation on the fathometer. A buoy was tossed on the mound and the diver landed on a rock pile in 17 feet of water. Five rock piles were located, each containing large blocks of granite, as well as other types of rocks and some bricks. The piles extended vertically from 1 foot to 3 feet from the bottom. Investigation around the perimeter of the site yielded no evidences of a shipwreck, such as timbers, frames, or machinery. The site is most likely a rock dump made up of construction waste.

At the four other sites (#803, #818, #836, #841) no material was discovered. At one site (#841) wire mesh protruded above the sand surface. Another site (#818) contained a large amount of sponges. The remaining two anomalies may have resulted from a sandy bottom pockmarked with large indentations made by flounder and sting ray, and medium-sized undulating ridges.

Old Navy Cove

The magnetometer had previously located several rock piles in this area worthy of a second look with the side-scan sonar. This sonar survey occurred on September 13, 1992. Buoys were used to mark the site and sonar transects were run across a broad area around the buoy. During the search over the primary targets, another anomaly was identified.

The first site (T-6-2) was the rock pile reported by the local Gulf Breeze resident. Several transects over and around the site generated no additional data to contradict the previous interpretation that the site was not a shipwreck. Sonar survey over the second site, T-B4-2, identified as a dump area, showed the pile to be about 30 feet long and 15 feet wide. Divers once again investigated the site and found no material suggesting a shipwreck. The last target subjected to the sonar was the marine railway footer said to be covering a wreck. Sonar transects at the site did not reveal the footer, and no additional information was collected that would help deny or confirm the presence of a wreck.

As transects were conducted around target (T-B4-2), an anomaly was detected by the sonar. The target was round in shape on the sonograph, suggesting a rock dump. Underwater investigations revealed a jumble of stones, bricks, and metal debris rising slightly above the mud surface.

Santa Rosa Sound

On September 16, 1992, a side-scan sonar survey was undertaken to locate the reported "Treenail Wreck." Armed with new coordinates placing the wreck 600 yards southwest of the previous area searched with the magnetometer, survey crew ran sonar transects over a large area surrounding the marker buoy, and along the 18-foot contour of the sand bank. Five anomalies were discovered, of which only one remotely corresponded to the reported wreck location. The anomaly ran in a east-to-west axis along the sand bank. Ground-truthing operations were conducted using the magnetometer to locate the anomalies, and results are discussed above under the Santa Rosa Sound magnetometer section.

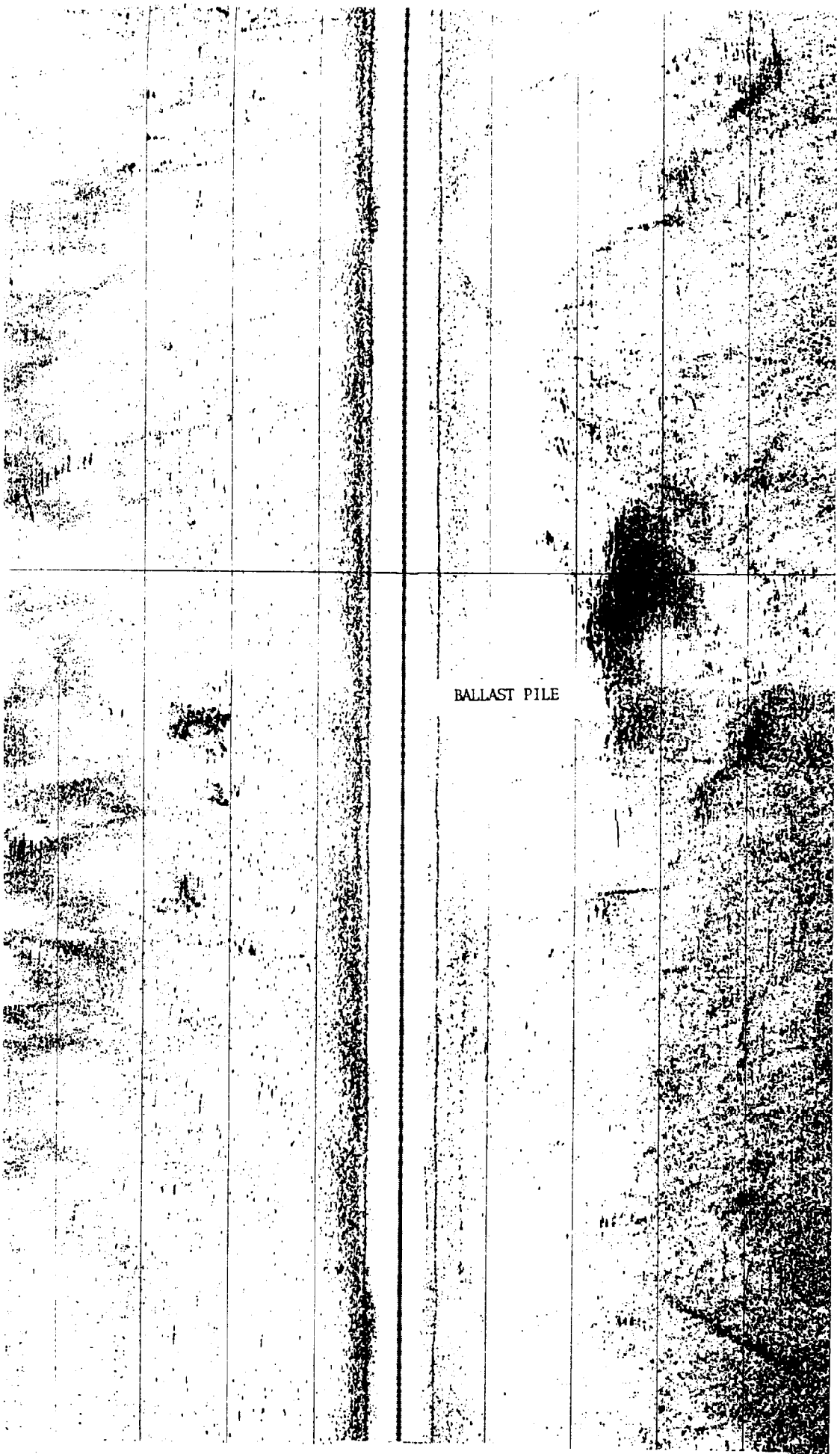


Figure 13. Side Scan Sonograph of Anomaly #111, Santa Rosa Island Wreck.

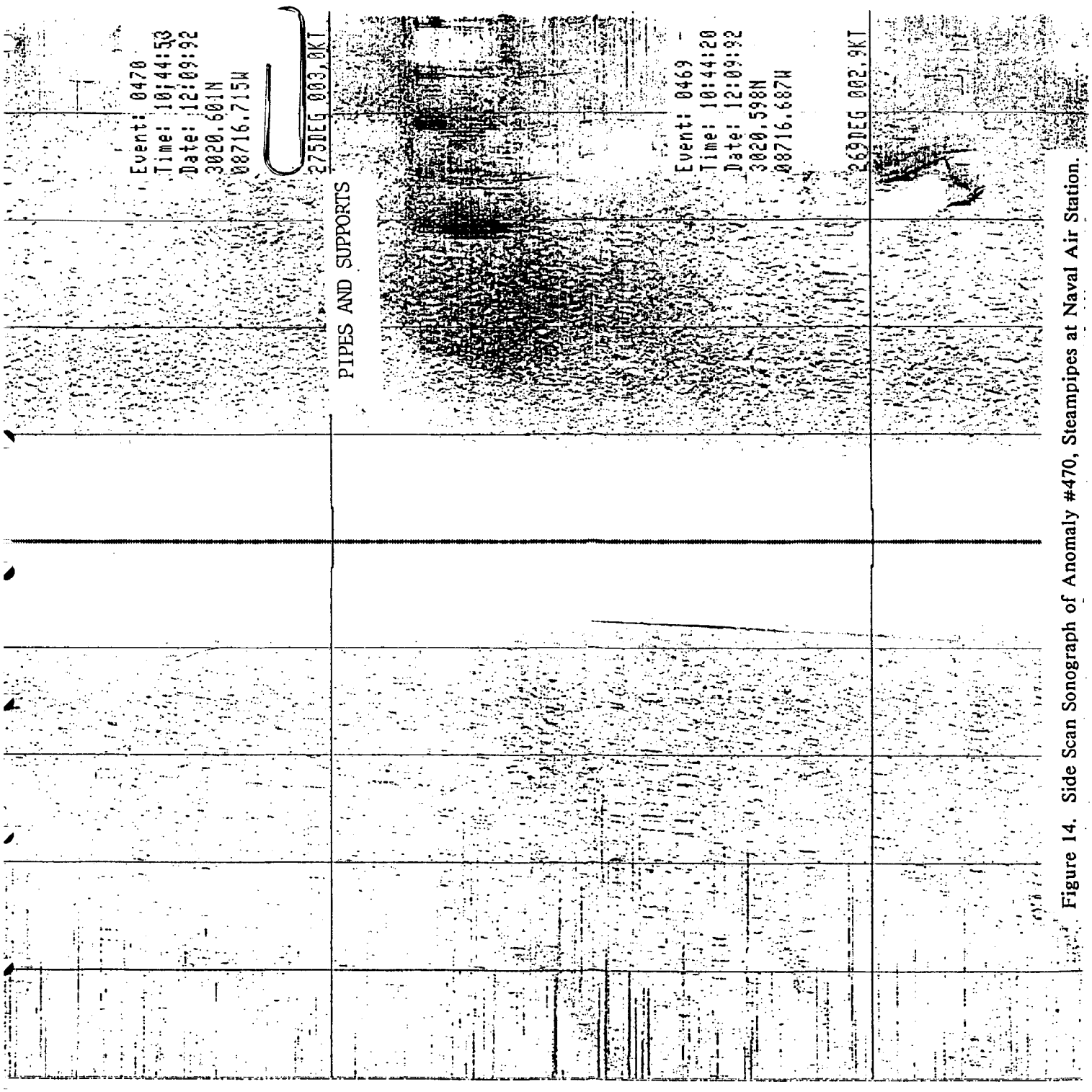


Figure 14. Side Scan Sonograph of Anomaly #470, Steampipes at Naval Air Station.

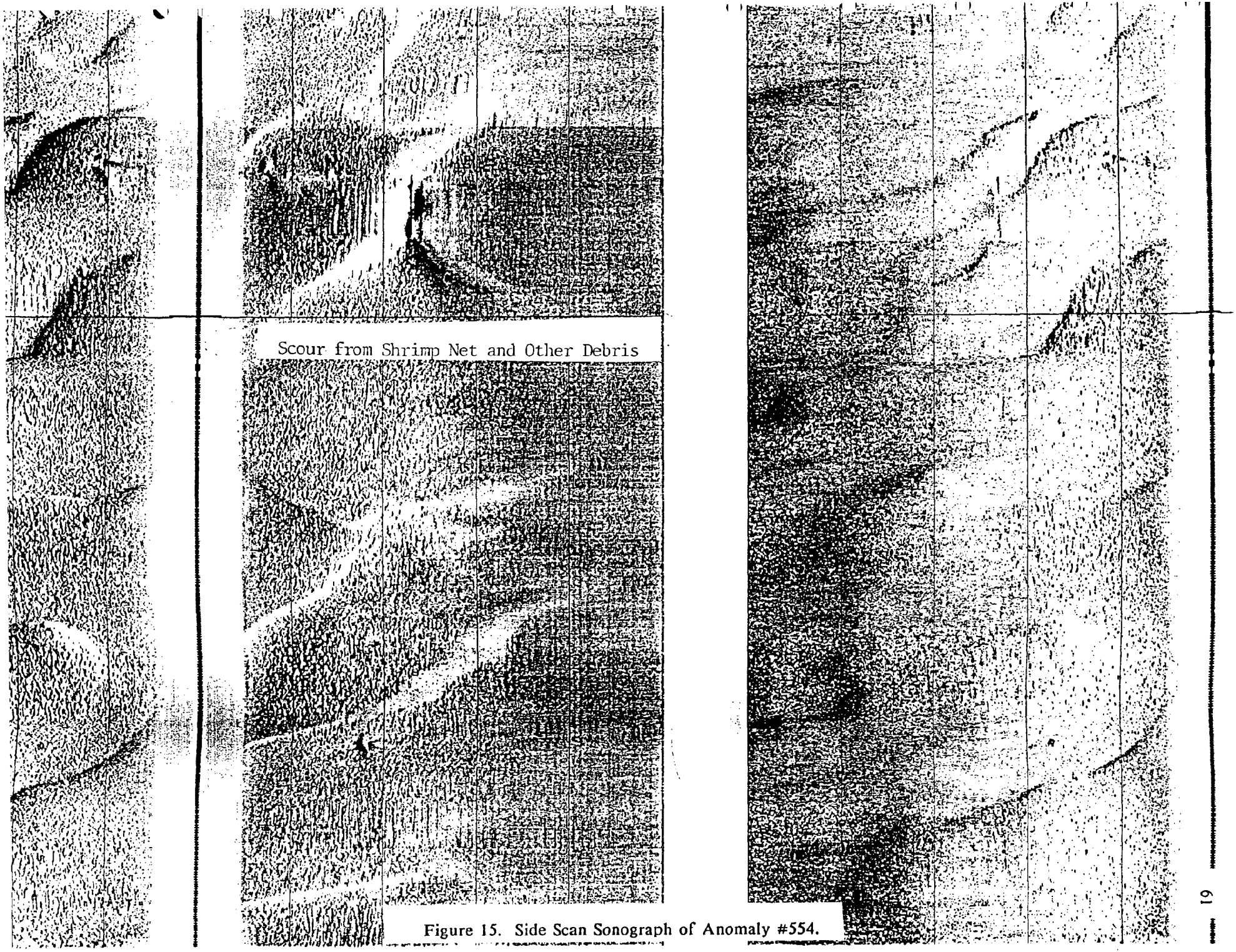


Figure 15. Side Scan Sonograph of Anomaly #554.

CHAPTER 6. INTERVIEWS

Introduction

One of the most productive and least expensive methods of locating shipwreck sites involved interviewing boaters, fishermen, and divers. Through interviews, the Survey hoped to locate undocumented wrecks, and possibly gain new information about wreck sites already recorded. Often, names of other people who might also provide information were obtained during the interviews.

Nautical charts marked with documented wreck sites were used during the interviews to orient the discussions, to pinpoint undocumented sites, and to reference search areas recommended by the informant. Interviews were recorded on audiotape and later transcribed into a permanent record. As a result of these interviews, many wreck sites and associated debris fields were located and documented.

Several approaches were used to locate people who had knowledge of shipwreck sites or who had recovered artifacts from local shipwrecks. The first step was public outreach by the Survey. Numerous contacts were made by giving lectures to groups and organizations in the Pensacola area. After nearly every lecture, people came forward with information about wreck sites or names of people who knew of wreck sites. Another tool used to solicit information was the informant form. These forms were distributed to bait and tackle stores and dive shops in the Pensacola area. The forms asked for shipwreck specifics such as LORAN-C location, construction material, and associated artifacts. Response to the forms was not as numerous as originally hoped for, but the interviews led to the discovery of several sites. Those interviewed included a mullet fisherman, a shrimper, a navy diver, a charter boat captain, a college professor, and a dive shop owner.

Mr. Howard Bernard

In 1991 Dr. Roger Smith contacted Major Calvin Dixon of the Florida Marine Patrol. During a visit with the Major at Marine Patrol headquarters in Pensacola, Dr. Smith learned of an area in Butcherpen Cove where several artifacts had been found in the past. Maj. Dixon provided the telephone number of Mr. Howard Bernard, a long-time resident and mullet fisherman in Pensacola. Maj. Dixon said Mr. Bernard would know more about the artifacts and wreck sites found in this area.

On August 12, 1992, Chuck Hughson, Della Scott, and James Spirek of the Pensacola Shipwreck Survey met Mr. Bernard to look for his sites in East Bay. Mr. Bernard told the staff that over the years, while setting gill nets in this area of the bay, he had found several ballast piles and shipwreck sites.

Mr. Bernard accompanied the staff for the day and directed them to the wreck site of a wooden vessel off Action Point. Due to low visibility, divers ground-truthed the area using a circle search line and probe. After probing to a radius of fifty feet around an oyster bed, no evidence of a shipwreck was found. Mr. Bernard said the wreck might be twenty yards or so to the north. A marker buoy was placed at that position and LORAN-C coordinates were obtained. To date no further search for the site has been conducted.

Mr. Bernard then directed the staff to another site east of the public landing near the powerline crossing over East Bay. This site was reported to have several ballast piles and a metal structure resembling a keel or a keelson. Divers found an area of large rocks, but no keel or keelson. Mr. Bernard recommended that the search in this area be resumed in the fall or winter when clearer water prevails.

The next site to which Mr. Bernard directed the Survey was called the PVC wreck; it lay on a sandy bottom with moderate silt cover in eight feet of water. The marker, a piece of PVC pipe protruding six feet out of the water, gave the site its name. Mr. Bernard had heard stories from some of the old-time fishermen who said that this wreck was a fishing smack belonging to the Warren Fish Company of Pensacola.

While diving this site, the staff discovered several frame tops on two foot centers protruding above

the sand. Following the frame line the divers found a modern radio antenna and coaxial cable. Planking heavily encrusted with oyster shells was also found. The planks were relatively thin in both thickness and width; one small iron nail was found adhered to the planks. The plank edges were relatively tight and the presence of caulking between the planks could not be determined. An area thought to be either a hatch or a live well was also discovered. To date, bow and stern orientation has not been determined. Mr. Bernard also reported another ballast pile in the same general area. He last recalled seeing this site four years ago. Searching for the site with a fathometer did not produce any leads.

On September 3, 1992, the staff met with Mr. Bernard once again, this time to investigate a ballast pile and a barrel well site in Butcherpen Cove. This was the site reported to Maj. Dixon, where several artifacts were retrieved. Some of the artifacts previously found included pottery, metal fragments, and bone. The site is located on the east side of Butcherpen Cove on the shoreline of the Naval Live Oaks preserve. The area around the site was probed and several artifacts were located. Artifacts observed included ceramic sherds and metal fragments. The barrel well itself was not located. Mr. Bernard stated the last time he saw the well was during the fall. He believes that the prevailing north winds during the fall and winter will once again uncover the well. The search for the ballast pile also proved fruitless. Mr. Bernard stated that the trick to locating sites in the Butcherpen Cove area depends on searching during the times of maximum water clarity, mainly during the winter.

Searching for wreck sites with Mr. Bernard was time well spent. Several ballast piles and wreck sites were documented and reported locations were noted, due to his information.

Captain Jeff Clopton

In May of 1992 Michael Williamson and James Spirek interviewed Capt. Jeff Clopton, a life-long resident of Pensacola, who comes from a long line of fishermen, since he is the third generation of his family to commercially shrimp the waters of Pensacola Bay. During the last two field seasons, Capt. Clopton provided the Survey with several shipwreck locations in different areas of the bay. Most of the sites were areas that he tried to avoid over the years, due to fear of snagging his shrimp net.

The first Clopton site investigated this year was in shallow water near the fish houses at the foot of B Street. Capt. Clopton originally showed the Survey this location in 1991. Ground-truthing of this area revealed two wrecks. The first wreck at this location appears to be a schooner, whose remains are one-hundred-fifty feet long and copper-sheathed. The vessel was heavily constructed and fastened using brass spikes and drift pins. The second wreck, a small barge seventy-seven feet long and twenty-eight feet wide, is similar to the one found in Bayou Chico and documented in 1991. (See Chapter 7 for a full discussion of these wrecks.)

In June of 1992, Capt. Clopton took the staff to four locations where he had snagged his shrimp nets in the past. The first site lies close to the port warehouse at the Municipal Pier; the second is just south of Bayfront Auditorium; the third lies south of the old sailing loft island at the entrance of Baylen Street slip; and the fourth site is located near the southwest corner of old Muscogee Wharf. By using a magnetometer, the staff was able to detect a magnetic anomaly at each of these locations.

On June 26, 1992, the site off the port warehouse was visually investigated. Capt. Clopton reported pulling up boards from this site with his shrimp net. Ground-truthing of the site with a hand-held probe failed to locate a wreck. On July 28, 1992, the staff used the magnetometer at this site, hoping that it would produce the original anomaly. After scanning the area for several hours, no anomalies were found and the search was called off.

During the field season Capt. Clopton continually provided the Survey with wreck locations and information about past maritime activities in Pensacola Bay. Capt. Clopton's vast knowledge of the snags in the bay was quite useful and helped locate several wreck sites.

Mr. Ray Manuel

On August 6, 1992, Williamson and Spirek interviewed Mr. Ray Manuel at his residence in Pensacola. Mr. Manuel has been part of the diving community of Pensacola since the mid-1950s. He once worked for the late Joe Kingry at Skipper's Dive Shop in downtown Pensacola. In the mid-1960s, Ray left Skipper's to open his own dive shop, called Ray Manuel's Diving.

During a phone conversation with Mr. Manuel two days prior to the interview he informed the staff that he did not have much information on wreck locations; however, he could pinpoint modern metal debris sites in the bay. Mr. Manuel obtained this information while working for many years as a commercial diver, retrieving objects and materials lost during construction and dredging projects throughout the bay.

Several sites of modern debris in the bay were pointed out by Mr. Manuel. The first site lies on the bottom of the bay, about two city blocks from the southeast end of the Port of Pensacola. The site consists of three to four joints of thirty-inch drain pipe with bell housings. The second site is a sunken aircraft located two hundred yards south of the east corner of Bayfront Auditorium. The third site lies between Muscogee Wharf and the center of the Bay Bridge and consists of a forty-foot steel hull. The fourth site, in the middle of the bay in the shipping channel, consists of hundreds of steel drums linked together and used during a dredging operation. Mr. Manuel also noted that on one occasion, while working in this area, shaped timbers were found. The fifth and last modern debris site Mr. Manuel pointed out is located two hundred yards west of the second hump of the Bay Bridge heading into Gulf Breeze. This site consists of a huge I-beam with a large metal ball on the end.

Mr. Manuel informed the staff of several wreck site locations in the bay. He was not able to pinpoint their exact locations; however, he was able to point out their general locations and give the names of other divers who would know more about these sites.

The first possible wreck site lies offshore from the power plant on Pensacola Naval Air Station. The site, a popular dive with sport divers, is called the "steam pipes." Mr. Manuel claims this area has been a hot spot for treasure hunters for years. Mr. Manuel stated that west of the steam pipes and parallel with the shore, a bank exists where the water changes depth from twenty-four feet to eighteen feet. Several large anchors and many artifacts are scattered on the bottom in this area. He was not positive that a wreck is associated with this debris, but he does recommend checking the area.

The second site was a barge containing lead that sank in Perdido Bay. Mr. Manuel did not know the exact location of this site; however, he did mention that another man found this wreck in the 1960s and would know more about its location.

The third site is prehistoric and is located in Pensacola Pass, offshore from the steel jetties at Fort McRee. The site consists of a group of huge tree stumps extending up from the bottom. Ray mentioned that several people have dove this site many times in the past and should be contacted for a more exact location.

The fourth site also lies in the pass. Mr. Manuel called this site the "boiler wreck." It has been a local hot spot for flounder for years. He also mentioned he heard there are three other wrecks within swimming distance from this site.

The fifth site is in the bay off Mustin Beach on NAS. Mr. Manuel mentioned he heard divers talking about two different wrecks in this area. A precise location for these wrecks was not given.

The sixth site mentioned was a ballast pile in the Gulf on Caucus Shoal. The site lies on the shoal halfway between the Pass and the USS *Massachusetts*. Divers allegedly retrieved large pieces of lead from this site in the 1970s.

The seventh site lies in the Gulf on the second sandbar, in an area called "the slabs," offshore from the bank on Pensacola Beach. This wreck is in approximately fifteen feet of water. A local story concerning the wreck is that two cannons were taken from the site in the early 1970s and placed in a

creek in Alabama to preserve them. These cannons were later found by someone else and removed from the creek. Mr. Manuel also mentioned this site was blown using a prop-wash deflector, or mail box. He said that while this operation was going on, several crystal items were removed from the ballast.

The eighth site is located off Gulf Breeze near the mouth of Gilmore Bayou. Mr. Manuel mentioned that a diver found a set of brass doors and a scupper valve on this site.

The ninth and last site, the "cannon wreck," is in Butcherpen Cove. According to Mr. Manuel, local shrimpers mentioned seeing two bronze cannons from their boats there in the early 1960s.

The most valuable information obtained from Mr. Manuel during the interview were the names of other divers who have actually been on the sites he discussed. Contacting these divers might shed light on the exact locations of these sites.

Captain Morris Bagleo

On August 11, 1992, Williamson interviewed Capt. Morris Bagleo. Capt. Bagleo has been an avid diver and fisherman for the past thirty years. As a captain licensed by the Coast Guard, Capt. Bagleo has owned and operated several charter boats over the years. On the evening of this interview, Mr. David Pilkenton, another local diver, was at the residence of Capt. Bagleo and also shared some information on shipwreck locations.

The first wreck location noted by Mr. Pilkenton is between one-quarter and one-half mile southeast of the mouth of Bayou Grande. Mr. Pilkenton has dived this site several times and stated that the area has a mud bottom with low visibility. There are large, shaped timbers associated with the site. Mr. Pilkenton is not positive that this site is a shipwreck; however, he did say the area has many ballast stones.

The second site reported is located on the Fort Pickens side of Pensacola Pass. The site is a ballast pile in twenty-five feet of water. This site is located in the same area Ray Manual pointed out during a previous interview. According to Mr. Manuel, this site is a barge found by George Moodey in the 1960s. Capt. Bagleo said he has not dived the site since the last dredging of the Pass, and that he was not certain the site was still there after the dredging.

The next possible wreck site pointed out is off Johnson's Beach in the Gulf. The site is a ballast pile lying inside the second sandbar. This site, when not covered by sand, is visible from the surface.

The fourth site was another ballast pile in seventeen feet of water. This site is in line with the picnic grounds on the Bay side of Fort Pickens.

The next site described by Capt. Bagleo appears to be the same site discussed by Ray Manual in connection with the "great cannon caper." According to Capt. Bagleo, this wreck lies within the second sandbar on Pensacola Beach. Before Hurricane Frederick struck in 1979, Capt. Bagleo used the end of the fishing pier and the Holiday Inn on Fort Pickens Road as land ranges to locate the wreck. The wreck is said to be almost in line with the Holiday Inn. Capt. Bagleo reported that the wreck has been covered since 1979, but is certain a magnetometer will find it.

The last wreck pointed out is in the Bay off Fort Pickens. This wreck is in forty feet of water near Fort Pickens and across the Bay from the USS *Forrestal* berthing. Capt. Bagleo has dived on this wreck for the past ten years and reported seeing many old bottles. On one occasion he saw something that resembled a cannon sticking out of the bank by the site. Capt. Bagleo also said he heard stories about a wood-stock anchor being removed from the site in the 1980s. In August of 1992, the staff of the Shipwreck Survey dived the site. During the ground-truthing of this area, several old bottles and a pile of coal were found. The area also contained several large piles of modern metal debris used as an artificial reef for fishing. An extensive search of this area failed to locate a shipwreck. In September this area was surveyed with a side-scan sonar, but to date, no shipwreck has been found in association with the site.

The information obtained from Capt. Bagleo produced several possible new sites to check. The information also confirmed the locations of some sites given by other people during previous interviews.

Mr. Ray Smith

On August 24, 1992, Spirek interviewed Mr. Ray Smith at the water training school at Pensacola Naval Air Station where Mr. Smith is an instructor. Mr. Smith also operates a dive charter operation called Dot's Divers. Mr. Smith admitted that his main interest in the bay is to find fishing spots, but over the years while looking for these spots he has found many artifacts in various parts of the bay. One of the more significant artifacts Mr. Smith found was an inkwell that dated from the 1700s.

Mr. Smith mentioned that during the 1980s he conducted several major expeditions to locate fishing sites along Santa Rosa Island near Fort Pickens. The most intensive effort involved use of three boats and several divers to search this area. While searching, the divers found scattered artifacts and a couple of shipwrecks.

The first wreck Mr. Smith pointed out was found during his big fishing site expedition. The inkwell he retrieved came from this area. The site lies on the north side of Santa Rosa Island in about thirty feet of water near Fort Pickens. The second site is in the northwest corner of the turning basin. Mr. Smith stated that a rock pile and three possible wreck sites are in this area. He mentioned that one of these wrecks contained a couple of cannon several years ago.

The third site is very close to the wreck of the *Rhoda*. Mr. Smith stated that this site contains a ballast pile with fragments of copper sheathing lying on the bottom. Mr. Smith also mentioned that an anchor is present on this site.

The majority of the sites Mr. Smith mentioned during the interview have not been surveyed to date. In September, while using a side-scan sonar to survey the north side of Santa Rosa Island, a shipwreck site was found in the same general vicinity where Mr. Smith reported finding the inkwell.

Mr. Robert Duncan

On June 2, 1992, Robert Duncan, a life-long resident of Gulf Breeze, was interviewed by James Spirek and Charles Hughson. Mr. Duncan's family was one of the original land grant holders of the area between Fair Point and the present-day Pensacola Bay Bridge. Mr. Duncan comes from a long line of fisherman, and spent a large part of his life fishing the Gulf Breeze peninsula. The first site to which Mr. Duncan took the staff consisted of two rock piles on the sandy flats at the west end of Old Navy Cove. One rock pile consisted of river cobble, and the other of large slabs of concrete. Divers probed both sites looking for wood and fasteners; neither were found. These sites are in approximately four feet of water. The second site was a barge that was discovered while looking for the previously mentioned rock pile. The barge was sixty feet long, thirty-six feet wide, and heavily constructed with longitudinal exterior strakes and perpendicular frames. It appeared similar to other barges found in this area that were built in the early 1900s. (See Chapter 7 for a full discussion of the site.)

The third site was another barge site called the "Cuban Barges." This wreck was not found on that day. Mr. Duncan also reported two other barges sunk in the 1940s near this location, but was not able to pinpoint their exact location.

Dr. William Bennett

On October 26, 1992, an interview was conducted by Michael Williamson with Dr. William Bennett. Dr. Bennett is professor of biology and botany at Pensacola Junior College. Over the years Dr. Bennett led several expeditions looking for submerged prehistoric tree sites, and he mentioned two items of interest. The first was a pig tooth found in the Kennacer River almost twenty years ago. The second item of interest was a rock pile located between the jetties and the fishing pier at Fort Pickens. Dr. Bennett reported finding several prehistoric projectile points in this rock pile in the early 1970s. He said this rock pile was easy to find because it caused turbulence in the currents and formed what he

described as a small whirlpool over the site. The area containing the rock pile mentioned by Dr. Bennett was not surveyed. If time permits this area will be ground-truthed.

Captain Fred Kelly

In August of 1992, Capt. Fred Kelly was interviewed by James Spirek and Dr. Roger Smith. After the interview, Capt. Kelly invited the staff of the Shipwreck Survey onboard his boat, *Nancy B*, to show the locations of two wreck sites explored by local divers over the years.

The first wreck site is said to be the wreck of the *Northern Lights*. Capt. Kelly did not have any information about this wreck other than its location. Ground-truthing of the site revealed a large ballast pile and a section of keel. Capt. Kelly also showed the staff another wreck site consisting of a composite-built wooden barge. Both of these sites were in twenty feet of water on the north side of Caucus Shoal, to the west of Pensacola Pass.

The information provided by Capt. Kelly was very useful. Not only did he provide the staff with the locations of two previously undocumented wreck sites, but he was also able to provide information about salvage activities on the USS *Massachusetts* during the 1950s and 1960s.

Conclusions

Recording oral history from the public was quite productive during the course of the 1992 field season. Many previously unknown wreck sites and ballast piles were located and documented because of the information obtained during these interviews. Response by the public was good, and showed that members of the Pensacola community were interested in finding and preserving their submerged cultural resources.

CHAPTER 7. WRECK INVENTORY AND DESCRIPTIONS

The following chapter discusses the various wrecks investigated by the Survey throughout the bay (Figure 16). Most sites were identified through interviews, and two of the sites were discovered by magnetic and acoustic devices during the remote sensing survey. These two may possibly represent colonial shipwrecks, as yet undated, while the rest are associated with the maritime expansion period in the mid to late 1800s.

PSS Site Number: T-7-3
Site Name: Emanuel Point Wreck
Florida Site File Number: 8ES1980

Site Location

The site is located off Emanuel Point in Escambia Bay in approximately 10 feet of water. Orange quartz sand surrounds shell hash around the exposed ballast rock. About 0.6 feet below this layer is a compact lens of shell hash and darker sediments. Among the ballast rock, the sediment consists of shell hash and a gray sand deposit. The ballast consists of light gray river cobble, ranging in size from several inches to about a foot and a half, and other miscellaneous lithics.

Site Description

A baseline was set along the longitudinal axis of the vessel. Exposed ballast rock extended for a distance of some 40 feet, and at its widest point was 23 feet broad on a northwest to southeast orientation. The rock was heavily encrusted with living oysters. No artifacts were found lying on or around the pile, to identify the site as a shipwreck. Three test pits, designated A, B, and C, were dug in the central region of the ballast pile.

In test pit A, the surface layer consisted of large rocks overlying slightly smaller rocks. With increasing depth, different kinds and shapes of stones were encountered, including quartz and chalk, and some large flat rocks. Around the latter were very small, flat, river cobbles. Also, in and below this layer was woody detritus, or dunnage. The layer of dunnage rested on the timbers, which were a ceiling plank and a foot wale. Also in this layer were pottery sherds of both unglazed and glazed coarse earthenware and an animal rib fragment. Under these timbers were two frames.

The test pit was approximately 4 feet in diameter and about 2 feet deep. The sediment profile consisted of a shell hash mixed with dark sediment extending down to about a foot or so, then a very compact layer of gray sand and silt.

All the timbers were measured. The foot wale measured 0.5 feet sided and 0.6 feet molded, with two beveled edges on either side. The foot wale rose above the ceiling plank by 0.3 feet. Between the ceiling plank and foot wale was some caulking, a white hard substance that broke apart when squeezed. Measuring 1 feet sided and 0.2 feet molded, the ceiling plank exhibited two sets of fastener holes, but no evidence of trunnels or iron. The fasteners were arranged with a probable treenail and spike almost in-line. They were 0.3 feet apart, and 1 foot from the next set. Trunnel diameter measured 0.1 foot. Below the ceiling plank, the fasteners did not line up with frames. The frames were 0.6 feet sided and molded, on 1 foot centers. Room and space measured 0.6 feet. A lap joint connected the next set of futtocks, most likely the second futtock, which had a concretion near the top near the ceiling plank. The foot wale was let into the frame by 0.3 feet.

In test pit B, the same ballast profile was encountered, except that the depth was about 1.5 feet before the top of the foot wale was reached, where excavation was halted. Again, coarse earthenware sherds were located nearby and on the footwale. In addition to the ceramics, a leather sole and an animal vertebrae were collected for analysis.

Discovery of the two foot wales allowed prediction of the main mast step's location. Removal of the ballast lens in test pit C revealed the interchange between mast step and keelson. The keelson measured 1.1 foot wide, while the mast step area flared out to 1.5 feet. On the keelson was a rectangular

incision 0.35 feet by 0.25 feet and 0.05 feet deep. Approximately 0.5 feet away was a disarticulated wood piece, possibly representing a buttress. The piece was 0.2 feet sided and 0.5 feet wide. Next, about 1.9 feet away from the incision, the mast step rose above the normal plane. A concavity for the bilge pump shaft, located on the south side, was carved into the mast step starting at 1.9 feet and terminating at 3.1 feet from the rectangle. Diameter of the bilge pump shaft was estimated to have been 1.4 feet. There was no other evidence of pump parts, although one piece of iron was discovered nearby. Probing inside the bilge pump area and soupy sediments, and between the floors, revealed the exterior strakes, a host of coarse earthenware sherds, and bilge scum. Additionally, the limber holes were discovered; they measured 0.2 feet long and 0.05 feet high.

Next to the pump well was a timber that may have been a buttress. The eroded nature of the transition between the two parts precluded determining if the arrangement comprised floor, ceiling, and then buttress, or just floor to buttress. Also, the mast step section of the keelson was let in over the floors. The mast step was notched 0.3 feet over the 0.9 feet molded floor, and was 1.2 feet thick. From top of the mast step to the exterior strakes measured 2 feet.

Ceiling planks on the south side of the mast step and keelson were 1 foot wide. The plank extending westwards was carved around the mast step flare. Also, a ceiling joint .6 feet from the rectangle was discerned, and next to that another plank run.

Samples for analysis were taken from each of the exposed wooden timbers: keelson/mast step, buttress, chock, ceiling, and foot wale. The faunal remains, shoe fragment, caulking, bilge scum, and dunnage were retrieved for examination as well. Additionally, foreign material inside two earthenware sherds was scraped and sent for study.

Artifacts

Categories of artifacts recovered included ceramic, faunal, metal, and leather remains. Coarse earthenware, both glazed and unglazed, was the most common artifact.

The majority of the earthenware sherds were recovered on the timbers, although two sherds were found in the ballast column, and one on top of the pile. Many of the unglazed sherds exhibited a bluish-gray slip. The glazed sherds were mostly black and primarily glazed on the inside, although several were glazed on both sides. One sherd had an oily bluish glaze on one side. No refined earthenware or table ware was discovered. The recovered sherds are probably the remnants of olive jars. The style ranges from early to middle. One unidentified piece of coarse earthenware is quite thick and has a fragment of foot protruding from the side. It is thought to be a fragment of a cooking brazier.

Faunal remains include one vertebra and two rib fragments. Two of the bones, the vertebra and one rib, are tentatively identified as coming from either a pig or goat, while the other larger bone might have come from a cow or horse. These will be examined by a specialist.

Shoe leather representing the sole around the heel of a shoe or boot was also recovered. The fragment exhibits signs of being stitched around the exterior.

The metal recovered is a piece of wrought iron. The fragment measured approximately 05 feet by 03 feet; its function is not known. Relatively free of corrosion, the fragment suggests that iron on the site is well preserved.

Threats to Site

Presently, only a few people know the site is a shipwreck. Others know it as a fishing spot, as evidenced by the presence of fishing line and tackle. Thus, the site is unknown to the public and apparently has not been salvaged in modern times. An indiscreet disclosure could jeopardize further study of the ship's architecture and contents. Unfortunately, the threat to this site is high. Some local residents have already shown that attention drawn to a valuable archaeological shipwreck site will lead to pilfering and molestation.

Assessment

The site represents a previously undetected shipwreck in Pensacola Bay. Based on the lack of artifacts on top of the ballast pile, the wreck was most likely salvaged shortly after its demise. The misaligned trunnel and spike locations and the absence of exterior strakes under the frames in test pit A suggest the sinking was likely catastrophic. In the bay this could only mean a hurricane.

The presence of only coarse earthenware suggests the ship was a merchantman or possibly a transport ship. As for nationality or time period, further research and analysis are necessary. For now, the shipwreck is identified as a colonial in age.

Recommendations

The site is an ideal candidate for restricted access status regardless of its relationship to Pensacola's development. In any event, the exact location should not be released until an intensive archaeological survey can begin. Additional archaeological investigation could be undertaken by a group of sport divers with permission of the Bureau, through a university field school, or by a graduate student for requirements of a master's or doctoral degree.

PSS Site Number: T-1-4
Site Name: Wayside Park Site
Florida Site File Number: 8ES1902

Site location

Located in 4 feet of water, the site is approximately 50 yards offshore of the Gulf Breeze Wayside Park. The outline of the site can be seen from the shore. Bottom sediments at the site consist of a layer of soft fine silt on top of granular quartz sand. Under the quartz sand is fine gray sand mixed with white ash-colored deposit.

General Site Description

A large ballast pile and two timbers make up the site. The ballast pile extends 35 feet east to west and 50 feet north to south. The ballast is small river cobbles, generally hand size, although some larger stones are interspersed throughout the pile. Encrusted on the ballast stones are very large oyster shells. The timbers are approximately 12 feet west of the main ballast pile (Figure 17).

The larger of the two parallel timbers measured 14.8 feet long by 1.2 feet in width. On the topside of the timber are four bolt holes 0.1 feet in diameter. The smaller timber is 3.3 feet in length and 1.2 feet in width. Copper cladding is fastened to the timbers with bronze sheathing tacks 0.1 feet in length. The exposed area of the timbers appeared burned. Fifteen feet west of the timbers was a scatter of concreted metal. Some of the objects are fasteners, but it is not known if they are associated with the ballast pile and timbers.

A 100-foot circle search revealed no additional timbers or structure associated with the site. One test pit was dug to search for ship structure under the ballast pile. Several pottery sherds were encountered, but no wood was found.

Artifacts

Pottery sherds, pipe stems, chert, and broken glass were recovered from the ballast pile for analysis. The pottery consisted of stoneware, feathered annular-banded whiteware, and a sherd of tin-glazed coarse earthenware, possibly Delft, dating to around the early nineteenth century.

Assessment

The Wayside Park Site contains fasteners, timbers, and ballast suggesting that it could be a wreck site. Or, the site could represent an old ballast dumping site or possibly a docking site from the late 19th century.

Recommendations

Additional survey work is needed to determine whether the site is a shipwreck or a ballast dump. Several test pits dug in strategic locations might reveal ship timbers. If no wood is found in the test pits, the site is probably a ballast dump area and needs no further investigation. Wood structure, however, would confirm the existence of a ship dating to no later than the early nineteenth century. Further investigations could reveal the nature, integrity, artifactual content, and type of vessel lying under the ballast rock.

PSS Site Number: T-11-2
Site Name: Old Navy Cove Barge
Florida Site File Number: 8SR1249

General Location

This vessel is located in four feet of water at the western end of Old Navy Cove on the north side of Gulf Breeze. Bottom sediment is quartz sand.

General Site Description

The remains probably represent a barge. Most of the structure is covered by sand. Portions of timbers that are above sand level are eroded and worm eaten. The longitudinal axis extends 55.8 feet, the transverse axis extends 31.4 feet. All exposed timbers were mapped (Figure 18).

Thirteen transverse beams are visible on the north side of the vessel. Presumably, others are covered by sand. Each exposed beam measured either 0.4 or 0.5 feet. Construction techniques were noted at the exposed northwest corner of the barge. A triangular chock or knee is fitted into the corner. This piece extends 1.4 feet and 2.0 feet along the outside transverse beam and the outside longitudinal beam, respectively. A second brace is fitted under the triangular chock and extends to 2.4 feet along the transverse beam and 2.5 feet along the longitudinal beam, where it meets the first inner transverse beam. This brace may be triangular in shape also, but because it extends under the upper chock, this is not known. No fasteners were noted. The interior of the barge is littered with corroded metal items, some identifiable as fasteners. Two items that appear to be ladders were noted and measured. They measure 2 feet long and just over 1 foot wide. Both have flanges at the ends of the uprights. One ladder has two rungs, while the other has only one. Other noted metal items include two L-shaped pieces and two circular "donut" pieces, one between the second and third inner transverse beams.

Threats to Site

This site is threatened by erosion caused by wave action. It is located in a very dynamic area of Old Navy Cove and will suffer from the continuous pounding of the waves. Beach construction and the proposed dredging of a channel into Bayou Gilmore may have adverse effects on this site. Presently, the site appears to periodically uncover and cover depending on the season.

Assessment

This site is probably the remains of a barge dating to the turn of the century. Like many of the many vessels in Old Navy Cove, the barge may have been abandoned after reaching the end of its usefulness.

Recommendations

Additional investigations could reveal the past function of the barge and offer the chance to compare construction details with the other barges in Pensacola Bay.

PSS Site Number: T141E
Site Name: B Street Schooner
Florida Site File Number: 8ES1903

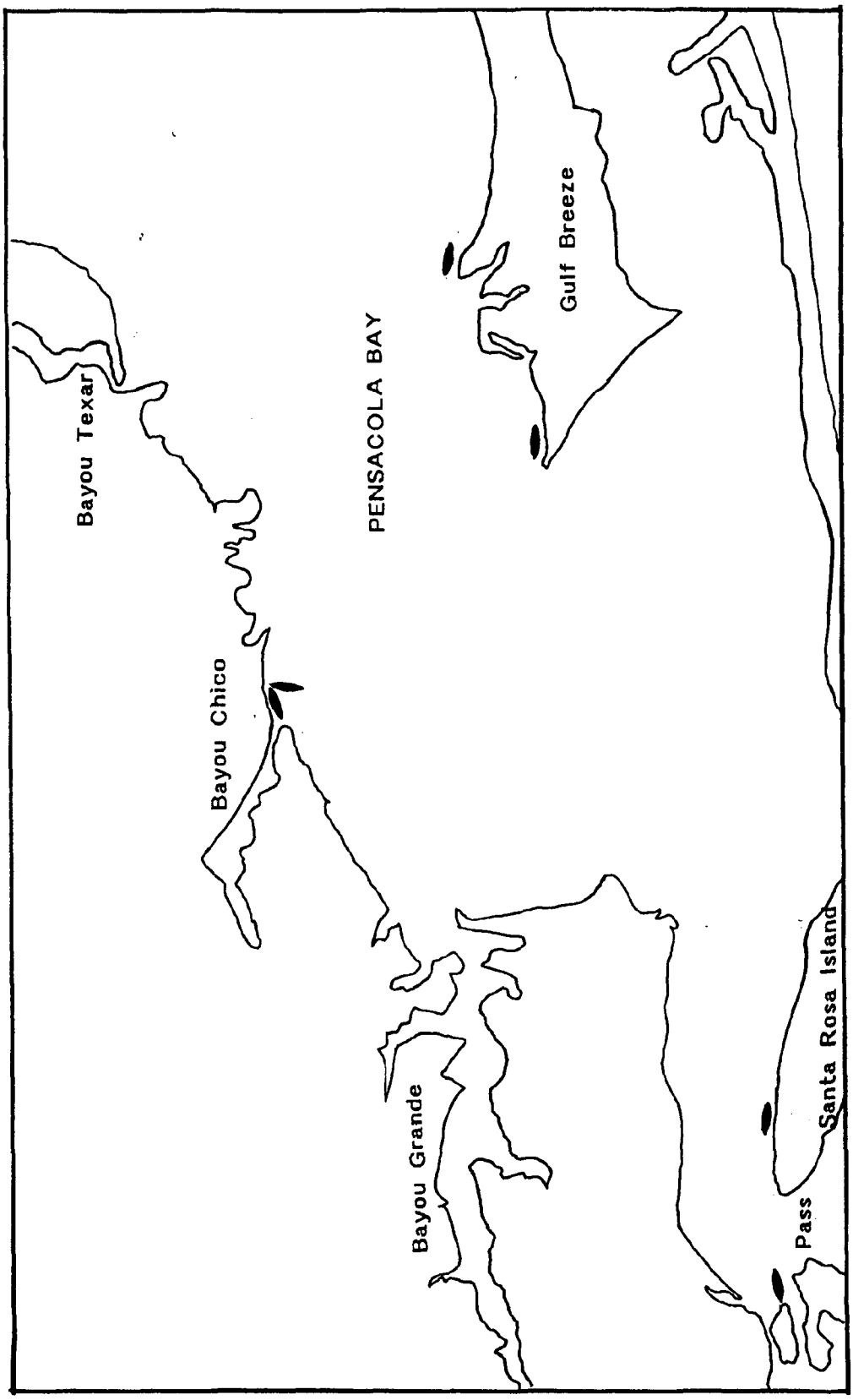


Figure 16. Map of Wreck Locations.

General Location

The site lies off the foot of B Street, east of Bayou Chico, in about 3 to 5 feet of water. Bottom sediments consist of a soft yellow sand lightly covered with silt.

General Site Description

A baseline was set along the center of the hull and all measurements are in reference to it. The large wooden hull measuring 149.6 feet in length and 34 feet in beam lay on a north to south axis, with the bow at the south (Figure 19). Exposed features consisted of the gripe and stempost, stern post and possibly the rudder, the frameline of the hull, exterior and ceiling planks, bronze fasteners, and miscellaneous concreted metal objects. Positive identification of several exposed features was hampered by heavy oyster encrustation. Several scour areas along the eastern section of the wreck revealed that the hull was copper sheathed. The wreck also showed some evidence of fire.

The bow consisted of the eroded and oyster-encrusted tops of the gripe and the stempost. At the northern end of the wreck, sand and oyster overburden hindered identification of the stern assembly. The two exposed pieces represented either the stern knee and stern post, or the stern post and the rudder. No gudgeon straps or pintles were discovered to aid in the identification.

Room and space measurements varied throughout the wreck. In the northeast section at 20 feet on the baseline, room measured approximately 1 foot and space of 0.1 feet. Elsewhere in the wreck, room measured 1 foot and space 0.4 to 0.5 feet. Frames generally had a molded dimension of 1 foot and a sided dimension of 1.5 feet. Futtocks were single and butt-joined to form the frames. Between one pair of frames on the western side of the wreck, two thin bronze pieces curved upward along and inside the space between two frames from the bilge, and between the exterior and ceiling planks. Too thin to represent structural straps, they may have some association with the bilge pump or may have acted as an air vent to the keelson and floor area of the ship. Exterior strakes had a molded dimension of 0.8 feet and a sided dimension of 0.3 feet. Ceiling planks measured 0.9 feet wide and 0.3 feet thick.

Throughout the site, brass fasteners were encountered lying on the sand surface. Two fasteners, a hand-forged spike and a ball-peened through-bolt, were retrieved. The square-shanked spike measured 0.7 feet long with a blunt wedge tip. Measuring 1.7 feet, the through-bolt had one rounded end and a ball-peened end with a rove. The rove was 0.1 foot in diameter. Spikes and through-bolts were also noted fastening the frames, exterior and ceiling strakes. One set of through-bolts was exposed showing a spacing of 2.1 feet along a frame.

In addition to the readily identified spikes and through-bolts, various unidentified concreted metal objects, metal cable, and wood pieces littered the interior of the wreck. At the 135 foot mark along the baseline, some large ballast stones and small pieces of worn rock were exposed. For the most part, however, the wreck's sandy interior remained free of debris.

Threats to Site

The site apparently is not well known and is in an area removed from active boat traffic and diving activities. Widespread knowledge of the site could cause those interested in obtaining brass fasteners to destroy the wreck to get the metal. However, this is an unlikely event due to its relatively obscure location in the bay. No environmental threats such as erosion are anticipated in the near future.

Assessment

The hull of the vessel is sturdily built, fastened with bronze spikes and through-bolts. Hull remains probably survive to the turn of the bilge. The vessel, tentatively identified as a schooner, probably dates to the middle or late nineteenth-century. A previous assessment suggested the site could represent a drydock associated with the Ollinger & Bruce Shipyard which was located nearby. The recent investigation confirmed that the site is a sunken ship. It may be a victim of one of the several hurricanes which struck Pensacola in the early twentieth-century (Franklin, 1991: 215-216).

Recommendations

Additional work on the site could reveal the nature and previous use of the vessel, artifactual detail, and provide more details of the lower hull construction.

PSS Site Number: T-1-9
Site Name: B Street Barge
Florida Site File Number: 8ES1904

General Location

This vessel is in 10 feet of water lying on a white quartz sand bottom. It is located in the bay at the foot of B Street near the city fish houses.

General Site Description

The remains above sand level were mapped (Figure 20). The vessel appears to be a wooden barge with a flat bottom and with forward frames that are canted upwards. Maximum length is 77.3 feet and the beam is 28.8 feet. All exposed timbers are extremely eroded and encrusted with oysters.

The stern transom beam is one continuous timber 0.7 feet wide. Nine longitudinal stringers extend from the extreme bow, where the beam ends are canted upwards to form a breakwater, to the transom beam. Each stringer measures 0.5 feet wide. Twenty-eight frame ends along the outside strakes are spaced between 2 and 3 feet apart. Two 0.5 foot transverse beams are evident at 50 to 54 feet along the north longitudinal section of the barge. Ceiling planks lie at right angles on these beams. The ceiling planks measure 0.4 to 0.5 feet and are attached with iron fasteners. The fasteners are arranged diagonally where the planks extend across the beams, and are in pairs where butt ends join.

Hand fanning along the south bow section revealed the presence of compacted mud and wood chips. The wood chips suggest the wreck may have been a lumber barge.

Threats to Site

None.

Assessment

The vessel appears to be a barge abandoned near the turn of the century. Possibly associated with the timber industry, the barge, like the schooner described above may have wrecked as a result of a hurricane or been abandoned.

Recommendations

Several barges abandoned in Bayou Chico and assessed in the 1991 report have similar construction details. Further investigations may reveal a typology of barges used in Pensacola Bay.

PSS Site Number: T-111-7
Site Name: Santa Rosa Island Wreck
Florida Site File Number: 8ES1905

Site Location

This site is located on the north shore of Santa Rosa Island in the Fort Pickens Aquatic Preserve. The water is between 14 and 22 feet deep. The natural bottom is quartz sand with a periodic silt cover dependent on the tides. Overburden at the site consists of fine shell hash, quartz sand and a fine silt cover.

General Site Description

The site consists of a large stone ballast pile and exposed ship timbers. For the purposes of recording, the baseline was run along the longitudinal axis of the vessel east to west. No excavations

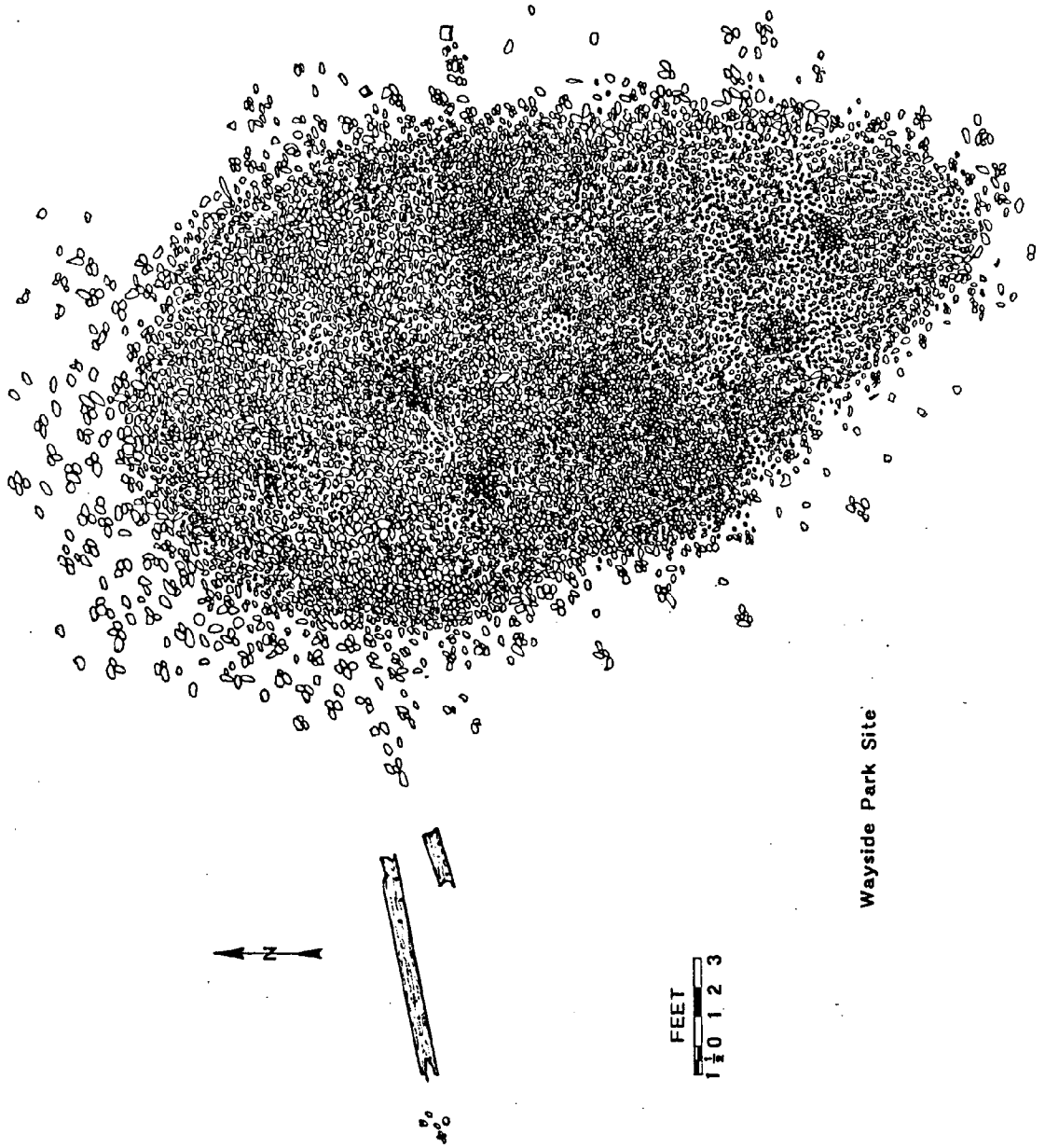


Figure 17. Site Plan of Wayside Park Site.

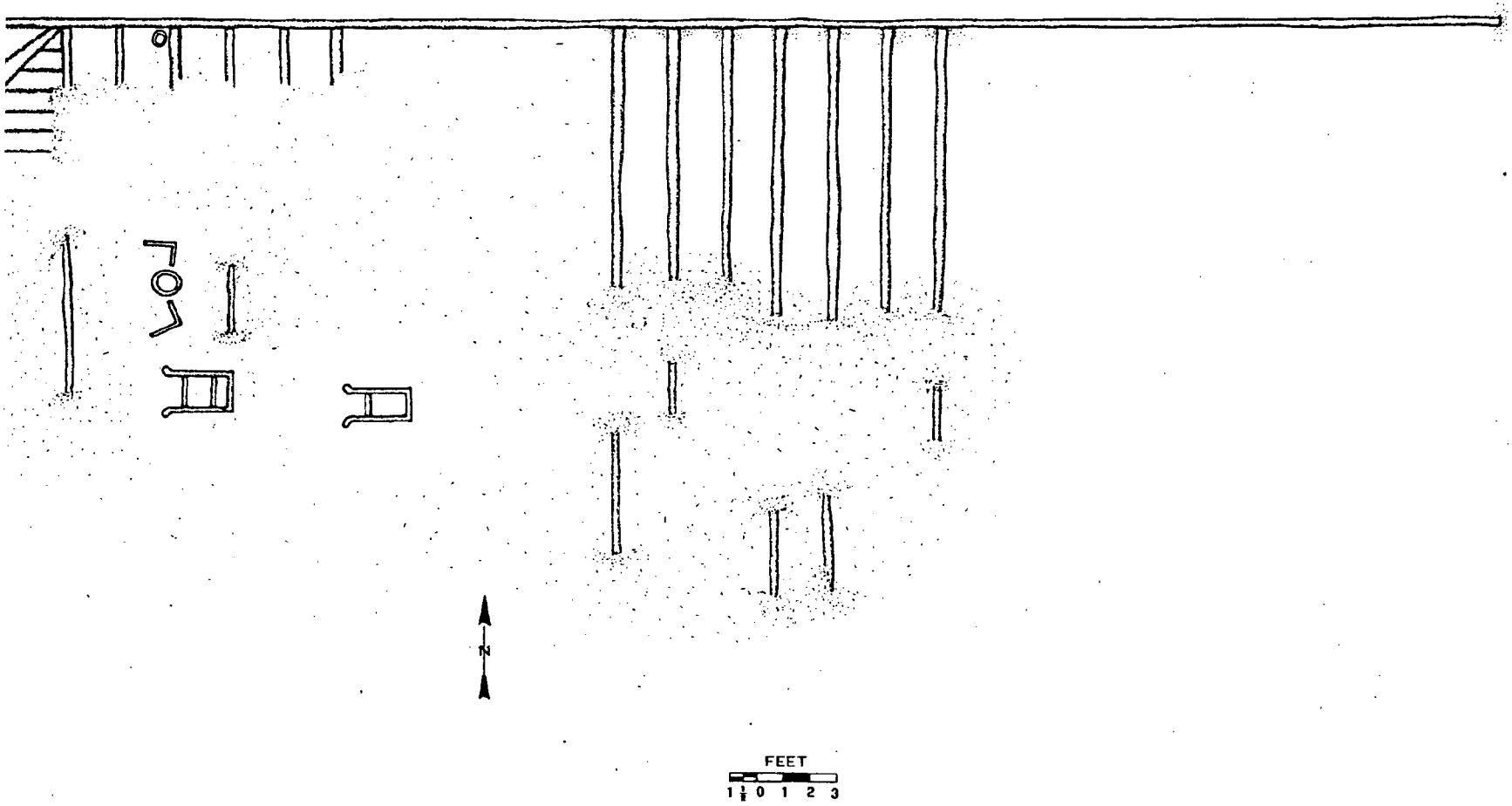


Figure 18. Site Plan of Old Navy Cove Barge.

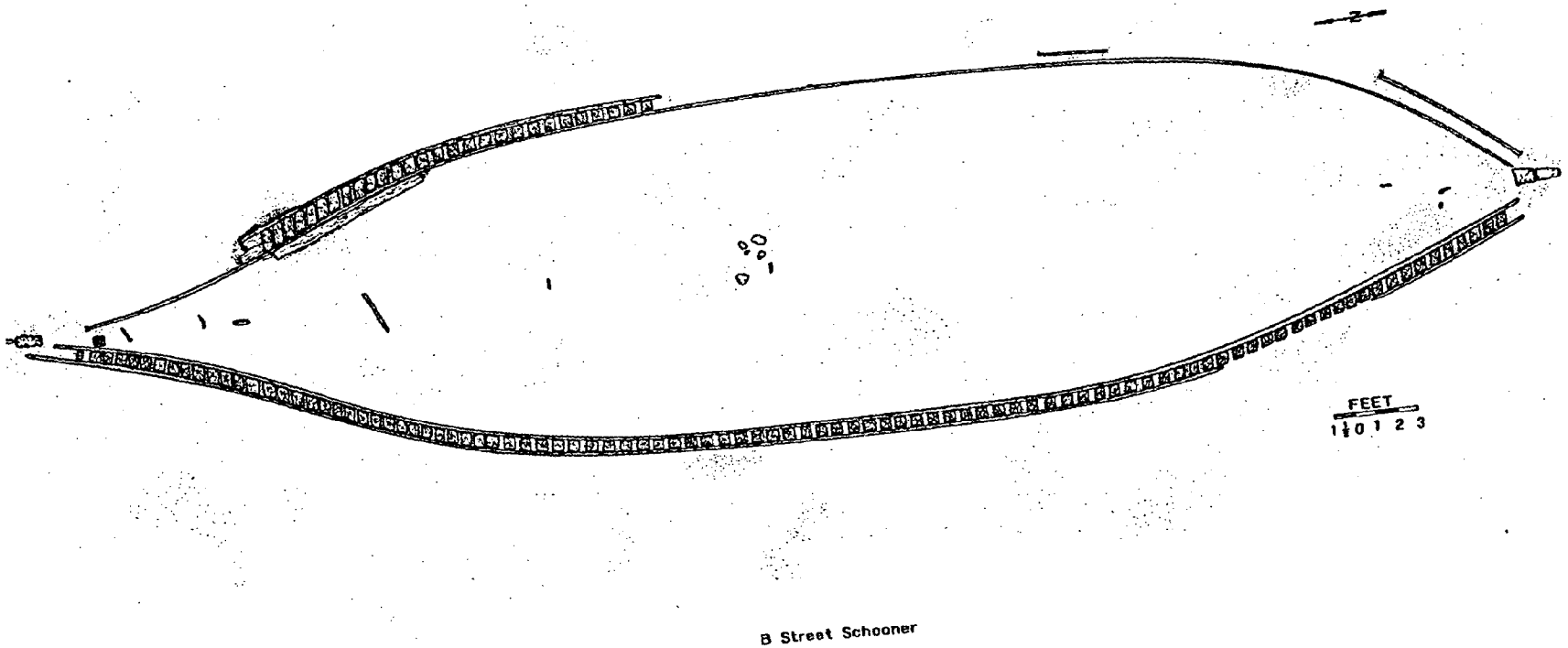


Figure 19. Site Plan of B Street Schooner.

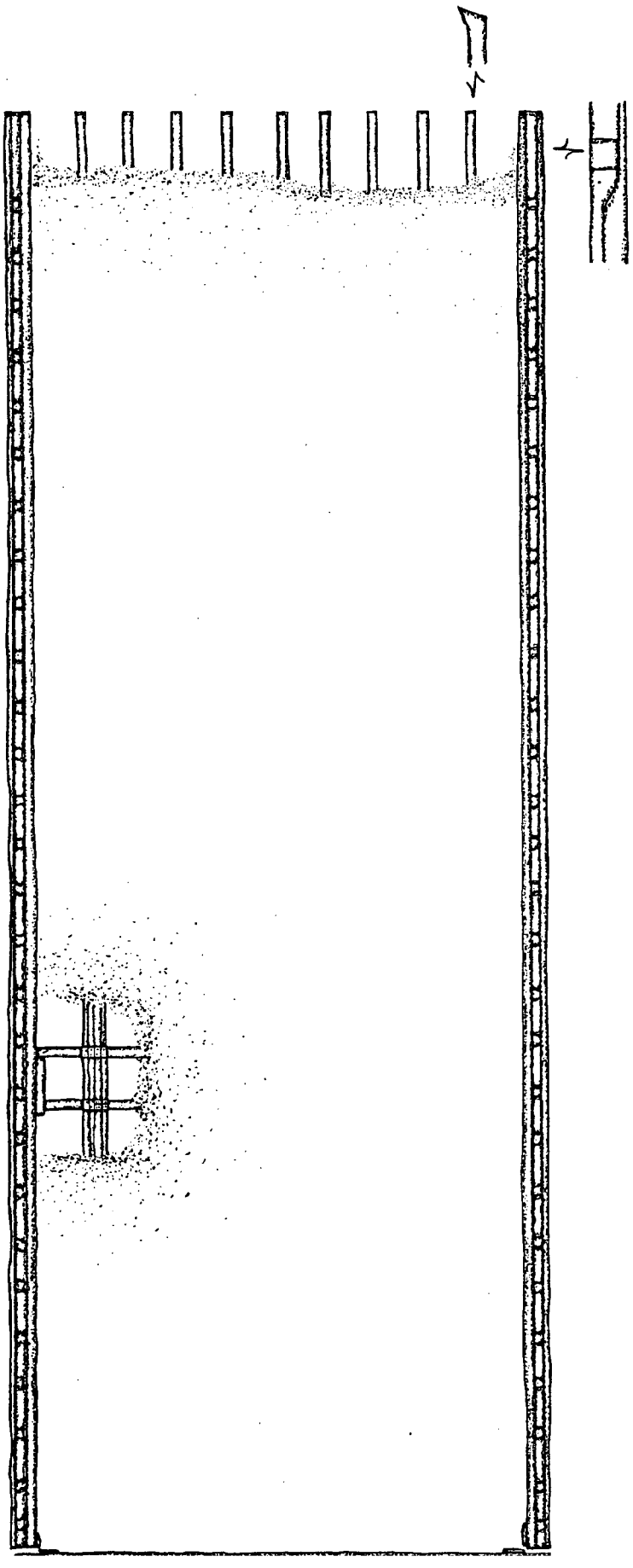


Figure 20. Site Plan of B Street Barge.

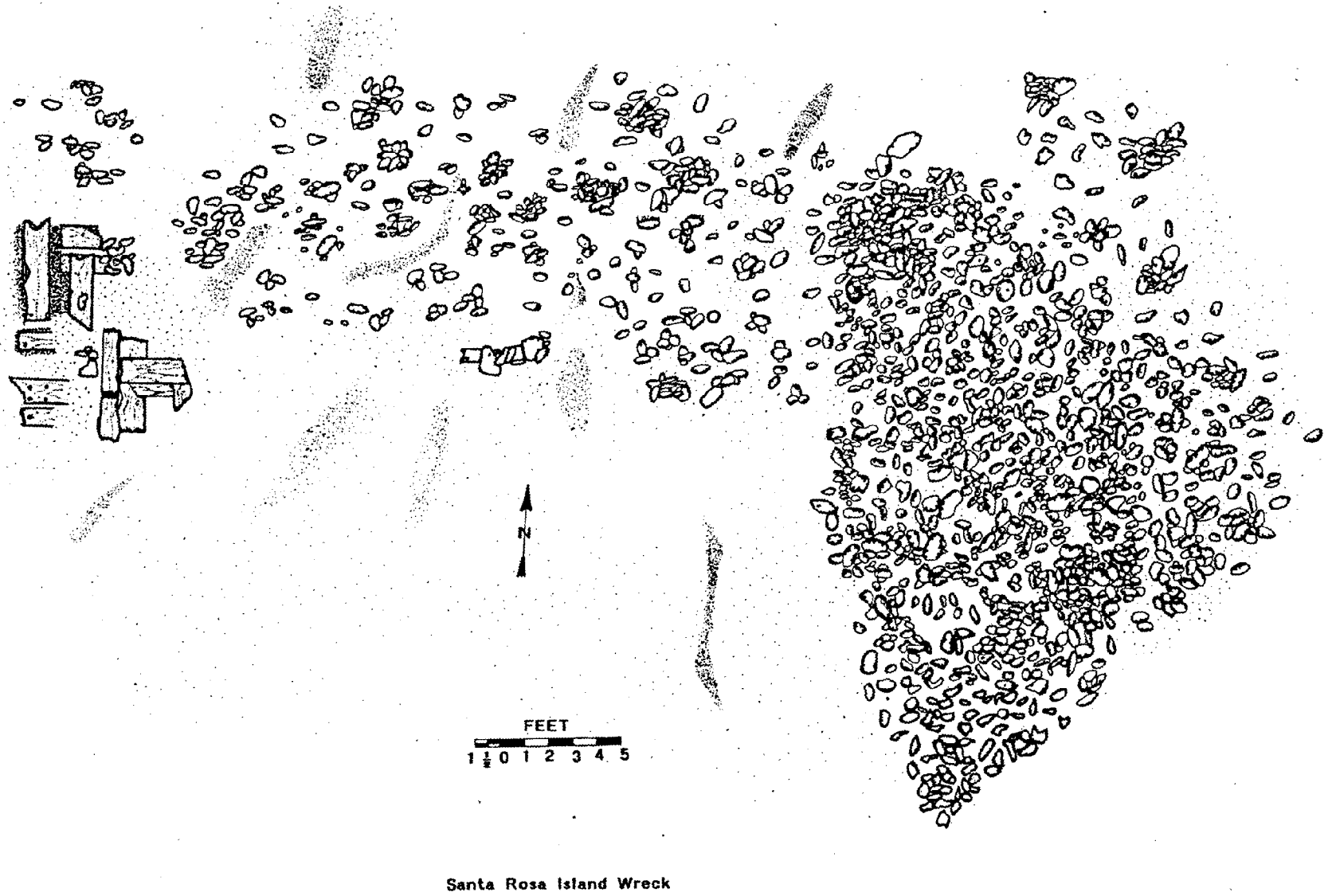


Figure 21. Site Plan of Santa Rosa Island Wreck.

were conducted and all elements were drawn in place. The largest concentration of ballast extends 30 feet to the north and 50 feet to the east. The ballast slopes northward from 10 feet to 22 feet in depth. The ballast is hand size river cobble mostly uniform in size and is not indigenous to Pensacola.

The timbers consisted of ceiling planks, framing, and exterior planks (Figure 21). Exposed timbers measured 8.6 feet in length and 5.8 feet in width. Frames were 0.9 feet wide. The exterior planks measured 0.9 feet in width, and the ceiling planks were 1 foot wide. At the twenty foot mark on the baseline lies an exposed section of timbers below concreted ballast stones. Underneath the exterior strakes is what appeared to be horse hair braided into rope and thin pieces of wood. Their presence suggests that the ship is wooden sheathed, although this is tentative as no pitch or cloth was observed.

Artifacts

No artifacts were retrieved from the site, and none were seen. Several concreted objects, however, were noted around the periphery of the site.

Threats to Site

The site is threatened primarily by erosion, tidal action, and wind and wave effects. It is currently uncovered, but will probably cover and uncover as storms pass over. Beachcombers and pot hunters are a potential hazard should the site's location become known. Further dredging in the pass could possibly alter the shape of the beach thus exposing the vessel to more direct tidal and current action.

Assessment

The vessel at Santa Rosa Island is probably a colonial-period vessel. So far, historical research has not revealed a possible nationality for the wreck. According to old French maps of the 18th century this area was a careenage site; therefore, this wreck may represent an abandoned vessel, like the Deadman's Wreck in Old Navy Cove. Or perhaps the vessel was either driven ashore by storm or by navigational error.

Recommendations

The site represents a potentially significant discovery worth further investigation. Additional investigations could answer several questions, such as extent of site, artifactual content, and construction pattern, among others. The site lies in the jurisdiction of two governmental agencies, the Florida Division of Historical Resources and National Park Service. Subsequent archaeological research can occur only with permission of both agencies.

CHAPTER 8. CONCLUSIONS

Between March and December 1992 the second phase of the Pensacola Shipwreck Survey accomplished many goals specified in the Coastal Zone Management grant. These objectives included the initiation of the fourth Florida underwater archaeological preserve; lecturing at public functions to increase awareness of Pensacola's maritime history and submerged cultural resources; and conducting remote sensing surveys to locate, identify, and assess shipwrecks in Pensacola Bay. The survey's two distinct and separate areas of generating public awareness and remote sensing operations complemented each other. One result of the two endeavors working jointly together was that with increased public involvement, more individuals familiar with the bay shared their extensive knowledge. This helped the Survey plan which areas of the bay to investigate.

Public Awareness and Education

The program of public education and awareness was extremely successful in generating interest and concern among the residents of Pensacola and Gulf Breeze in the submerged cultural resources of Pensacola Bay. The format called for organizing the Conference on Maritime History and Underwater Archaeology, generating media attention, giving lectures and programs, utilizing volunteers, and presenting sport diver workshops.

The Conference on Maritime History and Archaeology offered the citizens of Pensacola and Gulf Breeze a means of learning about the historically important artifacts on the bottom of their bay, and also about the equally important historical resources in other parts of the state and country and what is being done to protect them. The Conference was successful, attended by more than one hundred people.

During the Conference the nomination of the USS *Massachusetts* as an underwater archaeological preserve was presented and the goals of the Pensacola Shipwreck Survey were outlined. In this way the Conference was used as a means to begin the public education and awareness campaign. The efforts of the Pensacola Shipwreck Survey became well-known through the year as the staff informed Pensacola area citizens of the important historical resources under the waters of Pensacola Bay. Public response to the nomination of the USS *Massachusetts* as Florida's fourth underwater archaeological preserve indicated the Survey's efforts were reaching the intended audience. The support of Pensacola citizens, organizations, and businesses will combine to make the "Old Mass" an important addition to Florida's inventory of protected shipwrecks.

Media attention from television, radio, and local newspapers kept the people of Pensacola aware of the progress of the Survey. Citizens read or heard about the project and were informed of results and aspects of the project they could become involved with. In this way the Friends of the USS *Massachusetts* was formed from a group of concerned citizens and businesses. Also, potential volunteers contacted the Survey to offer their time and services to help the project. These volunteers helped with remote sensing and ground-truthing operations and contributed much to the work of the Survey.

Local organizations learned of the Shipwreck Survey and invited staff members to give lectures and presentations. This, in turn, afforded the Survey another way to generate interest in the important submerged cultural resources in Pensacola Bay. Often, people from the audience would offer information about a wreck site. In this way, the public education efforts tied together. That is, one means of making the public aware often lead to another way to bring information to people and, sometimes, these efforts resulted in learning of possible shipwrecks.

One other method promoted appreciation and preservation of sunken historic resources. The method focused on people who often find wrecks and who often unknowingly disturb these resources--sport divers. The Orientation to Underwater Archaeology for Sport Divers workshop was organized by the Survey staff and presented to any interested diver who signed up. The rudiments of theory and non-disturbance technique were taught and the divers were encouraged to promote preservation of shipwrecks. The hope of the Survey is that these divers will form the nucleus from which a cadre of divers will grow who are dedicated to preserving submerged cultural resources and who will inform the proper authorities of locations of new sites as well as any destruction or disturbance of known sites.

One conclusion that can be drawn from the public education and awareness efforts Survey is that people are interested in their local history and will help protect scarce historic resources. Programs initiated and events sponsored by state agencies provide citizens the opportunity to become involved in historic preservation.

Once involved, local organizations will often take the initiative and continue the process of preservation without involvement from the state, thus allowing the state to repeat its programs elsewhere. An example of this is the community involvement in Florida's underwater archaeological preserve system. The support and donations of money and materials from private individuals and businesses enabled the state to create preserves around the wrecks of the *San Pedro* and *Urca de Lima*. Even in areas that have little money for parks enough appreciation for historical resources exists to develop a preserve, as is the case for the *City of Hawkinsville*. This tradition is continuing today in Pensacola as another underwater preserve is created around the wreck of the USS *Massachusetts*.

Additionally, the sport diving industry's new attitude of "ecological consciousness" can be used to promote preservation of historical, as well as natural, resources. To foster this growing attitude, state-sponsored classes, such as the sport diver workshops, should be offered in as many areas as possible. Professional archaeologists can teach students about proper techniques, reporting procedures, and methods of preservation better than the average dive instructor can, though instructors can aid in teaching and certifying. Furthermore, once dive instructors understand the importance of preserving historical resources, they will deliver this message to their students and promote preservation and appreciation of the resources among new sport divers.

Remote Sensing Surveys

The mission of the remote sensing survey was to locate shipwrecks from the two periods unrepresented in the 1991 report, the First and Second Spanish Periods. If no shipwrecks of these specific periods could be found, the Survey at least hoped to locate shipwrecks from either the British or French colonial periods. Two possible colonial wrecks were discovered: the Santa Rosa Island Wreck and the Emanuel Point Wreck. To date they have not been assigned to a particular period; further archaeological investigations are necessary before a firm date can be arrived at. Several other shipwrecks were recorded dating to approximately the middle nineteenth-century and later. While it was hoped that more older sites would be located and recorded, the Survey managed to find several previously unknown sites by remote sensing devices and record them.

The electronic survey resulted in an extensive coverage of Pensacola Bay. Major survey areas included the west side of Gulf Breeze, Old Navy Cove, Emanuel Point, the northwest side of Santa Rosa Island, and along Pensacola Naval Air Station's south waterfront. By using archaeological prospecting tools such as magnetometry and side-scan sonar, hundreds of magnetic and acoustic anomalies representing potential submerged historical resources were discovered during the course of the survey.

Of these, fifty-two were ground-truthed. Following identification and evaluation, the targets were classified into several descriptive categories: Disposal-Intentional and Accidental, with sub-headings of fishing, dredging, military, construction; Natural Feature; Geological Feature; Buried Object; Ballast Dump; Shipwreck; Historic Material; Anchorage; and Active Structure. Some of the anomalies could be considered under several headings, but are primarily classified by their outstanding feature.

The predominant category of ground-truthed anomalies was accidental or intentional disposal of more recent material. Forty-eight percent of the ground-truthed anomalies were considered to be disposal refuse of no historical or archaeological significance. Most represented attempts by fishermen to create private artificial reefs. The next largest category was natural features, at twenty-three percent. The percentages of the other ground-truthed categories were as follows: Buried objects, ten percent; Ballast Dump, six percent; Shipwrecks, four percent; Geologic, four percent; and two percent each for Anchorages, Historic Materials, and Active Structures.

By understanding the cause of magnetic or acoustic anomalies through ground-truthing combined

with knowledge of the surrounding man-influenced environment, one can make certain assumptions develop or hypothesis of expected output generated by a remote sensing survey in a water body like Pensacola Bay. In the case of Pensacola Bay, seventy-seven percent of the ground-truthed anomalies proved of no historic significance. Only four percent were actual shipwreck sites, and another four percent of varying significance, while the rest were natural features of unknown origin. The high percentage of insignificant material would be expected in a highly active bay such as Pensacola Bay.

Analysis of the locations of over 4,000 shipwrecks in the Gulf of Mexico (Garrison 1989) reveals that seventy-five percent occurred along the coastline in shallow water, while the rest are in deeper waters. These results can be extrapolated to the expected findings of a remote sensing survey conducted in a bay used as a port and harbor.

If the Gulf coastline can be expected to contain many ship losses and related anomalies, then a port or harbor with an active maritime industry can be presumed to contain many ships and related artifacts along its shoreline. Given that the geographical parallel between the Gulf coastline and the bay is the bay's shoreline. And this indeed is where many of Pensacola Bay's wrecks are, in the transition zone between shallow and deeper water, as shown by the Santa Rosa Island and Emanuel Point Wrecks, and most of the wrecks investigated in 1991. In Pensacola Bay, the percentage of identified and assessed wrecks along the shoreline is approximately eighty-seven percent compared to thirteen percent in deeper water.

While wrecks can be expected along the shoreline in the bay, there are other mitigating factors in the bay (unlike the Gulf or other less populated bounded water bodies) that preclude assuming electronically induced anomalies are indeed ships or associated debris. Demographics, and how long the population has been there, industry, and other factors influence how many and what kind of acoustic and magnetic anomalies are to be expected. In the remote sensing survey conducted in Pensacola Bay, many more anomalies proved to be intentionally or accidentally disposed objects with no historical significance. Activities such as dredging, fishing, and dumping contributed to the bottom make up and represented potential magnetic and acoustic anomalies. There could even be instances of significant material covered or masked by these debris. Such deposits are often in the same zones as shipwrecks, in shallow water and above the shoreline.

Another important factor in assessing anomalies was the geological nature of the bottom. In Pensacola Bay, the bottom sediments consist of two main components, sand and mud. Of the fifty-two magnetic and acoustic ground-truthed anomalies, sixty-three percent of the anomalies were located on a sand bottom, thirty-three percent in mud, and the remainder in a combination of sand and mud. Mud proved a hindrance in locating anomalies, especially magnetic anomalies, while a sand bottom gave more false readings, especially while on sonar. Thus, bottom consistency can also contribute to the discovery and identification of anomalies depending on the equipment used. Part of the reason of bringing the side-scan sonar was to identify anomalies that were capable of being located by visual means only, rather than spending time on probing and digging.

Geological features, such as sand ridges, gullies, channels, etc., also contribute to the ability to identify remote sensing anomalies. Primarily, in areas of sandy bottoms, currents do not bury objects under sediments, and do cause objects to be exposed by scouring. Farther from this area, like in the middle of the bay and protected areas such as Old Navy Cove, currents are weaker and mud readily accumulates, eventually burying objects quite deeply, deeper than a probe can reach. Sand bottoms revealed more potential anomalies for visual inspection, while mud bottoms lessened the chance of a successful visual inspection, and required probing operations to determine the character of the anomaly.

Recent dredging activities in the ship channel have influenced the western area of Pensacola Bay, especially the region near Big Lagoon. Here, the dredge spoil island between the cut and Intracoastal Waterway is beginning to build up along its southern base and threatens to close the cut. An accretion of sand along the western-most area could threaten to obscure and bury material culture. The dredging activity has also reportedly caused an increase of currents in this area of the bay. Bottom make-up here, of large sand ridges, would cause these currents to move more rapidly along the bottom. A target found one year could well be buried by a sand ridge the next year.

Thus, identifying remote sensing anomalies depends on several variables, namely demographics, maritime and related activities, bottom type, and the equipment used. Each affects the ability to determine the exact nature of the source causing the anomaly and its location. The magnetometer proves more useful for conducting surveys in mud bottoms, where the likelihood of exposed features that could be detected acoustically is diminished. Probing is then necessary to locate and identify the object causing the anomaly, although it is sometimes difficult to determine the source. The side-scan sonar proved more useful for identifying anomalies above and slightly below the bottom, for immediate visual inspection.

Survey goals dictated that the priority be in the location and identification of First and Second Period Spanish shipwrecks, and Colonial shipwrecks. Assuming that ships of this period will have little surface expression, except possibly some ballast, low-lying and geographical anomalies were the only means in detecting a cultural resource of this age by the side-scan sonar. While the remote sensing survey did not result in an abundance of historical resources, those found do represent potentially significant sites requiring additional archaeological investigations. These sites include the Santa Rosa Island Wreck, Emanuel Point, and possibly the Wayside Park Ballast pile.

CHAPTER 9. RECOMMENDATIONS

Results of this year's survey helped increase public awareness of the importance of maritime endeavors in the bay. Some efforts must be undertaken to continue the interest generated during the brief two-year existence of the Pensacola Shipwreck Survey. Recommendations include involving the public through conferences and workshops, and to encourage organization of a group to conduct underwater archaeological activities like survey and recording, among others, to keep interest from flagging.

Public Awareness and Education

A Conference on Underwater Archaeology and Maritime History should be held annually to continue exchange of information and keep public interest high in the submerged cultural resources of Pensacola Bay. Some good candidates for the planning and implementation of the Conference are the historical societies of Pensacola and Gulf Breeze. These groups were instrumental in the planning and execution of the first and second Conferences and expressed interest in continuing the tradition. The large number of attendees at the 1989 and 1992 conferences indicates that future conferences would draw at least as many people. Future conferences should also continue the public education and awareness program begun by the Pensacola Shipwreck Survey.

The Orientation to Underwater Archaeology for Sport Divers workshop should be continued in Pensacola and begun in other regions of the state. Results of the first workshop and interest generated by the class indicate more workshops would be useful in creating a cadre of concerned sport divers who would protect submerged resources in the area. When the Pensacola Shipwreck Survey is no longer in operation, these divers would be invaluable in protecting historic shipwrecks in Pensacola Bay. By encouraging other sport diving instructors to continue teaching the class, the process of educating the sport diving public can be continued. The program should also be started in other areas of Florida to promote public education and awareness of the submerged cultural resources in that area.

It is imperative that the process of public education and awareness be continued to promote protection and proper archaeological investigation of the historic shipwrecks in Pensacola Bay. By encouraging the media to feature archaeological projects in the Bay, as well as in the city, public interest will not wane. A well-informed public will demand the protection and conservation of their archaeological resources will be inclined to notify the proper state authorities when an undocumented wreck is discovered.

Remote Sensing Survey

The remote sensing survey resulted in a large and extensive coverage of Pensacola Bay. Several areas, however, should receive future survey, namely, Butcherpen Cove, Garcon Point and White Point, Magnolia Bluff, and along the Scenic Highway Bluffs. In addition, submerged obstructions and snags reported by fishermen and shrimpers to the Survey remain to be either visually or investigated electronically.

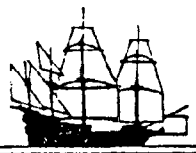
Several of the wrecks identified could be more thoroughly investigated to answer specific research questions. These include the Santa Rosa Island Wreck and the Emanuel Point Wreck. Further work on the Santa Rosa Island Wreck would require cooperation between the National Park Service and the Florida Bureau of Archaeological Research as the site lies in overlapping jurisdictions. A test trench dug in a strategic location, either the bow, stern, or main mast step area, could be useful in determining origin, nationality, and artifactual content. Undue attention to the site could jeopardize its fragile nature and well-preserved state, as it presently seems to be eroding out of the sand bank. The Emanuel Point Wreck, tentatively identified as a colonial wreck of uncertain nationality, is an excellent candidate for further scientific investigation Research questions would hopefully answer such questions as origin, date, last port of call, among other pertinent inquiries.

To locate early colonial shipwrecks a more sophisticated remote sensing package would be helpful.

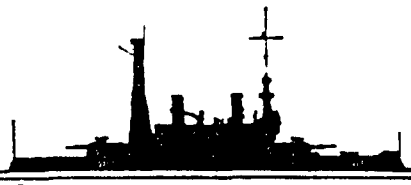
The ensemble would include not only side-scan sonar and magnetometry, but also a sub-bottom profiler and a more accurate positioning system. Archival research would also be beneficial. Knowledge of possible site locations gained from primary source documents could save time and money, by narrowing the search areas.

In conclusion, there is still plenty of work to be done in Pensacola Bay, ranging from public education to underwater archaeology pursuits. Continuing effort in Pensacola Bay will help keep the work done by the Pensacola Shipwreck Survey from becoming a mere memory. Some effort must be expended to make Pensacola a model that is evolving in its concern about submerged historical resources.

APPENDIX 1. MARITIME CONFERENCE FLYER



PENSACOLA



SHIPWRECK SURVEY

Maritime History and Archaeology Conference

Program

Morning Session

10:00-10:15 Della Scott, Pensacola Shipwreck Survey: *Welcome and Introduction*

10:15-11:00 Dr. Roger C. Smith, Florida Division of Historical Resources: *"The Pensacola Shipwreck Survey"*

11:00-11:30 James Spirek, Pensacola Shipwreck Survey: *"Exploring the USS Massachusetts"*

11:30-12:15 Dr. William Still, East Carolina University: *"Confederate Ironclads"*

12:15-1:00 Dr. Keith Holland, St. Johns Archaeological Expeditions: *"The Mystery of the Maple Leaf"*

Lunch Break

Afternoon Session

2:00-2:45 Dr. Judy Bense, UWF: *"On Land and Under Water: AStory of Pensacola Archaeology"*

2:45-3:30 Captain Robert Rasmussen, National Museum of Naval Aviation: *"Sunken Aircraft Recovery: Effects of Prolonged Underwater Exposure"*

3:30-4:00 Kevin Freeland, Gulf Coast Pro Dive Shop: *"The Role of the Sport Diver in Preserving Submerged History"*

4:00-4:15 Eilene Beard, Pensacola Charter Boat Association: *"Shipwrecks as Artificial Reefs"*

4:15-4:35 Tom Muir, Historic Pensacola Preservation Board: *"Historic Preservation in Pensacola Today"*

4:35-4:55 Sandra Johnson, Pensacola Historical Museum: *"Maritime Historical Resources in the Pensacola Collections"*

4:55-5:15 Pat D'Asaro, Santa Rosa Historical Society: *"The Importance of Keeping History Public"*

Final Remarks

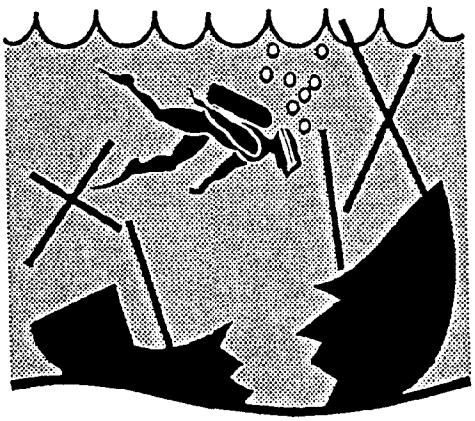
Refreshments provided by the Gulf Breeze Historical Society

Sponsored by: The Florida Division of Historical Resources, Historic Pensacola Preservation Board, Gulf Breeze Historical Society, Pensacola Historical Society, Santa Rosa Historical Society, Pensacola Archaeological Society, University of West Florida, Bayou Chico Business Association, Port of Pensacola, Scuba Shack, Gulf Coast Pro Dive, Gulf Breeze Pro Dive, Southwind Dive Shop, P.S.I. Diving Company.

APPENDIX 2. UNDERWATER ARCHAEOLOGY CLASS WORKBOOK

Orientation to Underwater Archaeology for Sport Divers

a workshop to acquaint divers with the essentials of underwater archaeology as practiced on submerged historic sites in Florida



Developed by the staff of the Pensacola Shipwreck Survey,
a project of the Bureau of Archaeological Research,
Division of Historical Resources, Florida Department of State;
Jim Smith, Secretary of State
November 1992

Acknowledgments

In developing this workshop, we drew from the following resources:

Beeker, Charles and KC Smith. "Sport Diver Orientation to Underwater Archaeology," (1986). Available from: Scuba Research and Development Group, Department of Physical Education, HPER Building, Indiana University, Bloomington, IN 47405.

Douglass, Darren. "Underwater Archaeology Specialty Course Instructor Outline," (1991). Available from: National Association of Underwater Instructors, NAUI Training Department, P O Box 14650, Montclair, CA 91763.

Harris, Lynn. "Underwater Archaeology Field School Information," (1992). Available from: Institute of Archeology and Anthropology, University of South Carolina, 1321 Pendleton Street, Columbia, SC 29208-0071.

Nautical Archaeology Society. "Archaeology Underwater: Training and Education," (n.d.). Available from: National Archaeology Society Certification Scheme, Institute of Archaeology, 31-34 Gordon Square, London, England WC1H OPY

Professional Association of Diving Instructors, Inc. Adventures in Diving. PADI Advanced Manual and Wreck Diver Specialty Course Instructor Outline, (1991). Available from: Professional Association of Diving Instructors, Education Department, 1251 East Dyer Road, #100, Santa Ana, CA 92705-5605.

Smith, Roger C., Marianne Franklin, and Robert Finegold. "Underwater Archaeology Field School Workbook," (1989). Available from: Pensacola Shipwreck Survey, 212 E. Church St., Pensacola, FL 32501.

Smith, Sheli O. "Educational Standards for Specialty Courses in Underwater Archaeology," (1991). Available from: Advisory Council on Underwater Archaeology, Los Angeles Maritime Museum, Berth 84, San Pedro, CA 90731.

Young Men's Christian Association. "Archaeological Diver Specialty Program Instructory Outline," (n.d.). National YMCA Center for Underwater Activities, Key West, FL 33040

Table of Contents

Acknowledgments iii

I. Introduction: What is Underwater Archaeology? 1

II. Sport Diving and Underwater Archaeology 3

III. Session 1: Classroom 5

IV. Laws Protecting Florida Shipwrecks 7

V. Session 2: Classroom 11

VI. Session 3: Confined Water 13

VII. Session 4: Open water #1 15

VIII. Session 5: Open water #2 17

IX. Session 6: Open water #3 and #4 19

X. Session 7: Classroom 21

XI. Wreck Diving Etiquette 23

XII. Pensacola History by Periods 25

XIII. Resource Organizations 27

XIV. Archaeological Glossary 31

XV. Nautical Glossary 37

XVI. Further Reading 39

I. Introduction: What is Underwater Archaeology?

As sport divers, we all have a vested interest in preserving things in the environment that we have spent time and money to visit. Our realm of "inner space" includes not only coral reefs and the manatee—of which there are precious few in Florida, much less in Pensacola—but also, the remains of wrecked or abandoned ships. Those who have dived the waters off Pensacola know about shipwrecks. Most divers who learned the sport in Pensacola were certified on the Three Barges—wrecks of coal barges sunk especially for us to dive. Our precious weekends are spent on the Russian freighter, the tugs *Sylvia* and *Tessie*, the dredge *Avocet*, and the Liberty Ships, to name a few. But how many Pensacolans are familiar with the historical wrecks that litter the bottom of the Bay and surrounding Gulf? Would you know a historic wreck if you found one? Would you know what to do with it?

This course is designed for the Sport Diver. This is not an archaeological field school, nor will the course make you an underwater archaeologist. However, it will give you the training and knowledge to participate in underwater archaeological projects and to help preserve submerged cultural heritage by knowing what to do if you find a historic wreck.

Shipwrecks are non-renewable resources. They are time capsules of history, and once they are disturbed or destroyed, they are gone forever. Coral reefs and manatees will grow back (although without our protection and concern, we may loose them before they have a chance to regenerate). Shipwrecks will never grow back. New wrecks may be made, but there will never be another wrecked 16th-century galleon or sunken Civil War gunboat. The study of these "microcosms" of history is vital to our understanding of the people who used these waters before us. But why should we even try to understand the past? Santayana said it best when he said, "Those who refuse to learn from the mistakes of history are doomed to repeat them."

Notes

II. Sport Diving and Underwater Archaeology

The diving public is encouraged to visit Florida's unique historical and archaeological sites, which include many shipwrecks around coastal regions and in the rivers of the state. These sites are protected by legislation that prohibits any disturbance or removal of objects from archaeological or historical sites on state-owned lands or submerged bottomlands without written authorization from the Division of Historical Resources. As with Florida's natural resources, such as live coral, manatees, and other marine life, sport divers are learning the importance of conserving and protecting cultural resources. Unlike natural resources; however, cultural resources do not grow back again once they are damaged or destroyed.

Florida's Division of Historical Resources includes the Bureau of Archaeological Research, which employs a state underwater archaeologist. Personnel from this office routinely work with the public, the sport diving industry, universities, colleges, and museums to examine and interpret underwater sites. Working with groups of volunteer divers, they have conducted surveys and excavations on both prehistoric and historic sites located offshore and in rivers and sinkholes—from submerged Indian middens and habitation sites to the remains of sunken steamboats and schooners. Since Florida has one of the longest continuous coastlines in the country, not to mention its river and cavern systems, the range of underwater archaeological sites is broad and covers thousands of years. Since the advent of scuba diving in the 1950s, many sites have been discovered by sport divers and amateur archaeologists; but, there are hundreds more about which we know very little.

When divers discover a submerged historical or archaeological site, it may be one that has already been reported, recorded, and studied. On the other hand, it may be a previously undiscovered time capsule. Before disturbing or removing anything from the site, divers should contact the State Underwater Archaeologist at the Division of Historical Resources, R.A. Gray Building, 500 South Bronough Street, Tallahassee, Florida 32399-0250, or call (904) 487-2299 for assistance. This office can help divers to assess and to date underwater discoveries, as well as offer advice on how best to proceed in researching the nature of the site. Many important historical and archaeological sites in Florida have been named after their discoverers, who had promptly reported what they had found to seek the help of professionals. Often these individuals have participated in the resulting research and recovery of information from the site they first discovered. On the other hand, many unique sites have been permanently damaged or destroyed by well-meaning but uninformed persons, who did not realize the consequences of their actions.

Dr. Roger C. Smith
Florida State Underwater Archaeologist

Notes

III. Session 1: Classroom

1. Introduction to course
   - Administration
   - Distribution of texts and other related materials
   - Discussion of equipment requirements
   - Review of course schedule and objectives

2. Fundamentals of scientific exploration
   - Study of submerged sites
   - Study of shipwrecks

3. Interdisciplinary nature of underwater archaeology
   - Anthropology, biology, geology, conservation, history, geography

4. Definition of archaeology, brief introduction, and definition of basic terms

5. Responsibilities and ethics in archaeology
   - Distinction between archaeology, salvage, treasure hunting

6. Qualifications for becoming an archaeologist
   - Higher education, professional organizations (SOPA)

7. Conservation and historic preservation
   - Preservation of historic sites
   - Conservation of excavated materials

8. Phases of an archaeological investigation
   - Archival and historical research, field research, survey, excavation, conservation, interpretation, reporting, exhibition

9. Introduction to underwater archaeological sites in Florida
   - Ships, careenages, docks, inundated Native American sites

10. Brief overview of underwater archaeological research
    - Florida, United States, abroad

11. Federal laws, state laws, and related topics
    - Abandoned Shipwreck Act, admiralty laws

12. Underwater Archaeological Preserves
    - United States, Florida, Pensacola

13. Marine Sanctuaries and National Parks
    - United States, Florida, Pensacola

14. Overview of Pensacola maritime history and ship losses
    - De Luna to present

15. Videotape: *Deadman's Shipwreck, The Movie*
    Slides: underwater projects

Notes

IV. Laws Protecting Florida Shipwrecks

With the passing of the National Preservation Act in 1966 came a way to protect our cultural resources backed by the Federal government. Florida passed its own Historical Resources Act in 1967 to protect the cultural resources in the state. This act established various programs and agencies to preserve these resources and encourage public interest while protecting the limited historical and archaeological sites. The Division of Historical Resources was created within the Department of State to administer these policies.

The Florida Historical Resources Act states that the title of all treasure trove, artifacts, and such objects having historical or archaeological value abandoned on submerged, state-owned lands belong to the State of Florida. Furthermore, there are two rules within the Historical Resources Act that have direct bearing on historic shipwrecks. These are:

- Chapter 1A - 31, F.A.C., provides that no person may conduct operations to explore, excavate, or salvage archaeological material from shipwrecks without a written agreement with the Division of Historical Resources. The Division may not enter into such an agreement unless it determines that the applicant seeking the agreement is professionally qualified through demonstration of archaeological ability to conduct such salvage activities. The rule also states that all archaeological property salvaged is the property of the state. Generally, however, the terms have permitted salvors to retain up to 80 percent of all the artifacts salvaged. The Division must also supervise the salvage activities and document all artifacts salvaged. The Division is required to limit the number of salvage contracts to a number which the Division can properly supervise.

- Chapter 1A - 32, F.A.C., establishes criteria that must be met by institutions seeking research permits. Only institutions and archaeologists meeting these criteria may conduct archaeological research on state-managed sites, and all artifacts remain in the custody of the state.

Violations of these rules are punishable by penalties provided for in accordance with Ch. 267, F.S. Persons must obtain written permission from the Division to explore, salvage, or excavate sites located on sovereignty submerged lands. Any person who violates the provisions of the Historic Resources Act is guilty of a misdemeanor punishable by a fine not exceeding $500, or by imprisonment in a county jail for a term not to exceed 6 months or both. The act further provides that the Division may impose an administrative fine of not more than $500 a day on any person or business organization that, without written permission of the Division, explores, salvages, or excavates treasure trove, artifacts, or sunken or abandoned ships located on state-owned or controlled lands, or on state sovereignty submerged lands (Florida Statues, Chapter 267.13).

Notes

Beginning 1979, claims were filed in federal courts in Florida regarding ownership of historic shipwrecks. These claims were based on federal admiralty law, which traditionally provides incentives for vessels to come to the aid of distressed vessels in marine peril. These incentives were usually portions of the cargo saved as a result of the assistance. This law was based on several hundred years of cases and was designed to save lives and cargo and then return that cargo to commerce circles. Prior to 1979, admiralty law had generally not been applied to historic shipwrecks.

In 1987, the Abandoned Shipwreck Act was passed by Congress. This federal act awarded title of all historic shipwrecks to the federal government; this title was then immediately transferred to the state in which the shipwreck resides. This act clearly exempts the federal government from the management of historic shipwrecks and overrides any federal admiralty law previously pertaining to those wrecks. In conjunction with this act, the National Park Service of the U.S. Department of the Interior issued guidelines to assist the states in developing programs to manage historic shipwrecks.

Notes

V. Session 2: Classroom

1. Archaeological excavation equals controlled destruction
   - Nondestructive investigation techniques

2. Locating sites
   - Research: historic documents, newspaper articles and photos, local informants
   - Maritime clues: ship traps, shoals, reefs; waterfront industry sites, careening sites, shipyards, abandoned vessels; sunken piers, docks, landings, refuse areas

3. Survey methods
   - Visual: towboarding, aerial photography, controlled swimlines. (Look for intrusive objects, e.g., straight lines, ballast stones, fragments of wreckage.)
   - Electronic: magnetometer, sonar, sub-bottom profiler, metal detector, ROVs. (Positioning systems, e.g., Loran, fathometer, GPS, Sat NAV.)

4. Recording methods
   - Importance of scrutiny, written notes, diagrams, photography, video
   - Basic equipment: pencil, slate, mylar, nylon tape, compass, plastic ruler, camera, video, underwater communication gear, baseline on reel, clothespins
   - Measuring: scales, feet vs. metric
   - Mapping methods: baseline, datum points, triangulation, offsets, additive and running measurements, diameters, profiles, bubble level, trilateration, grid system, direct survey method, photomosaics, SHARPS
   - Essentials of recording: site form, site plan, site photos, site videos, site reports

5. Phases of investigation
   - Phase one: preliminary historical research, site reconnaissance, pre-disturbance site survey, analysis and interpretation, report
   - Phase two: minor test excavations to answer specific research questions, including intensive mapping, minimal artifact retrieval, artifact recording, analysis, conservation, site interpretation, report, publication
   - Phase three: site excavation for mitigation or research, artifactual study, conservation, curation, complete report, publication

6. Shipwrecks and Ship Construction
   - Ship remains and site formation
   - Types of ship construction (wood, composite, metal)
   - Ship systems (hull, hardware, rigging, cargo, arms, etc.)
   - How to build a ship

7. Artifacts
   - Artifacts as clues
   - Artifact typology and identification
   - Ceramics
   - Glass
   - Metals
   - Organics
   - Conservation of artifacts

Notes

VI. Session 3: Confined Water

1. Review of basic skills
   - Buoyancy and body control, equipment control and recovery

2. Archaeological diving techniques
   - Anti-silting techniques, when to be negative

3. Mock shipwreck mapping
   - Datum points, baseline offsets, triangulation
   - Video and photo work
   - Site plan
   - Site analysis and interpretation discussion

Notes

VII. Session 4: Open Water #1

1. Dive boat charter to local shipweck site - *Sport*
   - Pre-dive briefing
   - Gear and buddy check

2. Phase One shipwreck investigation
   - Objectives
     - Measure the above-sand remains of the wreck
     - Triangulate remains for accurate positioning
   - Products
     - A complete site plan of the wreck
   - Methodology
     - Divide divers into teams and assign an area of the wreck to each team
     - Each team will accurately measure their area for inclusion in the site plan
   - Questions to be answered by each team:
     - What is the overall length of the wreck?
     - What is the maximum breadth of the wreck?
     - What materials were used in the construction of the vessel?
     - Are there any visible artifacts associated with the wreck? If so, what are they and where are they located?
     - What intrusive materials are associated with the wreck? Why do you think they are intrusive?
     - What steps could you take to determine the vessel's name, where she was built, what she was used for, how she sank?

Notes

VIII. Session 5: Open Water #2

1. Dive boat charter to local shipwreck site - *Rhoda*
   - Pre-dive briefing
   - Gear and buddy check

2. Site form preparation
   - Objectives
     - To reconnoiter the site and to complete the State of Florida Shipwreck Site Form
   - Products
     - A complete and correct site form for the *Rhoda*
   - Methodology
     - Dive teams will swim the site taking notes on slates to complete the site form
     - Once dive teams are back on the boat, they will fill out the site form (one per team)
     - The class will go over the site forms and complete a master site form from all data compiled

Notes

IX. Session 6: Open Water #3 and #4

1. Dive boat charter to local shipwreck site - USS *Massachusetts*
   - Pre-dive briefing
   - Gear and buddy check

2. Dive #1- site orientation and sketch maps
   - Identification and analysis of major archaeological features
   - Identification and analysis of marine life and biological creatures

3. Dive #2 - site documentation
   - Photo and video documentation of major features
   - Location of possible sites for mooring buoys

Notes

X. Session 7: Classroom

1. Compile and arrange field data
   - Prepare final site reports and maps

2. Discussion of methods of allowing the class to continue to network together and share future results
   - Start a "Pensacola Historic Shipwreck Club"
   - Discussion of offering another specialty course that consists of more advanced curriculum and theory

3. Certification ceremony and graduation celebration
   - C-cards, State of Florida participation certificates

Notes

XI. Wreck Diving Etiquette

1. Take only pictures, leave only bubbles!

2. Refrain from disturbing existing features, such as timbers and ballast piles.

3. Do not grab or hold onto the fragile timbers of wooden wrecks; do not stand or kneel on the wreck; be careful where you kick.

4. Do not expose more of the wreck; leave sand, stones, coral, silt in place to protect what is left of the site.

5. If you believe the wreck to be undocumented, contact one of the following:
   - Dr. Roger C. Smith, State Underwater Archaeologist, Bureau of Archaeological Research, Division of Historical Resources, Florida Department of State, Tallahassee, FL 32399-0250; (904) 482-2299
   - Pensacola Shipwreck Survey, 212 E. Church St., Pensacola, FL 32501; (904) 444-8405
   - Dr. Judith Bense, University of West Florida, Archaeological Research Facility, Building 80, 11000 University Parkway, Pensacola, FL 3251;, (904) 474-3015
   - Historic Pensacola Preservation Board, 120 E. Church St., Pensacola, FL 32501; (904) 444-8905
   - Sandra Johnson, Pensacola Historical Museum, 405 S. Adams St., Pensacola, FL 32501; (904) 433-1559
   - Nancy Van Epps, Pensacola Archaeological Society, PO Box 13251, Pensacola, FL 32591
   - Pat D'Asaro, Santa Rosa Historical Society, PO Box 3825, Milton, FL 32572

Notes

XII. Pensacola History by Periods

First Spanish, 1513 - 1763
British, 1763 - 1783
Second Spanish, 1783 - 1821
Early American, 1821 - 1861
Civil War, 1861 - 1865
Maritime Industrial Expansion, 1865 - 1906
Early 20th Century, 1906 - 1945
Late 20th Century, 1945 - present

First Spanish Period, 1513 - 1763

1513 Ponce de Leon lands in northeast Florida; beginning of Spanish interest in Florida
1520s Miruelo expedition into Pensacola Bay, reported by Cabeza de Vaca
1539 De Soto's lieutenant, Diego de Maldonado, waits in the harbor of Ochuse (Pensacola Bay)
1559 Expedition of Don Tristan de Luna y Arellano anchors on August 14 in Bahia de Santa Maria Filipina (Pensacola Bay). Expedition destroyed on August 18 by a hurricane while at anchor
1561 Settlement at Pensacola abandoned by settlers and soldiers
1693 Spanish reconnaissance of Pensacola Bay
1698 Pensacola occupied as a Spanish trade center by Juan Jordan de Reina
1718-1721 French occupation of Pensacola
1722 Spanish retake Pensacola, move settlement to Santa Rosa Island

British Period, 1763 - 1783

1763 British take over Pensacola at end of Seven Years' War
Pensacola named capital of new province of West Florida in October
1779 Spain declares war on Britain as a result of American Revolution; Pensacola considered a key position
1781 Spanish general Bernardo de Galvez takes Pensacola; British warship *Mentor* sunk in Blackwater River
1783 Florida, and Pensacola, returned to Spain at end of Revolution

Second Spanish Period, 1783 - 1821

1812 President Madison claims for the U.S. West Florida east to the Perdido River
1815 End of War of 1812 sees Spain with tenuous hold on Pensacola
1819 Spain renounces all claims to West Florida and Pensacola

1821	Florida officially becomes U.S. possession
1825	Congress authorizes construction of Navy Yard at Pensacola
1830s	Pensacola becomes major port; lumber and bricks are largest exports
1829 -1859	Forts Pickens, McRee, and Barrancas constructed to fortify the harbor

Civil War Period, 1861 - 1865

1861	Florida secedes from the Union; start of Civil War; Confederates seize Ft. McRee and Ft. Barrancas; Ft.Pickens held by the Union
1862	Southern forces abandon the city and Union forces occupy; steam and gunboats burned by Confederates as part of scorched earth policy

Maritime Industrial Expansion Period, 1865 - 1906

1885	Army Corps of Engineers declares Pensacola to be the most important port between Philadelphia and the Rio Grande
1896	Red snapper industry in Pensacola exceeds one million pounds of fish
1899	More than $14 million in exports passes through the Port of Pensacola

Early 20th Century Period, 1906 - 1945

1906	A major hurricane destroys the waterfront, Navy Yard, and the Gulf Marine Railway
1914	"Aeronautic center" established at Navy Yard; first flight made from Pensacola Naval Air Station
1920s	Port of Mobile surpasses Pensacola in significance
1930s	The Great Depression causes decline in red snapper industry
1940	World War II demand for aviators causes economy to boom in Pensacola

Late 20th Century Period, 1945 - present

1970	Port of Pensacola completes new terminal; imports increase
1980-present	Shrimp replaces snapper as principal seafood export; U.S. Navy aircraft carrier homeport at Pensacola

XIII. Resource Organizations

Florida and Pensacola

State Underwater Archaeologist, Bureau of Archaeological Research, Division of Historical Resources, Florida Department of State, Tallahassee 32399; (904) 482-2299

Pensacola Shipwreck Survey, 212 E. Church St., Pensacola 32501; (904) 444-8405

Archaeological Research Facility, Building 80, University of West Florida, 11000 University Parkway, Pensacola 32514; (904) 474-3015

Historic Pensacola Preservation Board, 120 E. Church St., Pensacola 32501; (904) 444-8905

Pensacola Historical Museum, 405 S. Adams St., Pensacola 32501; (904) 433-1559

Pensacola Archaeological Society, PO Box 13251, Pensacola 32591

Santa Rosa Historical Society, PO Box 3825, Milton 32572

Academic programs

Graduate degrees in maritime history and/or nautical archaeology are offered by the following universities; information about their programs may be acquired by writing to the institutions. In addition, there are many maritime education organizations in the United States which, while not providing formal academic programs or degrees, do offer opportunities for training and participation in activities related to maritime and archaeological preservation. A list of these may be found in the "Directory of Maritime Heritage Resources," published by the National Trust for Historic Preservation.

East Carolina University, Department of History, Underwater Archaeology and Maritime History Program, Greenville, NC 27834

Scottish Institute of Marine Studies, St. Andrew's College, Fife, Scotland KY1 69AJ

Texas A&M University, Department of Anthropology, Nautical Archaeology Program, College Station, TX 77843

University of Western Australia, Program in Maritime History and Archaeology, Fremantle, Western Australia

In Florida, undergraduate courses in underwater archaeology are offered by the following universities: **Florida State University, University of Miami,** and the **University of West Florida.**

Historical societies

Many states have historical societies that work to preserve maritime cultural resources; that foster public information programs; and that often sponsor research projects. A comprehensive list of such associations may be found in the National Trust for Historic Preservation "Directory of Maritime Heritage Resources." A few well-known national and international resources are cited below.

Champlain Maritime Society, PO Box 745, Burlington, VT 05402

Classic Yacht Restoration Guild, Inc., 683 Pond Neck Rd., Earleville, MD 21219

National Maritime Historical Society, 132 Maple St., Croton-on-Hudson, NY 10520

National Trust for Historic Preservation, Department of Maritime Preservation, 1785 Massachusetts Ave., N.W., Washington, D.C. 20036

Nautical Archaeology Society, 303 Brantley Harbor Dr., Longwood, FL 32779

Nautical Archaeology Trust, 24-28 Oval Rd., London, England NW1 7DX

Nautical Research Guild, 6413 Dahlonega Rd., Bethesda, MD 20816

Shipcraft Guild, 11 College Dr., Jersey City, NJ 07305

The Steamship Historical Society of America, 345 Blackstone Blvd., H.C. Hall Building, Providence, RI 02906

Wisconsin Marine Historical Society, 814 W. Wisconsin Ave., Milwaukee, WI 53233

Museums

Nearly 200 maritime museums in the United States are dedicated to the preservation of the nation's seafaring heritage. In addition to maintaining artifactual and literary collections for public display and research, many also sponsor research projects and public education programs, and have trained staff members to assist the public. A small sample of these museums is provided below.

Baltimore Seaport and Baltimore Maritime Museum, Pier Four, Pratt St., Baltimore, MD 21202

Confederate Naval Museum, PO Box 1022, Columbus, GA 31902

Great Lakes Naval and Maritime Museum, PO Box A-3785, Chicago, IL 60690

Maine Maritime Museum, 963 Washington St., Bath, ME 04530

Mariner's Museum, Newport News, VA 23606

Mystic Seaport Museum, Greenmanville Ave., Mystic, CT 06355

Naval Historical Center, Building 57, Washington Navy Yard, Washington, D.C. 20374

New Bedford Whaling Museum, 18 Johnny Cake Hill, New Bedford, MA 02740

Peabody Museum, Maritime History Department, East India Square, Salem, MA 01970

Philadelphia Maritime Museum, 321 Chestnut St., Philadelphia, PA 19010

Ships of the Sea Museum, 503 E. River St., Savannah, GA 31401

Smithsonian Institution, Museum of American History, 12th and Constitution Ave., Washington, DC 20560

South Street Seaport Museum, 207 Front St., New York, NY 10038

Professional organizations

Several nonprofit associations foster research or public awareness about maritime cultural resources and underwater archaeology. With the exception of the ACUA, one may join these groups for a nominal annual fee. Membership usually entitles one to receive periodic publications or newsletters of the organization, as well as other benefits.

Advisory Council on Underwater Archaeology [ACUA], 3610 Crowncrest Dr., Austin, TX 78759

CEDAM International, Department A, One Fox Rd., Croton-on-Hudson, NY 10520

Institute of Nautical Archaeology [INA], PO Drawer H, College Station, TX 77840

Maritime Archaeological and Historical Research Institute [MAHRI], 224 Route 130, Bristol, ME 14539

Mel Fisher Maritime Heritage Society, 200 Greene St., Key West, FL 33040

Society for Historical Archaeology [SHA], PO Box 241, Glassboro, NJ 08028

Underwater Society of America [USA], Box 513, Christiansted, St. Croix, USVI 00820

XIV. Archaeological Glossary

analysis: the stage of archaeological research that involves the description and classification of archaeological data.

anthropology: the study of humans, including the variety and distribution of physical, cultural and social characteristics.

archaeological data: materials recognized as significant evidence and collected by an archaeologist to enable interpretation of a site. There are many classes of archaeological data including artifacts, features, structures, food remains, historic documents and records, ecofacts and environmental information.

archaeological documentation: the body of data about a site, gathered through various scientific means including measurements, written records, photography, graphic illustrations, artifact analysis, and historic documents, which will enable interpretation of a site.

archaeological reconnaissance: a systematic attempt to locate, identify and record the distributuion of an archaeological site against its natural geographical and environmental background.

archaeological site: a place where humanly manufactured or modified objects, features, or ecofacts are found.

archaeologist: a trained individual who studies the past using scientific methods, with the motive of recording and interpreting previous human activity rather than collecting artifacts for profit or personal possession.

archaeology: the branch of anthropology which studies past human societies based on the material remains of their behaviors. The objectives of archaeology are to construct culture history, to reconstruct past lifeways, and to study cultural process.

archives: a place where public records and documents are kept; also, a specific body of records and documents.

articulation: the state of archaeological materials when they lie in the relationship to each other that they had in life or construction.

artifact: an object manufactured or modified by humans.

assemblage: all of the artifacts found at a site; also, the set of a particular type of artifact, such as a "ceramic assemblage."

association: the relationship between an artifact and other archaeological finds in a particular context, suggesting simultaneous deposition. Associations between objects are the basis for relative dating and cross dating.

attribute: a well-defined characteristic of an artifact which cannot be further subdivided, such as form, style, or technology of manufacture, and which is used to classify and to interpret an artifact.

casting: a technique in archaeological conservation used to restore or to replicate deteriorated metal artifacts. An exact copy of the original item is made, usually from epoxy resin or latex rubber, from the mold formed by an external marine concretion.

ceramics: objects of fired clay.

class: a general group of artifacts, such as "weapons," which can be further ordered into specific types.

classification: the ordering of archaeological data into groups with similar characteristics to enable descriptions and comparisons to be made.

concretion: a composite crust of marine minerals, corrosion products, sediments, and natural life that eventually coats most metal artifacts and some organic items deposited in the sea.

conservation: the treatment given to archaeological materials by proven means to restore their original likenesses, to insure their future survival, and to prepare them for museum displays or study collections.

conservator: a trained individual who uses scientific methods to preserve and to stabilize artifacts, and who also is responsible for recovering archaeological information through analysis of objects being conserved.

consolidation: conservation techniques for an artifact that is so badly deteriorated that its original likeness cannot be restored; the object thus is to stabilize the artifact against further deterioration.

context: the position of an archaeological find in time and space, established by measurements and the assessment of its associations, matrix and provenience.

corrosion: in underwater archaeology, a decomposition process that affects metals—excluding gold and, to a small extent, lead—when they are subjected to a marine environment. The effect contributes to the formation of a concretion around the artifact.

cross dating: a relative dating technique based on other objects or artifact associations of known age.

cultural resource: an archaeological site viewed as a non-renewable resource of information about past human activity.

cultural resource management: the conservation and management of archaeological sites and artifacts as a means of preserving the past.

culture: in anthropology, culture refers to a set of designs for living that helps to mold one's responses to different situations and which is the primary means for adapting to the environment. In archaeology, the term is applied to complexes of archaeological data found at several sites that can be defined and compared in a context of time and space.

datum point: a location on a site from which all measurements are made and which is tied into known, local geographical data.

diagnostic artifact: an artifact which, because of its attributes, can be associated with other materials of known age and origin, thereby helping to date it relatively or absolutely.

distribution: a description of the spatial location of artifacts, features, or structures over a landscape.

ecofact: a natural archaeological find that helps to describe a population's environment—such as faunal or floral remains, or behavior—such as ballast—but which was not humanly made or changed.

electrolysis: a conservation technique applied to metal artifacts to remove corrosion products, stabilize remaining metal, and reconvert corroded metal into stable compounds.

encrustation: same as a concretion.

excavation: the process of uncovering an archaeological site scientifically, in uniform layers, by removing the matrix, observing the provenience and context of finds therein, and recording them in a three-dimensional way.

feature: a unique, interrelated area of a site, containing identifiable archaeological or environmental evidence. The remains may be very clearcut—such as a skeleton or a ship's hull—or rather subtle—such as iron stains in the matrix.

grid method: a technique of archaeological excavation in which a scaffold with uniform units, conventionally two-by-two meters in size, is placed over a site to aid in mapping, recording and provenience identification.

historical archaeology: the study of material remains from cultures that had writing and that left documentary evidence. In American archaeology, it refers to events post-dating 1492.

history: the study of the past through written records.

hypothesis: an unproven theory or proposition that is tentatively accepted to explain certain facts or to form the guidelines of further investigation.

magnetometer: a remote-sensing device used to locate archaeological sites and materials by measuring variations (anomalies) in the natural magnetic field of an area that may be caused by intrusive iron objects.

material culture: pertaining to the technology and artifacts of a population.

matrix: the deposit in which an archaeological find is situated. Sand usually forms a shipwreck's matrix.

photomosaic: a composite illustration of a site made of smaller photographs of adjoining areas pasted together; used to aid site recording and mapping.

prehistory: the millenia of human history that preceded the development of written records.

primary context: an undisturbed association, matrix and provenience.

provenience: the documented position of an archaeological find in time and space, recorded three-dimensionally.

radiocarbon dating: an absolute dating technique based on measurement of the decay rate of the carbon isotope, Carbon 14, into stable nitrogen (E12). The resulting dates are calibrated from radiocarbon ages into calendar years using tree-ring chronologies (dendrochronology).

relative dating: the dating of sites or artifacts based on their sequential relationship to other known examples, but not tied to calendar years. Relationships commonly are established through stratigraphy, assemblages, or stylistic or technological characteristics and evolutions.

remote sensing: archaeological reconnaissance techniques using tools that detect the presence of features or materials which may be buried or camouflaged. Magnetometry, sonar, metal detection, resistivity, and aerial and infrared photography are examples of remote-sensing devices.

research design: a systematic and well-formulated plan for conducting scientific research.

sampling: the process of selecting part of the evidence from a field of study as a basis for generalizing about the whole. Since it usually is infeasible to collect or to analyze all possible data, sampling is a basic archaeological technique, and may be "systematic," based on a need to gather evidence for specific questions, or "random," based on the presumption that all data are absolutely equal, uninfluenced by external variables, and therefore may be selected for study entirely randomly.

scientific method: the operational method of science used for observing and testing phenomena, based on the construction of hypotheses, the gathering of data in scientific means, and the possibility of replicating any results.

secondary context: a context of archaeological material that has been disturbed by subsequent human activity or natural phenomena.

selective excavation: archaeological excavation of parts of a site, intended to give a systematic sampling of the entire area.

seriation: a process in which artifacts are placed in a chronological order based on similarities and evolutions in such aspects as form, technology or association.

site plan: a map illustrating the relationship of components of an archaeological site. Usually a single, horizontal representation of primary features, structures or artifacts, a site plan also can reflect vertical relationships through the use of overlays of various strata.

site survey: reconnaissance of a potential or obvious archaeological site, including recovery of diagnostic artifacts and basic recording, to enable evaluation of its archaeological significance.

sonar: an acoustic device which transmits sound waves through water, then registers and records the reflections vibrated back from any object encountered. In underwater archaeology, the sub-bottom profiler and the side-scan sonar are the tools most commonly used in this type of remote sensing.

small finds: the term applied to artifacts that can be picked up and transported from a site, as opposed to features or structures; also, on sites which have abundant artifacts, it can refer to particularly unique or unclassifiable object.

stratigraphy: the term applied to the superimposed layers of matrix in an archaeological site. The "theory of superposition" of such layers is fundamental in archaeology, suggesting that objects found in deeper sediments are older, thus establishing a relative, chronological relationship among materials in the vertical column.

surface survey: the collection of diagnostic evidence from an archaeological site without excavation, by sampling only what is on the surface.

test pit: a small, local excavation made at a site, either to sample or to probe the whole, or to help to determine where large-scale excavation should be undertaken.

total excavation: the complete excavation of an archaeological site, including all components. Sites with large features, such as structures or a shipwreck hull, often are not excavated totally, but rather, the features are recorded in situ.

triangulation: a technique of mapping whereby an object is located relative to its measured distance from two other fixed and geographically known points.

typology: the process of grouping artifacts with similar attributes into "types" to compare them with other groups. The types established by an archaeologist may or may not coincide with the "typology" that was perceived by the original maker or user.

XV. Nautical Glossary

after: relating to the part of a ship that lies in or toward the stern.

amidships: the middle of a ship, either along her length or across her breadth.

anchorage: an area where the holding ground is good and water depths are suitable for ships to anchor. An "open anchorage" is one where there is little or no shelter.

ballast: heavy material such as iron, stone, or gravel placed low in a vessel's holds to lower her center of gravity andprovide increased stability when she is carrying little or no cargo.

bow: the forward end of a vessel.

bulkhead: a vertical partition between two decks of a ship, running either lengthwise or across, forming and separating different compartments.

caulking: material driven into the seams of a wooden ship's decks or outer planking to make them watertight; usually a fibrous material which is coated with melted pitch or resin.

ceiling planks: the internal planking of a ship.

chainwales, or channels: broad, thick planks projecting horizontally from the side of a ship, used to spread the shrouds and thus to provide better support for the masts.

drift bolt: a large iron or copper pin which fastens the keelson to the keel; a common shipwreck artifact.

fastener: a term applied to the various nails, bolts, or tacks used in ship construction.

fore: relating to the forward part of a vessel, toward the stem.

frame: one of the curved, transverse members of a ship's structure, branching outward and upward from the keel, that determines the ship's shape and strength, and that provides the framework for the planking; also called a "rib" or a "timber." Each frame has several components, including floor timbers, futtocks and top timbers.

gunwale, or gunnel: the uppermost strake or run of planking; also a ship's sides.

keel: the principal length of timber in a ship, running fore and aft, which supports and unites the whole structure. Usually the first element laid down during construction, the keel often is made up of several sections scarfed together.

keelson: an internal keel mounted over the floor timbers, immediately above the main keel, to provide additional structural strength.

mast step: a wood or metal, socket-like fitting mounted in the keelson which holds the heel of the mast.

ordnance: the weaponry, including cannons, artillery and ammunition, found on a ship.

plank: another word for strake.

planking nail: an iron or copper fastener used to join hull or deck planks to the frames or deck beams.

port: the left side of the ship, looking forward.

rigging: a general term for the ropes and wires of a vessel, including those which support the masts and yards (standing rigging) and those used in working the sails (running rigging).

sheathing: a covering, usually of copper, nailed (with a sheathing tack) over the outside of ship's hull below the waterline to protect it against marine animals and fouling.

shipworm: any of a number of small marine mollusks (e.g., *Teredo navalis*) which burrow into and damage submerged wood.

starboard: the right side of a ship, looking forward.

stempost: an upright member on a ship that rises from the keel and unites the sides of the vessel at the foreward end.

stern: the rear end of a vessel.

sternpost: a vertical component mounted on the after end of the keel, terminating the hull and holding the rudder.

strake: a continuous range of planking running fore and aft along a ship's sides.

treenail: a cylindrical wooden pin used to fix a ship's planks to its frames.

wales: a number of strong planks extending the length of a ship's side at different heights, reinforcing the decks and helping to form the distinctive curve of the ship.

yard: a large spar mounted across a mast to carry sails.

XVI. Further Reading

The following is a selection of basic books and periodicals related to underwater archaeology and maritime history. Far from comprehensive, this bibliography can be augmented by reading lists included in most of the publications cited below.

Archaeology - general

Fagan, Brian. *In the Beginning. An Introduction to Archaeology.* Boston: Little, Brown and Company, 1981.

Fagan, Brian, ed. *The Adventure of Archaeology.* Washington, D.C.: National Geographic Society, 1985.

Hester, Thomas, Robert Heizer, and John Graham. *Field Methods in Archaeology* (6th ed.). Palo Alto, CA: Mayfield Publishing Company, 1975.

Hume, Ivor Noël. *Historical Archaeology.* New York: Alfred A. Knopf, 1969.

----------. *A Guide to Artifacts of Colonial America.* New York: Alfred A. Knopf, 1980.

Robbins, Maurice and Mary Irving. *The Amateur Archaeologist's Handbook.* New York: Harper & Row, 1981.

United Nations Educational, Scientific and Cultural Organization. *The Conservation of Cultural Property.* Paris: UNESCO, 1968.

Underwater archaeology - general

Arnold, J. Barto, III. *An Underwater Archaeological Magnetometer Survey and Site Test Excavation Project off Padre Island.* Austin, TX: Texas Antiquities Committee, 1976.

Arnold, J. Barto, III and Robert S. Weddle. *The Nautical Archaeology of Padre Island. The Spanish Shipwrecks of 1554.* New York: Academic Press, 1978.

Bass, George F. *Archaeology Under Water.* London: Thames and Hudson, 1966.

----------. *Archaeology beneath the Sea.* New York: Walker and Company, 1975.

Bass, George F., ed. *A History of Seafaring Based on Underwater Archaeology.* New York: Walker and Company, 1972.

----------. *Ships and Shipwrecks of the Americas.* New York: Thames and Hudson, 1988.

Gould, Richard A., ed. *Shipwreck Anthropology.* Albuquerque: University of New Mexico Press, 1983.

Green, Jeremy. *Maritime Archaeology*. New York: Academic Press, 1990.

Hamilton, D.L. *Conservation of Metal Objects from Underwater Sites: A Study in Methods.* Austin, TX: Texas Memorial Museum and the Texas Antiquities Committee, 1976.

Marx, Robert F. *The Underwater Dig: An Introduction to Marine Archaeology.* New York: Henry Z. Walck, Inc, 1975.

McGrail, Sean. *Sources and Techniques in Boat Archaeology.* Oxford: British Archaeological Reports No. 29, 1975.

Muckelroy, Keith. *Maritime Archaeology.* London: Cambridge University Press, 1978.

Muckelroy, Keith, ed. *Archaeology Under Water: An Atlas of the World's Submerged Sites.* New York: McGraw-Hill, 1980.

Peterson, Mendel. *History under the Sea. A Handbook for Underwater Exploration.* Alexandria, VA: by the author, 1973.
Throckmorton, Peter. *Shipwrecks and Archaeology: The Unharvested Sea.* London: Victor Gollancz, 1970.
United Nations Educational, Scientific and Cultural Organization. *Underwater Archaeology: A Nascent Discipline.* Paris: UNESCO, 1972.
Wilkes, Bill St. John. *Nautical Archaeology—A Handbook.* Newton Abbot, England: David & Charles, Ltd., 1971.

Maritime history

Andrews, Kenneth R. *The Spanish Caribbean. Trade and Plunder, 1530-1630.* New Haven: Yale University Press, 1978.
Boxer, Charles R. *Dutch Seaborne Empire, 1600-1800.* London: Hutchinson, 1965.
----------. *The Portuguese Seaborne Empire: 1415-1825.* New York: Alfred A. Knopf, 1969.
Casson, Lionel. *The Ancient Mariners.* London: Victor Gollancz, 1959.
Haring, Clarence H. *Trade and Navigation Between Spain and the Indies in the Time of the Hapsburgs.* Cambridge: Harvard University Press, 1918.
McCarthy, Kevin. *Thirty Florida Shipwrecks.* Sarasota: Pineapple Press, 1992.
Morison, Samuel E. *The European Discovery of America.* 2 Vols. New York: Oxford University Press, 1971.
Parry, John H. *The Spanish Seaborne Empire.* New York: Alfred A. Knopf, 1966.
Peterson, Mendel. *The Funnel of Gold.* Boston: Little, Brown and Company, 1975.
Singer, Steven D. *Shiupwrecks of Florida.* Sarasota: Pineapple Press, 1992.
Time-Life, Inc. *The Seafarers.* 10 Vols. Chicago: Time-Life Books, Inc., 1978.
Weddle, Robert S. *Spanish Sea. The Gulf of Mexico in North American Discovery, 1500-1685.* College Station, TX: The Texas A&M University Press, 1985.

Ships and ship systems

Anderson, Romola and R.C. Anderso. *The Sailing Ship. Six Thousand Years of History.* New York: Bonanza Books, 1963.
Casson, Lionel. *Illustrated History of Ships and Boats.* Garden City, NY: Doubleday & Company, Inc., 1964.
Chapelle, H.I. *A History of American Sailing Ships.* New York: Bonanza Books, 1936.
Cipolla, C.M. *Guns and Sails in the Early Phase of European Expansion, 1400-1700.* London: Collins, 1965.
Colledge, John. *Ships of the Royal Navy: An Historical Index.* 2 Vols. Newton Abbot, England: David and Charles, Ltd, 1969.
Franzen, Anders. *The Warship Wasa.* Stockholm: Norstedts, 1966.
Goldenburg, Joseph A. *Shipbuilding in Colonial America.* Charlottesville: University of Virginia Press, 1976.
Greenhill, Basil. *Archaeology of the Boat.* London: A&C Black, 1976.
Guilmartin, John F., Jr. *Gunpower and Galleys; Mediterranean Warfare in the Sixteenth Century.* London: Cambridge University Press, 1974.

Horner, David. *The Treasure Galleons.* New York: Dodd, Mead & Company, 1971.
Howard, Frank. *Sailing Ships of War, 1400-1860.* New York: Mayflower Books, 1979.
Johnstone, Paul. *The Archaeology of Ships.* London: Bodley Head, 1974.
Landström, Björn. *The Ship. An Illustrated History.* Garden City, NY: Doubleday & Company, Inc., 1961.
Marsden, Peter. *The Wreck of the Amsterdam.* London: Hutchinson, 1974.
Martin, Colin. *Full Fathom Five: The Wrecks of the Spanish Armada.* London: Chatto and Windus, 1975.
Manucy, Albert. *Artillery Through The Ages.* Washington, D.C.: Government Printing Office, National Parks Service Interpretive History Series #3, 1949.
Pears, Randolph. *British Battle Ships, 1827-1957.* Chatham, England: N&J MacKay and Co., Ltd., 1957.

Comprehensive References

Bathe, Basil W. *The Visual Encyclopedia of Nautical Terms Under Sail.* New York: Crown Publishers, Inc., 1978.
Champion, Sara. *Dictionary of Terms and Techniques in Archeology.* New York: Facts on File, Inc., 1980.
Kemp, Peter, ed. *The Oxford Companion to Ships and the Sea.* San Francisco: Oceanic Society Press, 1976.
McEwen, W.A. and A.H. Lewis. *Encyclopedia of Nautical Knowledge.* Cambridge, MD: Cornell Maritime Press, 1953.
National Trust for Historic Preservation. "Directory of Maritime Heritage Resources." Washington, D.C.: National Trust for Historic Preservation, 1984.
Uden, Grant and Richard Cooper. *A Dictionary of British Ships and Seamen.* New York: St. Martin's Press, 1980.

Periodicals

Archaeology Magazine
American Journal of Archaeology
International Journal of Nautical Archaeology
Journal of Field Archaeology
Mariner's Mirror
Newsletter, Institute of Nautical Archaeology
Newsletter, Society for Historical Archaeology
Sea History
Underwater USA

Pensacola

Baumer, David R. *Bethune Blackwater Schooner Report.* Florida Archaeological Resports, No. 21, Tallahassee: Bureau of Archaeological Research, 1990.
Bowden, Jesse Earl, Sandra L. Johnson, and Norman Simons. *Pensacola, Florida's First Place City.* Norfolk: The Donning Company, 1989.

Dibble, Earnest W. and Earle W. Newton. *In Search of Gulf Coast History.* Pensacola: Historic Pensacola Preservation Board, 1970.

Ellsworth, Lucius and Linda Ellsworth. *Pensacola : The Deep Water City.* Tulsa.: Continental Heritage Press, 1982.

Franklin, Marianne, John W. Morris, and Roger C. Smith. *Submerged Historical Resources of Pensacola Bay, Florida.* Florida Archaeological Reports No. 25, Tallahassee: Bureau of Archaeological Research, 1992.

McGovern, James R. *Colonial Pensacola, Volume I.* Pensacola: University of West Florida, Department of History, 1974.

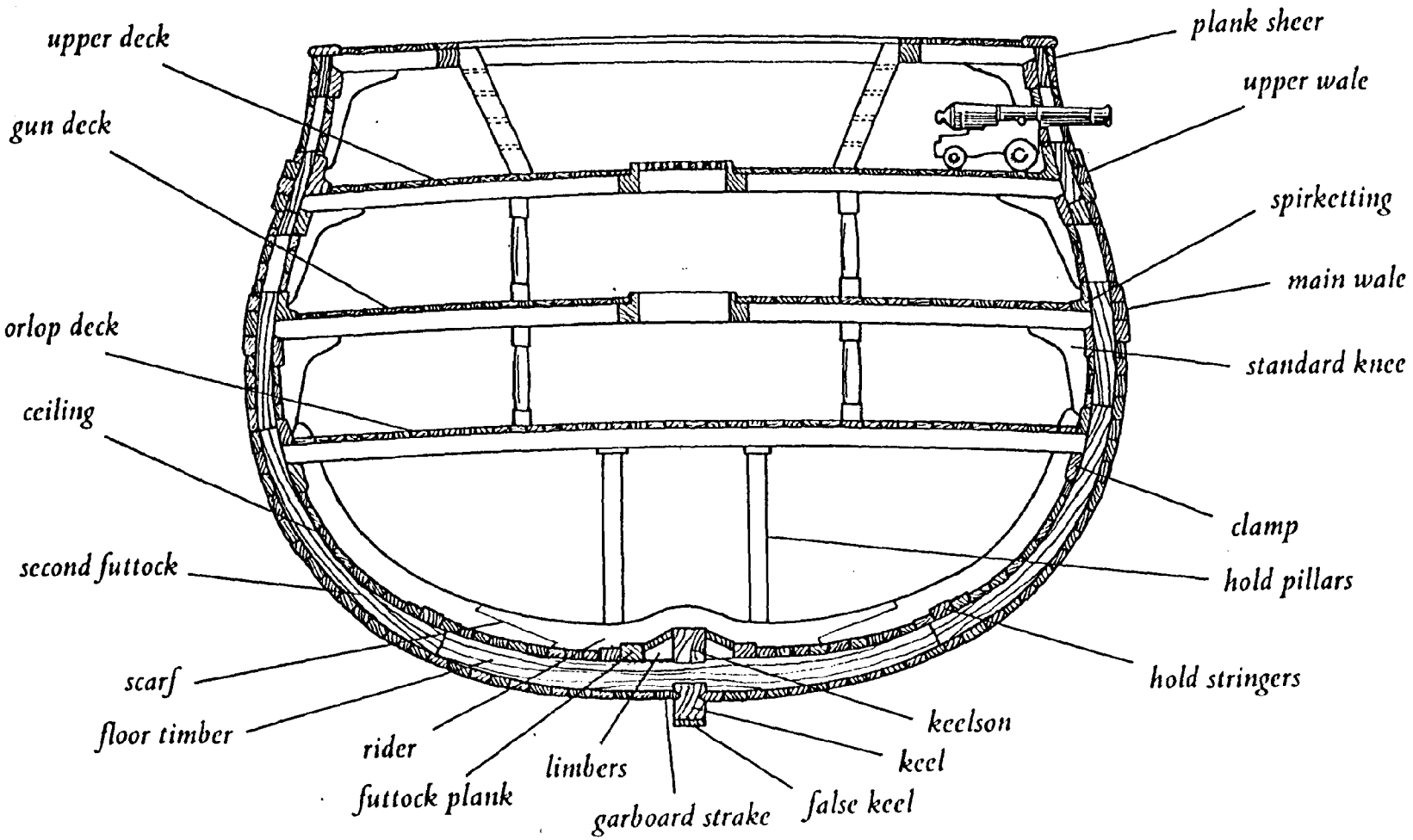
Muir, Thomas Jr. and David P. Ogden. *The Fort Pickens Story.* Pensacola: Pensacola Historical Society, 1989.

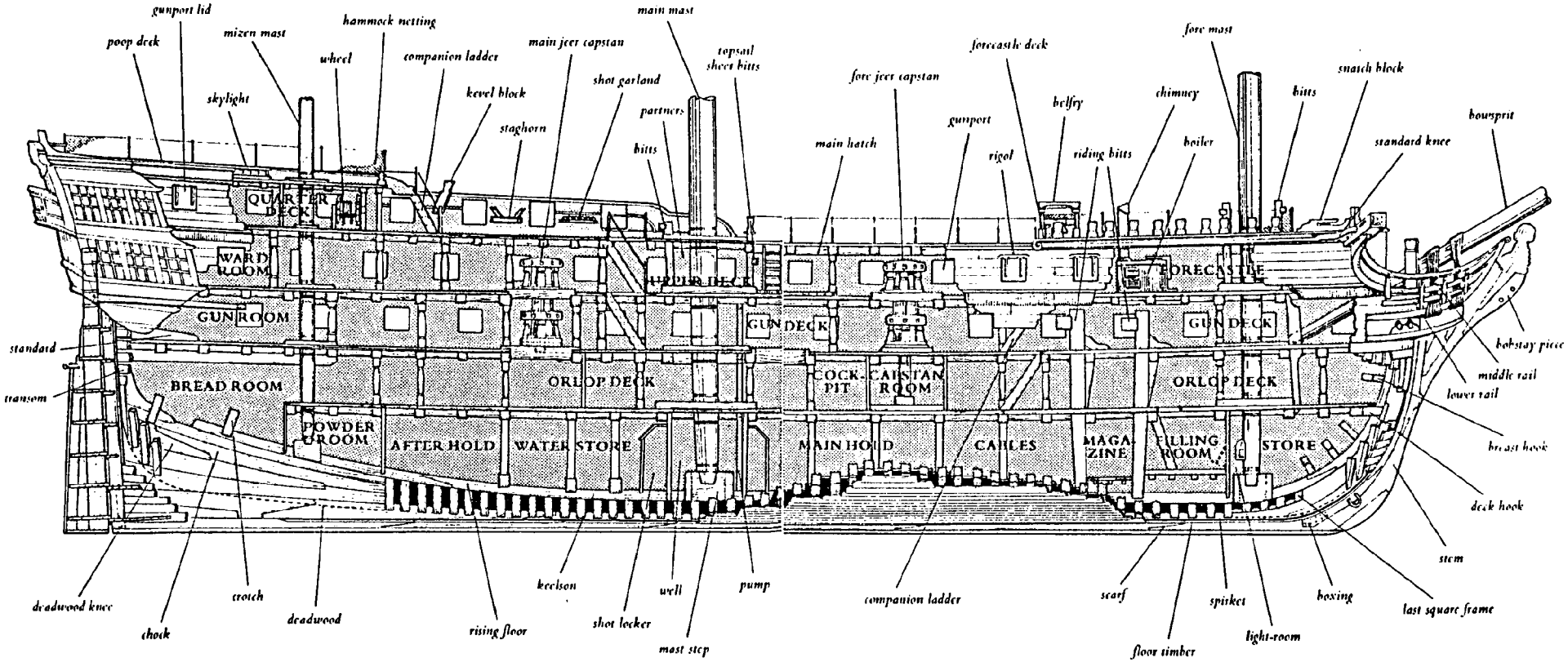
Parks, Virginia. *Pensacola : Spaniards to Space Age.* Pensacola, Fla.: Pensacola Historical Society, 1986.

Parks, Virginia, ed. *Siege! Spain and Britain : The Battle of Pensacola.* Pensacola.: Pensacola Historical Society, 1981.

Rush, Orwin N. *The Battle of Pensacola.* Tallahassee: Florida State University Press, 1966.

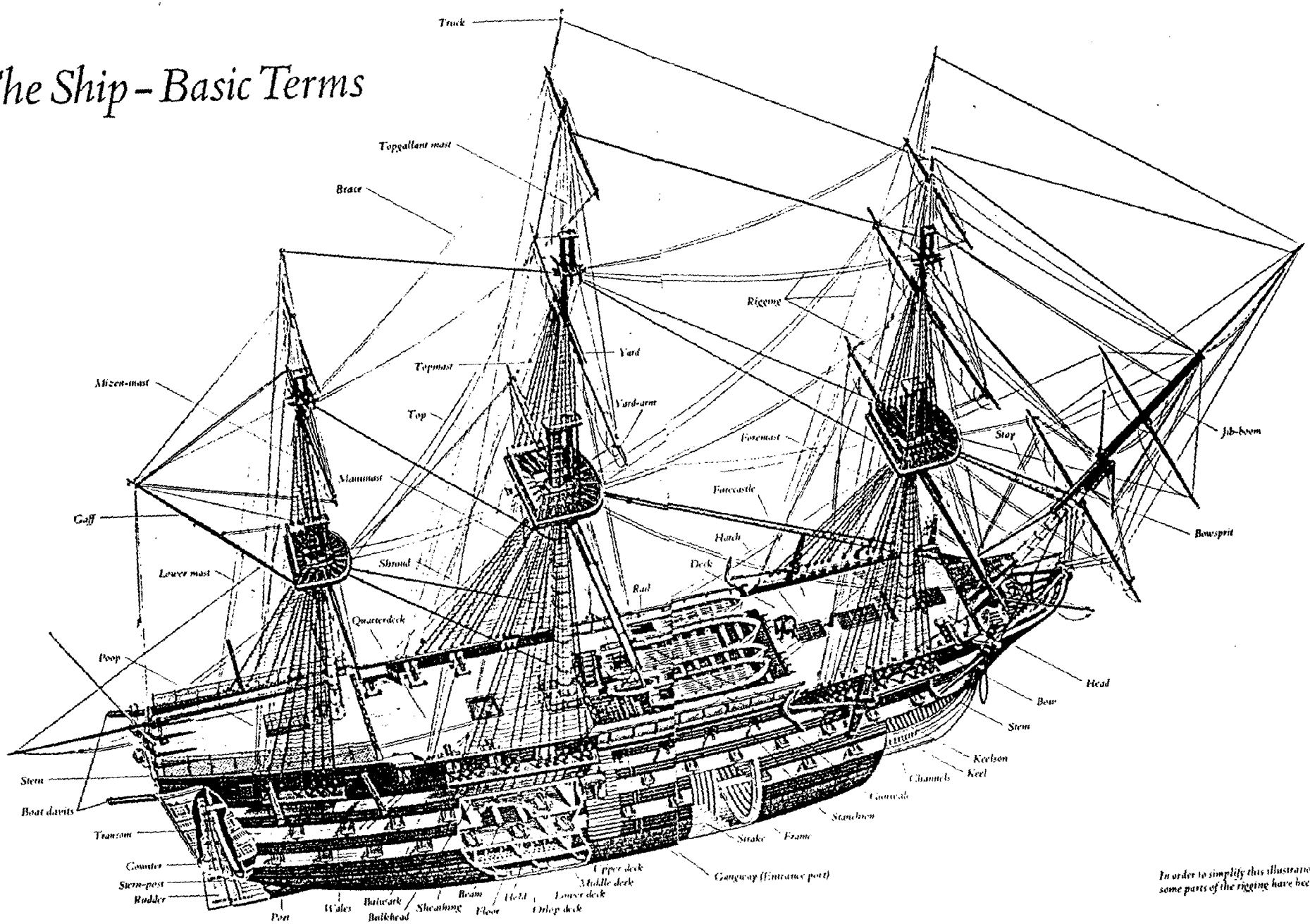
Simons, Norman and Dr. James D. McGovern. *Pensacola in Pictures and Prints, Volume IV.* Pensacola: University of West Florida, Department of History, 1974.


upper deck
gun deck
orlop deck
ceiling
second futtock
scarf
floor timber
rider
futtock plank
limbers
garboard strake
false keel
keel
keelson
hold stringers
hold pillars
clamp
standard knee
main wale
spirketting
upper wale
plank sheer



Cross-section of a Representative Ship

The Ship – Basic Terms



In order to simplify this illustration, some parts of the rigging have been o

Reprinted from EARLY MAN MAGAZINE, P.O. Box 1499, Evanston, IL 60204

The Men Who Stole the Stars

By George F. Bass

Early shipwrecks are being looted at an alarming rate around the world. There is no public outcry. The public, in fact, usually applauds the looters. Intelligent people who would stoutly defend land monuments such as Mount Vernon from being dismantled for private gain, by the sale of bricks and stones as souvenirs, feel that shipwrecks are resources to be mined in the name of free enterprise. I have failed so often in making a case for the protection of shipwrecks that I have almost given up. The story here is a true one, based on actual events, newspaper and magazine articles and editorials, photographs and correspondence. I have changed shipwrecks into stars and archeologists into astronomers in hopes of making my point.

When I looked into the sky that night, I thought at first that a cloud covered part of the Big Dipper. But the crisp night air had not a trace of moisture. After cleaning my glasses and looking again, I realized that Mizar simply was not there any longer. I called the observatory of the university nearest me.

"There's a star missing," I said. "Mizar isn't there any more."

"We have no comment at this time," was the reply.

The next issue of *Tempus*, our leading news magazine, provided an explanation. Under the "Science" heading was a brief item:

> Astronomer Claude Blakely, after years of research and experimentation, has at last developed a method of capturing stars. For an undisclosed price, he has sold Mizar to an anonymous dealer in Geneva. The dealer, through a New York spokesman, assures the public that the star will be put on display in a private planetarium within the next two years, and that hundreds of citizens will be able to see it there.

I began a flood of outraged letters to magazines, syndicated editorial writers and politicians. The stars, I said, belonged to everybody. Astronomers were supposed to map the stars, measure them and study them in the most minute detail. But, I added, astronomers were supposed to be after knowledge. They were not supposed to own the stars. I didn't believe that Mr. Blakely should really be called an astronomer.

"Your attitude strikes me as hoity-toity," replied one of the best known columnists. "Claude Blakely knows more about astronomy than any PhD or he couldn't have gone out and netted that star. And anyway, why should professional astronomers have *all* the stars? There are enough to go around. You're just jealous that you didn't make a buck out of it."

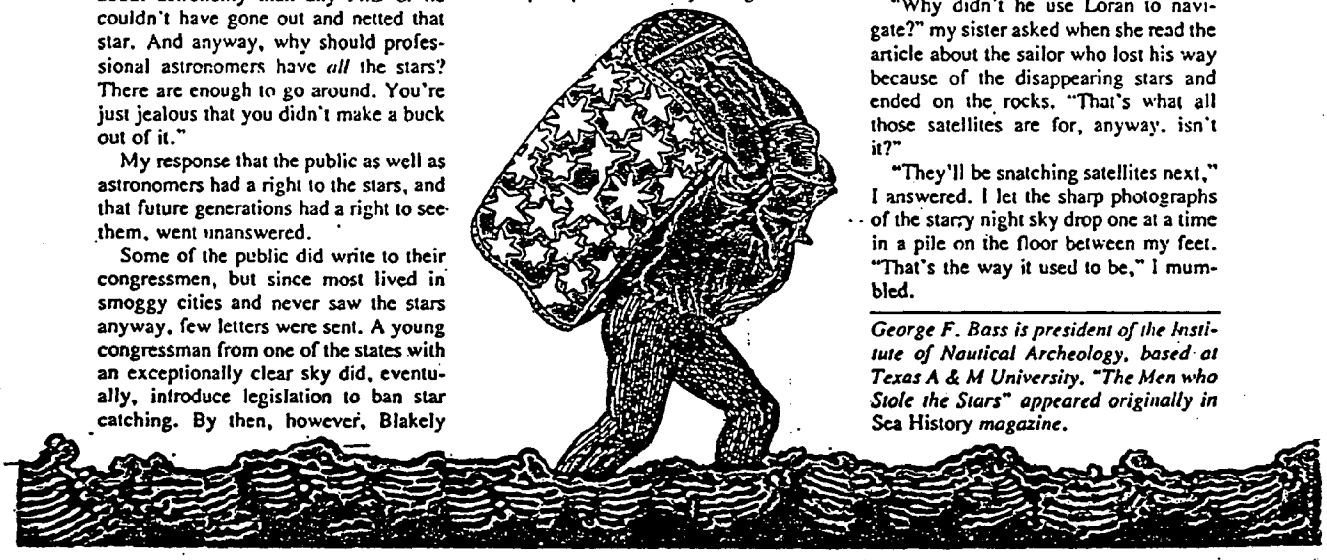
My response that the public as well as astronomers had a right to the stars, and that future generations had a right to see them, went unanswered.

Some of the public did write to their congressmen, but since most lived in smoggy cities and never saw the stars anyway, few letters were sent. A young congressman from one of the states with an exceptionally clear sky did, eventually, introduce legislation to ban star catching. By then, however, Blakely had sold rights to his star-stealing device to a number of partners.

"The clammy hands of big-brother government are trying to take away the hard-won spoils of the last of the great inventors," thundered the columnist. "Claude Blakely and his partners represent the last frontier of free enterprise."

The night that I noticed Sirius was no longer in the sky, I opened the *Newsletter of Private Star Lovers* that had arrived in the afternoon mail. It had as a logo a bald eagle holding a star in its talons, flanked by waving American flags.

> Fellow citizens: Write to your congressmen about the communist-inspired plot to take away our rights to catch and sell stars. There are millions of stars in the heavens, as any schoolboy knows. You can't even see some of them they are so dim. There cannot be any rational reason to keep them *all* up there. Especially when there are billions of dollars to be made by private investors. Stand up for your rights as an American. Stand up for free enterprise.



By then the night sky was beginning to look a bit faded. Investors were after the really bright, sparkling stars first, so the first-magnitude stars were disappearing at an alarming rate.

Astronomers made joint and private outcries about what was happening. "Precious knowledge about the creation of the universe is being lost forever. It doesn't do me any good to see Betelgeuse in the cavern of some Austrian duke," one wrote. "It's been taken out of context."

A senator from a rather foggy state submitted a piece to a family weekly:

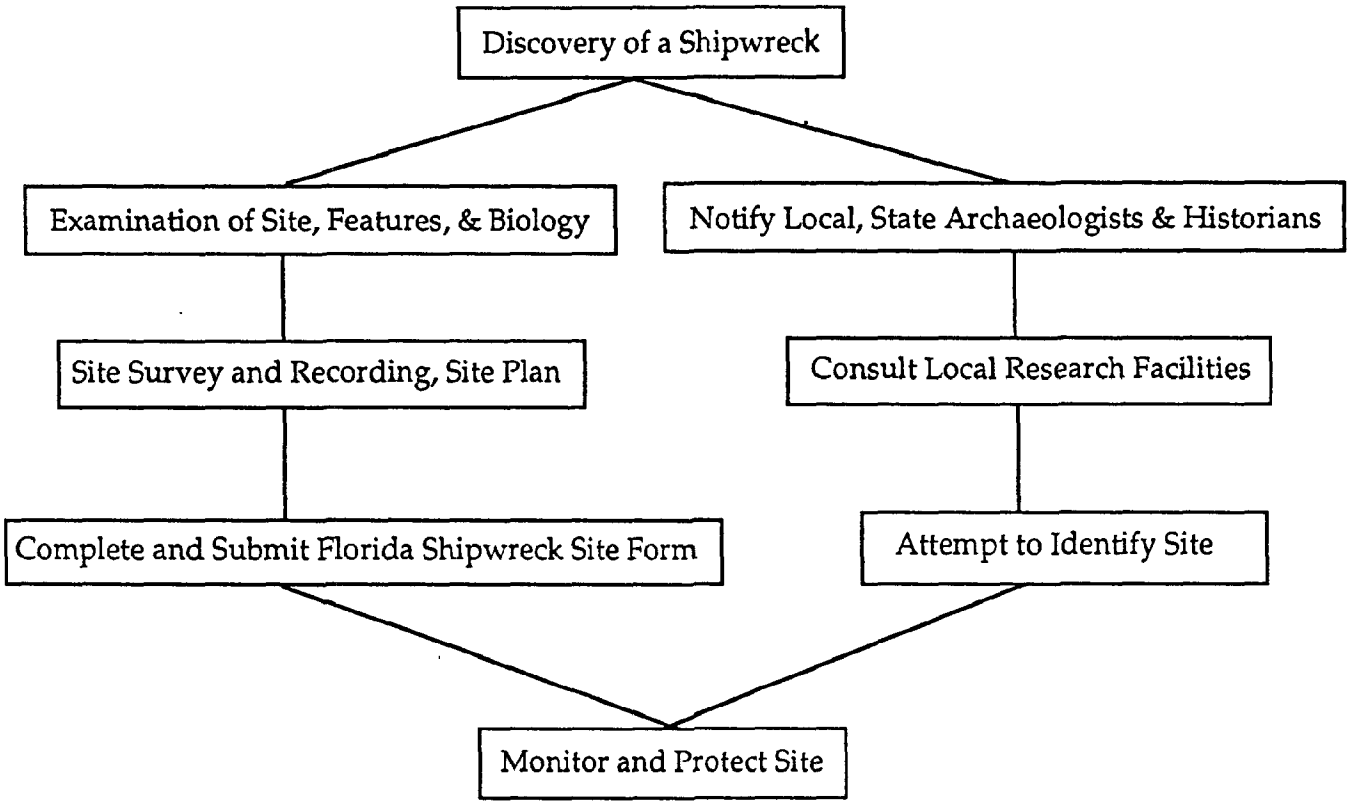
> At last astronomy is making money, not simply spending it. Millions of dollars of National Science Foundation grants will now be saved that would otherwise have been wasted on larger telescopes and more radio telescopes. Have all the astronomers, spending all that money for centuries, ever made a dime for the public? They talk about knowledge. Claude Blakely is the first one ever to show common sense!

When Polaris was snatched, I was sure that the tide would turn in favor of amateur star gazers and professional astronomers. But, except for a few yachtsmen, most people were watching their TV screens and couldn't be bothered about it.

"Why didn't he use Loran to navigate?" my sister asked when she read the article about the sailor who lost his way because of the disappearing stars and ended on the rocks. "That's what all those satellites are for, anyway, isn't it?"

"They'll be snatching satellites next," I answered. I let the sharp photographs of the starry night sky drop one at a time in a pile on the floor between my feet. "That's the way it used to be," I mumbled.

George F. Bass is president of the Institute of Nautical Archeology, based at Texas A & M University. "The Men who Stole the Stars" appeared originally in Sea History *magazine.*


Discovery of a Shipwreck
Examination of Site, Features, & Biology
Notify Local, State Archaeologists & Historians
Site Survey and Recording, Site Plan
Consult Local Research Facilities
Complete and Submit Florida Shipwreck Site Form
Attempt to Identify Site
Monitor and Protect Site

A Proposal
to Establish the USS *Massachusetts*
as a State Underwater Archaeological Preserve

Prepared by
The Bureau of Archaeological Research
Division of Historical Resources
Florida Department of State
May 1992

Abstract

Objective:

To propose the establishment of a State Underwater Archaeological Preserve at the sunken remains of the USS *Massachusetts*, the nation's oldest surviving battleship, which is located in shallow water near the entrance to Pensacola Bay. The site was nominated by a local diver in 1990 to be considered as a candidate for Florida's fourth shipwreck park. The *Massachusetts*, a popular fishing and diving location, can be better interpreted and made more accessible to the public for an increased appreciation of her role in national and regional history. A cooperative endeavor between state, county, and city officials, as well as interested organizations and individuals, is proposed to create a new historical attraction for Pensacola.

Florida's program of shipwreck parks began in 1987, with the designation as a Preserve of the *Urca de Lima*, a Spanish galleon that sank near Ft. Pierce during a hurricane in 1715. A second preserve was established in 1989 on the *San Pedro*, a galleon that grounded in the Florida Keys during a hurricane in 1733. In 1991, the *City of Hawkinsville*, a sunken steamboat in the Suwannee River, became the latest shipwreck park as a result of cooperative action between government and the public. As important examples of our maritime heritage, these sites are interpreted through widely distributed brochures and are made more accessible by mooring systems and underwater maps. They attract many tourists each year.

USS *Massachusetts* was one of three "Indiana" class warships that comprised the first true battleships built for the new U.S. Steel Navy. Launched in 1893, *Massachusetts* was designated BB-2 and was one of the most powerful ships of her time. She served in the Spanish-American War and later as an artillery training ship in the North Atlantic Squadron. Quickly superseded by larger and heavier battleships, *Massachusetts* was decommissioned three times during almost thirty years of service. In 1920, she was struck from the Navy List and loaned to the War Department as a target ship. The following year, she was towed to Pensacola and scuttled for an experimental artillery test; later she was used for target practice by naval aviation students. Returned to the Navy, the hulk was advertised for scrap but no acceptable bids were received, and the wreck became a favorite fishing spot. In 1956, title to the sunken vessel was awarded to the State of Florida by a court decision.

Today, the oldest remaining American battleship lies in just 20 ft. of water at the entrance to Pensacola Pass. Although worse for wear, the majority of the ship's remains are still recognizable; at low tide her two huge gun turrets are awash, marking her grave. Resting under the sea for over 70 of her 100 years, the *Massachusetts* has become home for many types of Gulf marine life, providing a beautiful and intriguing adventure for underwater visitors. Yet, many who come to fish and dive have forgotten *Massachusetts'* unique role in American naval history. Perhaps it is time for her remains to be interpreted and appreciated as she continues to serve her nation as a source of recreation and education.

Suggested Steps for the Establishment of a Preserve:

This proposal is the result of months of historical research on the USS *Massachusetts* and hundreds of hours exploring and recording her remains in response to her nomination as an Underwater Preserve. The purpose of this document is to present a case for Preserve designation, and to solicit input at all levels for a cooperative venture between government and the public to establish a shipwreck park. The project will depend on community support and participation, which have been key elements in the success of other shipwreck preserves in Florida. Suggested steps in preparing the site for a preserve are: a biological assessment of marine life on the wreck; installation of a mooring buoy system to aid fishing and diving boats and to prevent the loss of anchors; installation of an underwater plaque designating the site as a preserve; preparation of a brochure detailing the ship's history and present situation; preparation of an interpretive map to orient diving and fishing visitors to the site in conjunction with the mooring system; and, hopefully, preparation of a shore-based museum exhibit.

Front cover painting: The *Urca de Lima*, a galleon of the Spanish treasure fleet, sank in 1715 off Fort Pierce.

cover painting: The *Cecil Anne*, a . Army cargo boat converted to a pleasure craft, sank in 1967, the six aboard saved by a U.S. Coast Guard helicopter.

rinted in Hong Kong Published by Pineapple Press, Inc., Sarasota, Florida

THIRTY FLORIDA SHIPWRECKS

Sunken treasure, cannibalism, prison ships, Nazi submarines, the Bermuda Triangle—all are tied into the lore of shipwrecks along Florida's coasts. There are as many shipwreck stories as there are thousands of Florida shipwrecks. This book offers the stories of thirty of the most interesting of them—from the story of young Fontaneda, who wrecked in 1545 and was held captive by Indians for 17 years, to the story of the Coast Guard cutter *Bibb*, which was sunk off Key Largo in 1987 to provide an artificial reef and diving site. In between there is the *Atocha*, flagship of a Spanish treasure fleet, which sank in a hurricane in September 1622 and was found, along with its $100 million worth of gold and silver, by Mel Fisher in July of 1985.

Each shipwreck story has a map pinpointing its location and is illustrated in a full-color painting by renowned artist William L. Trotter. There is an extensive bibliography and a foreword by Florida state underwater archaeologist Roger Smith.

KEVIN M. McCARTHY teaches English at the University of Florida in Gainesville and is a certified scuba diver. He researched this book mostly on land in the state's libraries and archives. He has written six other books.

WILLIAM L. TROTTER is a registered Coast Guard artist who has been involved in maritime painting for over 30 years. His paintings have been used to illustrate several books.

ISBN 1-56164-007-7

51795

9 781561 640072

Foreword

With one of the nation's longest continuous coastlines and miles of rivers and lakes, Florida has a unique and broad range of submerged historical and archaeological resources. From prehistoric dugout canoes to modern steel freighters, Florida's waters have accumulated a significant number of sunken ships through storms, human error, naval actions, and other causes. The exact number of shipwrecks is, of course, unknown, but there are at least 2,000 documented ship losses in the waters of Florida. Undoubtedly many more undocumented wrecks exist.

Of course, many of these shipwrecks are relatively modern and of limited historical and archaeological interest today. Yet they are routinely visited by divers and fishermen for their recreational value and the marine life they harbor. Some, as you will learn from this book, have been purposely sunk for artificial reefs. Perhaps years in the future, they will have historical and archaeological value as well. But the most significant of Florida's shipwrecks are those that sank between the sixteenth and nineteenth centuries. They represent the cultural remains of several colonial maritime nations, including the United States. Florida was (and still is) a crossroads of the Americas, as well as the Atlantic Ocean, and a natural magnet for shipping.

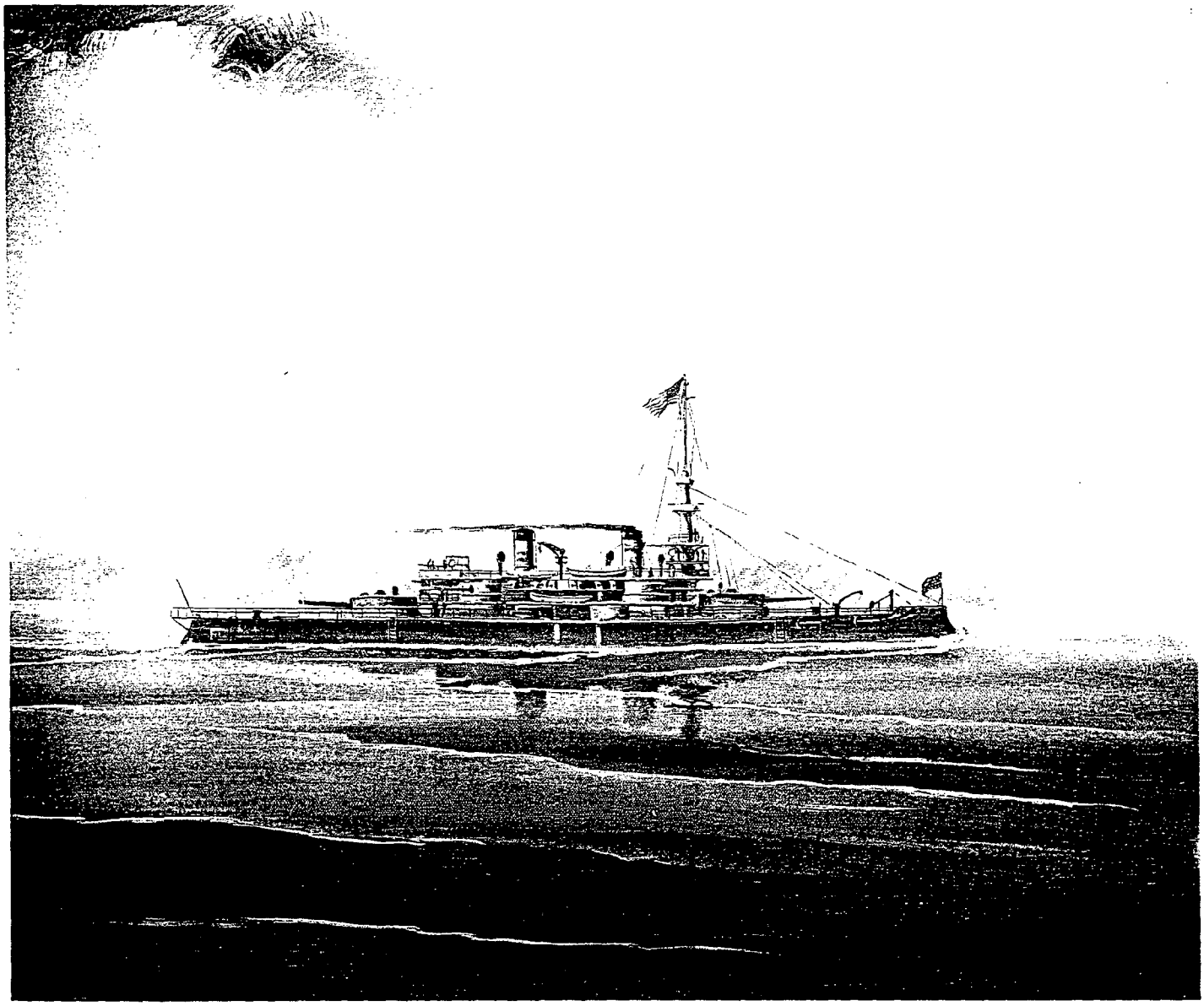
These wreck sites are time capsules that were left behind, however inadvertently, by those who came before us. They contain the remnants of the cultures that shaped our past, and they constitute a priceless but extremely fragile record of more than three centuries of exploration, settlement, colonization, and commerce. Some of these cultural resources, like the *Maple Leaf*, are surprisingly well preserved in Florida's warm, shallow waters. Others, like HMS *Loo*, have deteriorated over the years, as nature took its toll. Only a small fraction contained cargoes of precious metals or "treasure," yet media and public preoccupation with those few Spanish galleons, like the *Atocha*, have overshadowed and distorted the real picture of Florida's unique maritime heritage.

Since the advent of scuba diving in the 1950s, many of Florida's shipwrecks have been discovered by sport divers and explored by both amateurs and professionals. But over the years historic wreck sites have come under increasing pressure by treasure hunters searching for gold and silver who view the remains of sunken vessels as opportunities for private, short-term profit. Too often, discovery of a colonial vessel starts a destructive cycle of speculation, investment, and exploitation, based on the hope of finding "treasure." Now, as more and more of Florida's citizens and visitors enter its underwater world, they are recognizing the importance of conserving and protecting our natural resources, such as coral, manatees, and other marine life. They also are learning to respect Florida's cultural resources since, unlike the natural environment of which they have become a part, the sites of shipwrecks do not grow back again once they are damaged or destroyed.

The diving public is encouraged to visit Florida's sunken historical sites with the understanding that these sites are protected by legislation that prohibits any disturbance or removal of objects on publicly owned submerged bottomlands without written authorization. Adoption of the modern sport diving motto, "take only pictures, leave only bubbles," will help to ensure that Florida's vast underwater storehouse of history is preserved for future generations to enjoy.

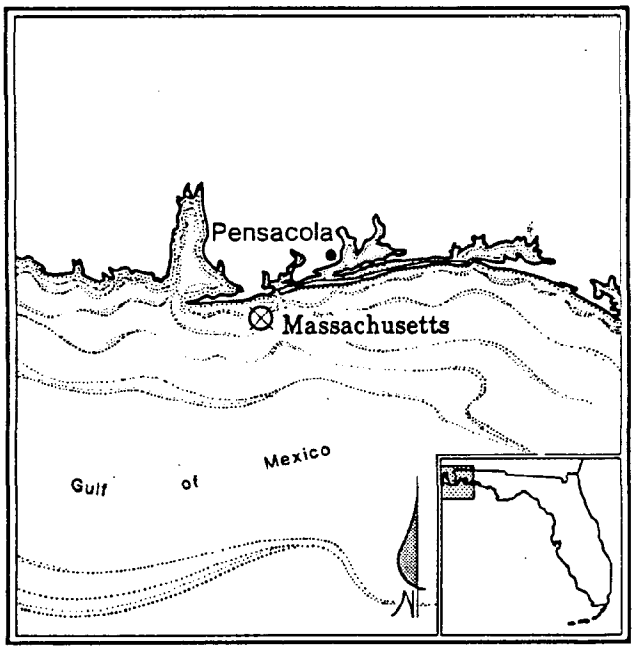
In the following pages, Professor McCarthy tells the stories of thirty Florida shipwrecks of various nationalities spanning four hundred years. A color illustration of each ship by William Trotter accompanies the narratives. Some shipwrecks, like *San Pedro* and *Duane* have become popular diving destinations. Others, like *Reformation*, have not yet been identified. Some, like *City of Hawkinsville*, were simply abandoned when they fell into disuse. Others, like SS *Gulfamerica*, were victims of warfare resulting in tragic loss of life. Each represents a fascinating chapter in the continuing saga of Florida's maritime history.

Dr. Roger C. Smith
State Underwater Archaeologist
Florida Division of Historical Resources



CHAPTER 22

MASSACHUSETTS, 1921



Location: The Massachusetts, *easily located from the gun turrets rising above the water, lies in 20 feet of water just west of the pass that leads into Pensacola Bay from the Gulf of Mexico.*

Florida's Emerald Coast, so called because of the color of the Gulf of Mexico there, attracts fewer divers than the more glamorous Keys and east coast of the state, but one shipwreck off Pensacola deserves more visitors: the 350-foot-long USS *Massachusetts*. Its name honors a state, as do most battleships, a practice that has encouraged the respective states to furnish their naval namesakes with silver service, recruits, etc., in return for which the states often received ownership of the battleships to be preserved as memorials instead of being scrapped. Beginning in 1920, the Navy also gave its battleships letter designations and numbers; thus the Pensacola ship was designated *BB2* as the second battleship of its kind.

The keel of the ship lying in shallow water near the entrance to Pensacola Bay was laid in Philadelphia in 1891. Built at a cost of $3,000,000, it joined the *Indiana* and the *Oregon* as the three members of the *Indiana*-class of battleship, all of them launched in 1893. Each displaced 10,000 tons of water and had formidable armaments of four 13-inch, eight 8-inch, and four 6-inch guns, along with a crew of between 473 and 636.

These three battleships were the result of a U.S. Navy policy board's recommendation in 1889 that the U.S. build 192 warships over 15 years at a cost of $281,550,000, including ten first-class battleships "of great endurance" with a range of 5,400 miles at 10 knots; the board also recommended the building of

25 battleships for use primarily as coastal defense ships. An anti-militarist attitude in the U.S. Congress that conjured up thoughts of imperialism and aggression greatly diminished the end results; the Act of June 30, 1890, authorized only three "sea-going, coastline battleships." The resulting ships had very heavy armaments and armor on a restricted displacement; the crowded design led to low freeboard and only moderate speed, characteristics that emphasized the Congressional mandate that the three battleships be coastline defenders rather than offensive warships.

The *Massachusetts*, like the *Indiana* and *Oregon*, had twin turrets fore and aft on the centerline that housed the four 13-inch guns. Eight 8-inch guns were in twin turrets, two on either beam at the upper-deck level, and four 6-inch guns were in casements amidships on the main deck. The crowded placement of the big guns on the decks resulted in the 13-inch guns' crews being affected by the blast from the 8-inch and 6-inch guns. All three ships in the *Indiana*-battleship class served in the Spanish-American War, but became obsolete by World War I.

The *Massachusetts* operated along the Atlantic coast and participated in training maneuvers off Florida. She helped blockade Cuba in 1898 during the Spanish-American War, warding off intruders with her huge guns. After that she cruised along the Atlantic coast and eastern Caribbean as part of the North Atlantic Squadron. In 1900, the battleship steamed into Pensacola with the flagship *Kearsarge* for repairs and caused a great outpouring of welcome from the townspeople that reminded old-timers of the days when the West India Squadron frequented the harbor. The local Pensacola *Daily News*, reminding people how profitable such visits could be to the town, drummed up much support. After the *Massachusetts* left Pensacola and cruised the Gulf, she returned to Pensacola in 1901 but ran aground in the harbor. The official navigational charts of the channel there indicated sufficient depth for the battleship, but shoaling reduced that depth in several places. Even though the local newspaper had a daily headline declaring that the channel was 33 feet deep, the battleship ran aground in water that was only 25 feet deep.

In 1903, the *Massachusetts* had the first major casualty for an American battleship since the 1898 sinking of the *Maine* in Havana harbor. What happened aboard the *Massachusetts* was a misfiring of one of her 8-inch guns because of improper safety procedures; nine crew members were killed. After authorities tightened up the procedures, she served in 1904 as a training ship for Naval Academy midshipmen off New England. In 1909-10, workers added a cage mainmast to the ship for a searchlight platform and for gunnery spotting. In World War I she served as a heavy-gun target practice ship in Chesapeake Bay and in the Atlantic. She was decommissioned in 1919, renamed the *Coast Battleship No. 2*, struck from the Navy list in 1920, and loaned to the War Department as a target ship.

In the early 1920s, the Navy turned over the *Massachusetts* to the Army, after which a tugboat towed her from Norfolk to shallow water near Pensacola, where engineers opened up the ship's sea valves, flooded the compartments, and sank her south of Fort Pickens and east of the channel that led into Pensacola Bay. Because too much superstructure protruded from the water at that site, engineers pumped the water out of the compartments and moved the battleship to deeper water on the west side of the channel. At the same time engineers were converting two unfinished battle cruisers, *Saratoga* and *Lexington*, to aircraft carriers, the second of which arrived in Pensacola in 1928 to undergo several experiments involving carriers, including the use of airplanes launched from the carrier to bomb the partially submerged *Massachusetts*. In order not to destroy the ship with a few well-placed bombs and therefore deprive future pilots of the chance to use her for target practice, military instructors had student pilots use fake bombs that had blank shotgun shells with small plungers in the nose of the bombs; when the bomb hit the ship, a little puff of smoke activated by the plunger would indicate how accurate the student bomber was.

The *Massachusetts* also served as a target for large army coastal guns. A flatcar in the freight yard at Brent outside Pensacola had a gun mounted on her that would fire projectiles over the city onto the ship. In 1925, authorities returned her to the Navy, which put her up for sale for scrap but received no acceptable bids.

Over the years fishermen discovered what a rich fishing ground the hulk provides, attracting schools of small and large fish. In 1955, the Corps of Engineers, ignoring the pleas of fishermen, gave the Mas-

sachusetts Company a permit to begin salvage operations on the ship. The company proceeded to fence off the watery area of the *Massachusetts* with buoys, which angered such groups as the Pensacola Anglers and Hunters Club and the Sports Association. Groups like the Pensacola City Council and the Warrington Kiwanis Club passed resolutions urging authorities to save their favorite watery landmark.

A lower court ruled in favor of the salvage company, but in 1956 the Florida Supreme Court reversed that ruling, citing English common law and ancient British admiralty statutes adopted as Florida laws that gave ownership of such ships to the state in its sovereign capacity. The Supreme Court noted that under old English law any shipwreck that remains unclaimed by its owner for a year and a day becomes the property of the crown. The State has succeeded to the sovereignty of the crown; since the Navy abandoned its claim to the *Massachusetts*, the State of Florida could claim it. Today the stately *Massachusetts* is a reminder of the days when battleships began to come into their own. In spite of her bulky size and ungainly appearance, she has served this country well and may continue to do so as an underwater park.

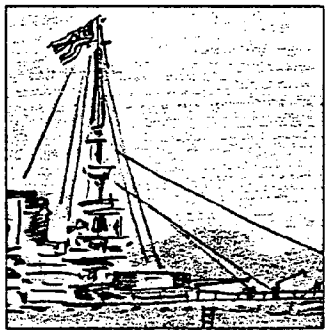
REFERENCES

Gibbons, Tony. *The Complete Encyclopedia of Battleships*. New York: Crescent Books, 1983: 134-35. pp. 113-15, 174-79.

Pearce. *U.S. Navy*, pp. 113-15, 174-79.

Pensacola Journal. Nov. 17, 1956: 1.

Reilly, John C., Jr. and Robert L. Scheina. *American Battleships, 1886-1923*. Annapolis, Md.: Naval Institute Press, 1980: 50-69.



Exploring

The San Pedro

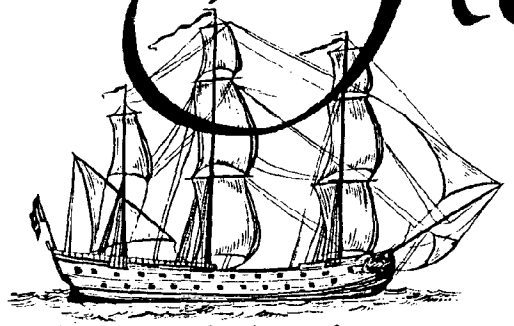
UNDERWATER ARCHAEOLOGICAL PRESERVE

A Window to the Past...

Make history come alive: experience the mystique of the Spanish Main by viewing the remains of an 18th century sailing ship.

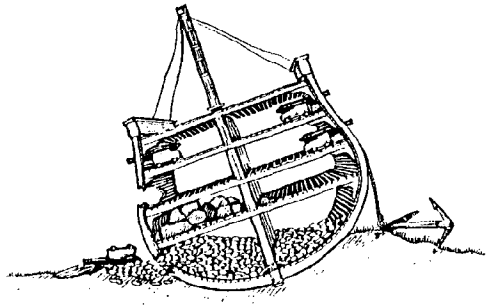
A Dynamic Living Ecosystem...

Observe firsthand how nature reclaims what humans construct: from brittle stars to barracudas, sea life thrives on the artificial reef.



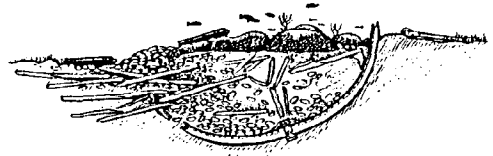
18th Century Merchant Ship

Designed to transport peoples and cargoes across vast oceans, the ship is a complex and highly organized expression of the technology of the time.



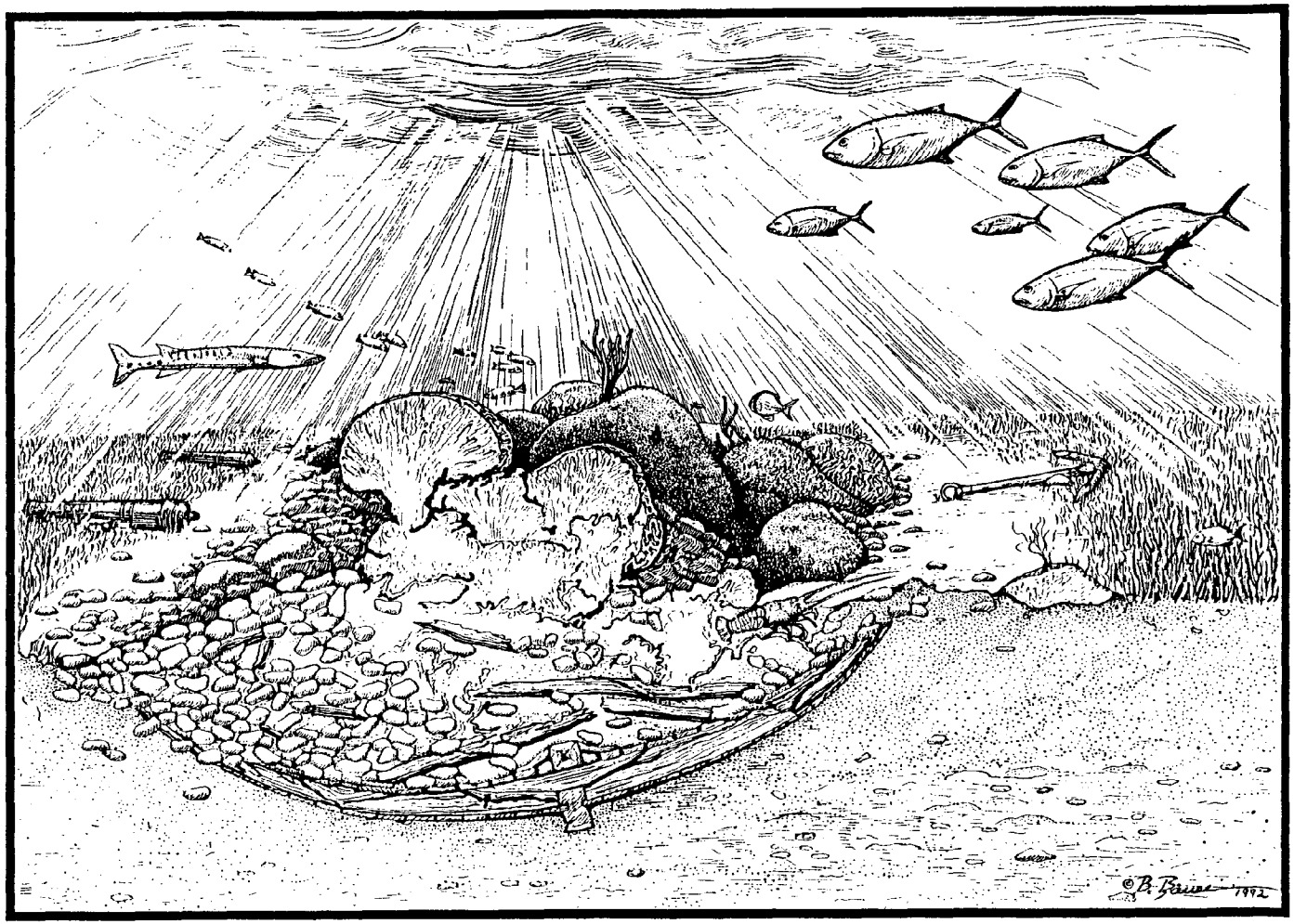
Time of Wrecking

The impact of the wreck damages the ship's structure and scatters parts. Winds, waves, and currents further scramble the remains.



One Hundred Years Later

Nature has taken its toll on the exposed part of the wreck. Shifting sands have covered much of the remains, and coral has begun to grow on the exposed ballast stones.



Today The wreck, shown here in a cutaway view, has become part of the seabed. Some parts are still preserved under the sand, and an artificial reef has developed on top of the remains.

©1992 Indiana University / Marine Continuum

A Cultu. Resource

The *San Pedro* departed Havana, Cuba, on Friday, the 13th of July, 1733, part of a Spanish treasure fleet bound for Spain. The next day a hurricane scattered the fleet over 30 miles of the Florida Keys, and all but one of the three galleons and eighteen merchant ships perished in the storm. The Spanish crown salvaged part of their cargo of tanned hides, rare spices, silver, gold, and jewels, in the 1730's.

Although the remaining treasure and numerous artifacts were recovered in the 1960's, the shipwrecks still have many features of historical interest, such as the ship's ballast, which were typically dense stones from European river beds which were stacked in the lower holds of the sailing ship to increase stability.

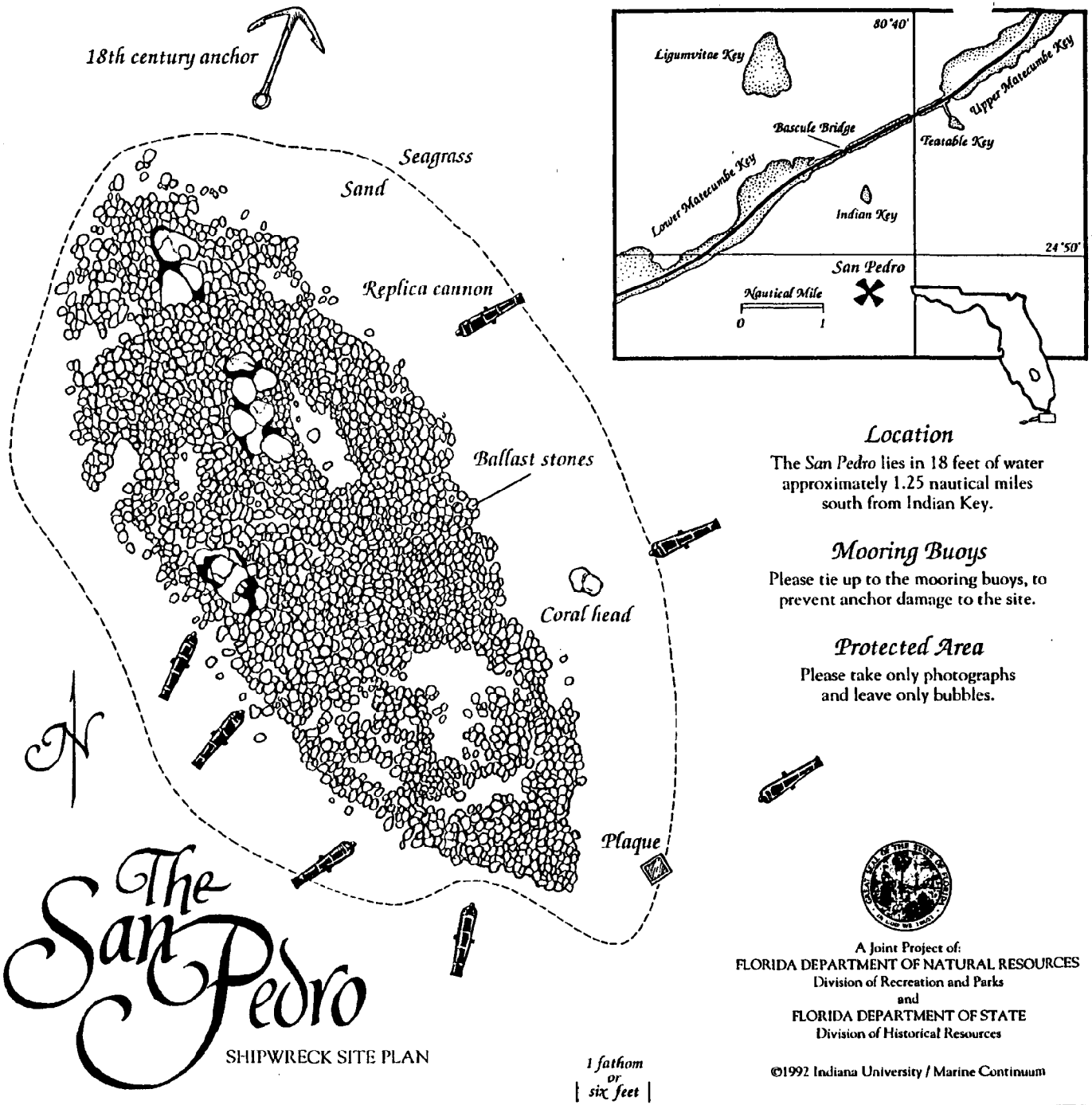
The *San Pedro* is representative of this era of Florida's maritime heritage, and offers visitors a vivid sense of history while viewing an actual shipwreck site. The park includes ship's remains, an eighteenth century anchor, replica cannons, and ballast stones encrusted with coral.

A Natural Resource

The *San Pedro*, one of Florida's oldest artificial reefs, offers visitors a unique opportunity to observe the results of over 250 years of activity by the marine environment on the remains of a large wooden vessel. The shifting sea beds and seagrass in the area usually keep coral reefs from forming, but the arrival of this shipwreck has provided a place for corals to grow.

Today, the *San Pedro* is a healthy reef supporting hundreds of species of fish, coral, and other sea life.

At night some of these marine organisms venture from the protection of the coral to graze upon the surrounding seagrass, creating a barren, sandy, "halo" that surrounds the wrecksite.



The San Pedro

SHIPWRECK SITE PLAN

Location

The *San Pedro* lies in 18 feet of water approximately 1.25 nautical miles south from Indian Key.

Mooring Buoys

Please tie up to the mooring buoys, to prevent anchor damage to the site.

Protected Area

Please take only photographs and leave only bubbles.

A Joint Project of:
FLORIDA DEPARTMENT OF NATURAL RESOURCES
Division of Recreation and Parks
and
FLORIDA DEPARTMENT OF STATE
Division of Historical Resources

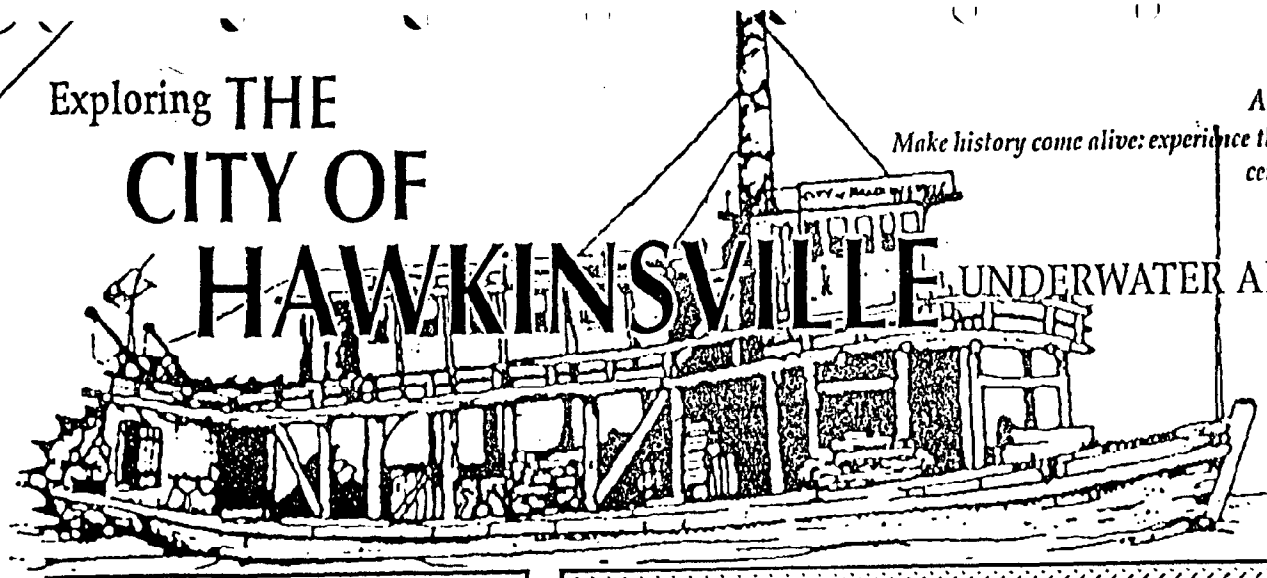
©1992 Indiana University / Marine Continuum

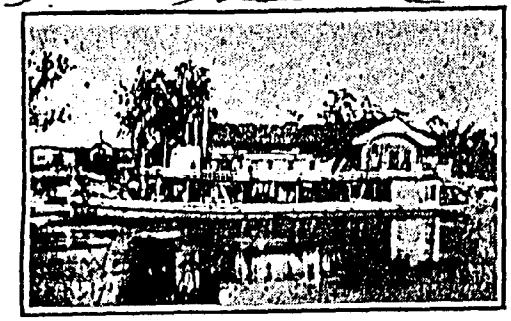
Slate Design: Joseph M. Dieter, Jr.

Exploring THE CITY OF HAWKINSVILLE UNDERWATER ARCHAEOLOGICAL PRESERVE

A Window to the Past...

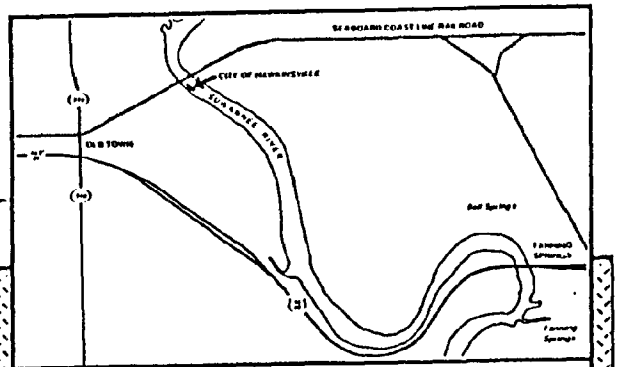
Make history come alive: experience the steamboat era in Florida by viewing the remains of a 19th century coastal steamboat.



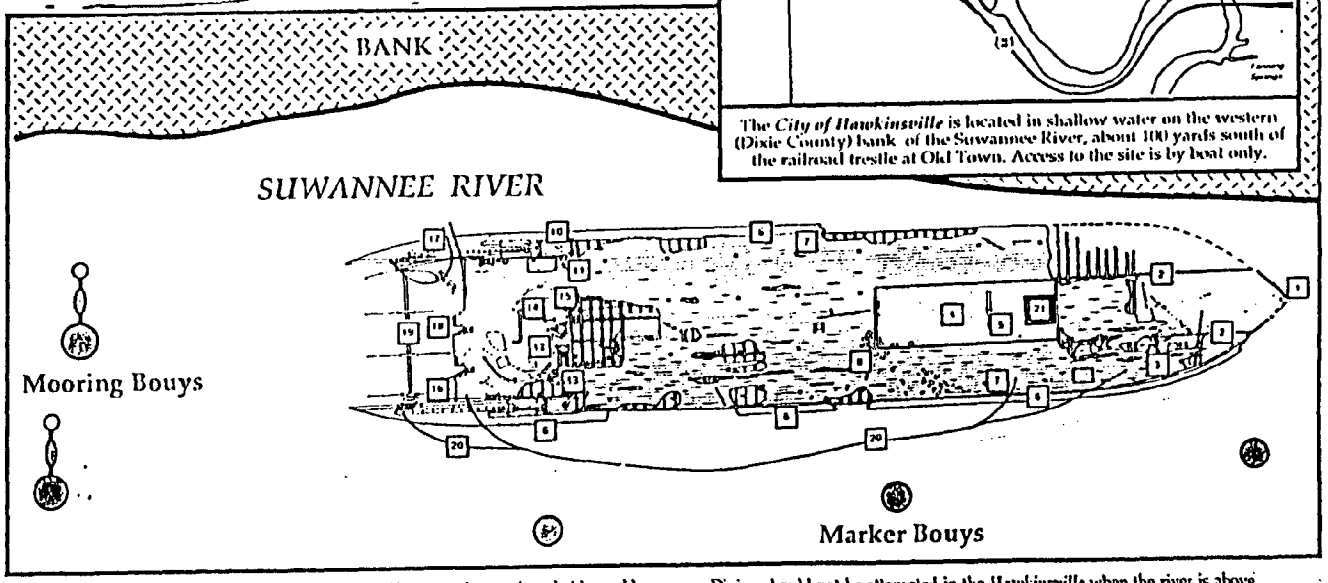


The *City of Hawkinsville* at Branford Station.

The *City of Hawkinsville* is a survivor of the 19th century coastal steamboat technology. She was the largest and the last steamboat stationed on the Suwannee River, serving a route that included Branford, Clay's Landing Old Town, and Cedar Keys. The *City of Hawkinsville* was 141 ft. long, with two decks, a single smoke stack, a square stern, and molded bow. Official records indicate that she was in service until May 19, 1922, when her last captain abandoned the vessel ending the steamboating era on the Suwannee River.



The *City of Hawkinsville* is located in shallow water on the western (Dixie County) bank of the Suwannee River, about 100 yards south of the railroad trestle at Old Town. Access to the site is by boat only.



The *City of Hawkinsville* is marked by a series of buoys on her starboard side, and by mooring buoys approximately 50 feet downstream from her stern (see above). Visitors to the *City of Hawkinsville* are asked to observe the following rules:

- Tie to the mooring buoys to prevent anchor damage to the site.
- Do not motor over the *Hawkinsville* inside and shoreward of the buoys.
- Display a "divers down" flag while diving.
- Divers should have Advanced Open-Water training.
- Do not dive into or under the hull.
- Avoid sharp edges, rough surfaces and stray fishing lines that can be encountered on the wreck.
- The minimum recommended equipment for a safe dive includes: (1) Full open water SCUBA equipment (2) Knife (3) Gloves (4) Underwater lights.
- Diving should not be attempted in the *Hawkinsville* when the river is above 4 feet on the gauge at nearby Wilcox Station in Fanning Springs, or if water visibility is less that 3 feet.
- Call Suwannee River Water Management District weekdays at 1-800-226-1066 to request Wilcox gauge reading.
- Call Florida Game and Fresh Water Fish Commission 1-800-342-8105 to report damage to site.

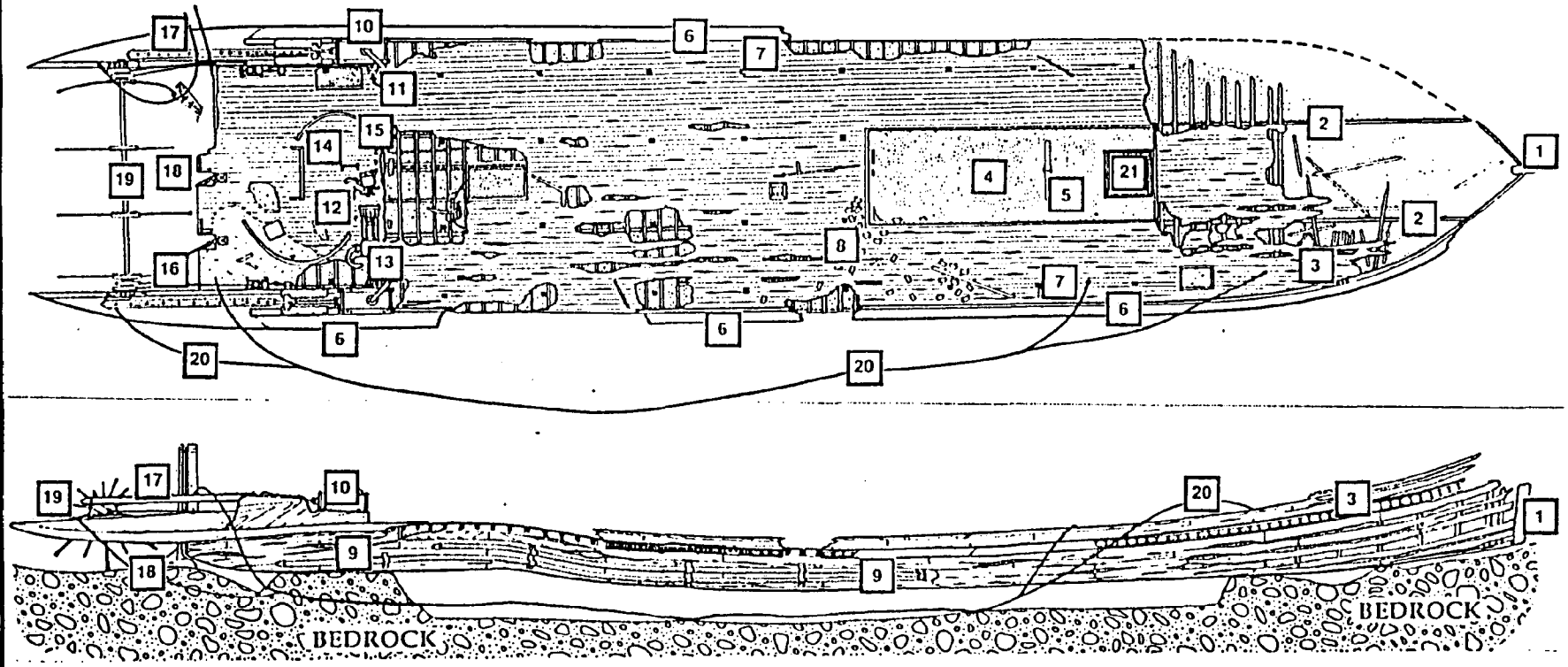
This publication produced by the
FLORIDA DEPARTMENT OF STATE
in cooperation with the
FLORIDA DEPARTMENT OF NATURAL RESOURCES
and the GULF MARINE EDUCATION FOUNDATION

THE VIEW FROM DOWN UNDER

Today, the *City of Hawkinsville* looks like a story-book ghost ship. The hull of the sunken steamer is virtually intact with her bow pointing upriver. From the stempost, one can swim along the entire deck of the vessel to her stern paddlewheel, exploring numerous deck fittings and steam machinery along the way. Inside darkened hatches, mudfish and catfish make their homes.

Tilting at an angle of 20 degrees to starboard, (right side) the steamboat rests on a series of limestone rocks that supports the hull above the river bed. The port (left) side of the vessel is partially buried in the river bank. Although the boat's steam boiler has been removed, most of the steam piping remains in place. The main propulsion system, consisting of two enormous horizontal piston engines, each of which drove a long Pitman arm connected to the paddlewheel, is easily recognizable along with its rods and gears. Perhaps the most dramatic feature of the wreckage is the four iron sprockets and their wooden spokes from the large paddlewheel that pushed the *Hawkinsville* up and down the Suwannee.

The *Hawkinsville* is a fragile piece of Florida's history. Do not stand on or hang onto wooden parts of the wreck. Please respect the underwater Preserve and leave the site as you found it for others to enjoy.



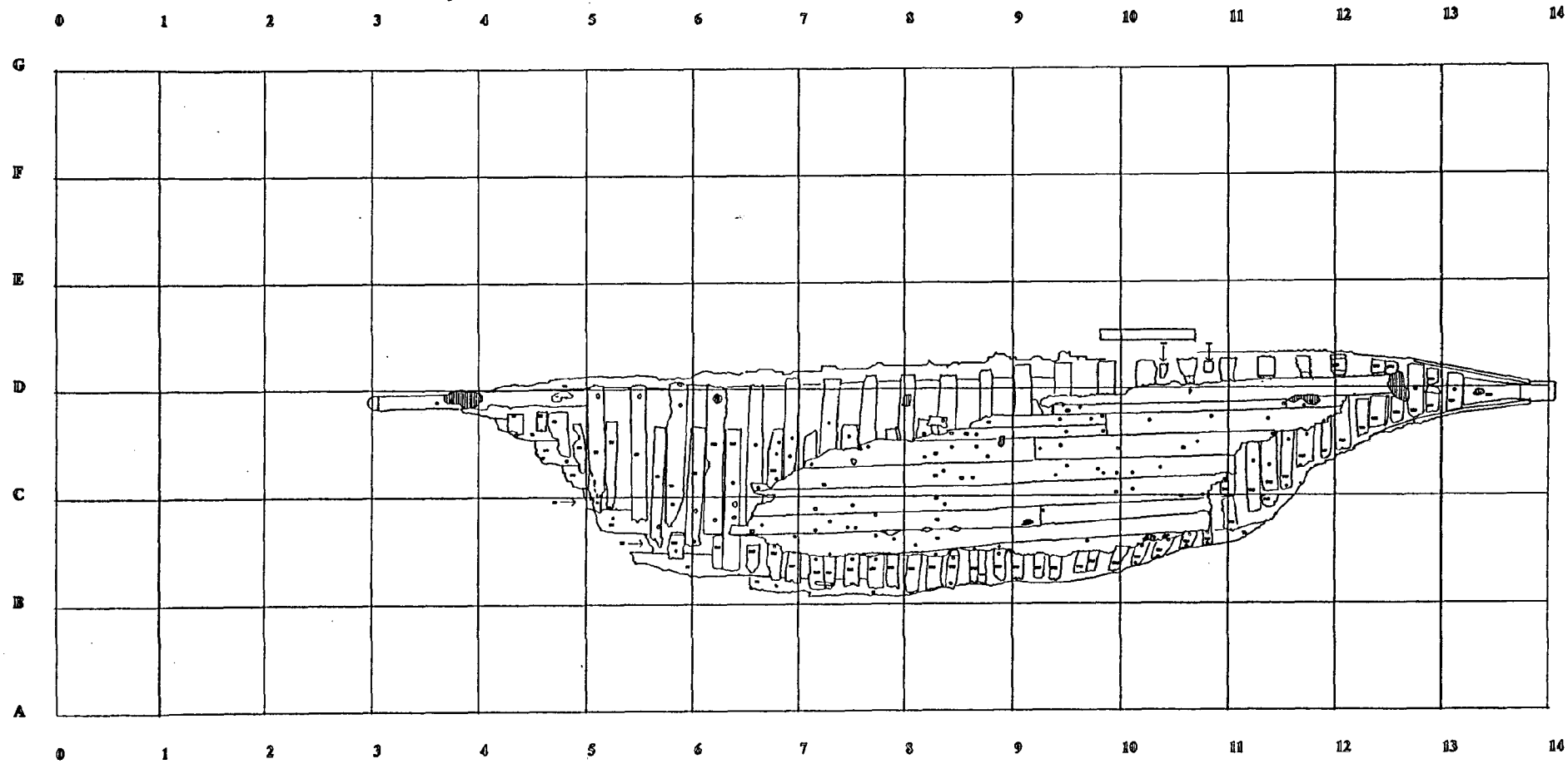
1. Stempost
2. Bulkhead
3. Fairlead
4. Boiler Room
5. Front Boiler Bracket with Fire Doors and Ash Pan
6. Guard
7. Stanchion
8. Bricks
9. Condenser Pipe
10. Steam Engine
11. Slide Valve
12. Condenser Pump
13. Water Pump
14. Shifting Lever
15. Steam Pipes
16. Shifting Linkage
17. Pitman Arm
18. Rudders
19. Paddlewheel
20. Hog Chain
21. *Hawkinsville* Plaque

Deadman's Wreck 8Sr782

Gulf Breeze, Florida

AUTOCAD®

AutoCAD Software courtesy of
AUTODESK INC., San Marino, CA.



0' 10'

N

▫ = Metal Fastener
▪ = Metal Concretion
○ = Wooden Fastener

Drawing by R. Finegold

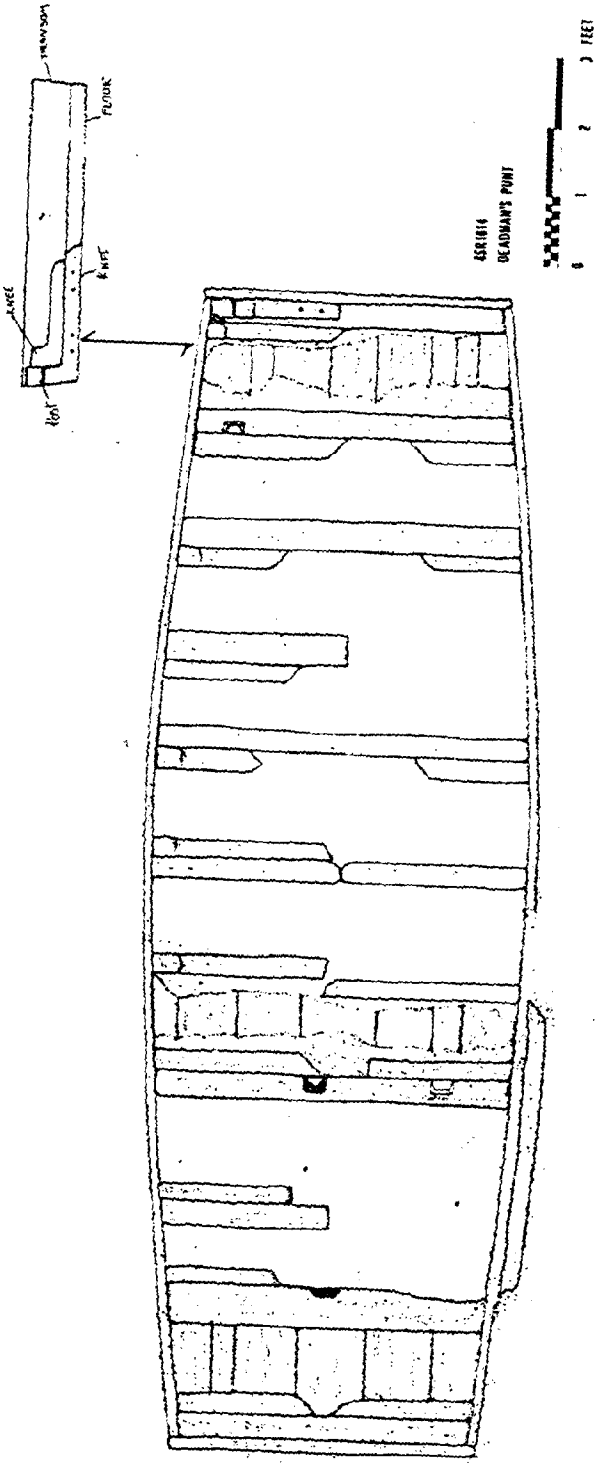


Figure 8.26. Site Plan of 8SR1013, Deadman's Punt.

APPENDIX 3. REMOTE SENSING SURVEY GROUND-TRUTHED TARGETS

KEY:

WGB .....West side of Gulf Breeze
ONC.....Old Navy Cove
NSRI .....North side of Santa Rosa Island
SNAS .....South waterfront of Naval Air Station
EP .....Emanuel Point
BC.....Butcherpen Cove
SRS .....Santa Rosa Sound
PB .....Pensacola Bay

Target No:	T-47-1
Location:	WGB
Equipment:	Magnetometer
Bottom Conditions:	Mud
Description:	Dredge pipe
Assessment:	Intentional/accidental disposal, dredging
Historical/Archaeological Importance:	None

Target No:	T-530-1
Location:	WGB
Equipment:	Magnetometer, sonar
Bottom Conditions:	Sand, silt
Description:	Fiberglass boat, tires, batteries, etc.
Assessment:	Intentional disposal, fishing
Historical/Archaeological Importance:	None

Target No:	T-803-1
Location:	WGB
Description:	No material culture
Equipment:	Sonar
Bottom Conditions:	Sand
Assessment:	Natural feature
Historical/Archaeological Importance:	None

Target No:	T-818-1
Location:	WGB
Equipment:	Sonar
Bottom Conditions:	Sand
Description:	Large field of sponges
Assessment:	Natural feature
Historical/Archaeological Importance:	None

Target No:	T-836-1
Location:	WGB
Equipment:	Sonar
Bottom Conditions:	Sand
Description:	No material culture
Assessment:	Natural feature
Historical/Archaeo-	

logical Importance: None

Target No: T-841-1
Location: WGB
Equipment: Sonar
Bottom Conditions: Sand
Description: Iron mesh, undulating bottom
Assessment: Intentional disposal, possible crab trap; natural feature
Historical/Archaeological Importance: None

Target No: T-851-1
Location: WGB
Equipment: Sonar
Bottom Conditions: Sand
Description: Five rock piles
Assessment: Intentional disposal, construction
Historical/Archaeological Importance: None

Target No: T-1-2
Location: ONC
Equipment: Magnetometer
Bottom Conditions: Mud
Description: Concrete block
Assessment: Footer of Gulf Breeze marine railway
Historical/Archaeological Importance: The footer reportedly rests on a shipwreck and a test pit could determine if it exists, and if so, that it antedates the marine railway.

Target No: T-2-2
Location: ONC
Equipment: Magnetometer
Bottom Conditions: Mud
Description: No material culture located
Assessment: Buried ferric object causing magnetic anomaly
Historical/Archaeological Importance: Unknown

Target No: T-3-2
Location: ONC
Equipment: Magnetometer
Bottom Conditions: Mud
Description: Tree stumps and logs
Assessment: Geological feature, or deeply buried man-made object
Historical/Archaeological Importance: Unknown

Target No: T-4-2
Location: ONC
Equipment: Magnetometer
Bottom Conditions: Mud
Description: Rock pile of hewn and natural rocks.
Assessment: Intentional disposal, construction or fishing
Historical/Archaeological Importance: None

Target No:	T-5-2
Location:	ONC
Equipment:	Magnetometer
Bottom Conditions:	Mud
Description:	Iron sheets and pipes
Assessment:	Intentional disposal
Historical/Archaeological Importance:	None

Target No:	T-6-2
Location:	ONC
Equipment:	Magnetometer/reported
Bottom Conditions:	Rock surrounded by mud
Description:	Rock pile, commodes, and shrimping net
Assessment:	Intentional dumping, bottom enhancement-fishing
Historical/Archaeological Importance:	May at one time have represented some early cultural debris now buried under rock.

Target No:	T-7-2
Location:	ONC
Equipment:	Magnetometer
Bottom Conditions:	Mud
Description:	Discovered mud hole surrounded by hard sand
Assessment:	Geological feature, or a well with buried man-made objects
Historical/Archaeological Importance:	If site represents a well, could possibly contain disposed material culture.

Target No:	T-8-2
Location:	ONC
Equipment:	Magnetometer/Sonar
Bottom Conditions:	Mud
Description:	Pile of rocks, ballast, logs, tiles, some metal
Assessment:	Intentional disposal, construction; could be site of a reported barge
Historical/Archaeological Importance:	Could represent a previously unrecorded type of construction barge.

Target No:	T-9-2
Location:	ONC
Equipment:	Magnetometer
Bottom Conditions:	Mud
Description:	No material culture discovered
Assessment:	Buried man-made object
Historical/Archaeological Importance:	Unknown

Target No:	T-10-2
Location:	ONC
Equipment:	Sonar
Bottom Conditions:	Mud
Description:	Large pile of ballast rocks, and stones
Assessment:	Ballast dump, shipping or construction
Historical/Archaeological Importance:	None

Target No:	T-5-3
Location:	EP

Equipment: Magnetometer
Bottom Conditions: Mud
Description: No material culture discovered
Assessment: Buried man-made object
Historical/Archaeological Importance: Unknown

Target No: T-7-3
Location: EP
Equipment: Magnetometer
Bottom Conditions: Sand, shell hash
Description: Ballast pile with ship remains
Assessment: Shipwreck site
Historical/Archaeological Importance: Colonial shipwreck, possibly first Spanish period.

Target No: T-14-3
Location: EP
Equipment: Magnetometer
Bottom Conditions: Shell hash, sand
Description: Metallic structure, possibly shrimping net assembly
Assessment: Intentional/accidental disposal
Historical/Archaeological Importance: None

Target No: T-2-4
Location: BC
Equipment: Magnetometer
Bottom Conditions: Mud
Description: Rock pile, and wood
Assessment: Intentional disposal, construction, possible reported barge
Historical/Archaeological Importance: Site could represent a previously unrecorded construction-type barge.

Target No: T-1-4
Location: BC
Equipment: Visual
Bottom Conditions: Sand, silt
Description: Ballast, pottery, glass, pipe stems, copper-sheathed timbers
Assessment: Ballast dump, or shipwreck
Historical/Archaeological Importance: Pottery sherds date to early nineteenth-century, and if a shipwreck is located underneath ballast stones could represent a potentially significant site.

Target No: T-1-5
Location: SRS
Equipment: Magnetometer
Bottom Conditions: Sand
Description: Dredge pipe
Assessment: Intentional/accidental disposal, dredging
Historical/Archaeological Importance: None

Target No: T-2-5
Location: SRS
Equipment: Magnetometer
Bottom Conditions: Sand, shell hash, silt

Description: Washing machine
Assessment: Intentional disposal, fishing
Historical/Archaeological Importance: None

Target No: T-3-5
Location: SRS
Equipment: Magnetometer
Bottom Conditions: Silt, sand
Description: No material culture located
Assessment: Deeply buried object
Historical/Archaeological Importance: Unknown

Target No: T-4-5
Location: SRS
Equipment: Magnetometer
Bottom Conditions: Mud
Description: No material culture located
Assessment: Object buried deeply in mud
Historical/Archaeological Importance: Unknown

Target No: T-1-6
Location: PB
Equipment: Sonar
Bottom Conditions: Mud, silt
Description: Wooden timbers
Assessment: Remains of USS *Preble*
Historical/Archaeological Importance: The site represents the possible location of the USS *Preble* sunk during the Civil War.

Target No: T-30-7
Location: NSRI
Equipment: Sonar
Bottom Conditions: Sand, shell hash
Description: No material culture discovered
Assessment: Natural feature
Historical/Archaeological Importance: None

Target No: T-30A-7
Location: NSRI
Equipment: Sonar
Bottom Conditions: Sand, shell hash
Description: Rubbish pile consisting of car hood, boat steering wheel, tires, and metal cable.
Assessment: Intentional disposal, fishing
Historical/Archaeological Importance: None

Target No: T-91-7
Location: NSRI
Equipment: Sonar
Bottom Conditions: Sand, shell hash
Description: Cinder blocks and flanged iron/steel pipes
Assessment: Intentional disposal, fishing

Historical/Archaeological Importance: None

Target No: T-91E-7
Location: NSRI
Equipment: Sonar
Bottom Conditions: Sand, shell hash
Description: Rubber tires, sand ridges and gullies
Assessment: Intentional disposal, natural feature
Historical/Archaeological Importance: None

Target No: T-MB-7
Location: NSRI
Equipment: Sonar, reported
Bottom Conditions: Sand, shell hash
Description: Coal, iron scraps, glass, ceramic, bottles, no evidence of ship timbers, and sand gullies and ridges.
Assessment: Anchorage debris, mid-19th century
Historical/Archaeological Importance: Moderate

Target No: T-111-7
Location: NSRI
Equipment: Sonar
Bottom Conditions: Sand, sea grass
Description: Ballast pile with exposed ship timbers
Assessment: Sailing ship-abandoned or wrecked
Historical/Archaeological Importance: Tentatively dated to late 18th century or early 19th century, and further research is necessary to determine its importance.

Target No: T-114-7
Location: NSRI
Equipment: Sonar
Bottom Conditions: Sand, shell hash
Description: Sand ridges and gullies
Assessment: Natural feature
Historical/Archaeological Importance: None

Target No: T-116-7
Location: NSRI
Equipment: Sonar
Bottom Conditions: Sand, silt
Description: No material culture discovered
Assessment: Natural feature
Historical/Archaeological Importance: None

Target No: T-207-7
Location: NSRI
Equipment: Sonar
Bottom Conditions: Sand
Description: No material culture discovered
Assessment: Natural feature
Historical/Archaeo-

logical Importance: None

Target No: T-214-7
Location: NSRI
Equipment: Sonar
Bottom Conditions: Sand
Description: No material culture discovered
Assessment: Natural feature
Historical/Archaeological Importance: None

Target No: T-233-7
Location: NSRI
Equipment: Sonar
Bottom Conditions: Mud, sea grass
Description: Thin cocoon-shaped object wrapped in plastic
Assessment: Intentional disposal
Historical/Archaeological Importance: None

Target No: T-234-7
Location: NSRI
Equipment: Sonar
Bottom Conditions: Mud
Description: Two car bodies
Assessment: Intentional disposal, fishing
Historical/Archaeological Importance: None

Target No: T-260-7
Location: NSRI
Equipment: Sonar
Bottom Conditions: Sand, mud
Description: Batteries and industrial air conditioner
Assessment: Intentional disposal, fishing
Historical/Archaeological Importance: None

Target No: T-307-7
Location: NSRI
Equipment: Sonar
Bottom Conditions: Sand, mud
Description: Metal scraps and tires
Assessment: Intentional disposal, fishing
Historical/Archaeological Importance: None

Target No: T-464-8
Location: SNAS
Equipment: Sonar
Bottom Conditions: Sand, shell hash
Description: Coal, brick, and airplane landing assembly with tire
Assessment: Accidental disposal, military; anchorage
Historical/Archaeological Importance: Limited value, most likely represents debris discarded for several decades.

Target No: T-470-8

Location: SNAS
Equipment: Sonar
Bottom Conditions: Sand, shell hash
Description: Intake pipes for steam plant
Assessment: Active structure
Historical/Archaeological Importance: None

Target No: T-511-8
Location: SNAS
Equipment: Sonar
Bottom Conditions: Sand, shell hash
Description: Wire cable, coal, two cement mooring blocks
Assessment: Intentional disposal; Navy mooring blocks
Historical/Archaeological Importance: Blocks probably used in the past, possibly for Navy PBY's.

Target No: T-554-8
Location: SNAS
Equipment: Sonar
Bottom Conditions: Sand, shell hash
Description: Shrimp net, metal cable, and miscellaneous debris
Assessment: Accidental disposal
Historical/Archaeological Importance: None

Target No: T-558-8
Location: SNAS
Equipment: Sonar
Bottom Conditions: Sand, shell hash
Description: Log
Assessment: Natural feature
Historical/Archaeological Importance: None

Target No: T-565-8
Location: SNAS
Equipment: Sonar
Bottom Conditions: Sand, shell hash
Description: No material culture located
Assessment: Natural feature
Historical/Archaeological Importance: None

Target No: T-578-8
Location: SNAS
Equipment: Sonar
Bottom Conditions: Sand, shell hash
Description: Refrigerator, small engine, and miscellaneous metal objects
Assessment: Intentional disposal, military and fishing
Historical/Archaeological Importance: None

Target No: T-583-8
Location: SNAS
Equipment: Sonar
Bottom Conditions: Sand, shell hash

Description:	No material culture located
Assessment:	Natural feature
Historical/Archaeological Importance:	None

Target No:	T-584-8
Location:	SNAS
Equipment:	Sonar
Bottom Conditions:	Sand, shell hash
Description:	Metal cable
Assessment:	Intentional/accidental disposal
Historical/Archaeological Importance:	None

Target No:	T-592-8
Location:	SNAS
Equipment:	Sonar
Bottom Conditions:	Sand, shell hash
Description:	No material culture located
Assessment:	Natural feature
Historical/Archaeological Importance:	None

Target No:	T-728-8
Location:	SNAS
Equipment:	Sonar
Bottom Conditions:	Sand, shell hash
Description:	Large squared log, metal cable, tire, two ceramic bowls, glass fragments.
Assessment:	Intentional/accidental disposal
Historical/Archaeological Importance:	The scattered effects of the site most likely are the results of dumping. The two ceramic bowls date around the late 19th century and had been discarded.

REFERENCES

Bagleo, Morris
1992 Interview. Conducted by the Pensacola Shipwreck Survey staff, on file with the Pensacola Historical Society, Pensacola, Florida.

Beeker, Charles and KC Smith
1986 "Sport Diver Orientation to Underwater Archaeology." Indiana University, Bloomington, Indiana.

Bennett, William
1992 Interview. Conducted by the Pensacola Shipwreck Survey staff, on file with the Pensacola Historical Society, Pensacola, Florida.

Bense, Judith A.
1989 "Pensacola Archaeological Survey and Summary of Archaeological Information in Pensacola to 1988, Technical Report, Vol. 1," *Pensacola Archaeological Society Publication 2.* Pensacola Archaeological Society, Pensacola.

Bernard, Howard
1992 Interview. Conducted by the Pensacola Shipwreck Survey Staff, on file with the Pensacola Historical Society, Pensacola, Florida.

Breiner, Sheldon
1973 *Applications Manual for Portable Magnetometers.* Geometrics, Sunnyvale, California.

Coleman, James C.
1991 "Gunfire on the Gulf." *Pensacola History Illustrated* 4.1:1-6.

Douglass, Darren
1991 "Underwater Archaeology Specialty Course Instructor Outline." NAUI, Montclair, California.

Duncan, Robert
1992 Interview. Conducted by the Pensacola Shipwreck Survey staff, on file with the Pensacola Historical Society, Pensacola, Florida.

Florida Bureau of Archaeological Research
1992 *A Proposal to Establish the USS Massachusetts as a State Underwater Archaeological Preserve.* Florida Division of Historical Resources, Tallahassee, Florida.

Franklin, Marianne, John William Morris III, and Roger C. Smith
1992 Submerged Historical Resources of Pensacola, Florida- The Pensacola Shipwreck Survey, Phase I. *Florida Archaeological Reports* 25, Tallahassee, Florida.

Garrison, E.G., C.P. Giammona, F.J. Kelly, A.R. Tripp, and G.A. Wolff.
1989 *Historic Shipwrecks and Magnetic Anomalies of the Northern Gulf of Mexico: Reevaluation of Archaeological Resource Management Zone 1.* OCS Study/MMS 89-0023. U.S. Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Regional Office, New Orleans, La. 3 Volumes.

E G & G Geometrics
(n. d.) *Operator's Manual, Model G-866 Recording Magnetometer.* Sunnyvale, California.

Harris, Brayton
1965 *The Age of the Battleship: 1890-1922.* Franklin Watts, Inc., New York.

Harris, Lynn
1992 "Underwater Archaeology Field School Information." University of South Carolina, Columbia, South Carolina.

Johnson, Cecil
1943 *British West Florida, 1763-1783.* Yale University Press, New Haven, Connecticut.

Leonard, Irving A.
1939 *Spanish Approach to Pensacola, 1689-1693.* The Quivira Society, Albuquerque, New Mexico.

Manuel, Ray
1992 Interview. Conducted by the Pensacola Shipwreck Survey staff, on file with the Pensacola Historical Society, Pensacola, Florida.

Mazel, Charles
1985 *Side Scan Sonar Training.* Klein Associates, Inc., Salem, New Hampshire.

McGovern, James R.
1974 *Colonial Pensacola.* The Pensacola Series Commemorating the American Revolution Bicentennial, Vol. 1, Pensacola/Escambia Development Commission, Pensacola, Florida.

Murphy, Larry and Allan Saltus
1990 "Consideration of Remote Sensing Limitations to Submerged Historical Site Survey." In *Underwater Archaeology Proceedings from the Society For Historical Archeology Conference.* Ed. Toni L. Carrell, pp. 93-96, Tucson, Arizona.

Nautical Archaeology Society
(n.d.) "Archaeology Underwater: Training and Education." Institute of Archaeology, London, England.

Navy Department
1969 *Dictionary of American Naval Fighting Ships Vol. IV.* Office of the Chief of Naval Operations, Naval History Division, Washington, D.C.

Padfield, Peter
1972 *The Battleship Era.* David McKay Co., Inc., New York.

Pearce, George F.
1980 *The U.S. Navy in Pensacola: From Sailing Ships to Naval Aviation (1825-1930).* University of West Florida, Pensacola, Florida.

Pensacola *News Journal*
1957 "Court Hears Mass Case," March 14.

Priestly, Herbert Ingram ed.
1928 *The Luna Papers.* 2 vols. Florida State Historical Society, Deland, Florida.

Professional Association of Diving Instructors, Inc.
1991 *Adventures in Diving.* PADI, Santa Ana, California.

1991 Wreck Diver Specialty Course Instructor Outline. PADI, Santa Ana, California.

Servies, James A. ed.
1982 *The Log of H.M.S. Mentor, 1780-1781.* University Presses of Florida, Pensacola, Florida.

Silverstone, Paul
1970 *U.S. Warships of World War I.* Doubleday & Co., Garden City, New Jersey.

SI-TEX
1987 *Installation-Operation Manual Model EZ-97 Loran-C Receiver.* Clearwater, Florida.

Smith, Ray
1992 Interview. Conducted by the Pensacola Shipwreck Survey staff, on file with the Pensacola Historical Society, Pensacola, Florida.

Smith, Roger C., Marianne Franklin, and Robert Finegold
1989 "Underwater Archaeology Field School Workbook." University of West Florida, Pensacola, Florida.

Smith, Sheli O.
1991 "Educational Standards for Specialty Courses in Underwater Archaeology." Los Angeles Maritime Museum, San Pedro, California.

Weddle, Robert S.
1985 *Spanish Sea: The Gulf of Mexico in North American Discovery 1500-1685.* Texas A&M University Press, College Station, Texas.

Young Men's Christian Association
(n.d.) "Archaeological Diver Specialty Program Instructor Outline." YMCA, Key West, Florida.

NOAA COASTAL SERVICES CTR LIBRARY
3 6668 14111429 0