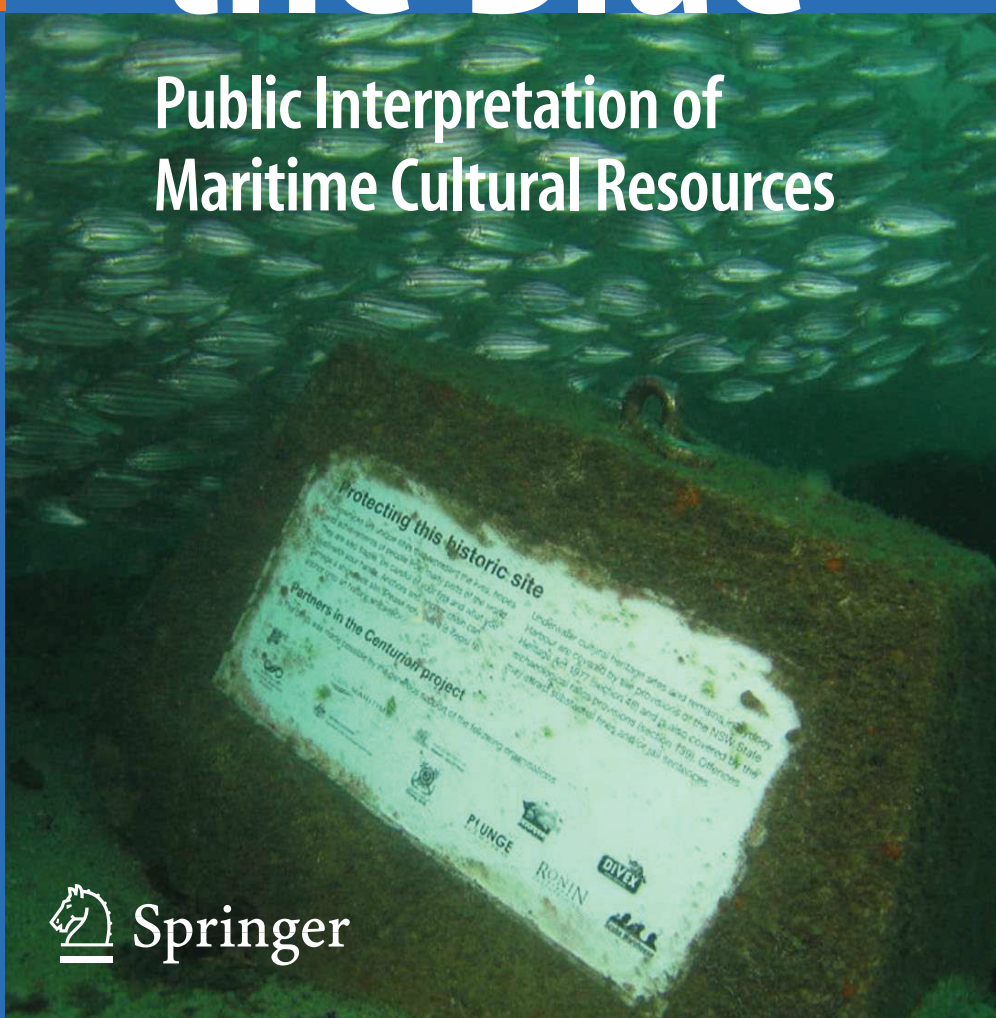
John H. Jameson, Jr. • Della A. Scott-Ireton
Editors

Out of the Blue

Public Interpretation of Maritime Cultural Resources



Springer

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Out of the Blue
Public Interpretation of Maritime Cultural Resources

With 81 Illustrations

Springer

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Introduction: Imparting Values / Making Connections

John H. Jameson, Jr. and Della A. Scott-Ireton

> Very deep, very deep is the well of the past. Should we not call it bottomless?
> – *Thomas Mann*

The spectacle of archaeology stirs the public interest like few other topics. Solving the detective story, finding the missing pieces of the puzzle, understanding an instilled sense of identity, making emotional and intellectual connections to resource meanings, entering global discourses and debates on heritage protection and conservation - all are part of the nexus of cultural values that define the meaning of archaeology to individuals and to the public at large.

Use of the term "value" is increasingly permeating public, private, and international discourses on heritage management. We hear about human vs. material values, tangibles vs. intangibles, moral vs. corrupt values, and religious vs. secular values. In many of our discussions, the word "value" is used interchangeably with other terms such as attribute, quality, and interest. But the term "value" is useful because it commonly connotes humanistic and emotional qualities. Values relate to tangibles and intangibles that define what is important to people. In all societies a sense of well-being is associated with the need to connect with and appreciate heritage values. In heritage management, we commonly articulate "values" as attributes given to sites, objects, and resources, and associated intellectual and emotional connections that make them important and define their significance for a person, group, or community. Site managers should strive to identify and take these values into account in planning and public interpretation efforts as well as physical treatments (Jameson, 2006).

As archaeologists and cultural resource managers, we endeavor to develop more holistic interpretations in which the values of sustainable environment and heritage are inextricably linked. We have recognized that multidisciplinary and inclusive approaches are the most effective. The sites we deal with are no longer limited to great iconic monuments and places, but can include millions of places of importance to sectors of society that once were invisible or intentionally ignored. These sites can play an important role in fostering peaceful multicultural societies, maintaining communal or ethnic identities, and serving as the indispensable theater

in which the ancient traditions that make each culture a unique treasure are performed periodically, even daily. The values of these sites and features often are not readily obvious in the material fabric or surrounding geography, but they must be identified and they require a narrative for the fullness of their meaning to be properly conveyed to local people, site visitors, and the public at large. This is accomplished through processes of public interpretation and education (Jameson, 2006).

Because of the great adaptability of humans for thousands of years, patterns of human settlement and activity have reached nearly every corner of the globe. With fluctuating sea levels, some terrestrial habitation areas have become submerged, adding further complication to their archeological and depositional characteristics, descriptions, and interpretations. Archaeological sites of all ilks are located in public spaces as well as private spaces, on land as well as underwater. Maritime cultural resources encompass sites and associations of human actions, both within and bordering on navigable waterways. In many cases, sites are in close proximity to urban areas or can easily be reached by boat, although their visibility may be low or limited. This leads to special challenges for site management regarding conservation, protection, and enforcement of legal mandates for public education, outreach, and interpretation.

We believe that one of the primary purposes of public interpretation in maritime heritage management is to foster the understanding that cultural resources are fixed points or inalienable objects in the public conscious. The placement of inalienable objects in museums - behind glass, spot-lighted, or otherwise specially treated - signifies inherent value through the mode of display. Sites such as shipwrecks provide special challenges in that they are rarely entirely raised, conserved, and placed in an exhibit. The vast majority of shipwrecks and other submerged maritime sites that are interpreted at all are *in situ* at their resting place on the ocean floor. Thus, in order to be effective, archaeologists, resource managers, and interpreters must employ innovative and provocative interpretive strategies that go beyond traditional exhibition techniques in illustrating and emphasizing the heritage values associated with shipwrecks and other sites within the maritime landscape.

The Challenges and Opportunities of Heritage Tourism

At an ICOMOS conference on heritage tourism in 2004, Richard Engelhardt, UNESCO regional advisor for culture in Asia and the Pacific, addressed the escalating impact of tourism on Asia's heritage sites. According to Engelhardt, the major threat to heritage sites in the region is the rapidly growing tourism industry (Engelhardt, 2004). Engelhardt's arguments strike a chord with those who have worked with indigenous and First Nations communities and have seen how tourism can hijack local community agendas. In this scenario, heritage "experts" and advisers see the role of heritage as a mechanism for local identity building, and, in some cases, as an aid to communities in protecting sites from exploitation and in buffering them from the juggernaut of tourism.

In heritage management, we are just beginning to realize and appreciate the effects of globalization. Heritage tourism, with its ties to the currents of rapidly evolving global economies, is causing increasing needs and demands for cross-cultural and international communication and interdisciplinary training. The emphasis is on transferable skills such as applying interdisciplinary approaches, writing for both academic and non-academic audiences, developing effective oral presentations, and gaining experience with multimedia packages.

Some resource specialists engaged in the heritage tourism industry start from the premise that tourism is inevitable and that tourism accompanied by some form of public interpretation is the ultimate outcome of the heritage endeavor. Those of us whose primary goals and interests are conservation should be determined that our values and standards are not compromised or diminished. The challenge is to ensure that high standards of skill and competency in heritage management are accepted, welcomed, and valued at local and community levels. A special challenge pertains to maritime and underwater resources that are particularly susceptible to sensationalism and exploitation by those whose primary motive is profit.

Purpose and Content of this Volume

Quality public interpretation and outreach can assist in managing and protecting archaeological sites in remote locations. They also are key elements in garnering public and institutional support for research and in monitoring "ownership" by local communities and frequent users who can assist in long-term preservation and public stewardship. The chapters in this book encompass both on-site and off-site interpretative efforts including heritage trails, virtual trails, museum exhibits, and examples of public interpretation as a management tool. Sites and projects from coastal, intertidal, fully submerged, and deep water archaeological contexts are presented to illuminate effective interpretive and management strategies. These include examples of maritime heritage trails and underwater parks, field schools, avocational training, classroom instruction, and innovative diver access programs, as well as exhibits, virtual visits, and educational programs at maritime museums.

The volume is organized into broad topical foci, beginning with introductory, broad-based discussions by John Jameson and Della Scott-Ireton, respectively. The editors explain that the primary goal of public interpretation and outreach at maritime sites is inclusive public access to accurate and non-sensationalized information. They point out that the cultural heritage values inherent at sites and objects are links to the past and stimuli for heritage tourism. They also explain the need to record public archaeology and public interpretation successes so that others will not have to reinvent the wheel. Another broad-based chapter by David Nutley follows with a discussion of the management and public interpretation strategies implemented in New South Wales, Australia, that has resulted in the development of a three-part plan. Nutley explains how elaborate partnerships allow the respective parties and interests to be identified, engaged, and empowered, ensuring that

the effective management of underwater cultural heritage is not reliant on the finite resources of one agency.

The introductory chapters are followed by three presentations about the brave new world of underwater and maritime heritage trials. Roger Smith tells how the Florida Division of Historical Resources' Maritime Heritage Trail was conceived with an interpretive strategy of providing information rather than a marked route. The program also utilizes posters and brochures and a Web site to get the word out. Next, Margaret Leshikar-Denton and Della Scott-Ireton describe the Cayman Islands Maritime Heritage Trail Initiative's goals of fostering stewardship and encouraging preservation, as well as how it enhances existing diver tourism and helps to relieve pressure on fragile coral reef ecosystems. Jennifer McKinnon follows with a description of an elaborate partnership strategy used to manage the sites and tell the story, using innovative interpretive guidebooks, of the 1733 Spanish Plate Fleet wrecks located in the Florida Keys.

The next seven chapters describe a variety of innovative programs involving partnerships for management and interpretation of maritime resources. In chapter seven, Jason Burns describes the successful alliance forged for waterfront revitalization in Georgia. Georgia's maritime archaeology program revitalization projects, he explains, provide opportunities for connections between the past and the present through effective interpretations of cultural heritage resources, such as river towns, in ways that demonstrate significance and meaning. Programs that reach out to scuba diving enthusiasts are important in efforts to foster public stewardship of our irreplaceable maritime heritage. Joseph Zarzynski presents the challenges of public interpretation at Lake George in New York, where a rich military and maritime heritage spans several centuries. A variety of interpretation strategies have been adopted involving a partnership of underwater archaeologists, multi-media technicians, and avocationalists to "make shipwrecks speak." Another very important and successful diver awareness program is outlined by Mark Wilde-Ramsing and Lauren Hermley from North Carolina's Underwater Archaeology Unit. The program, Dive Down, is internationally recognized as an exemplary effort to maximize public educational and outreach opportunities involving the story of Blackbeard's flagship, *Queen Anne's Revenge*. The program is designed for advanced recreational divers and includes four educational modules focusing on maritime history, underwater archaeology, ecology, and geology.

Not all maritime cultural resources are located under water. Victor Mastone and David Trubey explain how the SHIPS program in Massachusetts fosters public stewardship by engaging the beach-walking public in the discovery of maritime archaeological sites and by helping them record and report shipwrecks and other historic resources located on the state's beaches. John Halsey then describes pubic interpretation efforts surrounding beached shipwrecks in the Great Lakes. With furnishings, passengers, and crews spread all across the Great Lakes region, these shipwrecks provide the background and props for telling compelling stories of the crews' and passengers' lives and deaths, "the wonder and sadness connected with these Great Lakes wrecks."

Maritime resources located in extremely deep water present a particularly difficult challenge for managers charged with their protection and interpretation. Dave Ball, Jack Irion, and Chris Horrell of the U.S. Minerals Management Service tell of that agency's deep-water shipwreck management and outreach program that provides unique opportunities to educate the public about all varieties of vessels operating in the Gulf of Mexico, their role in maritime history, and their overall importance to the history of the nation. The WWII Japanese midget submarine found in deep water near Pearl Harbor, Hawaii, is described by Hans Konrad Van Tilburg. The vessel's unique history is related, along with the impressive orchestration of efforts involving three federal agencies and other partners to study the vessel and its environment. Van Tilburg concludes with a thoughtful discussion of the challenges associated with preserving maritime cultural resources in a harsh environment, and of presenting those resources to a public who will never be able physically to visit them.

Next come compelling accounts of the discovery, recovery, and public interpretation and outreach efforts associated with the internationally renowned Confederate submarine *H.L. Hunley*, sunk near Charleston, South Carolina. The extraordinary array of partnerships assembled for the project complements its remarkable discovery, preservation, and research strategies. First, Dave Conlin describes the National Park Service's involvement in the *H.L. Hunley* project through its in-house Submerged Resources Center and illustrates the ingenious methods employed to raise the vessel intact. James Hunter then explains how the *Hunley* project has involved a myriad of both public and private partnerships. Ultimately, he explains, the Herculean international efforts to conserve *H.L. Hunley* have laid the foundation for a much larger public outreach and education goal: the creation of an international museum that will permanently exhibit the submarine and its associated artifacts.

The final chapter by Gordon Watts and Kurt Knoerl points out the opportunities for public interpretation afforded by computer reconstructions and virtual reality models. With today's and tomorrow's technology and the availability of delivery modes afforded by the Internet, the non-diving public can be brought into a virtual world of underwater archaeological research.

In compiling this book, we have attempted to bring together, in an easily accessible manner, state of the art ideas, research, and scholarship associated with maritime public education and interpretation. With few publications currently available that feature the public interpretation of maritime and submerged cultural resources, this volume adds to a limited body of knowledge in a field that is steadily growing. Because public interpretation of archaeological resources on public lands often is mandated by law, this book should be helpful to managers who are tasked with implementing public education and outreach programs and who want to know what has been tried and tested, what has proved successful, and what has not reached full potential. We also think this book will be useful for those new to the field and for those who are experienced but want to try new directions.

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1
Not All Wet: Public Presentation, Stewardship, and Interpretation of Terrestrial vs. Underwater Sites

John H. Jameson, Jr.

> The Nautilus was piercing the water with its sharp spur, after having accomplished nearly ten thousand leagues in three months and a half, a distance greater than the great circle of the earth. Where were we going now, and what was reserved for the future?
>
> *– Jules Verne, 20,000 Leagues Under the Sea*

Introduction: A Heritage of Conservation and Interpretation

The beginnings of cultural heritage management in the United States can be traced to the conservation movement of the nineteenth century and the developing concepts of public stewardship of lands and resources in the early and mid-twentieth century. By the 1960s, public concern for the preservation "for posterity" of thousands of endangered sites such as the Southwest pueblos and prehistoric mound complexes culminated in the passage in 1966 of the National Historic Preservation Act. Among other things, the act called for establishment of a National Register of Historic Places and a process to identify and protect sites eligible for listing in the Register. The act also established the president's Advisory Council on Historic Preservation and authorized federal funding to be used by the states to review and comment on National Register eligibility determinations. For federally licensed or sanctioned actions, the Section 106 process of the National Historic Preservation Act applies, as set forth in implementing regulations. Section 106 of the act requires that federal agencies take into account the effects of their undertakings (any sanctioned action or project) on historic properties and afford the Advisory Council on Historic Preservation an opportunity to comment on such undertakings. This federal law applies to projects where federal funding is involved or where a federal agency permit is required.

Until the late 1980s, the main body of heritage management literature focused on emerging standards of recordation and significance evaluation promulgated by the "36 CFR 800" code of federal regulations to enforce the 1966 act. Today, public archaeologists realize that they are the purveyors of the promised

FIGURE 1.1. "Because the past is our common destiny" archaeological conservation and protection public awareness poster. (Painting by Martin Pate; image courtesy of the Southeast Archaeological Center, NPS).

"posterity" of the 1960s and 1970s and, with the many thousands of sites investigated and millions of artifacts collected and conserved, that we have an imperious, even ethical, responsibility to provide public access and benefit. With widening definitions of stakeholders, including the realization of the importance of traditional and indigenous cultural values, major developments, such as the emergence of ethnically sensitive archaeologies, have forever changed the ideological landscape of heritage management. Enhanced standards for site and artifact recordation, curation, accountability, and site stabilization, coupled with a proliferation of educational and public interpretation efforts, have underlined public agency commitments to preserve our rich cultural heritage and to make it more meaningful to people (Figure 1.1).

Values-Based Management and Holistic Interpretations

A discussion and articulation of the term "value" is increasingly permeating public, private, and international discourses. We hear about, for example, human vs. material values, tangibles and intangibles, moral values, religious vs. secular values. In many of our discussions, the word "value" is used interchangeably with other terms such as attribute, quality, and interest. But the term "value" is useful because it commonly connotes humanistic and emotional qualities. One might say that the term "value" in this sense is values-loaded. Values relate to tangibles and intangibles that define what is important to people. In all societies a sense of well being is associated with the need to connect with and appreciate heritage values. An understanding of how and why the past affects both the present and the future contributes to a sense of well being.

In heritage management, we articulate "values" as attributes given to sites, objects, and resources, and associated intellectual and emotional connections that make them important and define their significance for a person, group, or community. Site managers should strive to identify and take these values into account in planning, physical treatments, and public interpretation efforts. Operating in postcolonial contexts, we attempt to illuminate the undocumented details and contexts of cultural history beyond diluted and incomplete recordings of what the prominent historical archeologist James Deetz described as "a minority of deviant, wealthy, white males." To many of us, the most important outcome of archaeology is to democratize history. We have had the time and resources to contemplate and explore these issues in ways that contribute to the democratization of heritage values. Under the big umbrella of heritage we include industrial sites, historic houses, battlefields, cultural landscapes, historic and cultural corridors, historic districts, sacred indigenous sites, submerged sites, and places of memory and conscience of the recent past. Our own values affect this process and represent attempts to present, protect, and understand the past in modern contexts (Jameson, 2005; US/ICOMOS, 2004).

By examining the places people lived and the traces left behind, archaeologists strive to discover the fabric of everyday life in the past and to apply this knowledge in seeking a greater understanding of the broader historical development of societies. We use archaeology to sharpen our focus on the past and to help explain how we have arrived at the present, and even to project the future. We believe that archaeology can provide insights into historical processes that written records *by themselves* cannot. Interpretations in archaeology attempt to deal with the unintended, the subconscious, the worldview, and mind-sets of individuals (i.e., their humanistic values) as reflected in the sites, features, and artifacts left behind (Jameson, 2005).

Typically, at heritage sites, "authenticity" is offered through presentation of information and by experts along with physical and sensory trappings such as exhibits, three-dimensional reconstruction, audio-visual sounds and sights, smells, and special effects. The terms "authenticity" and "integrity" are linked in meaning in that the latter can mean unspoiled, physical, or unadulterated authenticity.

"Authenticity" and "integrity" as terms can be seen as representing the values of historic preservation, as articulated by archaeologists, architectural historians, and other resource specialists.

Today, the effects of globalization are being felt in complex and significant ways. Heritage tourism, with its ties to the currents of rapidly evolving global economies, is causing increasing needs and demands for cross-cultural and international communication and interdisciplinary training. Emphasis is on transferable skills such as the application of interdisciplinary approaches, writing for both academic and non-academic audiences, oral presentation, and experience with multimedia packages. Heritage management in the West is increasingly focused on preservation (especially resource integrity), on public interpretation issues, and on developing analytical and technological competences. Because of the increasingly diverse and multicultural nature of audiences, training programs are shifting in emphasis from an academic to an increasingly applied focus. Professional or formal training of local staff is necessary to ensure that high standards are maintained and are, for many regions, internationally portable. Those of us whose primary goals and interests are conservation should be determined that our values and standards in this scenario are not compromisedor diminished. The challenge is to ensure that high standards of skill and competency are accepted, welcomed, and valued at local and community levels (US/ICOMOS, 2004).

In many developing countries, heritage management is emerging as a critical component of national economies to promote tourism and to structure development initiatives. Development schemes focus on sustainable concepts that encourage both the preservation of resources and the recognition of socio-economic values of local people. And, hopefully, these schemes involve participative decision-making and learning processes attuned to the culture and traditions (i.e., values) of the people affected. These trends can be seen as facets of the post-modern paradigm that reflect the principals of multiculturalism and more subjective interpretation (US/ICOMOS, 2004).

We should keep in mind that one effect of globalization is that prescriptions for authenticity, integrity, and most concepts associated with modern and standardized definitions of historic preservation originated in Western systems of classification and ranking, that is, the notion that heritage is an *inclusive possession of all humanity* belonging to no one individual. Concepts such as World Heritage Site, National Park, and other forms of commemoration developed within Western philosophical traditions. Who are the people in charge of heritage sites? They are usually Western or Western-trained. In the U.S., for the most part, it is government and museums. What values in society do they reflect?

Stewardship can be defined as a long-term commitment to protecting and managing cultural values and their associated physical and nonphysical aspects and integrities. In the U.S. National Park Service and elsewhere, as "experts" and resource specialists at parks and sites, we see ourselves as the everyday stewards of our national treasures, tasked to preserve these values and their associated environments for the benefit and enjoyment of the people, that they be left unimpaired for the

enjoyment of future generations. Our public interpretation programs seek to create opportunities for audiences to form intellectual and emotional connections to the meanings and significance of historical and archeological records and sites and the peoples who created them.

It is important for those of us who manage, study, and present the past to be aware of how the past is understood within the context of socio-economic and political agendas, how that influences what is taught about the past, and how the past is valued, protected, authenticated, and used. We must understand the philosophical, political, and economic forces that affect how sites and parks are managed. We know that archaeological resources, as well as the built environment, are being degraded. Dwindling budgets and reductions in personnel are exacerbating the problem. Political currents are threatening to weaken long-standing principles, standards, and commitments to public stewardship. Heritage tourism pressures have become important elements of interpretive messages at parks, historic sites, and museums.

We are functioning in political climates that increasingly reject or discourage institutional and, especially, governmental husbandry or stewardship of cultural resources and values. The challenge for archaeologists and other resource stewards is to educate ourselves on the requisite knowledge, skills, and abilities to deal with these issues. Paramount for educators and interpreters is to ensure that our audiences connect with and understand cultural heritage values, those tangibles and intangibles that define what is important to people.

We strive in these endeavors to develop more holistic interpretations, in which the values of sustainable environment and heritage are inextricably linked. We have recognized that multidisciplinary and inclusive approaches are the most effective. The sites we deal with are no longer limited to great iconic monuments and places, but now include millions of places of importance to sectors of society that once were invisible or were intentionally ignored. These sites can play an important role in fostering peaceful multicultural societies, in maintaining communal or ethnic identities, and in serving as the indispensable theater in which the ancient traditions that make each culture a unique treasure are performed periodically, even daily. The values of these previously ignored and heretofore low priority sites and features often are not readily obvious in the material fabric or surrounding geography, but they must be identified and require a narrative for the fullness of their meaning to be properly conveyed to local people, site visitors, and the public at large. This is accomplished through processes of public interpretation and education (US/ICOMOS, 2004).

For many of us trained and employed in archeological pursuits, our "value sets" if you will, are changing and evolving, albeit uneasily in some circles, from traditional definitions – i.e., historic, archeological, scientific – to incorporate intangibles such as aesthetic, artistic, spiritual, and other values stemming from introspection. This involves an expansion and broadening of the content of "archeological knowledge" to be more inclusive and accepting and less authoritative – that is, a broadening of the meaning of "expert." This trend will result in profound ramifications for definitions of significance in heritage management

deliberations and what is ultimately classified, conserved, and maintained. It will change the role we play and the values we present in historic preservation and education. It will affect our strategies for conducting research and the public interpretation of that research. One of the very important developments in this trend is the emergence of the interpretive narrative approach in archaeological interpretation, where archaeologists, instead of just presenting sets of derived data, actively participate in structuring a compelling story. The narrative is used as a vehicle for understanding and communicating, a *sharing* as well as an *imparting* of archeological values within the interpretative process (Jameson et al., 2003).

Evolving Public Interpretation Standards

In the last few decades we have witnessed a dynamic period of evolving standards and philosophy in public archaeology and heritage interpretation. Philosophical approaches and techniques, exemplified by the U.S. National Park Service's Interpretive Development Program (IDP), have formed a basis for the development of international definitions, standards, and approaches that lead to more effective strategies for site protection and conservation through enhanced public stewardship. These standards stem from the belief that public interpretation is probably the most important activity that occurs at an historic site in that it delivers the conservation, education, and stewardship messages that represent the transcendent humanistic values of the resource or site (NPS IDP, 2006) (Figure 1.2).

International initiatives, led by the non-governmental International Council on Monuments and Sites (ICOMOS), are embodied in the ICOMOS Ename Charter on Interpretation that declares that, "Interpretation of the meaning of sites is an integral part of the conservation process." Discussions on issues such as authenticity and inclusiveness continue to dominate international debates about the significance and proper use of sites.

The importance of interpretation in every region of the world led ICOMOS to launch in the spring of 2004 a profound global discussion on this issue, using the ICOMOS Charter on Interpretation and Presentation of Cultural Heritage Sites (Ename Charter) as a stimulus to guide and inform the process. A US/ICOMOS conference in May 2005 attempted to address the values attributed to heritage sites and features and why they need to be protected. It attempted to identify a degree of consensus on how to construct narratives and tell stories that convey "values" and "significance" to a society, community, group, or individual. It examined these topics in depth and worked to develop a global consensus on goals and acceptable standards. The need for this conference derived from public interest and mass tourism, the connections to current heritage management practices, and the expanding possibilities opened by modern technologies (US/ICOMOS, 2004).

The commitment of ICOMOS to development of interpretation standards is reflected in the newly formed ICOMOS International Committee on Interpretation and Presentation (ICIP). The aim of ICIP is to study the evolving

FIGURE 1.2. "Unlocking the Past." (Painting by Martin Pate; image courtesy of the Southeast Archaeological Center, NPS).

techniques and technologies of public interpretation and presentation, evaluating their potential to enrich contemporary historical discourse and to heighten sensitivity to the universal values and particular modes of human expression embodied in cultural heritage sites. The work of this committee will contribute to international dialogue and the planned adoption of a doctrinal document on interpretation at the Sixteenth ICOMOS General Assembly to be held in Québec, Canada, in 2008 (ICOMOS ICIP, 2006).

The challenges for international relevance and application posed by the ICOMOS Ename Charter initiative will form the center of future debates and deliberations. The goal of more inclusive interpretations will require an acceptance of divergent definitions of authenticity that depend on a level of tolerance of multiple definitions of significance with concomitant, objectively derived, assigned, and ascribed heritage values. We can hope that these efforts lead to the recognition

of humanistic values that are reflected in site commemoration and protection decisions by controlling authorities.

Public Interpretation of Terrestrial and Marine Sites

Submerged and marine sites have a social attraction and fascination for people. From Jules Verne to modern state-of-the art explorations, such as with the American Civil War submarine *H.L. Hunley*, we are captivated by what can be brought from the deep.

In the 1980s, several thousand historically significant shipwrecks were located in the navigable waters of the United States. During this time, advances in technology made access to many of the shipwrecks more feasible. Confusion arose between state and federal courts because states claimed ownership of what appeared to be abandoned shipwrecks on their submerged lands, while federal courts resolved disputes concerning the discovery and contents of these shipwrecks by applying admiralty principles.

The Abandoned Shipwreck Act of 1987 has attempted to remedy the legal confusion and focus more recent attention on submerged resources in the U.S. The act provided for the United States to assert ownership over any abandoned shipwreck in state waters and submerged lands. It also provided guidelines for the designation of abandoned shipwrecks as national historic parks, recreation areas, and marine biological sanctuaries. The act provides federal authority to transfer ownership of abandoned shipwrecks to the state on whose submerged lands the wreck is located. The act provides federal protection to any shipwreck that meets the criteria for eligibility for inclusion in the National Register for Historic Places. Disposal of dredged or other material on or in the near vicinity of such wrecks is prohibited by the act. The act allows for appropriate public and private sector recovery of shipwrecks consistent with the protection of historical values and environmental integrity of the shipwrecks and the sites. The National Park Service's Abandoned Shipwreck Act Guidelines call for integration and consideration of shipwrecks into the general planning, engineering, operations, and regulatory compliance actions (Figure 1.3).

The Abandoned Shipwreck Act states that federal grants funds shall be available for a variety of activities, including interpretation of historic shipwrecks and properties. Working in partnership with various interest groups and providing for the interpretation of publicly owned shipwrecks helps increase the public's knowledge and understanding of our nation's maritime history.

Recent international efforts for protection of marine sites have addressed both direct and indirect impacts. For example, the adoption in 2001 of the UNESCO Convention on the Protection of the Underwater Cultural Heritage addressed the urgent need for an international legal framework to regulate activities that affect sites (Dromgoole, 2006). Hopefully, as with the Abandoned Shipwreck Act in the U.S., enhanced international protection measures will coincide with increased public interpretation and outreach efforts.

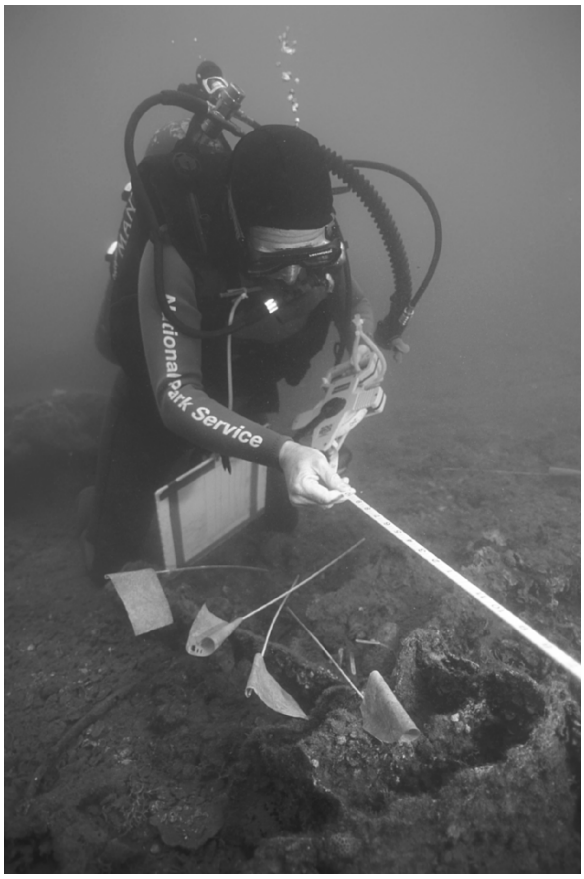

FIGURE 1.3. National Park Service underwater archeologist works at the USS *Arizona* site, USS *Arizona* National Memorial, Pearl Harbor, Hawaii. (Photo courtesy of NPS).

Advances in Technology Contribute to Greater Public Understanding and Attention to Submerged Sites

The focus of the vast majority of academic symposia and publications on the public interpretation of archaeological resources has been on terrestrial rather than on underwater or marine sites. Generally in the past, available technology provided greater access to terrestrial sites vs. marine or maritime sites. But modern technology now has generated an unprecedented profusion of data and opened greater public access to information about submerged sites, vessels, artifacts, and data (Figure 1.4). The new data and innovative strategies have made information more accessible for underwater archaeology and the stories it can tell about the human past.

FIGURE 1.4. The *H.L. Hunley* submarine being unloaded at the conservation treatment facility in Charleston, S.C. (Photo courtesy of Friends of the Hunley).

How has technology expanded the archeologist's reach to ever-deeper waters? A list of some of the major technological advances and the nature of their contributions would include (WHY Files, 2004):

- **Marine Magnetometry:** A popular underwater archeological technology where a magnetometer, a device that, in underwater investigation, is usually towed behind a boat, senses variations in the Earth's magnetic field caused by metal objects. The instrument is towed in prescribed interval paths, following a grid.
- **High-Resolution Side-Scan Sonar:** A device that emits high-frequency sound waves and records the echoes. The pattern of signals, when analyzed by computer, provides near-photographic resolution of the lake or sea floor.
- **Laser Line Scan:** This device uses laser pulses, that, when fired downward, bounce off the sea floor back to the ship, where they are recorded and processed by computer. It has a laser-packed head that spins at nearly 3000 RPM, providing a nearly photographic coverage of the sea bottom.
- **Sub-Bottom Profiler:** This instrument sends out low-frequency sound pulses that can penetrate the seabed. It can be effective in detecting depositional layers of sediment.
- **Global Positioning System:** GPS is a satellite navigation system originally designed and controlled by the U.S. Department of Defense. GPS provides

specially coded satellite signals that can be processed in a GPS receiver, enabling the receiver to compute velocity, time, and position within a few meters or more accurately (University of Colorado, 2000).

"Where are We Going Now, and What is Reserved for the Future?"

Today, with the development and recognition of the benefits of more democratic, values-based management practices, heritage management world-wide increasingly encompasses an ethical responsibility to provide public access and benefit to an escalating variety of stakeholders. Evolving standards and philosophy in public archaeology and heritage interpretation, with a goal of more inclusiveness in interpretations and presentations, require a level of tolerance and recognition of diverging, multicultural perspectives. Enhanced international protection measures are coinciding with increased public interpretation and outreach efforts of terrestrial as well as maritime sites.

Where are we going now, and what is reserved for the future? With this adaptive take from Jules Verne, we note that advances in investigation and recording technology have the potential to vastly increase the scope and reach of underwater archaeology. Although public access to accurate and non-sensationalized information about underwater sites has often been hampered by media presentations that appeal to human curiosity and an amateurish "treasure hunt" mentality, an increasing number of successful projects, programs, and exhibits in recent years behooves us, the public archaeology and public interpretation professionals, to recognize and chronicle these exemplary efforts as collective experiences about what has worked and what has not worked. The chapters in this book highlight a number of exemplary success stories and serve as a start at alleviating the dearth of documented and comparable case studies on public outreach and interpretation of our submerged and maritime heritage.

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2
The Value of Public Education and Interpretation in Submerged Cultural Resource Management

Della A. Scott-Ireton

Introduction

Interpretation and management of maritime sites present unique challenges in the arena of historic preservation and heritage tourism. Archaeologists and managers struggle to change public perception of what shipwrecks represent, while encouraging visitation but controlling use-related impact to fragile sites. The most effective way to protect archaeological sites, whether on land or underwater, is to instill in the public the concept that these places and objects have value. Not the intrinsic value of treasure hunter propaganda, but cultural and historical value as precious pieces of our past. Methods for instilling and fostering this sense of value have been developed and employed in various settings around the world. This chapter explores several of the most successful methods, and also discusses some unique issues and problems involved in the establishment and management of underwater archaeological preserves, shipwreck parks, and maritime heritage trails.

Value

The concept that some objects are endowed with cultural value that is symbolic, and that cannot be reduced to monetary or materialistic worth, is recognized by anthropologists (Bell and Werner, 2004:xi). These objects may be considered to be "sacred" or "inalienable," not to be given away or sold. Renowned economic anthropologist Maurice Godelier (1999:8) wrote, "No society, no identity can survive over time and provide a foundation for the individuals or groups that make up a society if there are no fixed points, realities that are exempted (provisionally but lastingly) from the exchange of gifts or from trade." At least some of these "fixed points" represent a society's history and heritage - the tangible remains of its past as a reminder of where it came from and how it developed. These include, but are not limited to, historic sites, structures, and buildings, and archaeological remains including shipwrecks.

Shipwrecks have lost all of their intended and expected value. A shipwreck, by definition, is a failure: by virtue of the fact that the ship is no longer floating, it has failed in its intended job and purpose. Once a shipwreck becomes part of the archaeological record, however, it again becomes valuable, not only as a symbolic cultural fixed point, but also in terms of economic and social value, which should be considered when interpreting a shipwreck for public education and enjoyment.

The economic value of archaeological and cultural sites is linked to the heritage tourism and historic preservation industry. According to a state-wide study performed in Florida in 2000, in that year more than 123,000 jobs were created as a result of historic preservation activities, and more than US$3.7 billion was spent by tourists visiting historic sites, including museums, state parks, and archaeological sites (Center for Governmental Responsibility at the University of Florida and Center for Urban Policy Research at Rutgers University (CGR/CUPR), 2002:5). Heritage tourism is one of the fastest growing segments of the tourism industry, generating income that benefits not only the economy in general, but also contributing directly to funding historic preservation initiatives and maintaining historical/archaeological sites (CGR/CUPR, 2002:13).

In a more specific sense, the value of a shipwreck fluctuates with each event or transaction, and what once was discarded may recover its value in another arena (Kirshenblatt-Gimblett, 1998:259-260). For example, the sternwheeler *City of Hawkinsville*, the largest and last steamboat to ply Florida's Suwannee River, once was abandoned by its owner as valueless, having become obsolete by the construction of the cross-Florida railroad. Today, it has regained its social value as a heritage production, ascribed by virtue of its age (over 50 years, a criteria of state law and the National Register of Historic Places), existence (as there is no other Suwannee steamboat so intact), and designation and interpretation (through its listing on the National Register and by the state of Florida as an Underwater Archaeological Preserve) (Figure 2.1). The story of *Hawkinsville* is distributed throughout the region on brochures and posters, and serves to educate the public about the history of the southern steamboat era. Although its economic value as a transporter of goods and people is long over, the steamboat still serves the community economically as a lure for heritage and recreational tourism, and symbolically as one of the last remnants of an important but extinct commercial history.

Instilling Value

One of the primary purposes of public interpretation of shipwrecks is to foster their value as fixed points or inalienable objects in the public conscious. The placing of inalienable objects in museums signifies their value through the mode of display: objects behind glass or in a case or specially lighted must be inherently valuable (either intrinsically or culturally). In very few cases, however, (the Tudor warship *Mary Rose* and the Swedish warship *Vasa* being famous exceptions) are shipwrecks entirely raised, conserved, and placed in an exhibit. The vast majority of those that are interpreted at all are "displayed" *in situ* at the location where they

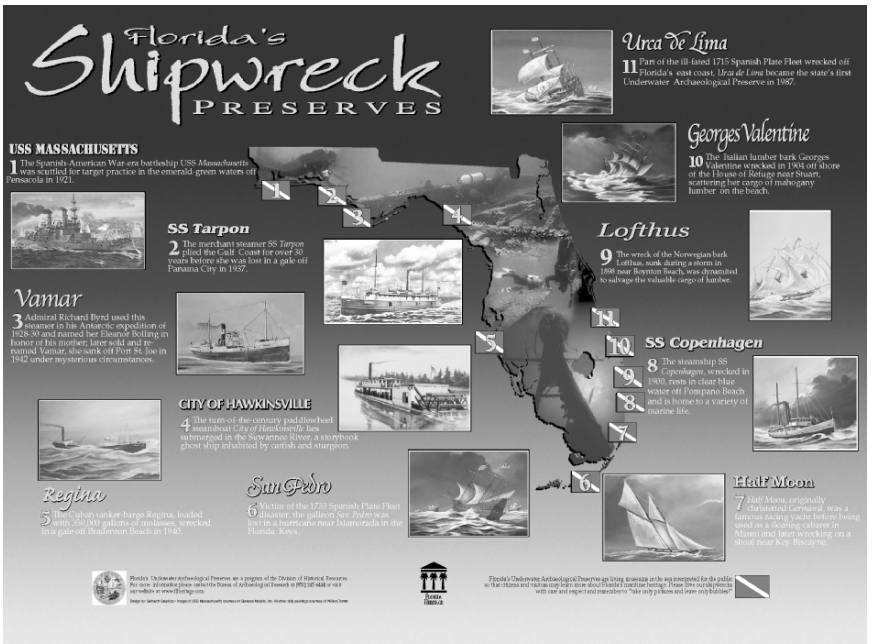

FIGURE 2.1. Florida's Preserves are presented as 'Museums in the Sea' for divers and snorkelers (Image courtesy of the Florida Bureau of Archaeological Research).

impacted the sea floor. Archaeologists and managers must employ interpretive strategies, rather than exhibition techniques, to illustrate and emphasize the cultural value of the shipwreck.

A comparison of preserve, park, and trail programs around the world reveals three common ingredients for success, regardless of the type of resource or environment: community involvement, effective interpretation, and active management. The term "success" in this context means that the resource is visited consistently by the public who are educated as well as entertained, and that the resource is maintained in a manner consistent with sustainable use (both public and scientific) and long-term preservation. The three ingredients are most successful when applied cooperatively so that each compliments the other to create a program that balances public use with resource preservation.

Community Involvement

Archaeologists have long recognized that a significant portion of the public is intrigued by archaeology and what it can reveal about the ancient past (Fagan, 1984:175). The most savvy archaeologists and cultural resource managers take advantage of this fascination to meet their research and preservation objectives by involving the public in their work. Involvement of local communities in the creation process, and often in management, is one of the most shared attributes of

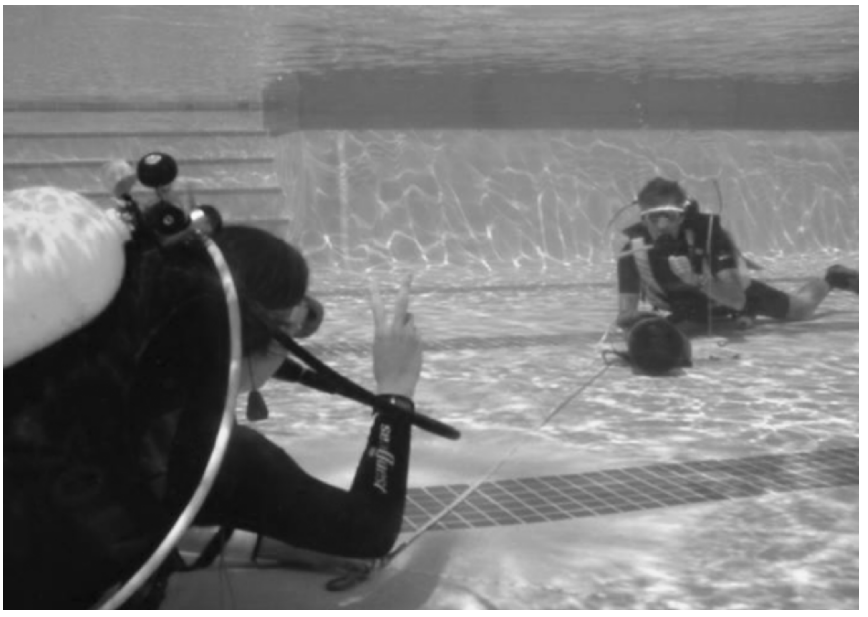

FIGURE 2.2. Sport divers training to assist archaeologists in recording a local shipwreck (Photo courtesy of the Florida Bureau of Archaeological Research).

preserve, park, and trail programs around the world. Experience in Florida, and other locations, shows that when local communities are involved at the start of underwater archaeological preserve projects they become stewards of the resources, fiercely protecting their historical and physical integrity (Scott-Ireton, 2003b) (Figure 2.2).

When presenting a maritime cultural resource as a heritage tourism attraction, managers should consider the effect on the community and actively promote community support. Unlike any other industry, tourism relies on the amity and cooperation of the community surrounding the attraction. Where planning and development do not take into account the needs and desires of the community, hostility and resistance are liable to occur. This kind of opposition can raise costs associated with development and can destroy the potential for cultivating the industry altogether.

Effective Interpretation

Various methods of interpretation and education have been developed for preserves, parks, and trails around the world. These may be divided into two major categories: those targeted to terrestrial audiences and those targeted to submerged audiences, although the two often overlap. Interpretive materials range from visual attractions on-site to printed media for distribution, and generally also

FIGURE 2.3. The story of South Australia's *Star of Greece* shipwreck is presented on interpretive signage (Photo by Della Scott-Ireton).

incorporate mass media such as television, magazine articles, and the world-wide web (Figure 2.3). The most common interpretive strategy, for both submerged and terrestrial maritime sites, is the production of literature such as brochures and pamphlets describing the resource. These take several forms with varying degrees of success in terms of educating visitors and changing public perceptions of what shipwrecks are and what they symbolize.

Regardless of the form of interpretation, all interpretive methods have the same goal: to impart accurate information about the resource in an entertaining manner. The best interpretation does not simply give facts, but also integrates the resource into the larger historical picture and describes what impact the resource had on local cultural identity. This goal is not, as a rule, easy to meet in a small-sized brochure, and many programs choose to use several forms of interpretive material to provide the whole picture, or to enable the visitor to choose the form best suited to their particular desires.

Active Management and Protection

The most effective method for management and protection of maritime cultural sites directly engages the ingredients of community involvement and interpretation. Acknowledgement by local people that their maritime resources are valuable is one of the most crucial steps in management and protection. Legislation only goes so far to protect submerged cultural resources; communities need to be

encouraged to take responsibility for their heritage resources. Actively managing submerged sites is as much about managing the people who visit them as it is about the sites themselves. Once visitors see shipwrecks as valuable pieces of their past that deserve protection, the most difficult step toward preservation is taken. The most efficient way to instill the concept of value in public perception is by explaining the resource's economic, historical, and social values; that is, by effective interpretation.

By combining the three elements of successful management, a well-rounded and dynamic program can be created that will result in the best possible outcome for the resource - sustained preservation. Such programs often take on a life of their own, with continuing and active community-based management and monitoring.

Issues in Preserve/Park/Trail Establishment and Management: The Logistics of Instilling Value

Although the creation and management of underwater archaeological preserves, shipwreck parks, and maritime heritage trails may seem to be straightforward ventures in public education with willing and enthusiastic support from every quarter, they are, actually, endeavors filled with challenges. Funding, for example, always seems to be an issue, as programs rarely have dedicated funding, whether for initial recording and research or for the continual printing of literature. Resource managers and archaeologists, in many cases charged by law with ensuring public access to sites, have met these unique issues in a variety of innovative ways. Here are a few of the particular challenges:

Definition of "Park," "Preserve," and "Trail"

Each of these terms has its own connotation in the mind of the public and can affect how the project is received, and ultimately how it is marketed. "Preserves" and "reserves" often are thought of in ecological terms as areas where people may not be allowed to enter, or may be permitted only in limited numbers or locations. Many people think of "trails" as nature trails, where paths are marked and a route can be completed in a matter of a couple of hours or less. At least one archaeologist has stated that any place where the public is encouraged to visit a submerged cultural resource is not a "preserve" or a "reserve" or a "sanctuary," but should only be termed a "park" (Hannahs, 2003:5). A "park," however, usually is thought of as an area or site that is open to the public, managed by uniformed rangers, and with facilities that include parking lots and restrooms, which submerged sites generally do not possess. In the case of interpreted maritime resources, these terms need to be defined and made very clear to the visitor to avoid misunderstandings.

An example of how misunderstandings can arise is the story of Florida's *City of Hawkinsville* Underwater Archaeological Preserve. Local people heard of the

new "shipwreck park" being planned and interpreted it to mean that the banks of the Suwannee River at the wrecksite would be clear-cut, paved for parking, and portable toilets installed. Incensed at what they thought the state had planned for their community, a large group of irate townspeople, armed with righteous indignation if not torches and pitchforks, arrived at a scheduled public meeting ready to fight for their pristine river environment. Once they understood that the intended plan called only for mooring buoys and some literature, their mood changed completely and the group became some of the most vocal supporters of the project. The entire cause of the misunderstanding was perception of the term "park," and the lack of sufficient public involvement early in the project which would have eliminated any confusion.

Site Selection

Deciding which maritime site(s) to interpret can be one of the most challenging tasks associated with preserve, park, or trail creation. Establishing an attraction without consulting the community is a recipe for disaster, but promoting any and every site, as some communities wish, as a preserve or park also is not desirable. Not every site can (or should) be promoted, and each case is unique.

The State of Florida approached the issue of site selection by encouraging the public to nominate sites to the Underwater Archaeological Preserve system, thus neatly avoiding the problem. In the case of the first preserve, officials of St. Lucie County approached the state to make the 1715 wreck of *Urca de Lima* off-limits to treasure hunters and to create an underwater park at the site (Smith, 1991:43). This request by a local community for state assistance was the impetus for the entire Preserve program and set precedent for nominations of new sites. By responding to formal requests from local people, the state avoids being perceived as a bureaucratic entity that has no regard for the preferences and opinions of its constituents. Rather, state involvement and assistance is regarded as a validation of community opinion of the importance of local sites. Not all nominated sites, however, are appropriate for promotion as heritage attractions.

A strategy that has worked well in several locations for determining appropriateness for interpretation is the development of criteria. Criteria for selecting sites for the Cayman Islands Maritime Heritage Trail take into account historical significance, variety of maritime themes, island-wide representation, interesting visual features, public access, safety, and site sensitivity (Leshikar-Denton and Scott-Ireton, this volume). With many possible sites to choose from, these criteria helped organizers to select the best sites for illustrating the maritime history of the islands, and to eliminate sites that were inappropriate for increased use.

Use of Resource

One of the negative impacts of tourism on a fragile resource, whether ecological or historical, is the possible damage that may occur due to increased traffic and use (Jeffries, 2001:45-47). Shipwrecks are especially vulnerable because their

continued preservation depends on maintaining the equilibrium that is established over time between wrecks and their environment. A major challenge for managers and archaeologists is to balance public access with sustaining the resource, both for future enjoyment and for future scientific research. In some cases, these goals can be mutually exclusive; especially sensitive sites, for example, may be too fragile both in terms of physical condition and scientific potential to sustain public visitation. The task of deciding the best use of the resources generally falls to the resource manager who must weigh the benefits of public education with possible damage to the site and the information it holds.

Unfortunately, experience has shown that educational efforts, and even actual physical barriers, sometimes are not enough to protect shipwrecks from damage, whether intentional or inadvertent. Managers for New York's 1758 radeau *Land Tortoise* Submerged Heritage Preserve in Lake George installed a chain mounted on stanchions around the wreck, the oldest intact warship in North America (Zarzynski et al., 1996). The barrier is intended to keep visitors from hanging onto and damaging the fragile wooden hull; the chain does not at all hinder viewing the radeau, merely serving the same purpose as a velvet rope at a historic house museum. Despite this measure the wreck still was damaged in 1995 by divers who attempted (unsuccessfully) to remove two cannon port lids; damage also was noted to other portions of the wreck (Zarzynski et al., 1996:39).

In this case the managers walk a fine line. The radeau is extremely historically significant and has National Register and National Landmark status; as a wooden-hulled vessel in fresh water it is very well preserved but also very fragile. The most effective option for preservation of the shipwreck is to not allow visitation at all (Zarzynski et al., 1996:36). This, however, is not a viable option as the wreck is widely known in the local sport diving community, is a fascinating piece of American history, and belongs to the public. The preserve managers control visitation as best they can through permitting divers, making every effort to keep the wreck from being damaged, and educating the diving public about the significance of the warship. These efforts have proven, for the most part, to be successful; of the hundreds of divers who have visited *Land Tortoise*, apparently only a few missed, or ignored, the message. Nevertheless, increased use is negatively affecting the wreck and is an issue which the managers must constantly address.

Enhancement and Alteration of Sites

Divers visit shipwreck parks and preserves to see shipwrecks. The more dramatic the experience, the more they will garner from the visit in terms of excitement for the topic and interest in the resource. An interested and excited diver is ripe for educational efforts. It follows, then, that the more exciting and visually appealing a shipwreck is, the better. But to what extent is dramatizing a shipwreck ethically acceptable, and how much enhancement can a site sustain before it becomes a parody of itself and little better than a shipwreck theme park?

There is no easy answer to the question, but managers have developed a variety of solutions to fit their resources and their standards. Replica artifacts, and in some

FIGURE 2.4. Replica cannons on the *San Pedro* Preserve in the Florida Keys (Photo courtesy of the Florida Bureau of Archaeological Research).

cases entire replica vessels, have been effectively employed. In Florida, cement cannons were placed at the *Urca de Lima* and *San Pedro* Preserves in an attempt to recreate a semblance of how the shipwrecks appeared before their cannons were salvaged by treasure hunters (Scott-Ireton, 2003a:103-104) (Figure 2.4). The Dominican Republic has two preserves that are entirely fabricated using objects recovered from wreck sites (Indiana University, 2003), but they nevertheless present an opportunity for the public to see artifacts that otherwise would be stored away and never displayed, and their representation of shipwrecks is an innovative way to educate the public about shipwreck archaeology. In a similar vein, two historic wrecks in Puerto Rico were removed from their original context to prevent them being destroyed by planned harbor dredging (James et al., 2003) and placed in an area more conducive to visitation. Although the wrecks sites no longer possess their original archaeological context, they remain valuable additions to the heritage tourism industry.

Tracking Visitation

One of the most difficult aspects of the establishment of preserves, parks, and trails, and their continued management, is the measurement of their success both in terms of resource protection and popularity as an attraction. The problem is that these types of sites are difficult to continuously monitor. In areas where diving visitors can access sites through charter boats, personal boats, or shore entry, it may not be possible to accurately count the number of visitors a shipwreck park

receives. Some underwater preserves, such as those in Vermont and New York, are strictly controlled and require visitors to register to dive the sites, making monitoring divers and collecting statistics easier (Cohn, 2003:88; Zarzynski et al., 1996:36). In the case of Scotland's "visitor schemes," visitors take a short orientation class before being granted a license to dive the shipwrecks (Robertson, 2003:74), and guided tours are the only way to see Curaçao's SS *Mediator* preserve (Raymond Hayes 2004, personal communication). Such measures are practical in these locations because of the relatively light visitor traffic. Submerged resource managers in locations such as Florida (the top sport diving destination in the United States) and the Caribbean would be hard-pressed to institute similar regulations due to the sheer volume of diving and snorkeling visitors; the administrative costs alone are more than the managing agencies could afford.

Several methods have been tried to make accurate counts of the numbers of visitors to underwater preserves and shipwreck parks. Surveys and questionnaires, generally distributed through participating dive shops or via the internet, are useful when visitors make the effort to complete and submit them; the State of Maryland employs this method with limited success (Langley, 2003:50). Some managers have proposed that divers to preserve sites be permitted only through certain charter boat businesses that agree to participate in preservation and management efforts. This, however, will not account for divers who may use private vessels, or who enter the water from shore.

Use of interpretive literature to help track visitation has had some success. For example, diving visitors to the Roman harbor of Caesarea Maritima in Israel borrow laminated cards illustrating the sunken harbor breakwaters and other structures from the single dive shop on site. Once the diver uses the card for a self-guided tour around the harbor, the card is returned to the dive shop. Diving visitors are counted based on the number of times each card is borrowed. This method is not perfect, however, as a single diver may borrow a card for a buddy team of two or even more divers, or the diver may opt not to use the card at all.

Legality and Liability

The litigious nature of modern society makes legal issues, especially liability concerns, a subject that must be considered by managers of submerged cultural attractions. Scuba diving carries an inherent risk that cannot be reduced to zero; by promoting shipwrecks as places to visit, managers are encouraging the public to engage in an inherently risky activity. Archaeologists for the State of Florida asked their legal counsel to consider this fact and to provide an opinion regarding liability if a diver were to be injured while visiting a state Underwater Archaeological Preserve. The State's Attorney determined that shipwrecks in Florida waters already were being visited by divers and that by interpreting the sites, providing safe diving suggestions, and recommending minimum certification levels, the state's preserve program was making visitation safer, therefore the state was not assuming any additional liability by encouraging visitation to the Archaeological Preserves (Figure 2.5). The State of Vermont's

The ***City of Hawkinsville*** is marked by a series of buoys on her starboard side, and by mooring buoys approximately 100 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.

FIGURE 2.5. Instructions for safely diving the *City of Hawkinsville* Preserve are included on the interpretive brochure (Image courtesy of the Florida Bureau of Archaeological Research).

Attorney General's Office issued a similar opinion declaring that since the state allowed divers to visit its shipwrecks it already assumed a degree of liability and, assuming conditions were no more hazardous than what normally is encountered in diving, additional liability was minimal (Lawrence, 2003:66).

Fortunately for preserve, park, and trail programs around the world, there have been no reported incidents of diving accidents, and (to date) no legal action has been brought against government-operated programs. If liability ever is tested in a court case, however, the resulting decision most likely will have ramifications for all submerged cultural attractions.

Management Strategies

Encouraging public access to archaeological sites has been described as both incompatible with and contradictory to the goal of preserving a site intact (Hannahs, 2003:6). Certainly the best-case scenario for the preservation of a site is to never be discovered at all, but that is disingenuous and defeating the point of archaeology. Once a shipwreck is discovered, however, it cannot be "undiscovered" and the job of managing the site - taking into account relevant legislation, needs of the public, and needs of science - must begin. Instilling the concept of value through educating the people who visit the site is the best method we have to ensure the site is treated with respect and care so that it will last into the future. No empirical evidence exists that indicates a better understanding of archaeology, or of what can be gained by studying the past, will result in increased protection for historical or cultural sites (Stone, 1997:24). On the other hand, there is no empirical evidence indicating otherwise. Legislation, while effective to help control large-scale threats such as commercial salvage and treasure hunting, has

FIGURE 2.6. Local people, tourists, and a television news crew speak with archaeologists recording the Ponte Vedra Wreck in Florida (Photo courtesy of the Florida Bureau of Archaeological Research).

proven relatively ineffective in controlling individualized looting and vandalism (Prott and O'Keefe, 1981:177). Grass-roots education initiatives are the best, and perhaps only feasible, means to combat ignorance and malice (Figure 2.6).

Community involvement is a key to successful management of submerged archaeological sites, especially where public access to the resource is promoted. People helping to monitor shipwrecks in their own "backyards" are among the most effective means for protection. The local charter boat captain who tells his divers, "Don't disturb this wreck and don't collect 'souvenirs,' or don't get back on this boat," is many times more effective than legislation and threat of arrest and prosecution.[1] Additionally, the captain's respect for the shipwreck will be communicated to the divers, ideally with positive results: the shipwreck is preserved, the divers are entertained and educated, and the captain's source of revenue is sustained. By encouraging local people to become engaged and invested in their maritime resources and to value them as historical and economic opportunities for their community, long-term preservation goals can be met as well.

Ultimately, the exact process for effective management of maritime, and particularly submerged, sites is not definite, but rather is dependant upon the individual resource, environment, community, and circumstance. Experience has

[1] Heard by the author on a charter dive boat off Pensacola, Florida.

shown, however, that if the three ingredients of fostering value – community involvement, effective interpretation, and active management – are employed, then success in preservation and sustainable use is, if not absolutely guaranteed, certainly more likely than if the resource is left unattended and unappreciated.

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3
Look Outwards, Reach Inwards, Pass It On: The Three Tenures of Underwater Cultural Heritage Interpretation

David M. Nutley

Introduction

There are probably few people, if any, who would not agree that interpretation of underwater cultural heritage is fundamental to good heritage management practice. However, there is room for discussion on who has the key responsibility for that interpretation. A common perception is that heritage managers own center stage and all interpretation should be either initiated or at least controlled by them. As a heritage manager of underwater cultural heritage for almost twenty years, I have often observed and been aware of the temptation of heritage management agencies and their representatives to operate almost as the sole player. Partnerships, comprised of corporations, individuals, and other government agencies, predominantly have been in support of projects "owned" by heritage management agencies. Clearly there is a place for heritage managers to be initiators, strategists, and leaders and these are essential characteristics of a good heritage management regime. What is worth exploring is how best to foster, encourage, support, and complement the skills, interests, and ambitions of "other players" - in other words, to work as facilitators. We need to place as much value on backing roles as we do on the lead role. While there are many circumstances where heritage management agencies can do the work themselves, there are times when as much strength may be gained by playing the role of a supporting actor.

Three actions are required in order to achieve such a goal. First, looking outwards to identify the people and organizations who are the "other players" and what their goals, objectives, or current projects may be. Second, reaching inwards to identify which organizational goals or objectives of the heritage management agency complement those of the other players and what skills, perspectives, and other resources could be made available. The third step is to pass on those resources through appropriate delivery mechanisms and formal agreements. This approach is demonstrated through the policies and strategies employed by an Australian cultural heritage agency, the New South Wales Heritage Office's Underwater Cultural Heritage Program.

The Heritage Office is located in the eastern Australian State of New South Wales and employs two maritime archaeologists. The office's Underwater Cultural Heritage Program is involved in the management of all submerged cultural heritage sites in coastal and inland waterways, including shipwrecks, port facilities, and other relics considered to be of heritage significance. This is a vast jurisdictional area. In terms of historic shipwrecks alone, there are nearly 1,800 potential sites, 273 of which have been located to date. This does not include submerged aircraft, inundated towns, and potential Indigenous sites. The State also has over 60,000 registered divers and is host to many dive shops and clubs.

There is a great incentive to promote a positive environment for broad-based community and government involvement in management of underwater cultural heritage. This is reflected in a program that has a strong emphasis on education and promotion and the sharing of responsibilities with community groups, individuals, and government agencies. State Government agencies associated with the Heritage Office program include the New South Wales Marine Parks Authority, New South Wales Water Police, Manly Hydraulics Laboratory, and the New South Wales Maritime Authority. The sharing of responsibilities also extends to a Federal level. In Australia, the Federal Government requires State authorities with expertise in underwater cultural heritage management to request management responsibilities under the *Historic Shipwrecks Act 1976*; once requested those responsibilities then are delegated to the State. That Act is administered through the Department of Environment and Heritage under delegation to appointed Delegates in the States and Territories. One of the benefits of this arrangement is that it helps to foster interaction and cooperation with other Federal departments and agencies such as the Australian National Maritime Museum and the Department of Defence.

In 1987, the Heritage Branch of the Department of Planning received increasing numbers of reports of shipwrecks uncovered on beaches during storms and found by divers. Historical archaeologists in the Heritage Branch had no experience in recording, investigating, or managing these maritime sites and, as a result, drew the New South Wales Government's attention to the need for engaging expertise to deal with shipwrecks and other underwater cultural heritage. The Underwater Cultural Heritage Program commenced the following year. The Director of the Department of Planning accepted delegated responsibilities under the *Historic Shipwrecks Act*. This supplemented existing State responsibilities for underwater cultural heritage under the New South Wales *Heritage Act* 1977. This delegation was transferred to the Director of the New South Wales Heritage Office (Figure 3.1) when it was established as a separate agency in 1996. Eighteen years since it started, a strong, innovative program continues to emphasize community involvement, public access to information, the responsibilities of other government agencies, and integration with the State's environmental planning framework.

The Heritage Office is an independent New South Wales Government agency within the portfolio of the Minister for Infrastructure and Planning. The office provides heritage management advice to the Minister, the New South Wales Heritage Council, and the community. Through the Historic Shipwrecks Act

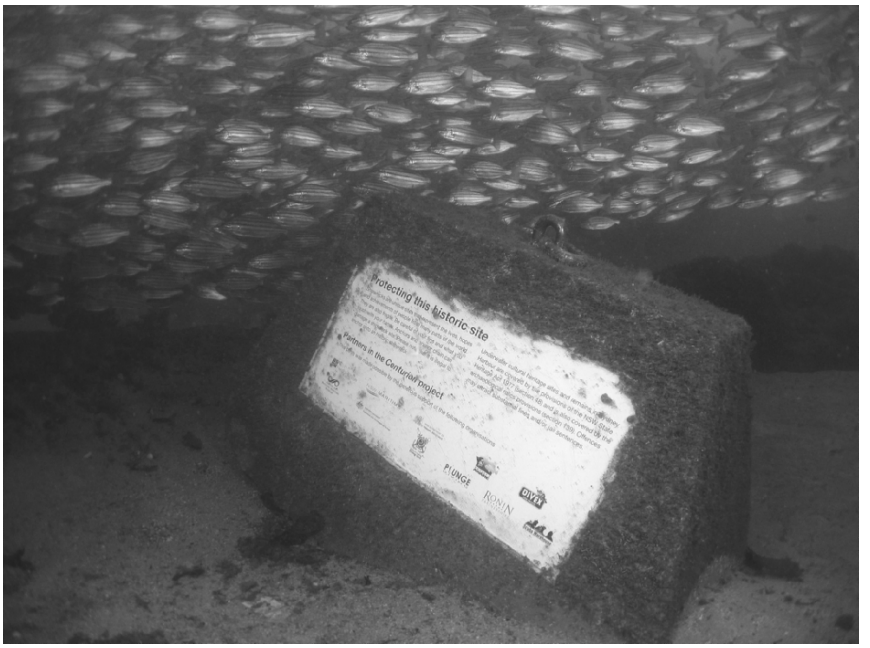

FIGURE 3.1. Signage on the wreck of the sailing ship *Centurion* (1869-1887) in Sydney Harbor provides access to information and encourages diver involvement in managing the site (Photo by David Nutley).

delegation, the Heritage Office's underwater cultural heritage program is an extension of the National Historic Shipwrecks Program. Essentially, the program is involved with the management of all submerged cultural heritage sites in coastal and inland waterways, including shipwrecks, port facilities, and other relics. In the conservation, management, and interpretation of the State's underwater heritage, the Heritage Office:

- undertakes underwater archaeological surveys;
- creates education and information programs;
- supports participation of private individuals and organizations in the recording, assessment, and management of underwater sites;
- provides advice to local, State, and Commonwealth governments and to government agencies about management of underwater cultural heritage (Underwater Heritage, 1996:4).

The Heritage Office public outreach program is based on a belief that if people understand heritage they are better able to understand and assist preservation strategies. The Heritage Office's outreach projects include publications, lectures, training courses, wreck survey projects, a "Wreck Spotters" network of volunteers, and extensive liaison with the dive industry and Nautical Archaeology Society

training courses under the auspices of the Australasian Institute for Maritime Archaeology (AIMA). Dive clubs, community groups, university students, and government agencies respond with their own contributions such as dive experiences, family oral histories, and photographic records. A direct result of outreach projects is a marked increase in support, involvement, and understanding of underwater cultural heritage.

Looking Outwards

In 1988 I was given the opportunity to establish the first formal program for management of underwater cultural heritage in New South Wales. This program began in the Heritage Branch of the Department of Planning and I had a six month contract - with virtually no operational budget! The Branch Manager gave sage advice; the words I recall from a number of meetings were, "Don't get bogged down in the detail," and, "Look for the other players." These words profoundly influenced the initial and ongoing development of this program, now in its nineteenth year.

I confess initial apprehension that the Manager's reference to "detail" meant the program was to be run without involvement with site surveys and research. This was not the case. He wished to avoid endless processing of applications, including preparation of reports on the applications' strengths and weaknesses, tabling of those reports at formal meetings of other heritage specialists, and correspondence including but certainly not limited to confirmation of receipt, requests for additional information, and notification of the final decision. His vision was for a strategic, project-based underwater cultural heritage program that both engaged the community and maximized resources available to the Department.

The central request was for a program that identified other players whose interests, ambitions, and projects could be complemented by the resources and expertise of the Department. The Department was therefore to be not only an initiator but, just as importantly, a facilitator. This philosophy continued with the development of the Heritage Office and means that other players are not viewed as competitors but rather as potential associates, partners, and colleagues. At times, these other players are entirely independent and conceive, develop, and launch programs where government involvement is simply one of endorsing completed ethical, responsible projects that complement the objectives of the Heritage Office. The program works actively to support not only avocational interests but also professional interests of people operating outside of the government program, including independent maritime archaeological consultants. As a result of this philosophy, Australia has limited opportunities for maritime archaeological employment outside of government, heritage agencies, or maritime museums. New South Wales was the first, and still is largely, the only State where regular work is available for independent maritime archaeological consultants.

A regrettable casualty of this approach was the demise of the volunteer organization Maritime Archaeological Association of New South Wales (MAANSW). This small group of skilled and dedicated divers performed site surveys of a number of shipwreck sites since the 1970s and began to develop a

shipwreck database. By 1988 its main membership was based in Newcastle, a couple of hours north of Sydney. Development of an official government program caused the group to struggle to maintain its interest, due to a number of factors. The volunteer association was a fairly small group and, like any small club, was vulnerable to change, both internal and external.

Internally, many members began to have family and personal responsibilities that caused them to move away from diving. Externally, the advent of a formal government program reduced their autonomy to some extent. The new program had a strong management focus rather than primarily research and site documentation as the MAANSW had done. Excavation and artifact recovery, although generally undertaken responsibly by the volunteers, was more strongly regulated. Perhaps most importantly, Occupational Health and Safety regulations for occupational diving operations meant the volunteers could work alongside government archaeologists only if they held current occupational diver certification, an expensive option beyond the means of most of the volunteers at that time. That restriction resulted in a sort of barrier between the activities and interests of the volunteer association and the State program. A new program was needed to bridge the barrier and to actively provide a complementary focus that benefits divers, the diving industry, and heritage conservation practice.

In adopting the "looking outwards" philosophy, the Wrecks Alive program was initiated as a part of the New South Wales Underwater Cultural Heritage Program. This program sought to link with a much wider diving community through the existing dive shops and dive clubs of the State. Participants were provided with a printed guide for undertaking shipwreck surveys including the types of information to be recorded, the documentation of sources of archival information, and the structure of a survey report. In its first three years, this project engaged thirty-three groups of divers from as far south as Eden near the Victorian border to Tweed Heads on the Queensland border. This represented a far greater geographical spread and a far greater number of divers involved in shipwreck research and survey than had been possible through the MAANSW. The program continues informally with divers operating independently of the Heritage Office, either simply expanding their diving enjoyment through a new focus or incorporating their activity with other dive training qualifications. Since the commencement of Nautical Archaeology Society (NAS) courses through AIMA in 1997, divers who would have taken part in the Wrecks Alive scheme now are more likely to undertake their first survey activity as part of their Part 2 training project. The outcome remains the same, a constant engagement of skilled avocational divers in the research, survey, reporting, and monitoring of underwater cultural heritage.

Reaching Inwards

As in many places, underwater cultural heritage in New South Wales occupies a unique position in the world of heritage management. It is comparatively free of development-driven imperatives and timelines. In the first six months of 1988 there was no influx of permit applicants relating to sites that were about to be

destroyed by a dredging program, cable laying project, or sand mining proposal. These all came in good time but their infrequency provided the opportunity to develop a program that focuses on underwater cultural heritage wherever it is located rather than just where construction projects are occurring. From the outset it was therefore possible to develop clearly articulated objectives, policies, and procedures for the management of underwater cultural heritage in New South Wales. These included articulation of the existing and potential roles of government, community, and developers regarding underwater cultural heritage.

By the end of the first six months we were armed with organizational goals and objectives for the management of underwater cultural heritage in the State. Work then commenced to identify how these could complement the goals and objectives of other players and to recognize the skills and resources within the Department that could be made available as required.

Our inventory of skills and resources at the end of 1988 amounted to:

- diving equipment – nil
- diving archaeologists – one
- field operational budget – nil
- underwater photographic equipment – nil
- heritage significance assessment skills – yes
- articulated set of objectives and management principles – yes
- conservation management plans for underwater cultural heritage sites – nil
- public information brochures and pamphlets on underwater cultural heritage – two
- database of known and potential shipwreck sites in New South Wales – card file commenced

Clearly this inventory identified great opportunities and challenges!

Delivery Mechanisms

A key management issue from the very beginning of the New South Wales program was the development of a publicly accessible inventory, not just a list of sites under threat or of sites as they are found, but a database of all known instances of shipwreck. This database was never a bureaucratic secret list to be hidden away in internal files. Our approach is that a community with ownership of its heritage understands and values that heritage. Within the constraints of privacy, site security, and the cultural values of specific community groups, the sharing of knowledge about that heritage is a public responsibility and a basic principle of the Heritage Office. Prior to the availability of the world-wide web, however, making database information available to the public was difficult. An early initiative to overcome this problem was the publishing of *Shipwreck Atlas of New South Wales*. This caused more than a few eyebrows to be raised. There were repeated warnings that telling divers where shipwrecks were located meant they would simply go out and destroy them. Indeed, in 1988, divers themselves told me that that I was wasting my time trying to protect shipwrecks because divers

would simply keep taking things off shipwrecks because that was what divers did! As a reformed collector of bits of coral and shellfish, I knew that divers, when provided with relevant information, did change habits and, as a community, recreational divers were among the most environmentally aware groups in society. When the first edition of the *Atlas* was published, a very curious response confirmed the value of this approach. The office was besieged with phone calls and letters providing additional information about sites in the *Atlas* as well as reports of sites that had not previously been identified. Two further editions of the *Atlas* were produced and each was accompanied by a similar response. It was a powerful lesson in the value of trust.

After the third edition of the *Atlas*, and with the increased availability of the web, the delivery of the New South Wales Shipwreck database to the public in printed form was replaced with an online database. The precursor of the New South Wales Maritime Heritage Online web site was the database developed by the AIMA. Originally an off-line database, this was delivered to the web about 1994. With limited resources, however, the database, though useful, was extremely basic and of little research value to users of the site. Maritime Heritage Online was designed to deliver not only the nationally standard shipwreck data fields but also unprecedented access to information about the State's maritime heritage. The site enables the Heritage Office to place almost all of its maritime heritage information online. This covers all forms of underwater cultural heritage and includes:

- the New South Wales shipwreck database
- aircraft losses over water
- site plans from Heritage Office underwater surveys
- Heritage Office information brochures
- research documents
- a publications reference list
- photographic records
- information about maritime related sites including coastal defences, lighthouses, Aboriginal fish traps, customs offices, pilot stations, ports, shipwrecks, and shipwreck information signs along the coast
- informational signage about shipwrecks along the New South Wales coast (Figure 3.2).

Downloadable resources include electronic copies of Heritage Office maritime archaeological reports, information sheets, guidelines on site conservation and anchoring practices, site photographs, video clips, diver-focused information, and school project information.

The site includes contributions from many individuals, photographers, videographers, and researchers. References promoting research on New South Wales shipwrecks are included in the Research Centre publications list whether it is has been initiated by or developed independently of the Heritage Office. The site's most powerful feature, however, is the ability for data to be updated quickly and without the costs associated with reprints of paper-based materials. This ability to respond quickly is particularly valuable when divers,

FIGURE 3.2. Local Council interpretation of the stern of HMAS *Parramatta* at Queens Wharf, Parramatta, developed in association with the NSW Heritage Office following listing on the State Heritage Register (Photo by David Nutley).

researchers, and other users of the site provide updates about specific details. A rapid response and update confirms to the provider that the Heritage Office values their contribution and that they are an active part of the delivery of maritime heritage information to the community. This level of interactivity promotes an ongoing and open and positive relationship with a wide range of other players in the community – individual, corporate, and government. In a sense, the site works as a portal, not just for the Heritage Office but for the community.

Public Access through Formal Agreements

The following case study is an example of how a formal agreement can have significant outcomes in expanding the involvement of organizations and people in underwater cultural heritage management. The management of underwater cultural heritage in New South Wales marine parks falls within the responsibilities of three main government agencies: the New South Wales Marine Parks Authority, the New South Wales Heritage Office, and the Commonwealth Department of Environment and Heritage.

In February 2002, the Heritage Office entered into a joint partnership with its fellow State agency, the Marine Parks Authority. The partnership expanded the influ-

ence of maritime heritage management policies and principles of the Heritage Office and of the Commonwealth Historic Shipwrecks Program. The Heritage Office and the Marine Parks Authority co-signed a Memorandum of Understanding (MOU) and produced a set of management principles that cover legislative, procedural, and philosophical values related to underwater cultural heritage management. The MOU and management principles expand the number of personnel engaged in underwater cultural heritage management beyond the direct control of the Heritage Office and ensure that this management is conducted in an environment of common understanding and consistency in application. A direct outcome of this new relationship was a joint Heritage Office/Marine Parks Authority maritime archaeological survey conducted in Lord Howe Island Marine Park in February 2002.

Not all Marine Parks officers have training in cultural heritage management. Because these officers, through the MOU, undertake activities independently of the Heritage Office, the Management Principles include guidelines regarding the importance of underwater cultural heritage as unique archaeological deposits and describing the basic principles of context. They point out, for example, standard principles such as:

Any disturbance of archaeological context can be justified only if there is:

- an adequate research design;
- full archaeological recording prior to and during the disturbance or removal;
- appropriate stabilization of the site and any recovered artifacts;
- storage of artifacts in a suitable repository where the collection as a whole can be accessed for purposes of study or public display (Management Principles, 2002:5).

The guidelines recommend that the Marine Parks Authority uses the specialist knowledge and experience of heritage agencies like the Heritage Office or other specialist consultants in maritime archaeology and materials conservation.

While cultural heritage may be relatively unfamiliar territory, the specialty of most workers in marine parks is the natural marine environment. The connection between underwater cultural heritage and the natural environment is therefore highlighted in the Management Principles in terms of the colonization of, and interaction between, shipwrecks and the marine environment.

Where visitation impacts can be kept to a minimum, the Heritage Office strongly believes in encouraging access to underwater cultural heritage sites for non-disturbance purposes. Therefore, while stressing the archaeological potential of underwater cultural heritage, the Management Principles document also indicates the potential for recreational activities, including both diving and non-diving visitation.

Through the MOU Management Principles, the Marine Parks Authority gives particular consideration to the vulnerability of underwater cultural heritage sites to damage from fishing and anchoring activities, particularly in formulating recommendations for marine park zoning plans. Effectively, this means that underwater cultural heritage management is integrated into the core planning framework of marine parks. Research within marine parks, whether

incorporating disturbance or non-disturbance techniques, requires use consent from the Marine Parks Authority. This has powerful additional management implications because, outside of marine parks, only disturbance-based on-site research requires such consent.

Due to the overlap of responsibilities, the Management Principles document provides an important means of designating procedures that apply to excavation permits. Since these permits are issued by the Heritage Office and not by the Marine Parks Authority, there is potential for a conflict of purposes. Therefore both the Heritage Office and the Marine Parks Authority have agreed that excavation permits will not be issued by the Heritage Office without prior consultation with the Marine Parks Authority. This ensures that potential impacts to bio-diversity and ecological processes, as well as to conservation of cultural heritage, and other issues are adequately considered (Management Principles, 2002:7).

Engaging the Marine Parks Authority and its officers greatly facilitates the reporting of incidences such as a new discovery of an historic shipwreck or damage to an historic shipwreck. Marine park staff are well placed to hear of such occurrences and to ensure that the information is communicated promptly to the Heritage Office, and to assist in compliance with the 30-day notification requirement of the Historic Shipwrecks Act (HSA, 1976:s9).

The Management Principles address compliance and enforcement issues and formalize an agreement that designated marine parks officers will undertake enforcement procedures relating to cultural heritage in marine parks as part of their park management duties. The pre-existing experience and training of marine park officers in enforcement has considerable benefits when expanded to the role of Wreck Inspector under the Historic Shipwrecks Act. The agreement by Marine Parks Authority significantly expands the use of such Inspectors in New South Wales. The role of Wreck Inspectors in New South Wales is primarily to facilitate information exchange and education of the diving and fishing public. Training provided by the Heritage Office emphasizes this role.

The principle of involving other players is extended even within the Marine Park context. In the event that a Wreck Inspector becomes aware of a breach of the Historic Shipwrecks Act, the Inspector is strongly encouraged to make arrangements for trained police officers, rather than the Marine Park Wreck Inspector, to apprehend the party or parties involved. This still allows the Marine Park staff to act as witnesses in the event the matter goes to court, but limits the involvement of marine park staff time in preparing the paperwork consequential to boarding vessels, seizing property or artifacts, or making an arrest consistent with the powers of Wreck Inspector.

The intention of the MOU is to create an atmosphere of cooperation in achieving stated objectives. The identified objectives are:

- permits issued by the Heritage Office in relation to accessing historic shipwrecks for recreation or research will be coordinated with consents from the Marine Parks Authority for the carrying out of organized research activity relating to historic shipwrecks;

- coordination between the agencies in relation to "Protected Zones" under the Historic Shipwrecks Act 1976;
- incorporation of cultural heritage considerations in Marine Park Zoning and Operational Plans;
- coordination of commercial wreck diving;
- improved liaison and reporting procedures;
- coordination in relation to development proposals within marine parks;
- appointment and utilization of selected "Wreck Inspectors" under the Historic Shipwrecks Act from staff used by the Authority as provided by s.31 of the Marine Parks Act;
- coordination of the development and maintenance of a Marine Parks Authority s.170 Register of cultural heritage in marine parks in accordance with the New South Wales Heritage Act 1976 (MOU, 2002:1-2).

The effectiveness of the formal agreement with the Marine Parks Authority can be best illustrated through a joint Heritage Office and Marine Parks Authority survey of underwater cultural heritage in the Lord Howe Island Marine Park in February 2002. The remoteness of this location previously made such a survey prohibitively expensive. By combining the resources of the Marine Park Authority and the Heritage Office, however, the survey was able to be undertaken very cost effectively. In-kind support from the Western Australian Maritime Museum (magnetometer) and financial support through another partner, PADI's Project Aware, also assisted in making this survey feasible.

Appointing Wreck Inspectors and conducting the Lord Howe Island Maritime Archaeological survey could, of course, theoretically have proceeded without the MOU. However, the formal process of clarifying roles and mutual objectives made the decision by the Marine Parks Authority easier and ensured a framework of mutual understanding and joint endeavour. The process of setting out clearly the legislative environment and management responsibilities resulted in a mutually agreed document that helps to provide an effective framework for successful, ongoing management and cooperation.

Examples of Outcomes of the Heritage Office Approach

Publications

The Heritage Office's encouragement of and support for independent researchers is reflected in the publication of a number of independent books about underwater cultural heritage. In some instances this support was made possible through direct grants or interest-free loans through the Heritage Incentives Program. Other books were supported through assistance in editing drafts, providing Forewords, or simply listing the publications on the Maritime Heritage Online web site's Research Centre. Authors of eleven significant publications supported to date include:

- Gleeson, Max
  1993, *The Vanished Fleet of the Sydney Coast*, Topan Printing, Sydney

1996, *Shipwrecks Storms and Seamen*, Topan Printing, Sydney
2004, *Destination Never Reached*, (self published), Sydney
- Berry, Grieg,1994, *Shipwrecks of the Central Coast, Vol 1: 1800-1899*, Tacoma
- Mawer, G. Allen
1994, *Fast Company: the lively times and untimely end of the clipper ship Walter Hood*, Fast Books, Glebe
1997, *Most Perfectly Safe - about convict ships wrecked in Australia*, Allen & Unwin Pty Ltd, Sydney
- Riley, John and Fields, Peter, 1995, *Myola: Sydney's Last Shipwrec*k, John Riley (self published), Sydney
- Dundon, Gwen, 1997, *The Shipbuilders of Brisbane Water, NSW*, (self published), Gosford
- Linton, Rebecca, 1998, *Crowdy Head: Lighthouse of the Manning, its Shipwrecks, Fishing Industry, National Parks and Residents*, Sunbird Publications, Killabakh
- Richards, Mike, 1997, *Pig and Whistle Run: Men and Ships of the NSW South Coast*, (self published), Grafton
- Kenderdine, Sarah, 1994, *Historic Shipping on the Murray River*, Department of Planning, Sydney
- Sim, Norma, 2005, *The Sixty Miler*, (self published), Sydney

Wreck Spotters

The Heritage Office's belief in engaging community interest in the preservation of the State's underwater heritage sites is reflected in the Wreck Spotters project. This project was established in 2000 to create formal links with local shipwreck enthusiasts who had demonstrated a commitment to identifying and preserving New South Wales shipwreck heritage. The Wreck Spotters are spread along the length of the coast and provide valuable first-hand advice on local discoveries and the condition of visited sites.

Wreck Spotters are volunteers who assist with documenting and preserving underwater cultural heritage. They are people with established local contacts who share an interest in maritime heritage. This network has access to up-to-date reports of new site discoveries, site conditions, and events. Their links to the Heritage Office facilitate improved response times by the Heritage Office and resulted in better site management.

Wreck Spotters usually have contacts with long-time residents with extensive local knowledge of shipwreck sites. They also have direct contact with other researchers, historical societies, local libraries, regional museums, and people with private collections of shipwreck memorabilia (including photographs and oral recollections). They are highly sought by regional media outlets that have a great interest in promoting local identities.

Recreational Diver Projects

In 1991 the discoverers of the collier SS *Duckenfield* (Figures 3.3 and 3.4) off Sydney's northern beaches, Allan and Neil McLennan, having completed formal notification of their find, organized of their own volition a public event to announce the discovery. This involved booking a space to hold 300 people, mainly divers, since the discovery of a large iron shipwreck close to Sydney had enormous public appeal. The government department role was one of support and positive response to their initiative and enterprise. The public event arranged by the McLennans ensured maximum publicity both for the wreck site and for them as the discoverers. This also provided the Department of Planning, the organization responsible at that time for management of the site, with a perfect opportunity to acknowledge their contribution to the documentation of New South Wales maritime history. Importantly, it also provided an opportunity to create awareness of the management regime that was enacted to ensure that the site was not "loved to death" in the first hectic weeks following the announcement. A subsequent award ceremony involving the presentation of plaques to the McLennans by the Minister for Planning ensured maximum media coverage and recognition of their achievement. In effect, however, this was the McLennans' project right from the initial planning of the search for the site.

An extension of this theme of supporting the projects of divers has been the close association of the New South Wales Underwater Cultural Heritage Program

FIGURE 3.3. Boiler on the wreck of SS *Duckenfield* (1875-1889) (Photo by David Nutley).

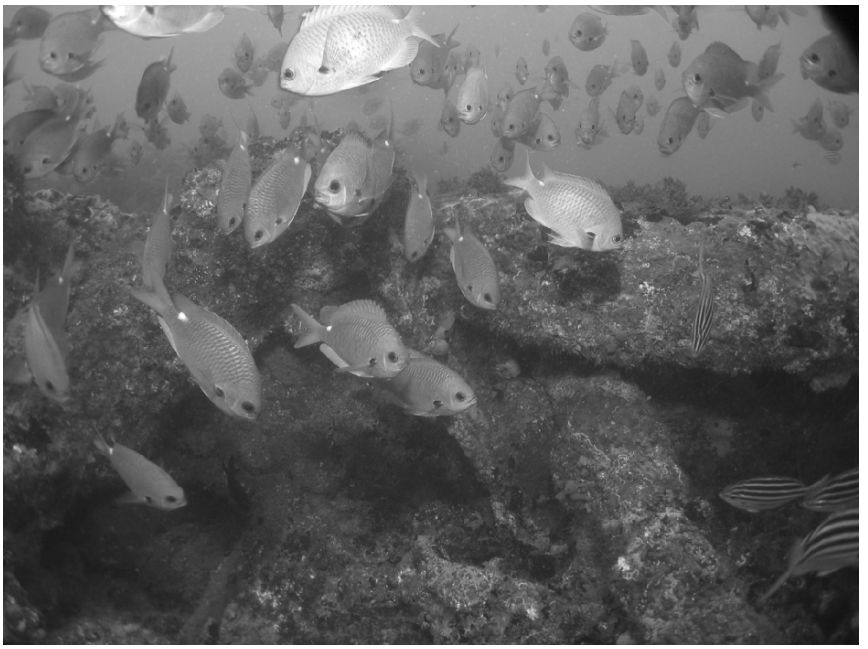

FIGURE 3.4. Fish life colonizing the wreck of SS *Duckenfield* (1875-1889) (Photo by David Nutley).

with technical divers. This association dates back to 1990 when a group of divers undertook a remarkable underwater photographic project of the wreck of *Catterthun* off the New South Wales Central Coast. This deep-water, non-disturbance project, lead by Mark Spencer, was a private project in which the State's Underwater Cultural Heritage Program had no say in the tasks, priorities, timing, or outcome of the documentary work. The work, planned in the finest detail and involving an underwater photographic studio with multiple strobes, demanded the most stringent pre-planning for the staging of each shoot. While not an archaeological survey, the photographic record created and published in an article in *Australian Geographic* was a seminal contribution to deep-water historic shipwreck documentation in Australia.

In recent years, Spencer and other technical divers sought to enshrine best practice principles in technical diving, both to improve safety and to ensure the activities of technical divers are consistent with best practice for natural and cultural heritage preservation. Called "The Sydney Project," the objectives of the group are clearly articulated in their web site which states:

> The Sydney Project aims to extend the boundaries of diving exploration in order to document the unique underwater heritage in Sydney and surrounding areas through the use of safe technical diving practices and leading diving technology. We work alongside Governmental and Scientific Bodies, educating and encouraging divers to develop their

skills and ability. This web site is dedicated to documenting and sharing the discoveries and knowledge with both the diving and wider communities.

Our Charter is the Exploration of new dive sites, Documentation by site recording, Preservation by environmental care and Education by liaising with all interested bodies. By entering our Web Site we hope that you will enjoy sharing part of The Sydney Project as we endeavour to become the forefront of the Discovery of Shipwreck and Submerged Heritage in Sydney and surrounds.

This view is shared by a number of other groups of technical divers and the Heritage Office has been very pleased to be associated with these groups. The Heritage Office's contribution is as a supporter and facilitator. The office provides training in maritime archaeological survey techniques through NAS courses; assists with liaison with other government departments, community groups, and the media; and also promotes the results of discoveries through award plaque presentations to the reporters of the new discoveries. A presentation ceremony on the New South Wales south coast in September 2005 involved presentations by the Chair of the New South Wales Heritage Council to local diver charter operators, the fishing cooperative, and The Sydney Project for their roles in reporting the location of SS *Bega* (1908) in 76 meters (250 feet) of water, and the Liberty Ship *William Dawes* (1942) in 138 meters (452 feet) of water.

At present another recreational diver-led project endorsed by the Heritage Office is a video documentary on coastal colliers undertaken by another remarkable diver, author, and photographer Max Gleeson, whose publications on shipwrecks along the New South Wales coast are noted above. Funding always is a key challenge for independent book or document projects and the Heritage Office assists with identifying possible grant programs.

The potential for Indigenous Australian sites to survive in an inundated environment is an area of investigation gaining momentum in Australia. An example of a significant project initiated from outside the Heritage Office commenced in September 2005. This project was instigated by two consultant archaeologists with combined Aboriginal, historical, and maritime expertise who volunteered their time to coordinate a team of volunteer divers comprising the Underwater Research Group (URG, a recreational dive club) and a government archaeologist on recreational leave (the author). This team undertook a visual inspection of South West Arm estuary of Port Hacking south of Sydney. This is an area where a considerable number of rock shelters are recorded on the surrounding hills. The objective of the survey was to establish whether potential rock shelter formations survived in the drowned valley of the estuary. No site disturbance was involved and there was no attempt to search for artifactual evidence. The discovery, however, of a number of potential shelters including one with a 3 meter (9.8 feet) overhang, 6.6 meters (21.6 feet) in length, and with a drip-line height of 2.7 meters (8.8 feet) to the current level of silt was a significant find (Figure 3.5). This is an important discovery and one likely to provide considerable incentive for formalized, professional, long term investigation of this and similar sites. Such investigations will necessarily involve relevant government and Indigenous authorities. Participation will expand to include expertise from many specializations

FIGURE 3.5. Diver inspecting a potential inundated rock shelter formation at Port Hacking, Sydney Harbor (Photo by David Nutley).

but a key and lasting aspect of the significance of this project will be its origin from outside the official statutory role of government agencies. This is, of course, not a new concept. Such initiatives have many parallels. It is important, however, to recognize the origins of such projects and to ensure that those who are responsible for instigating the projects are not then excluded and disenfranchised from subsequent phases. This is where the concept of shared ownership and multiple partnerships needs to be a conscious component of planning and project management.

Signage Projects

Outdoor signs and marked information trails represent significant maritime heritage events such as a shipwreck tragedy. A number of these have been developed in New South Wales, most undertaken by local government or State government agencies other than the Heritage Office. The approach taken in this State is to recognize the significant advantages in encouraging the people and organizations that have the closest connection with a site, usually the managers of public land adjacent to the shipwreck location, to develop signs and trails. Two key advantages of this approach are that it:

- ensures that the design is consistent with the overall signage plans for the open space. This helps to avoid visual pollution that can arise from having too many signs with incompatible and competing structural forms and design layouts.
- provides a localized ownership of the sign. Those responsible for land management have a local presence to assist in monitoring the condition of the signs and in determining if they need repair or maintenance. A centralized and remote ownership by, for example, the Heritage Office in Sydney is unlikely to be able to maintain an up-to-date awareness of maintenance issues for signs that are up to ten hours drive from Sydney!

Signage projects around New South Wales (Figure 3.6) are supported and acknowledged as a virtual trail on the Maritime Heritage Online web site. This adds value to local initiatives through providing an overall view of interpretation facilities in New South Wales. Regions in which signage projects are featured on the web site are Central Coast, Mid North Coast, South Coast, Hunter Valley, Sydney, Illawarra, and Darling River. These represent sites from the north coast to the south coast and out to the far western reaches of the State.

A recent and exciting development in the inclusion of other players is the interest shown by canoeing groups in New South Wales in recording details of shipwrecks. Canoeists visit many remote parts of the State's waterways and have opportunities for close viewing of abandoned shipwrecks on the banks of rivers,

FIGURE 3.6. Shipwrecks incorporated in Local Council signage at Maroubra, New South Wales (Photo by David Nutley).

streams, and lakes. In the August 2005 edition of *Gone Paddling* magazine, an article titled "Places to Paddle" encourages canoeists to visit the shipwrecks in Homebush Bay near the site of the 2000 Olympic Games. This site, at one time a ship-breaking yard, features the remains of a number of iron hulks dating from the early twentieth century. They include a range of vessel types including colliers, a troop ship (*Ayrfield*, built in 1912, which carried American troops in the Pacific in World War II), the naval cable layer *Karangi* (another vessel that saw action in WWII), and the tug *Heroic* (New South Wales Heritage Office, 2005). The Heritage Office's role is to support the interests of canoeing groups by liaising with other government departments who have management responsibilities in the areas where these sites are located. As with a similar project in South Australia, canoeists see benefits for their members both through introducing areas to investigate and through promoting canoeing (and kayaking) in any publications or other interpretive material that may develop as an outcome of their recording activities (New South Wales Canoeing Inc., 2005).

Conclusion

A conscious choice was made in the development of the Underwater Cultural Heritage Program in New South Wales. The choice was between the office being the central figure or being one of a number of significant players facilitating effective management strategies and projects. This path is consistent with the Heritage Office's broad approach to heritage which is to assist the community to manage its heritage as compared to managing heritage for the community. The emphasis is, therefore, on continually looking for projects to which the Heritage Office can contribute, developing guidelines in response to particular needs and opportunities, suggesting possibilities to address current issues, making connections between researchers, encouraging direct and virtual access to underwater sites, and promoting the academic and recreational value of these sites.

The interpretive plaques along the New South Wales coast are not all under the livery of the Heritage Office. The publications are by a variety of authors, from a variety of backgrounds and for a variety of audiences, often with little or no direct Heritage Office input. In the view of the Heritage Office, these are successful outcomes. It reflects that other players have been identified, engaged, and empowered. It also ensures that the effective management of underwater cultural heritage is not reliant on the finite resources of one agency. Through integration within a general framework of environmental planning, the infrastructure of the recreational diving industry, and the interests of private researchers, the resources of the Heritage Office are used effectively and efficiently. A broad range of active participants have ownership of significant research, decision making, and interpretive projects. It is this objective that continues to drive strategic planning for the underwater cultural heritage of New South Wales.

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4
Florida's Maritime Heritage Trail

Roger C. Smith

Introduction

With the longest coastline in the continental United States, Florida always has been tied to the sea. For thousands of years, Floridians have lived and worked along the coast, leaving a legacy of remains and reminders of the past. Since before European contact, Florida's coasts played a key role in human settlement, transportation, subsistence, and commerce. Historically, settlement began at the coasts and only slowly spread inland with the development of rail and highway transportation. Before the mid-nineteenth century, the principal settlements and the vast majority of human activity were along the coast, dependent upon water transportation for communication, transportation, and commerce. The state's modern fortunes are still linked to coastal resources and their relationship with maritime commerce, defense, lifestyles, and tourism. A significant proportion of Florida's historical sites, many of which are accessible to the public, reflect Florida's maritime orientation. Today, tourism is Florida's largest economic sector, and the importance of eco-tourism and heritage tourism is increasing each year as visitors and residents seek alternatives to theme park vacations. However, until recently, there was little modern recognition of the importance of the coast in Florida's development. There was no focus of tourism marketing to identify the complex of heritage locations that represent this critical aspect of the state's history, and there was no organized effort to develop and distribute heritage tourism information focused on the maritime perspective.

In 1998, the Florida Bureau of Archaeological Research proposed to develop a conceptual Maritime Heritage Trail in Florida that would provide tourism and historical information about the broad range of resources already available to the public, and to establish the trail by producing and distributing two separate products. The first would be a series of pamphlets/posters designed to be displayed as a poster on one side and read as a brochure on the other side. Each piece would present maritime heritage information and locations centered on a single coastal theme. The poster side would develop the historical and cultural aspects of the theme, while the brochure side would present a brief description and access

information for several key locations on the Trail connected with that theme. The second product would be a web site incorporating the same information, but offering additional opportunities for learning more about a region, or a historical topic, or a location, as available through existing internet links. The Trail would consist of information rather than a marked route, and would basically comprise a collection of interesting and enjoyable locations that are open to the public. Visitors would be able to access any sites on the Trail in any order.

To develop the Maritime Heritage Trail, the Bureau wrote a grant proposal to the Coastal Management Program of the Florida Department of Community Affairs, which administered funds awarded by the National Oceanic and Atmospheric Administration (NOAA) to the State of Florida. In 1999, the proposal was accepted and the Bureau was provided a sub-grant of US$75,000 as part of NOAA Award No. NA97OZ0158. A portion of this funding was utilized to hire a researcher/writer/editor and an internet web designer. Another portion was used to hire graphic designers for the Trail brochures and posters. The remainder was set aside for the printing of 30,000 brochure/posters. The project was completed in the fall of 2000, when the printed materials and web pages were made available to the public.

The Florida Maritime Heritage Trail

Florida's Maritime Heritage Trail is made up of six themes: Coastal Environments, Coastal Communities, Coastal Forts, Lighthouses, Historic Ports, and Historic Shipwrecks. Each theme includes a number of places to visit or learn about, and each place features pictures, a historical narrative, a map, and information about how to visit including directions, admission fees, and times of operation. The themes explain how natural and cultural elements developed historically and how they fit together in a region.

The Trail is presented in a series of six poster/brochures that describe the history and maritime importance of representative sites. The posters were designed as a set, like a series of postage stamps, and were intended for display in school classrooms, libraries, and other educational venues. On the reverse sides, each theme is discussed in relationship to several representative examples of sites along the Trail, with a map showing their locations. When folded, the posters become brochures intended for more portable distribution at historic sites and museum gift shops. In addition, the Maritime Heritage Trail is available on the World Wide Web as a large web site featuring many more examples of places, resources, and links to other web sites: (http://dhr.dos.state.fl.us/archaeology/underwater/maritime/). The following is a description of the six themes explored on the Trail, with examples of sites and locations featured on each theme.

Coastal Environments (Figure 4.1)

Florida is bounded by the Atlantic Ocean and the Gulf of Mexico, and the zone where land and water meet has been the most important human ecosystem for thou-

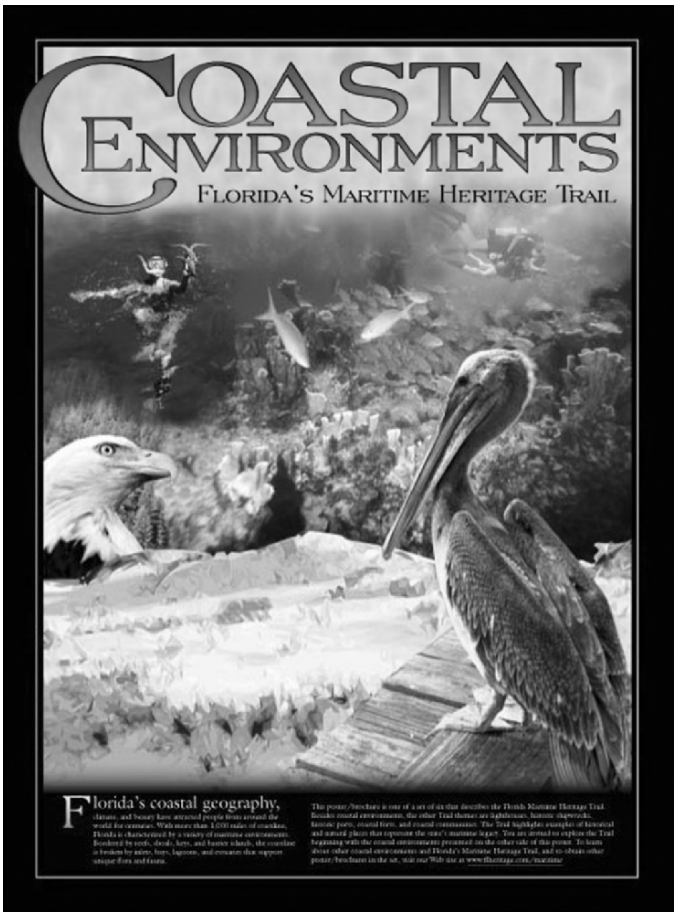

FIGURE 4.1. Coastal Environments poster (Image courtesy of Florida Division of Historical Resources).

sands of years. The peninsula is characterized by a variety of marine environments. Bordered by reefs, shoals, keys, and barrier islands, the coast is broken by inlets, bays, lagoons, and estuaries that support unique flora and fauna. The elements of the Maritime Heritage Trail are spread out along this coast in distinctive patterns. By exploring Coastal Environments, it is possible to see how these parts fit together, historically and in modern times.

Florida's coastal geography has always allowed people access to the reefs, shoals, beaches, bays, lagoons, tidal creeks, marshes, and rivers, and the vast array of resources they contain. Here were opportunities for transportation, commerce, security, shelter, recreation, and settlement. Before the modern highway system, people relied on watercraft, from dugout canoes to steamships, to move themselves and their goods, to develop the resources of the interior, and to trade with a wider world.

Pensacola is a good example of this coastal pattern. As the largest deep-water harbor in Florida, this bay was well known to Spanish pilots in the early sixteenth century. Tristán de Luna's 1559 attempt to establish Florida's first permanent colony failed when a hurricane destroyed more than half of the fleet's eleven vessels. When Great Britain obtained control of Florida in 1763, Pensacola served as capitol of British West Florida. A nineteenth-century lumber boom, and a twentieth-century red snapper fishery caused Pensacola to prosper economically and culturally. Fed by the Escambia, Blackwater, and Yellow Rivers, the bay is protected on the Gulf side by the barrier islands of the Gulf Islands National Seashore. The deep, wide inlet was protected by several forts, beginning in 1698, and still is marked today by a tall lighthouse. The bay continues to be militarily important, now more for aircraft than for warships.

Similarly, Jacksonville, situated at the mouth of the St. Johns, Florida's largest river, shares the patterns of coastal environments. The sea and river have dominated the region's subsistence and commerce, supporting abundant and rich food sources for Native American people beginning some 7,000 years ago. Beginning in 1562, French, Spanish, and then English settlers recognized the strategic cultural geography of the area, building forts to guard a growing number of plantations, towns, mills, and farms that opened up the interior of the Florida peninsula. By the mid-nineteenth century, Florida had become a refuge for tourists, invalids, and settlers, and steamboat service connected inland settlements to Jacksonville and eventually the world. Today, Jacksonville is Florida's second largest port and third largest city.

When Hernando de Soto landed at the southern end of Tampa Bay in 1539, this rich environment had been home to Native groups for more than 10,000 years. Taking advantage of the bay's estuarine resources, Amerindians constructed great mounds of shell and earth surrounded by a town plaza. However, European exploitation shifted to the peninsula's east coast, and the west coast received little attention until 1823 when the federal government constructed Fort Brooke, which was supplied by sea since travel in the interior flatwoods and wetlands was difficult at best. Entrance to Tampa Bay is through a natural channel north of Egmont Key. The location is marked by Egmont Key Lighthouse and protected by Forts Dade and De Soto, constructed during the Spanish-American War. The harbor is deep and well protected, and as a result, the Port of Tampa SHIPS three times as much cargo as Florida's next largest ports. Through the twentieth century Tampa and adjacent waterfront communities experienced some of the fastest population growth in the state, and residents continue to depend on and enjoy the natural features of the Gulf, the barrier island beaches and lagoons, the bay, its tributaries, and the surrounding uplands.

The Florida Keys are like no other environment in the United States. This string of limestone islands stretches from the eastern tip of the peninsula into the Gulf of Mexico more than 160 kilometers (100 miles) to Key West and another 112 kilometers (70 miles) west to the Marquesas and Dry Tortugas. Beyond the Keys toward the mainland is the shallow Florida Bay which receives fresh water discharge from the Everglades, and beyond the Keys toward the Caribbean is the

outer fringing reef of a vast coral ecosystem. For several thousand years, native people of South Florida occupied the Keys, and historic records recount sea travel in large dugout canoes to Cuba and other Caribbean islands. By the time of Ponce de León's so-called "discovery" of the Keys in 1521, the islands probably were well known to sailors. The inlets of the Keys are not entrances from the sea to the land, but rather channels that connect the sea to protected harbors, or that allow passage through the shallow waters between the Atlantic and the Gulf of Mexico. The hazardous reefs were a trap for unlucky vessels, especially in hurricane season, and a series of lights marks the length of the Keys. Upon statehood in 1845, coastal fortifications were begun in Key West and through the nineteenth century the region played a critical role in national defense.

Coastal Communities (Figure 4.2)

Waterfront real estate has always determined where people live and work in Florida. Maritime communities depend on occupations such as fishing, boat building, recreation, transportation, and trade. These places reflect Florida's coastal orientation, defining the lives of millions of people for thousands of years. The peninsula's geographic location as a maritime crossroads between North and South America, the Gulf of Mexico, and the Caribbean Sea made it attractive to a succession of immigrant groups both in the past and in the present. Despite occasional warfare and disastrous storms, Florida's coastal communities have thrived. Typical economic activities began with simple harvesting of seafood. Soon cooperative processing and transportation provided opportunities for commerce, which led to new industries and new jobs. Over time, a complex cultural and economic web of human coastal pursuits developed with various customs, traditions, and rituals.

Today, Florida's coastal communities are at the crossroads of the global marketplace. For simplicity, this theme is featured in a chronological fashion over four periods of human activities: Native Florida, European Expansion and Colonial Settlement, Nineteenth Century, and Twentieth Century. These chronologies also are available on the Trail's web pages, as well as a map with examples of the locations of several prominent Coastal Communities.

Coastal Forts (Figure 4.3)

Maritime nations have long relied on the permanent placement of guns to ward off attacks from the sea. This strategy protected harbors, inlets, rivers, inland territory, and harbor traffic, and supported naval defense power. To mount these weapons and to house and protect the troops needed to operate and maintain them, coastal forts were built. The location of a fort and the height and thickness of its walls had to repel whatever artillery could be fired from SHIPS. The development of aerial bombing in World War I made most coastal forts obsolete.

The first coastal forts in colonial Florida were made of earth or wood and were positioned to warn off competing claimants to Florida. These forts were effective

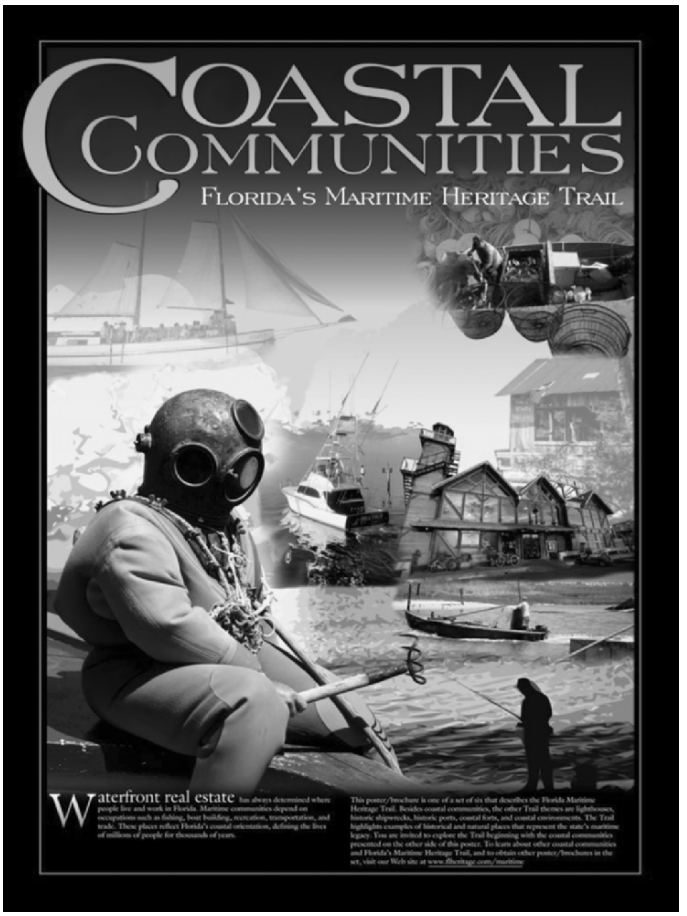

FIGURE 4.2. Coastal Communities poster (Image courtesy of Florida Division of Historical Resources).

against Native Americans, but generally were inadequate against attacks by other Europeans. Later forts were built of masonry, brick, and reinforced concrete and were designed to defend settlements, ports, or naval installations. Some of Florida's coastal forts have disappeared, while others are preserved as they originally were built. Many existing forts now are within national parks, state parks, or wildlife refuges and have undergone refurbishing and interpretation to provide us with a glimpse of our maritime past. The Trail's poster/brochure highlights twelve of Florida's coastal forts.

The Trail's web pages offer a more extensive treatment of the theme. Visitors can choose to learn about 23 coastal forts. For example, Castillo San Marcos, a Spanish coastal fort completed in 1696, has a web page of its own. There are links to maps, virtual tours, photographs, and other information about the Castillo, which is a National Monument, managed by the U.S. Park Service.

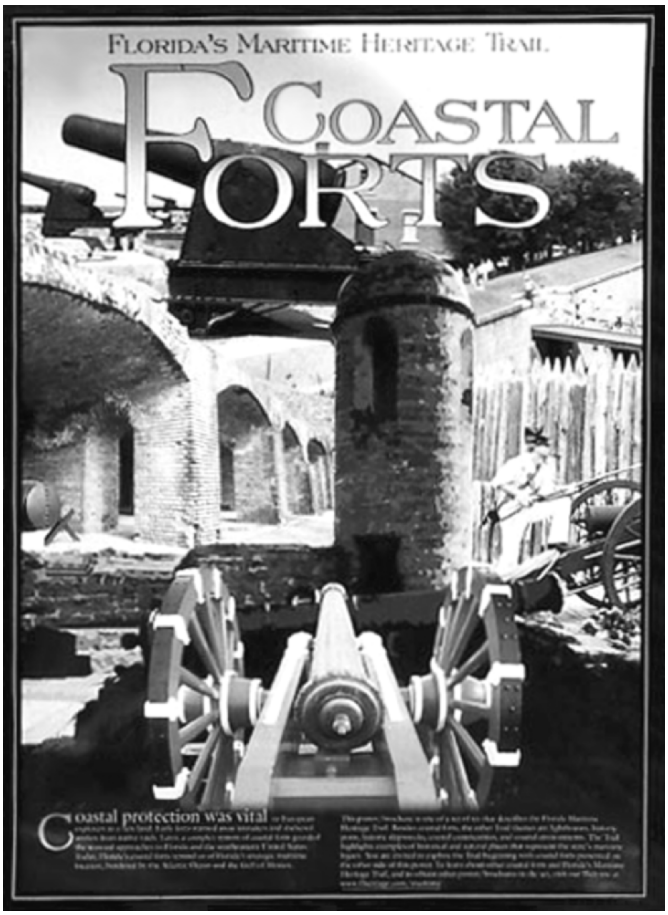

FIGURE 4.3. Coastal Forts poster (Image courtesy of Florida Division of Historical Resources).

Lighthouses (Figure 4.4)

Florida's first coastal navigational aid was a 1586 Spanish watchtower at St. Augustine. The first true lighthouse was a 22-meter (73-feet) tall harbor light built there in 1824. But offshore masonry towers proved vulnerable to storms - the lighthouse built in 1827 on Sand Key, near Key West, collapsed in an 1846 hurricane, killing 14 people seeking refuge there. A new screw-pile design provided stronger anchoring in sandy seabeds and its open iron framework offered less resistance to storm force winds and waves. Between 1852 and 1900, more than a dozen pile lighthouses were built along Florida's dangerous reefs and they remain in use today. Each one of the state's 30 lighthouses has a distinctive daytime color and a unique nocturnal light sequence to aid in navigating more than 1,609 kilometers (1,000 miles) of coastline. The public's desire to preserve these coastal

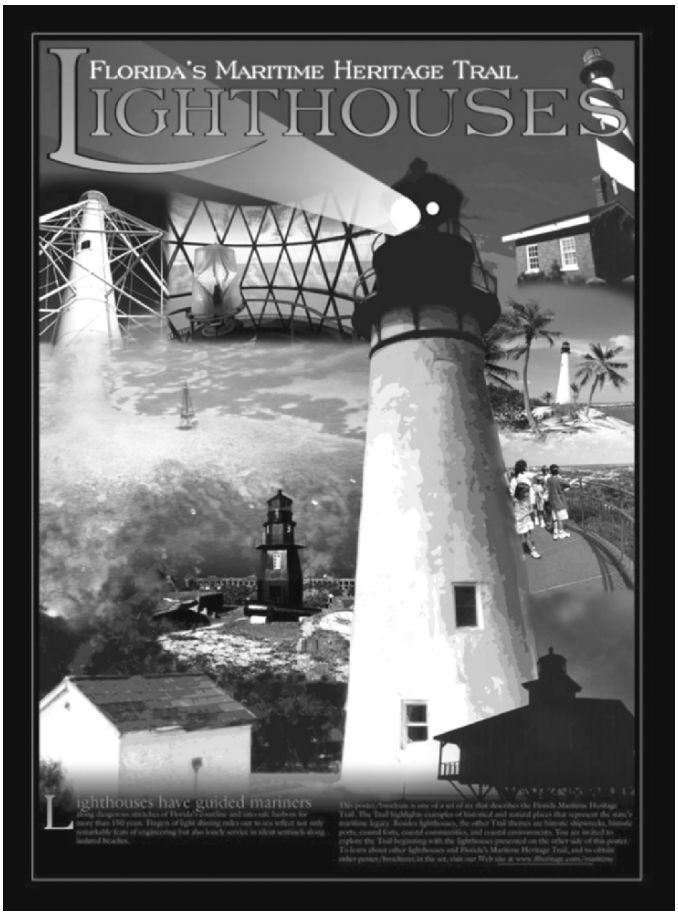

FIGURE 4.4. Lighthouses poster (Image courtesy of Florida Division of Historical Resources).

guardians has resulted in most of Florida's lighthouses being placed on the National Register of Historic Places. Many are now parts of parks, wildlife refuges, or recreational areas. The Trail poster features 15 of Florida's lighthouses. The Lighthouses web page contains all of the 30 lighthouses, as well as a Light Ship and a House of Refuge.

One of the more interesting lighthouses is located on Cape Florida, at the head of the Florida Keys. Built in 1825, the lighthouse guided shipping though the Straits of Florida near Key Biscayne. In 1836 a dramatic fight between Seminole Indians and the lighthouse keeper led to an interior explosion heard 19 kilometers (12 miles) away. The light was damaged during the Civil War by confederate sympathizers, but it was re-lighted in 1867. Located in a state park, the lighthouse is open for guided tours and can be seen at night for a distance of 11 kilometers

(7 miles). The site's web page contains a number of links, maps, photographs, and other materials available to visitors.

Historic Ports (Figure 4.5)

Florida has some of the best natural harbors in the United States. Consequently, the peninsula has become a maritime crossroads connected to four continents: North America via the Gulf of Mexico, South (and Central) America via the Caribbean Sea, and Europe and Africa via the Atlantic. Before railroads and highways, Florida's sheltered harbors defined the occupational and economic patterns of native peoples, European colonists, and territorial settlers. As strategic and commercial ports evolved, coastal communities developed around specific

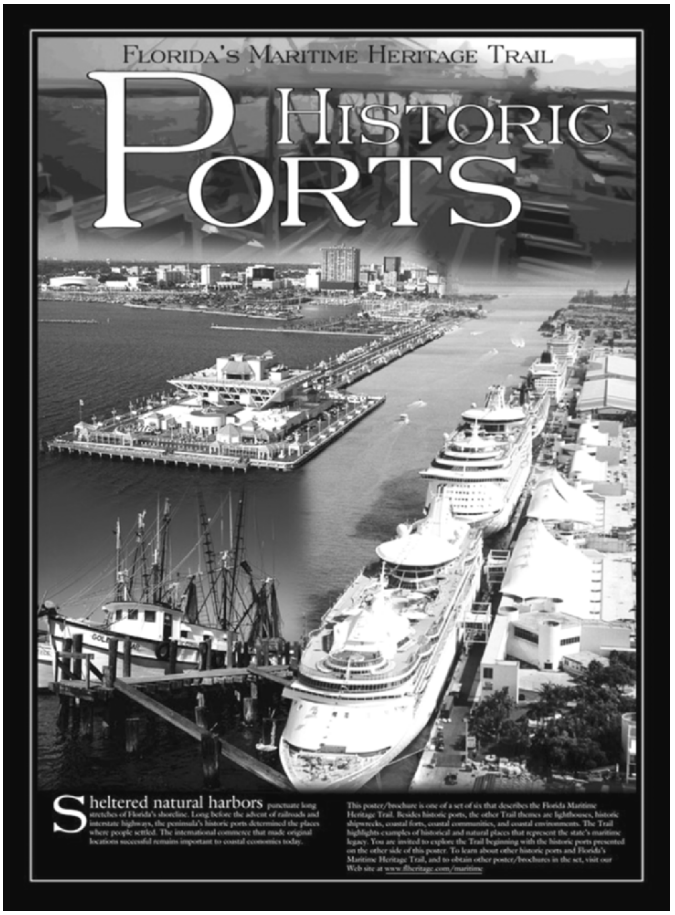

Figure 4.5. Historic Ports poster (Image courtesy of Florida Division of Historical Resources).

activities such as fishing, and around products such as lumber. Some were defined by a single export such as phosphate, or by a special function such as naval support. Today, Florida's ports play a leading role in international trade and tourism that continues to grow in economic importance.

The Gulf Stream, seasonal trade winds, and numerous natural harbors encouraged a European discovery of Florida thousands of years after Native Floridians had mastered its inland and coastal waterways. Florida was situated perfectly for European maritime commerce. Historically, three ports in particular helped to mold Florida's maritime character: Pensacola to the west, St. Marks along the northern Gulf, and Key West off the southwestern point of the peninsula. Today, Florida's ports hold the international lead in cruise ship tourism, adding another vigorous economy to the commerce and defense that helped to create these dynamic places. The Trail's web page features twenty historic ports throughout Florida.

One of these ports was Indian Key. Situated a third of the way down the Florida Keys, the island became a convenient location for SHIPS loading fresh water and for salvage operations that took advantage of the numerous shipwrecks along the treacherous Florida Reef. The island also was a haven for pirates. The nearby Gulf Stream made Indian Key a natural trading port between Florida, Europe, South America, and the Caribbean Islands. The harbor served a booming resort trade in the early nineteenth century, but in 1840 raiding Natives killed the inhabitants and burned the town and port facilities. The Key never recovered as a vibrant community, although in the late nineteenth century it served briefly as a naval station and shipyard. In 1973 the State of Florida bought the island and today Indian Key looks much the same as it did before European contact.

Historic Shipwrecks (Figure 4.6)

Favorable winds and currents and profitable trade routes have brought hundreds of thousands of SHIPS to Florida's shores. War, piracy, hurricanes, and treacherous shoals have contributed to the loss of several thousand vessels in Florida waters. The coastline of Florida can be a welcome sight for deepwater mariners. It also can be a trap for unlucky SHIPS. The remains of SHIPS and the cargos they contain all have a story to tell. The real treasure of Florida's shipwrecks is in the opportunity they provide for us to explore the past and to preserve it for the future. These are the ghosts of more than 500 years of maritime endeavor, human drama, great expectations, and lost dreams. Many of Florida's older shipwrecks have over the years become artificial reefs that offer visitors an opportunity to see how nature has adopted these sunken relics. Others have been sunk intentionally in recent years as fishing and diving attractions. Historic Florida shipwrecks turn up on a regular basis, often due to storms scouring the coastline and to the development of technology to dive deeper.

The Maritime Heritage Trail takes advantage of an existing group of historic shipwrecks that have been designated as State Underwater Archaeological Preserves around the coast of Florida, and of those on a Shipwreck Trail devised

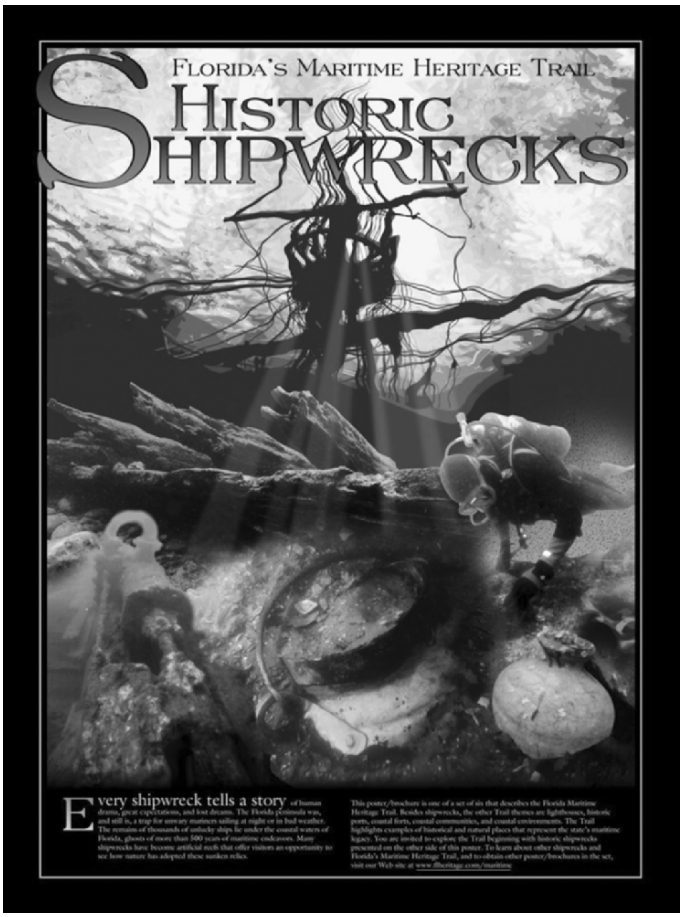

FIGURE 4.6. Historic Shipwrecks poster (Image courtesy of Florida Division of Historical Resources).

by the Florida Keys National Marine Sanctuary. All of the historic shipwrecks on the Trail are easily accessible to the public, and are interpreted in a number of ways.

One of the Archaeological Preserves is the English-built steamship *Copenhagen*, which began her last voyage at Philadelphia, Pennsylvania, in May of 1900 with her cargo holds filled with coal for Havana, Cuba, a major coaling depot after the Spanish-American War. Heading south close to the Florida coast to avoid the strong northerly Gulf Stream current, *Copenhagen* suddenly crashed at full speed in broad daylight into a reef offshore of present-day Pompano Beach. Her captain was found to be at fault for improper navigation. Today, you can visit the remains of *Copenhagen* in 4.5 to 10 meters (15 to 35 feet) of water. In 1994, *Copenhagen* became Florida's fifth Underwater Archaeological Preserve.

As with all of Florida's Underwater Preserves, the historic wreck is interpreted with a brochure that explains its history, how to locate the site, and what sealife may be encountered. In addition, a plastic laminated underwater guide was created for visitors to take a self-guided tour of the Preserve. It also describes the amazing variety of marine life that thrives on the wreckage.

Florida's Underwater Archaeological Preserve program started in 1987, and has grown over the years to include a sunken steamboat in the Suwannee River, a Spanish galleon that sank in 1715, one of the earliest American battleships, and a Kaiser-era German racing yacht. Each was nominated to become a Preserve by local waterfront communities, who worked together with state and county officials to establish and maintain the site as an attraction for heritage, recreational, and ecological tourism.

Today, there are eleven Underwater Archaeological Preserves around the coastline of Florida. Each has a unique story to tell. Most had many fascinating chapters to their lives, and all have been resurrected for a final mission that involves public participation in the preservation of Florida's Maritime Heritage.

Florida's Maritime Heritage Trail is a product of the Florida Department of State, Division of Historical Resources, Bureau of Archaeological Research. The project was made possible by support from The National Oceanic and Atmospheric Administration, administered by Florida Coastal Management Program of the Florida Department Community Affairs.

5
A Maritime Heritage Trail and Shipwreck Preserves for the Cayman Islands

Margaret E. Leshikar-Denton and Della A. Scott-Ireton

Introduction

Maritime heritage trails, underwater archaeological preserves, and shipwreck parks are proven methods for promoting public access to maritime cultural sites, both on land and under water (Spirek and Scott-Ireton, 2003). Inclusive educational and interpretive strategies employed in public access programs help to preserve sites by inspiring the public. People become guardians of the past as they learn about sites and their importance for research and recreation. Interpreted maritime cultural resources become heritage attractions for their communities, providing economic benefits through tourism and site visitation.

Many maritime cultural sites, both on land and under water, are appropriate for public access and interpretation. Land-based maritime sites, such as lighthouses, wharves, and careenages interpreted thematically, provide opportunities for visitors to learn about a community's seafaring heritage. Diving and snorkelling visitors can experience submerged resources such as shipwrecks, inundated sites, and structures built in water that are presented as both historically significant cultural resources and as environmentally important ecological resources. While certain maritime sites are too fragile and archaeologically sensitive to support public visitation, there are other more robust sites that have become stable in their environment. Effectively interpreted and actively managed, these sites can sustain large numbers of visitors.

The Cayman Islands' Rich Maritime Heritage

Reasons for a Maritime Heritage Trail and Shipwreck Preserves

The Cayman Islands are ideally suited to support maritime heritage attractions. The Caribbean nation's long seafaring history resulted in physical remains of maritime activity, many of which are easily accessible and visually interesting.

A maritime heritage trail provides a way to promote Island heritage and history while adding to existing tourism opportunities. Shipwreck parks complement and enhance existing dive tourism, as well as help to relieve pressure on fragile coral reef ecosystems that currently are heavily visited in one of the top diving and watersports destinations in the world. If Cayman's endeavors prove successful, they can serve as models for other countries with tourism-driven economies, particularly in the Caribbean, that are struggling with preservation and management of their cultural heritage.

Over 500 Years of Maritime Heritage

The history of the Cayman Islands is founded upon the seas (Craton, 2003; Leshikar, 1993; Smith, 2000). In the absence of evidence of prehistoric occupation, it seems that an untouched natural environment existed at the time Europeans first arrived in the 1500s. During Columbus's fourth voyage, on 10 May 1503, his son Ferdinand recorded the sighting of Cayman Brac and Little Cayman. Although the explorers did not anchor or disembark, they noted the abundance of sea turtles in the waters surrounding them and called the islands Las Tortugas. The isolated landforms in the western Caribbean Sea became well known landmarks, navigational hazards, and turtle provisioning grounds for Spanish, Dutch, English, and French seafarers. Soon after people set foot upon these shores, the islands were renamed Las Caymanas after the abundant crocodiles, or caymans, found living there. In April 1586, Sir Francis Drake came ashore in Grand Cayman and described unfamiliar plants and animals. The crew took a hundred turtles for food, but sailed away after two days having found no fresh water sources.

Cromwell's army seized Jamaica from the Spanish in 1655, and soon English turtle fishers set up a semi-permanent turtle fishing village on the nearby island of Little Cayman. By the 1670 Treaty of Madrid, Spain officially recognized England's rights to these Caribbean holdings. Pirates and privateers frequented Jamaica and the Cayman Islands at the close of the 1600s through the early 1700s. An incident involving Spanish privateer Manuel Rivero Pardal, who raided the turtling camp in Little Cayman in 1669 and burned turtling vessels at anchor there in retaliation for Henry Morgan's sacking of Porto Bello, resulted in total destruction and abandonment of the Little Cayman fishing camp. In 1730, Englishman Neal Walker arrived on the scene to salvage the wreck of the Spanish ship *San Miguel*, lost on Little Cayman with a cargo of brandy and fruit; in the same year he salvaged the infamous Spanish treasure ship *Genovesa*, lost upon Jamaica's Pedro Banks.

British and French warships patrolled the Caribbean Sea in the 1700s, as these two powerful European countries vied for control of Caribbean islands. The first British Admiralty Chart of Grand Cayman was drawn by Surveyor George Gauld in 1773. The most famous shipwreck in Cayman Islands history occurred when HMS *Convert*, formerly the captured French *l'Inconstante*, and nine vessels of her convoy wrecked on the East End reefs of Grand Cayman in 1794. Fort George

and Prospect Fort were built in the late 1700s, the former at George Town being rebuilt after it was destroyed in the1780s by Spaniards from Cuba. Caymanian settlers were building their own SHIPS and boats by this time, a tradition that continued for the next two hundred years.

By the time Edward Corbet recorded the first official census in 1802, the population of Grand Cayman was 933 people, about half of whom were enslaved. Local industries, including turtle fishing, shipbuilding, and merchant trade, thrived. When news of emancipation arrived via ship from Jamaica in 1835, newly freed citizens undertook maritime activities and began the process of building their own lives. In the nineteenth century, passing SHIPS continued to wreck along Cayman's treacherous reefs, while Caymanian schooners were lost in 1838, 1846, and 1876 due to tropical hurricanes (National Shipwreck Inventory).

The Islands were recognized as a hazard to international shipping, resulting in construction of a series of lighthouses in the early 1900s. Among shipping losses was the Norwegian-owned barque *Glamis* wrecked in 1913. Local shipping losses were generally associated with hurricanes, especially in 1903, 1910, and 1932. In the twentieth century, shipbuilders employed their traditional construction methods not only upon watercraft, but also upon civic building projects, resulting in unique Caymanian vernacular architecture. During World War II the Cayman Islands were touched by international affairs, while Caymanian seamen travelled the world's oceans on bulk carriers in the merchant marine. Turtling and shipbuilding thrived in the first half of the twentieth century, although traditional maritime industries became replaced in modern times by tourism-associated maritime activities, including fishing, boating, watersports, and cruise-ship arrivals.

Underwater Archaeology in the Cayman Islands

The first professional underwater archaeology in the Cayman Islands was undertaken by the Institute of Nautical Archaeology (INA), under the direction of Roger Smith in 1979-1980, when 77 sites were recorded (Leshikar-Denton, 1997, 2002; Smith, 1981, 2000). The National Museum, established by law in 1979 and opened to the public in 1990, developed an interest in archaeology. Surveys for indications of prehistoric occupation were undertaken in the early 1990s by University College London and the Florida Museum of Natural History, although no evidence was found. In the 1990s Margaret Leshikar-Denton investigated the "Wreck of the Ten Sail," the loss of the frigate HMS *Convert* and nine SHIPS and brigs of her 58-ship merchant convoy (Leshikar, 1993; Leshikar-Denton, 1994), with results featured in a Texas A&M University dissertation, a National Museum exhibition, a National Archive publication, a Postal Service special stamp issue, and a Currency Board commemorative coin. As archaeologist for the National Museum and assisted by other government departments, especially the Department of Environment (DoE) and volunteers, she continued to build the Islands' shipwreck inventory to over one hundred and forty recorded sites, although more certainly will be discovered. In 2002, the Maritime Heritage Trail Partnership was established

between the Museum, the Cayman Islands National Archive, the National Trust for the Cayman Islands, and DoE, which resulted in the 2003 launch of the Cayman Islands Maritime Heritage Trail, and in plans to create Shipwreck Preserves in the future. Additionally, the Partners have a keen interest in developing heritage legislation for the islands.

Legal Protection for Shipwrecks

Shipwrecks located in Cayman Islands waters for more than fifty years are claimed under the *Abandoned Wreck Law* (5 of 1966, 1997 Revision), with ownership of artifacts "vested in Her Majesty in right of Her Government of the Islands." This law is deficient, however, in that: 1) it does not recognize shipwrecks as cultural property; and 2) it was enacted to ensure that the government receives a percentage of the value of articles recovered from shipwrecks and, once the government enters into an agreement with a prospector, it is obliged to return to the prospector at least one half of the value of the wreck. Today, the government of the Cayman Islands consistently denies applications from treasure hunters and has determined that the *Abandoned Wreck Law* is inadequate to protect and manage Cayman's underwater cultural heritage. Work is underway to achieve new legislation, taking into account recent international initiatives such as the ICOMOS International Charter on the Protection and Management of Underwater Cultural Heritage (1996) and the UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001).

Keys to Success

Three keys to success became apparent during development of the Cayman Islands Maritime Heritage Trail: building relationships with experts, government agencies and authorities, non-governmental organizations, and the public; using long-established, thriving trail and preserve models; and recognizing that flexibility in all areas is essential.

Building Relationships With

Experts

The maritime heritage trail project benefited from a close working relationship among people with experience and expertise in a variety of fields including history, archaeology, public education, and outreach and interpretive methods. The authors, with experience in Caymanian maritime history and nautical archaeology and in developing submerged and maritime sites for public access and education, combined their skills to create a proposal for the new trail. They approached the Museum, which in turn approached archivists and environmental and historic preservation and interpretation experts in governmental

agencies and other organizations, eventually developing a partnership alliance that ensured the historical accuracy and educational integrity of the trail.

Government Agencies and Authorities, and Non-governmental Organizations

The Cayman Islands Maritime Heritage Trail Partners include the Cayman Islands National Museum, the Cayman Islands National Archive, the Department of Environment, and the National Trust for the Cayman Islands. In 2002–2003, these organizations provided the funding, support, and personnel to establish the land-based Maritime Heritage Trail. The Partners have different but complimentary areas of jurisdiction that contributed to a holistic approach for the development and management of the Heritage Trail. The National Museum is the repository of archaeological and historical artifacts of island history and currently maintains the National Shipwreck Inventory. The National Archive holds collections of historical documents and photographs and maintains a database of island oral histories. The Department of Environment manages offshore reef ecosystems in which shipwrecks are embedded, supplies technical support for fieldwork, and provides law enforcement capabilities. The National Trust is responsible for historic preservation initiatives including terrestrial and maritime environmental and cultural sites, and has developed several interpreted walking trails featuring historic buildings.

The Public

The Partners worked together to select and research sites for inclusion on the Trail, considering historical significance, visual impact, visitor safety, and resource preservation. They also considered what form the Trail should take, and the types of interpretive materials that should be developed and how those would be distributed. Once the Partners agreed on a proposed format for the Maritime Heritage Trail, they hosted public "focus group" meetings on all three islands. The focus group meetings were open to the public and those interested in the project were encouraged to attend and offer their thoughts and suggestions. Invitations were sent to government officials and departments such as the various Ministries, the Lands and Survey Department, and the Planning Department, and to community organizations thought to have specific interest, including the Cayman Catboat Club, Maritime Heritage Foundation, and the Seafarer's Association. The intention of the meetings was to publicize the project, to promote a feeling of public ownership of the Trail, to encourage community involvement, and, finally, to ask advice about the proposed sites. The meetings were successful in achieving these objectives.

Use Established, Successful Models: Florida, Australia, United States National Marine Sanctuaries

In developing the Trail, the Maritime Heritage Partners drew on the experience of existing maritime heritage trail programs, including the integrated land and sea trails of Australia, the Florida Keys National Marine Sanctuary's Shipwreck Trail,

and, especially, the Florida Maritime Heritage Trail. The form of the Cayman Islands Maritime Heritage Trail is based on the model of the Florida Maritime Heritage Trail. In 1997, the State of Florida's Division of Historical Resources developed a project to promote citizen and visitor appreciation of the state's long maritime history. The project grew into a maritime heritage trail consisting of six themes: historic shipwrecks, lighthouses, coastal communities, ports, coastal forts, and coastal environments. Each theme is featured through a colorful poster/brochure with images on one side and information about trail sites on the other. Although many of the sites on the trail are open for visitors, sites are scattered around the state and people cannot be expected to circumnavigate the trail in a day or two. A virtual "information trail" was conceived so visitors can experience the complete trail. The information trail consists of the poster/brochures and a comprehensive web site that presents additional information. The Florida Maritime Heritage Trail is extremely popular, with thousands of poster/brochures distributed around the state and the world each year, and tens of thousands of visitors to the web site.

Flexibility to Accommodate New Locations, Situations, and Infrastructure

Lessons learned and experience gained in the establishment of existing trail programs proved invaluable while planning a similar program for the Cayman Islands. The Islands' unique geography and existing infrastructure, however, meant that different methods of interpretation and visitor access could be implemented.

The Cayman Islands Maritime Heritage Trail Partners liked the model of the Florida trail but envisioned changes that would complement the Cayman Islands. Because the islands are small and can be explored in a timely manner, the Cayman Islands Maritime Heritage Trail was designed to be a physical trail rather than simply a virtual trail. On all three islands, each of the three segments of the Trail can easily be driven in a day, and portions of the Grand Cayman Trail in George Town can even be visited by those on foot. Signs on the ground mark sites where Trail visitors can physically explore maritime activities, from enjoying the peaceful nautical interior of Elmslie Memorial Church, to climbing inside dark and musty Hurricane Caves, to snorkelling over the historic anchors of Bloody Bay.

Cayman Islands Maritime Heritage Trail – The Land-Based Trail

The Cayman Islands Maritime Heritage Trail is a land-based driving tour around all three islands with stops for public access marked by signs at historically significant maritime sites. The stops are interpreted through two colorful poster/brochures, one for the Sister Islands of Cayman Brac and Little Cayman, and one

for Grand Cayman (Cayman Islands Maritime Heritage Trail Partners, 2003) (Figures 5.1a&b). At Trail stops, explorers can learn in an entertaining and interactive way about a wide range of maritime themes, activities, and industries unique to the Cayman Islands.

Criteria for Sites on the Trail

The Partners developed a set of criteria to aid in selecting sites appropriate for inclusion on the Trail. The Partners agreed that the Trail should provide a safe and entertaining activity and should comprise sites of a variety of maritime themes represented on all three Cayman Islands. Sites had to have historical significance and interesting visual features with a safe and publicly accessible viewing area.

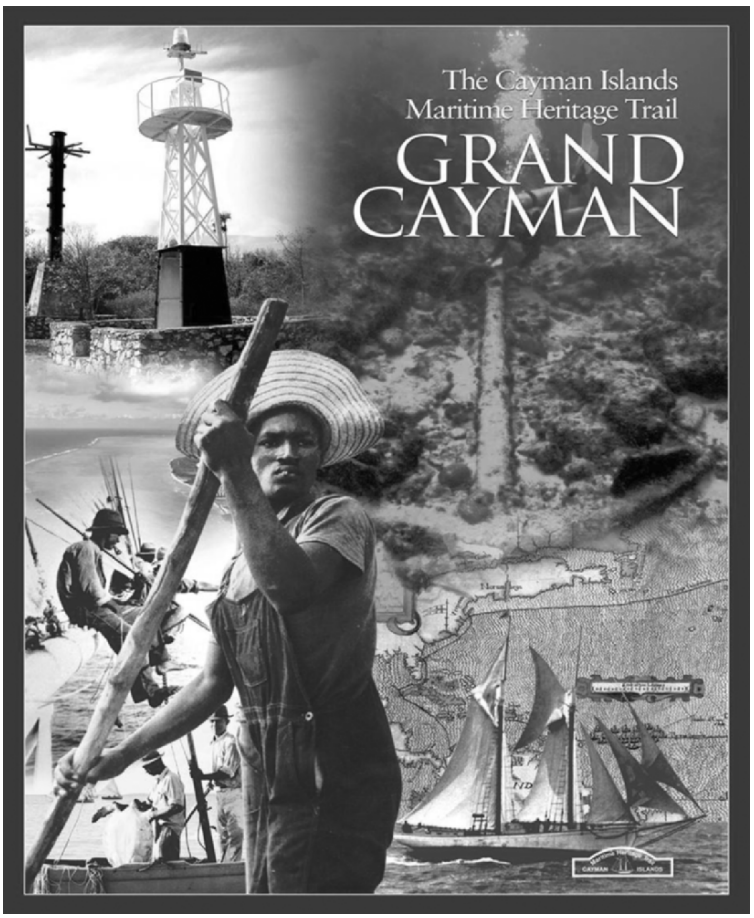

FIGURE 5.1a. Two poster/brochures interpret the Cayman Islands Maritime Heritage Trail (Image courtesy of the Cayman Islands Maritime Heritage Trail Partners).

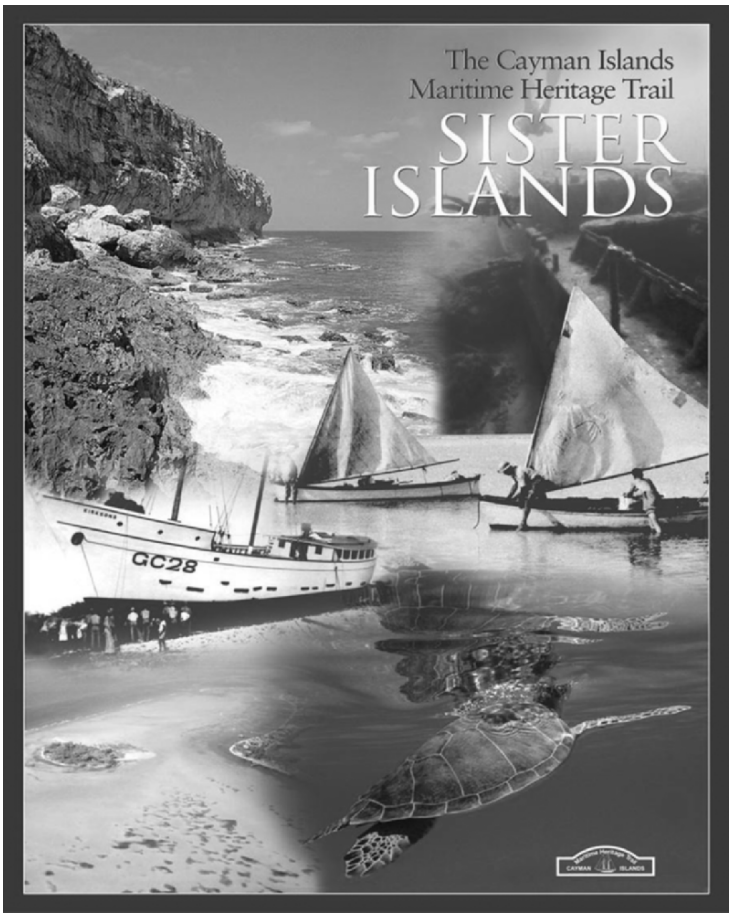

FIGURE 5.1b.—(*Continued*)

Most importantly, interpretation must not adversely impact sensitive sites; although many sites of maritime activity were available to choose from, not all the sites were stable enough to sustain increased visitor traffic.

A Variety of Maritime Sites on the Trail

Maritime Place Names

Several locations and geographical areas around the islands are named for their connections to maritime activities or events. Pull-and-be-Damned Point off the southern coast of Grand Cayman is named for the futility of rowing against the swift current flowing out of South Sound. Little Cayman's Owen Island is named for Richard Owen, surveyor for the British Admiralty, who performed the first

hydrographical survey of the Sister Islands in 1831. Nearby Blossom Village is likely named for his ship, HMS *Blossom*.

Lighthouses

Lighthouses are featured prominently on all three Cayman Islands where mariners depend on them for safe navigation around treacherous reefs and sheer coastlines. A succession of lighthouses have been situated on Grand Cayman's Gorling Bluff at East End since the early 1900s, newer lights replacing older ones as technology improved or hurricanes destroyed them. Islanders describe that sand for the foundation of the lighthouse on Cayman Brac was carried in thatch baskets up the 42.6 meter (140 feet) high bluff.

Maritime Architecture

Caymanian shipbuilders with years of experience producing schooners, Catboats, and other island watercraft also turned their hands to civic building projects. Captain Rayal Bodden, a famed local shipwright, built the Elmslie Memorial Church and the Post Office in George Town using traditions and methods most familiar to him. As a result, the ceiling architecture of his buildings resembles the inverted hulls of SHIPS. Because few historic Caymanian SHIPS or boats still survive, these terrestrial constructions offer some of the best opportunities to see Cayman Islands shipbuilding techniques.

Shipbuilding

Because of Caymanian dependence on the sea, SHIPS and boats were built in many areas around the three islands. Small slips and coves, called barcaderes, carved by man or nature into the ironshore can be seen dotting the shoreline. Large schooners and small boats, including the Caymanian Catboat invented on Cayman Brac, were built and launched in large numbers.

Hurricane Caves

The limestone bluff of Cayman Brac is riddled with caves and cavities. Some of these have been used for centuries by residents seeking shelter from storms and hurricanes. More than one hundred people can fit inside Peter's Cave on the northeastern side of the island, where Islanders sought refuge as recently as Hurricane Ivan in 2004. Rebecca's Cave, near the western end of the bluff, is named for a small child who perished of exposure and was buried in the cave during the great Storm of 1932.

Forts

Two historic forts protected Grand Cayman from seaborne invasion. Portions of the wall of Fort George on the waterfront in George Town are the only surviving remnants visible today. Built around 1780, Fort George was composed of limestone walls supporting a few guns manned by a volunteer militia. Burned by the

Spanish in the last quarter of the eighteenth century, the fort was rebuilt with embrasures for eight cannons. A similar limestone fort once stood at Prospect on the southern coast, but it was destroyed in the twentieth century. Today the area includes a simple monument surrounded by a modern housing development.

Turtle Fishing

First remarked by early European mariners for the abundance of sea turtles swimming in the sea about the islands, the Cayman Islands eventually developed one of the most profitable turtle fishing industries in the Caribbean. Turtle rangers captured the reptiles using a locally invented net, and held turtles awaiting slaughter in crawls, or pens, located around all three islands (Figure 5.2). Today, the Cayman Turtle Farm still provides turtle meat for local consumption, and also contributes to conservation efforts with a turtle-release program.

Anchorages

Several natural anchorages with good holding ground and natural shelter are known around the Cayman Islands. Old West Bay Historic Anchorage was the community gathering place for that district until a storm destroyed the wharf in 1944. Hog Sty Bay is the historic and modern anchorage for George Town;

FIGURE 5.2. The location of historic turtle crawls is one of the sites on the Cayman Islands Maritime Heritage Trail (Photo by Margaret Leshikar-Denton).

historic stepwells mark the bay's watering places. The anchorage near Bloody Bay on the north side of Little Cayman still holds anchors, lost by unwary seamen, ranging in age from colonial wooden-stocked anchors to iron-stocked schooner tackle.

Early Explorers

The Cayman Islands were known to Europeans from 1503 when Christopher Columbus's young son Ferdinand described the Sister Islands in his journal while accompanying Columbus on his fourth and final voyage to the New World. Sir Francis Drake's fleet stopped at the islands during his voyage of 1585-1586, harvesting turtles and crocodiles for food.

Maritime Activities

The remains of maritime activities are located in many places around the islands. Evidence of shipbuilding, turtling, and wrecking can be seen in the cut slips, turtle crawls, and shipwrecks that dot the Cayman Islands. Other activities are apparent as well. For example, the historic careenage in Grand Cayman's North Sound contains stratigraphically intact deposits of archaeological material associated with this most important of maritime maintenance industries.

Shipwrecks

Among the Cayman Islands' most important archaeological resources are the remains of hundreds of SHIPS and boats that wrecked on the reefs and shoals surrounding the Islands. Ranging in age from colonial vessels such as HMS *Jamaica*, a pirate-hunting Royal Navy sloop wrecked in 1715, to *Soto Trader*, sunk in a fiery accident in 1976, Cayman's shipwrecks reflect five centuries of maritime history and the seafaring traditions of at least fifteen nations.

Value for the Cayman Islands

The Maritime Heritage Trail Partners designed the Cayman Islands Maritime Heritage Trail to have multiple values. As a land-based attraction, it is accessible to everyone. It is uniquely Caymanian, promoting appreciation of the Islands' history and heritage for residents and visitors. The Trail encourages travel around the coastlines of all three islands, leading to patronizing of local businesses along the route to boost the local economy. It is an effective cultural resource management tool, promoting visitation while encouraging appreciation for all island historic sites. Existing heritage resources are interpreted for the public, promoting the Cayman Islands' history and encouraging a sense of national pride. As the first of its kind in the Caribbean region, the Trail serves as a model for the interpretation and protection of maritime cultural resources in other Caribbean nations.

Progress and Results

The Cayman Islands Maritime Heritage Trail was launched in 2003 to coincide with Quincentennial celebrations recognizing the 500th anniversary of Christopher Columbus sighting the Cayman Islands in 1503. The Trail was launched with grand opening celebrations on all three islands attended by citizens, visitors, elected officials, and dignitaries. Framed posters were presented to district representatives as a symbolic gesture of the Maritime Heritage Partners "giving" the Trail to the people of the Cayman Islands. The Trail received local publicity through media sources including newspapers, magazines, tourist publications, and radio and television coverage. The success of the Trail resulted in greater appreciation among Cayman residents and visitors of the Islands' maritime heritage and the importance of preserving its tangible remains. The Partners were encouraged to move forward with the next phase of their plans for maritime heritage interpretation and resource management. Using information from archaeological surveys, historical reports, and tourism statistics, the Partners developed a proposal for the first shipwreck preserve and presented it to government ministries for consideration.

Cayman Islands Shipwreck Preserve Trail

The second initiative in Cayman's multi-phase program to promote and protect maritime cultural resources is the introduction of a series of Shipwreck Preserves, accessible to the public, in the waters of all three islands. The Maritime Partners looked to models developed in Florida and other states, Australia, and the United States National Marine Sanctuaries for inspiration and practical knowledge, as they had done for the land-based trail. The Preserves, consisting of a variety of shipwreck sites managed, interpreted, and legally protected for the benefit of present and future generations, are envisioned to be thematically linked as the Cayman Islands Shipwreck Preserve Trail.

Criteria for a Shipwreck Preserve

Selection criteria were developed by the Maritime Heritage Trail Partners to guide them in choosing historic shipwreck sites to become Shipwreck Preserves. They proposed the following criteria, although these will be reviewed and refined as the first Preserve project progresses. To become a Cayman Islands Shipwreck Preserve, the wreck must: 1) be located in Cayman territorial seas (to 19.3 kilometers or 12 miles) or in the contiguous zone (to 38.6 kilometers or 24 miles); 2) be historically significant; 3) have a reasonably verifiable identity and history; 4) have recognizable features; 5) be environmentally healthy and stable as determined by Department of Environment; 6) be robust enough to withstand sustained visitation without compromising archaeological integrity; 7) be accessible to the public; and 8) have safe visitation conditions.

The wreck of *Glamis*, under consideration to be the Cayman Islands' first Preserve, meets the Partners' criteria. It is located just off the East End of Grand Cayman in Cayman territorial seas and within sight of diving resorts on-shore. It is historically significant to island history with a known documentary history, both before and after wrecking. The site includes extensive and robust iron features, situated on a healthy reef in clear water. *Glamis* is accessible by boat to the diving and snorkeling public, with favorable dive conditions for 200-250 days of the year.

Glamis – *Cayman's First Shipwreck Preserve*

Site GC 013 in the Cayman Islands Shipwreck Inventory is believed to be the wreck of the iron-hulled barque *Glamis*, built in Dundee, Scotland, in 1876 and lost under Norwegian flag in 1913 (Leshikar-Denton and Ho, 2004). Characterized by large sections of iron hull components, anchors, and multiple sailing-ship deck features, the site is located in a shallow reef environment in clear water off the East End of Grand Cayman (Figure 5.3).

Frequently visited by East End watersports operators and their clients, the site has been plagued by misidentification and lack of interpretation about the wreck's role in Caymanian history. Thus, *Glamis* is an ideal candidate to become the Cayman Islands' first Shipwreck Preserve. Wrecks that have known histories, like *Glamis*, and that are structurally stable and located in a healthy environment are appropriate for *in situ* interpretation and reasonable access by the public. The best

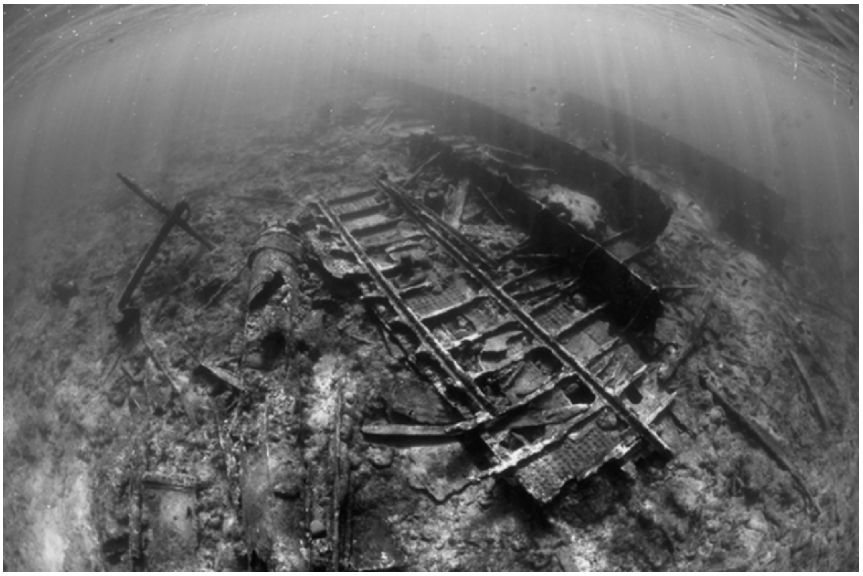

FIGURE 5.3. Panoramic underwater view of the wreck of *Glamis* off Grand Cayman's East End (Photo courtesy of Steve Broadbelt).

way to manage these sites for the present and future is to establish them as dynamic underwater museums in the form of Shipwreck Preserves.

Cultural Value of Glamis

The *Glamis* site includes evidence of the ship's iron construction techniques, illustrating technical achievements of the time and enhancing its rich history as a sailing barque in the closing days of the Age of Sail (Ho, 2004; Leshikar-Denton and Ho, 2004). During the *Glamis*' celebrated career with the Dundee Clipper line at the end of the nineteenth century, she carried immigrants from Great Britain to Australia, and cargoes such as jute from India to Dundee and dressed timber from Montrose to Melbourne. *Glamis* had a second fruitful career as a Norwegian-owned bulk cargo shipper in the early twentieth century. The iron-hulled barque demonstrates that oceans are avenues of communication and commerce; they tie countries together. SHIPS, rather than being simply isolated communities at sea, are truly transporters of ideas, cargoes, and human populations.

Glamis third role as part of Cayman's important wrecking industry transpired when Caymanian wreckers from shore reached the stranded vessel, helped to save the crew, and negotiated salvage rights to much of her cargo. A fourth occupation for *Glamis* is envisioned to be an *in situ* underwater museum, including the modern interpretation of the shipwreck as a heritage attraction embedded in a healthy marine environment of identifiable corals and fish, for the adventurous aquatic public. Today *Glamis* has the potential to tell her story in a wonderful new way, by becoming the first underwater Shipwreck Preserve in the Cayman Islands.

Support

The Maritime Heritage Trail Partners supported the *Glamis* Preserve project as the next step in the interpretation and promotion of Cayman's maritime cultural resources. The Cayman Islands National Museum again was lead agency through the participation of the Museum Archaeologist as principal investigator. Department of Environment (DoE) was instrumental due to the location of the shipwreck within a reef ecosystem and under the jurisdiction of DoE. DoE placed a mooring buoy at the site of *Glamis* as part of their continuing effort to provide safe moorings at popular diving locations around the islands; the buoy also protects the wreck from inadvertent anchor damage. The National Archive and the National Trust again assisted with historical research and interpretation strategies.

The importance of public and private support was realized during the Maritime Heritage Trail program which successfully built a feeling of community ownership for the project. The Shipwreck Preserves also must garner public and private sector support, particularly because they will be located near discrete island communities and specific diving and watersports operators. In the case of *Glamis*, East End's Reef Resort housed the *Glamis* Mapping Project crew for two weeks. Ocean Frontiers Dive Resort also is located in East End very near the shipwreck, and

divemasters routinely guide visitors around the wreck and surrounding reef. From the beginning of the project, Ocean Frontiers management and staff were included and encouraged to participate. The resort provided accommodations for project personnel, as well as boats and equipment. In addition, Mr. Steve Broadbelt, owner of Ocean Frontiers, was asked to provide an assessment of the condition of *Glamis* and its potential as an underwater museum based on his knowledge of diving tourism. His recommendations were instrumental in the decision to propose establishing *Glamis* as the Cayman Islands' first Shipwreck Preserve. The Cayman Diving Lodge and Tortuga Divers also provided assistance and valuable advice.

Accessibility and Dive-Operator Assessment of the Glamis Site

Steve Broadbelt of Ocean Frontiers Dive Resort compiled a dive-operator site assessment for *Glamis* to provide a commercial dive operator's evaluation of the feasibility of establishing a Shipwreck Preserve at the *Glamis* site. His observations follow:

Advantages of the *Glamis* wreck

- Close to major resort areas in the district
- Close to public and private docks for boat access
- Suitable for snorkelers as well as divers due to the shallow depth
- Within close range of other existing dive and snorkel sites and moorings
- Actual wreck site large enough and with sufficient points of interest to make it a feature site for visitors
- Abundant quantity and variety of fish and other marine life
- Mooring pin at the site for safe mooring and direct positioning of the site
- Reliably good visibility throughout the year
- Away from navigational channels and hazards
- Very safe due to no areas permitting penetration inside the wreck by divers

Disadvantages of the *Glamis* wreck

- Access can be restricted subject to weather at certain times of year (November through February), although the site should be useable 200 to 250 days per year.
- Area over the wreck can be a little choppy and cause seasickness to passengers on dive/snorkeling vessels.
- Wreckage has some sharp edges.

Overall Mr. Broadbelt's observations were in favor of *Glamis* becoming a Shipwreck Preserve and encouraged the Maritime Heritage Trail Partners to proceed with the *Glamis* as the first Preserve Project.

Site Recording

The first step in the creation of the Preserve was to produce an accurate archaeological site plan of existing wreckage and its relationship to the surrounding marine geology. This large-scale project was completed by the Museum Archaeologist in collaboration with the Anthropology Department

of Florida State University. Bert Ho, a graduate student specializing in underwater archaeology, was offered the chance to research and record *Glamis* as the topic of his master's degree thesis. Ho worked with author Leshikar-Denton, additional student volunteers from FSU, and staff from Ocean Frontiers to record the wreck. Scaled mapping using a baseline, offsets, and triangulation was used to accurately record the shipwreck. Large features such as anchors and hull sections were recorded in detailed drawings and in photographs and video.

Site Interpretation

The completed site plan will be used to create a variety of interpretive literature. A brochure will feature the ship's history and the story of the dramatic wrecking event, including historic photographs and the site plan of the ship today. A laminated underwater guide will present the site plan with features labeled so that divers and snorkelers can take a self-guided tour of the wrecksite and understand what they are seeing (Figure 5.4). Sea life commonly encountered will be described as well. The wrecksite also will be marked with a bronze plaque set in a cement monument. The plaque will provide a short description of the ship and designate the site a Cayman Islands Shipwreck Preserve. Other possible interpretive initiatives include shore-based signage, a museum exhibit, a poster, a web site, publications and articles about the ship's history in magazines and newspapers, patches, and stickers.

FIGURE 5.4. *Glamis*' iron mast will be featured on the laminated underwater guide (Photo courtesy of Alexander Mustard).

Proposal to Government Ministries

In August 2004, a formal proposal entitled *The Probable Glamis Site: Archaeological Mapping and Potential for a Shipwreck Preserve* was presented to the two relevant Caymanian governmental ministries (Leshikar-Denton and Ho, 2004). The proposal identified the archaeological and historical understanding of *Glamis*, the potential cultural value of this site for local and visiting populations, and the fact that the site is a finite and non-renewable historical resource. Before the proposed *Glamis* Shipwreck Preserve is opened to the public, issues of management, methods of interpretation, and legal protection of *Glamis* for the benefit of present and future generations must be considered. The proposal suggests that Maritime Heritage Trail Partner discussions should take place in consultation with the relevant ministries and government departments including the Department of Tourism, Cayman Islands Tourism Association, and the general public to help answer these concerns. The authors believe that if successful, the *Glamis* Shipwreck Preserve model will facilitate the creation of other historical Shipwreck Preserves in the Cayman Islands, and that together the Preserves eventually will form the Cayman Islands Shipwreck Preserve Trail around all three islands.

General Steps for the Establishment of Cayman Islands Shipwreck Preserves

The Maritime Heritage Trail Partners suggest the following process for creating Shipwreck Preserves in the Cayman Islands (Leshikar-Denton and Ho, 2004). The purpose of a formalized program for establishment is to ensure all shipwrecks proposed for Preserve status receive the same level of consideration, research, recording, interpretation, and management. This process will help the Partners to choose appropriate sites for interpreted visitation and to make sure all Preserves are established and managed in a consistent manner.

1. A shipwreck is nominated to become a Preserve by the Maritime Heritage Trail Partners in consultation with other government agencies, Cayman Islands Tourism Association (CITA), Cayman National Watersports Association, other interested organizations, and the general public.
2. The wreck site is inspected by the Archaeologist to determine if it meets the necessary criteria for Preserve status.
3. The Archaeologist advises the Maritime Heritage Trail Partners about the suitability of the shipwreck to become a Preserve based on the criteria, and a final determination is made. This determination is forwarded to the nominating group. If the shipwreck is suitable, it is announced to the public as a Preserve candidate.
4. The Archaeologist, with the assistance of local and overseas professional archaeologists, DoE staff, qualified academic institutions, local volunteer divers, and watersports operators, surveys and records the shipwreck to prepare an accurate archaeological site plan. In addition, the ship's history is researched

and verified. An assessment and inventory of the site's biological diversity is conducted by Department of Environment personnel.
5. An official site report is prepared containing all information about the Preserve, the site plan, and a description of the educational, cultural, and economic benefits of the Preserve, and is distributed to the Maritime Heritage Trail Partners.
6. Interpretive materials are created (possible products include: brochure, booklet, site guide, poster, web site, underwater monument, etc.).
7. A grand opening celebration is held to dedicate the Shipwreck Preserve and to introduce and distribute promotional and interpretive materials.
8. Cooperative arrangements are developed for ongoing management and promotion (e.g., permanent mooring maintenance and environmental monitoring by DoE, site monitoring by Archaeology Program personnel, plaque cleaning and site policing by adoptive dive operator(s), literature reprints by Maritime Heritage Trail Partners, promotional liaison with Department of Tourism and local and overseas media groups, etc.).

Glamis *as a Model for Future Preserves*

E.L. Banks *(west end of Grand Cayman)*

The Caymanian schooner *E.L. Banks* was sunk during a violent storm in 1944 while at anchor in West Bay waiting to unload a cargo of lard. Today the wrecksite is in 13.7 meters (45 feet) of clear water in a pocket of white sand surrounded by a vibrant coral reef ecosystem. A mound of shipwreck material, including ballast, fasteners, the remains of lard casks, and anchor chain, is visible and easily identifiable. The shipwreck appears to be undisturbed, despite decades of diving activities near the site. The schooner's compass was discovered by archaeologists during a recent inspection and wooden remains likely are present under the sand. This site represents one of the only known and identified Caymanian schooners of the type that once was a familiar sight around the islands' waters. The shipwreck is sturdy and compact and can withstand increased visitation. The diverse biology presents an opportunity to describe the surrounding coral reef and tropical marine life that abounds on Cayman's shipwrecks. This shipwreck also relates to a land-based site on the Maritime Heritage Trail, the Old West Bay Historic Anchorage & Town Centre.

Prince Frederick *(Cayman Brac)*

The Norwegian-registered ship *Prince Frederick* wrecked in 1897 off the southern coast of Cayman Brac. Today the iron hull of the ship provides a solid foundation for coral, sea fans, and other reef organisms. Shallow enough for snorkelers as well as divers, the shipwreck abounds with small tropical fish, crustaceans, and mollusks. The site also provides an opportunity to tell the story of Caymanian wrecking, a vital industry for residents of the isolated islands. The ship was stripped of everything considered useful by islanders, who even tried to chop down the ship's iron mast.

Soto Trader *(Little Cayman)*

The tragic story of *Soto Trader* still is fresh in the memory of residents of Little Cayman. The island transport was loaded with goods from Grand Cayman, including gasoline, when she docked at Little Cayman on 4 April 1976. While dispensing the fuel, fumes in the hold ignited, causing the ship to become engulfed in flame; two men were badly burned and later died of their injuries. The ship sank at her mooring and today sits upright in 18.2 meters (60 feet) of water. Although this wreck is not as old as some others around the islands, her demise is part of the dramatic story of Caymanians and the sea. The ship already is a favorite diving location and is visited by thousands of divers each year, many of whom never learn of the terrible events that led to its sinking.

Future Directions

Plans are underway to begin establishing Shipwreck Preserves around the Cayman Islands. Although an initial setback occurred due to damage from Hurricane Ivan in 2004, the Islands are again ready to proceed. The first will be at the wreck of *Glamis*; historical and archaeological research is completed (although post-hurricane mapping is required) and ready to become the foundations of interpretive materials. The wreck of *E.L. Banks* is proposed to become the second Preserve, giving Grand Cayman a Preserve at each end of the island. The third and fourth Preserves will be established in the Sister Islands at the proposed sites of *Prince Frederick* and *Soto Trader*. In this way the Shipwreck Preserve Trail will include all three islands from the inception of the program.

As shipwreck sites are proposed, inspected, and recorded, the Shipwreck Preserve Trail can grow in scale. The number of Preserves making up the Trail is limited only by the number of shipwrecks meeting the selection criteria. Governmental and public commitment is necessary to support field projects and to manage the Preserves in a manner consistent with ecological conservation and historic preservation. Eventually, the Shipwreck Preserve Trail is envisioned to surround all three islands and to feature the seafaring history of the Cayman Islands and of the many nations whose SHIPS wrecked in Caymanian waters.

Rare Sites: Potential for Archaeological Research

The authors believe interacting with history through the Maritime Heritage Trail and Shipwreck Preserves will help people to develop an appreciation and understanding that archaeological sites are sensitive and fragile, containing information available nowhere else in the world. Some sites, however, such as the earliest shipwrecks, are too vulnerable to support increased visitation. These rare and fragile sites are not appropriate to become Shipwreck Preserves, but rather deserve special protection, management, and study. People can share the knowledge extracted by professional archaeologists through reading publications, visiting museum exhibitions, and viewing filmed documentaries. If investigation

is undertaken for research purposes or for mitigation, special responsibilities must be met, including adequate funding, professional expertise and documentation, conservation, site stabilization, collections management and curation, and dissemination of information to the public.

While no shipwrecks are being excavated in the Cayman Islands at this writing, significant early heritage sites that deserve archaeological attention are located in the islands. For example, in Grand Cayman HMS *Jamaica*, a British sloop on patrol for pirates, was lost in 1715. An unidentified sixteenth- or seventeenth-century wreck of undetermined nationality was discovered on the East End reef, and a mid-eighteenth-century Spanish wreck yielding a wide range of ceramic material has been located. The Duck Pond careenage, used for centuries, exists in a relatively undisturbed state. Among sites in the Sister Islands worthy of specialized archaeological research are English vessels lost during a 1670 battle with privateer Manuel Rivero Pardal, a late-seventeenth-century site of undetermined nationality, and the Spanish ship *San Miguel*, wrecked in 1730.

Conclusion

The Cayman Islands Maritime Heritage Trail and Shipwreck Preserves are new endeavors in heritage education, recreation, and tourism for the Caribbean nation. They are envisioned to add to the Islands' tourism product while promoting the preservation of maritime cultural sites. Many historical sites have been negatively impacted in recent years due to unprecedented growth. Cayman residents and visitors believe the Islands' heritage deserves protection; the establishment of historical walking tours through island communities and the restoration of historic sites such as Pedro St. James (number 13 on the Maritime Heritage Trail), are evidence of this. The Trail and Preserves will focus attention on maritime historic sites which, ideally, will lead to their long-term protection.

Perhaps the most significant immediate benefit of the Maritime Heritage Trail project was the creation of the Maritime Heritage Trail Partners. Each of the partnering agencies is responsible for separate but complimentary elements of research and preservation that, when combined, result in a powerful force for action. The Partners are committed to continuing their three-tiered maritime heritage initiative, and particularly to advocating for legislation to formalize the protection of shipwrecks in Caymanian waters.

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6
Creating a Shipwreck Trail: Documenting the 1733 Spanish Plate Fleet Wrecks

Jennifer F. McKinnon

Introduction

The Florida Keys are home to North America's only living barrier reef which draws over six million visitors a year. It is the top diving and snorkeling destination in North America and visitors from all over the world travel to the Keys to enjoy this natural resource. Cultural Heritage such as shipwrecks also draw thousands of visitors per year to the Keys; this is evident in the numerous visitors to Florida's Underwater Archaeological Preserve, *San Pedro*, and to the Florida Keys National Marine Sanctuary Shipwreck Trail. The shipwrecks of the 1733 Spanish Plate Fleet located in the Florida Keys provide yet another unique opportunity for coastal management and interpretation of submerged cultural heritage because of their high-profile location and exciting history. These thirteen wrecks have the possibility of drawing even more visitors interested in heritage, recreational, and ecological tourism to the Florida Keys.

Florida's Bureau of Archaeological Research partnered with the Florida Keys National Marine Sanctuary (FKNMS), John Pennekamp Coral Reef State Park, and Biscayne National Park to conduct a one-year project to inspect and document the 1733 Spanish Plate Fleet shipwrecks and to create a "Spanish Galleon Trail" by which interested visitors may tour "real life" Spanish shipwrecks. This project was funded in part by a research grant from the National Oceanic and Atmospheric Administration (NOAA) through the Florida Coastal Management Program. During the summer 2004 season, a crew of four archaeologists from the Bureau traveled to the Florida Keys to conduct the field portion of this year-long project. This chapter reports on the results of this research, describes the public interpretation of this intriguing historical event and attempts to answer the question: how can managers interpret significant shipwrecks allowing unlimited access, but also begin to limit the amount of human disturbance they receive?

History of the 1733 Fleet

The story of the 1733 fleet could be a modern story or an ancient one. Hurricanes continue to affect vessels traveling in the warm Caribbean waters every summer season. SHIPS sink, cargoes disappear, crews lose their lives, and the story goes

on. But the 1733 fleet disaster will forever remain in history and in the hearts of adventure seekers and archaeologists because it was an incredible event of wrecking and salvage.

The account of the ill-fated fleet began in Havana, Cuba, on Friday the 13th of June 1733. The New Spain Fleet had assembled in Havana for the return voyage to Spain, loaded with raw and finished materials from the New World. In all there were 22 SHIPS including 4 armed galleons and 18 merchant *naos*. Commanded by Rodrigo de Torres aboard the newly built *capitana, El Rubi*, the fleet left Havana on that fateful day (Smith, 1988a). The convoy traveled through the night and the following day sighted the present-day Florida Keys. As the fleet was nearing the Keys, the winds shifted and grew to hurricane force. Sensing the approaching hurricane, Captain-General Torres ordered his SHIPS to turn around and sail back to Havana, but by that time it was too late. At the end of the day all of the SHIPS but one had been driven onto the reefs and shallows along some 128 kilometers (80 miles) of the Florida Keys (Figure 6.1).

The wrecks' survivors assembled on shore and built makeshift shelters from floating debris that washed up with the storm. One ship survived the storm, and returned to Havana just after Spanish admiralty officials dispatched a small sloop to assess the fate of the fleet. Survivors reported seeing several large SHIPS grounded near a place called "Head of the Martyrs" (present-day Islamorada). Nine rescue vessels were loaded with supplies, food, divers, and salvage equipment and sent to the scene of the disaster (Smith, 1988a).

Several salvage camps were constructed in convenient locations and the salvage operations were overseen by soldiers sent to protect the precious cargoes. Nearly half the vessels were re-floated and towed back to Havana; those left were burned to the waterline enabling divers to access the cargo holds and concealing the wrecks from freebooters. Salvage of these vessels continued for several years. When the final calculation of recovered materials was made, more gold and silver was retrieved than had been listed on the original manifests, tell-tale evidence of contraband aboard the vessels (Smith, 1988a).

Maps showing the grounded vessels were created by the Spanish, enabling modern treasure hunters and adventure seekers to locate the wrecks in recent decades. Although several Spanish maps exist, much confusion has arisen regarding the specific identities of these wrecks because the ship names and locations differ map to map. Archaeologists have visited many of the 1733 fleet wrecks over the years; however, no professional archaeological surveys have been conducted on all of the thirteen wrecks. Numerous popular accounts dealing with the salvage of the wrecks also have been produced in a variety of formats including books, videos, and DVDs.

Compared to the earlier 1715 Spanish fleet disaster on the east coast of Florida, little "treasure" has been recovered by treasure hunters from the 1733 wrecks. This is due in large part to the success Spain had in locating and salvaging these wrecks. Regardless of the lack of "treasure," the general public continues to associate the 1733 shipwrecks with gold, silver, precious stones, and jewels. As a result, the historical and archaeological values of the shipwrecks have suffered due to looting and destruction. There are few artifacts, if any, left

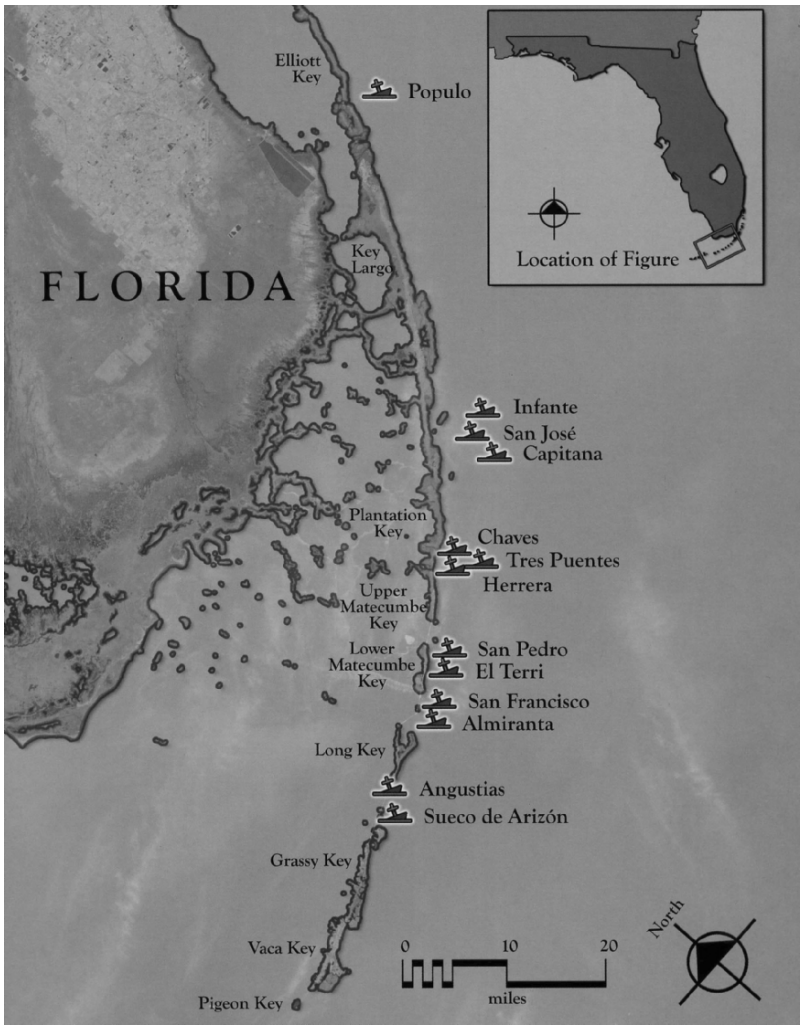

FIGURE 6.1. Map showing location of the 1733 fleet shipwrecks (Image courtesy of Florida Bureau of Archaeological Research).

on the sites and much of the ballast and timbers have been disturbed or moved from their original locations.

Modern Discovery of the Fleet

The earliest evidence in modern times of rediscovery and salvage occurred in the 1940s when a local fisherman discovered the fleet's *capitana* and guided Art McKee, a local diver and treasure hunter, to its location (Weller, 2001). Adventurers and treasure hunters continued to locate and work the wrecks and by

the 1960s almost all of them had been discovered and partially or fully looted. A period of time passed when the State of Florida allowed private salvage of these sites while field agents working with the Division of Archives, History, and Records Management (now the Division of Historical Resources) oversaw these operations and attempted to systematically record as much of the sites as possible. In fact, two field agents, Roger Smith and Jim Dunbar, conducted a project in 1977 to locate and map all of the wrecks, thus producing the first archaeological report on the 1733s (Smith and Dunbar, 1977).

In 1985, archaeologists David Moore and Jim Dunbar from the Bureau of Archaeological Research returned to the Keys and mapped *San Jose* after it was exposed by treasure hunters. In 1988, Indiana University and Florida State University students conducted a field school in which all of the 1733 shipwrecks were surveyed for potential nomination to Florida's Underwater Archaeological Preserve Program (Smith, 1988b). The field school students nominated the wreck of *San Pedro* and in 1988 it became Florida's second Underwater Archaeological Preserve. *San Pedro* is one of eleven Underwater Preserves in the State of Florida and continues to attract visitors interested in heritage and ecotourism. In the last decade little archaeological research has been conducted on the 1733 fleet with the exception of mapping exercises by Indiana University field schools on *San Pedro* and *El Terri*.

Because these sites were discovered and initially salvaged by treasure hunters, the public perception that they should be mined for their cargoes rather than preserved for future generations still persists, particularly on a local level. This has made preserving and interpreting these shipwrecks difficult. Twelve of the thirteen shipwrecks are located in State waters and one is located in both State and Federal waters; each of these sites are afforded the same amount of protection under State and Federal law as outlined in the Abandoned Shipwreck Act of 1987. All of the SHIPS but *Populo*, in Biscayne National Park, are located within the FKNMS. The FKMNS and the Division of Historical Resources share management responsibilities and have a specific management plan regarding submerged historical and archaeological resources.

Although they are located primarily in FKMNS waters, access to the sites has been unlimited as their locations are common knowledge and divers visit the sites as they please. Unlimited access to sensitive shipwrecks is a concern when deciding whether a shipwreck should be interpreted and its location advertised; however, this was not a concern for the 1733s as they have been subjected to a great deal of pressure since their discovery. The question then remains: how can managers interpret these wrecks allowing unlimited access, but also begin to limit the amount of human disturbance they receive?

Field Project

The field portion of this project was conducted in the summer of 2004 over a two and one-half month period. Field headquarters were located on Lower Matecumbe Key, a central location to all of the shipwrecks. The shipwrecks are

essentially in groups of two and three which made accessing and mapping the sites relatively easy. To relocate the shipwrecks GPS numbers were extracted from two sources; *Galleon Alley: The 1733 Spanish Treasure Fleet*, a book by Robert Weller (2001), and "Galleon Hunter," a video by Don Ferguson (1996). Surprisingly, two of the shipwrecks were even displayed prominently on the preloaded GPS mapping system as hazards to navigation.

Because the shipwrecks are scattered for 128 kilometers (80 miles), each has its own unique ecosystem. Two of the shipwrecks are located on the reef in 6 to 9 meters (20 to 30 feet) of water and as a result have excellent visibility (15 to 30 meters or 50 to 100 feet) and a variety of reef-dwelling organisms. Three are located in sand pockets where the only sign of life is an occasional stingray scurrying across the seabed. Three of the wrecks are located in shallow grass beds drawing another type of sea life altogether, and the remaining wrecks are located in Hawk Channel where nutrient-rich waters rush daily over the site feeding corals as large as 3 meters (10 feet) wide (Figure 6.2).

In addition to unique ecosystems, each site varies in terms of how much of the shipwreck is visible. Most of the SHIPS that wrecked either on the reef or on a hard marl bottom sit prominently above the seabed floor and can be identified by copious amounts of round river-rock ballast mounds sometimes rising as much as

FIGURE 6.2. Photo of diver surveying the wreck of *Infante* (Photo courtesy of Florida Bureau of Archaeological Research).

2 meters (6.5 feet) above the seafloor. River-rock ballast is the most obvious identifier of these 1733 wrecks, however, a few sites yielded portions of ship timbers.

Exposed timbers range from single disarticulated planks to a half-dozen exposed framing stations. A substantial amount of hull structure is likely to be preserved in layers of sand and mud beneath the ballast mounds. Because the fleet consisted of SHIPS built in several European nations, an archaeological comparison of contemporary building techniques among early eighteenth-century shipyards would be a useful addition to the history of naval architecture.

As mentioned previously, these shipwrecks have suffered from various salvage attempts by adventure seekers, lobsterers, and treasure hunters visiting the sites. Remnants of these visitors are strewn across the sites in the form of empty beer cans, tools used for working the sites, makeshift datum stakes, and gaping holes in otherwise consistent ballast piles. During the 2004 survey a few of the sites were noted to have been recently impacted by treasure hunters and/or lobsterers. This is particularly evident on one of the more intact sites, *El Terri*, where large sections of intact ballast stand up to 2 meters (6.5 feet) tall.

Both recreational and commercial lobstering activities have affected the shipwrecks. Recreational divers caught-up in the chase often pull the ballast apart to get at the lobsters and commercial lobster pots are literally dragged across the sites as they are being loaded and unloaded from boats. The shipwrecks also have been affected by years of natural processes such as wave and current action which have contributed to a "leveling" process.

By understanding the goals and intended products before beginning field research, the most effective method for recording the sites was selected. After locating the shipwrecks, a simple but effective tool was employed to map the wrecks: an azimuth, which utilizes distances and bearings at standard degree intervals. This method was chosen primarily because the remains of the shipwrecks largely consisted of a single ballast pile with little or no exposed hull structure. Additionally, the azimuth technique was selected because the results of this project were to provide a general site plan for interpretive dive guides rather than for scientific purposes. Natural and cultural features including the edges of ballast piles, surrounding grass and sand pockets, ship timbers, large corals, intrusive features, old datum stakes, and excavated or disturbed areas were recorded (Figure 6.3).

Weather days were spent at the headquarters sifting through historical data about each site. Data sheets for each wreck were created which allowed access to important information at a glance and ranked the sites according to their archaeological integrity and opportunities for visitation as part of the 1733 Spanish Galleon Trail.

Despite dodging four major hurricanes, the fieldwork portion of the project was a great success. Each of the thirteen sites were relocated and surveyed, and several connections were made with local researchers and managers concerned with these shipwrecks.

FIGURE 6.3. Site plan of *Populo* (Image courtesy of Florida Bureau of Archaeological Research).

Public Interpretation

The greatest advantages of interpreting and promoting these shipwrecks are education and protection. By educating the public we promote protection of these cultural heritage sites. Perhaps educating may be an incorrect term for what this project hopes to achieve, and reeducation may be a better term for the process. Reeducating the public allows them to understand what the 1733 fleet was and is: a convoy of SHIPS traveling from Havana to Spain loaded with raw and finished materials, and NOT a "treasure fleet" loaded to the gunwales with precious gold, silver, and jewelry. Florida's history, particularly its Spanish history, is entrenched with myths of Spanish galleons laden with treasure. Stopping at any gift shop on US Highway 1 in the Florida Keys to see the "real" gold coins on display or visiting a small-town diner on the "Treasure Coast" which serves food on a treasure map placemat are both examples of this fixation. Debunking this myth will take time and considerable effort but the 1733 project is a step in the right direction.

While education is the way to advocate protection and stewardship, the project also must compete to entertain the public. After all, it is difficult to contend with visions of "treasure." An interpretive guide book was developed for this purpose (Figure 6.4). The booklet is a colorful twenty-four page work which informs visitors about the history of the 1733 fleet disaster, provides a description of each

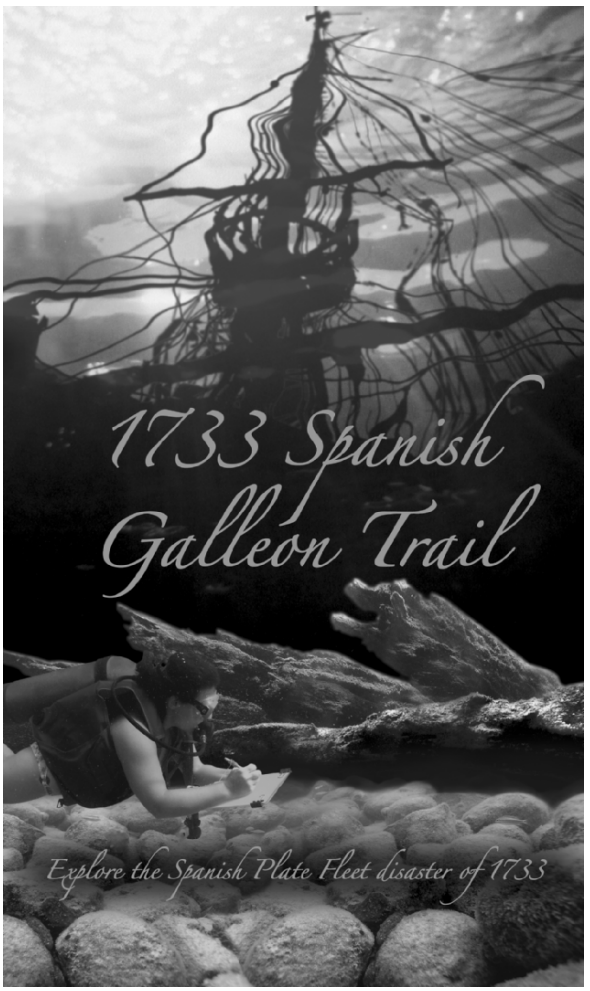

FIGURE 6.4. 1733 Spanish Galleon Trail booklet (Image courtesy of Florida Bureau of Archaeological Research).

shipwreck site and expected conditions, presents directions on how to access and safely dive each site, supplies instructions on minimizing visitor impact on cultural and natural features, and relates a message of conservation and preservation. Included are a plethora of color photos and maps with exciting fonts and an intriguing account of the disaster.

The booklet's contents were carefully planned, from the beginning of the field project to the final printing. Conservation and preservation were considered the most important messages; subsequently, the first page includes a section on the Sanctuary's message, a definition of historical and archaeological resources, and

the laws protecting those resources. The story of the Spanish plate fleet system follows with an in-depth account of the shipwreck disaster. To give the booklet and story an authentic feel, old Spanish charts serve as watermarks and colorful photos of the sites line the edges of the pages. Conservation and preservation were woven into the "Create Your Own Adventure" section where readers find directions on how to visit the dive sites and the "take only photos, leave only bubbles" message. In this section, the booklet attempts to capture the adventure of the fleet disaster and distill that excitement into the new adventure of diving these shipwrecks today.

Finally, two pages are devoted to the importance of "Preserving our Underwater History" and the question of "Why are all of the Cannons and Anchors Falling Apart?" The idea that these shipwrecks are non-renewable is reiterated by the telling photos of crumbling cannons and anchors lining US Highway 1. A paragraph on the process of conservation follows after which the open-ended question is asked, "Wouldn't you rather see a shipwreck looking as it did when it wrecked with its cannons in place instead of rotting on the roadside?"

One page is devoted to each of the thirteen shipwrecks. The page includes a detailed description of the ship's history (where and when it was constructed), the type of ship it was and who captained/owned it, and descriptions of its cargo and Spanish attempts to salvage that cargo. It also includes a description of the shipwreck as it looks today including natural and cultural features and diving conditions. GPS coordinates are recorded at the bottom of the page and the site plan is a watermark behind the text. A colorful photo of the site frames the bottom of the page and the centerfold of the booklet contains additional photos of each wreck in one sexy collage. The end result is an informative yet stimulating booklet which visitors can use to visit and explore the "real" Spanish galleons of the 1733 fleet.

The initial print run of the booklet yielded 25,000 copies into which a letter from Florida's Governor and Secretary of State was inserted. The letter dedicates and connects this project and booklet to the 2005 Hispanic Heritage Month celebrations. The majority of the brochures will be distributed to visitors at John Pennekamp Coral Reef State Park, FKNMS, and local Keys dive shops. Extra booklets were printed so that every school in Florida will have a copy for educational purposes. As with all grant-funded projects there are questions about where the monies will come from for additional printings. This issue has been considered in the development of the Florida Underwater Archaeological Preserve Program as well. The solution is to allow for FKNMS or John Pennekamp to reproduce the booklet as the need arises, as well as to use future grant monies for printing additional copies.

These booklets augment the FKMNS's education and outreach programs by providing materials for the creation of a cultural heritage curriculum and other products that foster stewardship of cultural heritage and natural resources. The same data were used to create a website containing comprehensive 1733 fleet information, with links to parnering agencies and waterfront community organizations (http:// www.flheritage.com/archaeology/underwater/galleontrail/). The website is

interactive and includes additional in-depth information about the history of the fleet disaster. It also will be a source of information once the initial booklets have been distributed to the public. Finally, the field data forms the foundation for a multiple property nomination of the thirteen sites to the National Register of Historic Places.

Providing citizens with access to historic sites and educating them about local shipwrecks helps them to gain a sense of pride and ownership in their unique maritime heritage and encourages them to become involved in preservation and the promotion of heritage tourism. Eventually it is hoped that visitors to these shipwrecks will be less inclined to collect and consume, and more inclined to protect and conserve. By telling the real story of the 1733 Fleet in an exciting way Florida's citizens and visitors are educated about the "real" treasure of these shipwrecks: the incredible history of their sinking and salvage.

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7
Refocusing on Georgia's Rivers: The Role of Maritime Historical Archaeology in Waterfront Revitalization

Jason M. Burns

Introduction

Waterfront revitalization is occurring around the world as cities begin to refocus on their waterfronts. Often abandoned or underutilized following post-World War II suburbanization and neglected after failed urban renewal projects of the 1950s and 1960s, cities now are striving to attract people back to their cores through historic rehabilitation, waterfront development, and the many recreational opportunities that waterfronts provide. This move toward waterfront revitalization, commonly seen in large port cities like Baltimore, San Francisco, and Boston, has spread to historically significant nineteenth-century river towns in Georgia including Augusta, Rome, West Point, Columbus, Albany, Bainbridge, Milledgeville, Hawkinsville, and Macon (Figure 7.1). As these cities turn their attention back to their rivers and waterfronts they often seek out methods for interpreting their river heritage to a new generation of residents while striving to revitalize their downtown economies. Cultural resource management and protection, including both submerged maritime resources and their associated waterfront components, can and should be an important and contributing element of these ongoing revitalization efforts.

Georgia's nascent maritime archaeology program is tasked with surveying, inventorying, and managing the state's submerged cultural resources while educating the public about these resources. In an effort to address as many conservation and management issues as possible within the scope of a single undertaking, maritime archaeology survey and inventory projects in West Point on the Chattahoochee River, in Rome on the Coosa River, and in Macon and Hawkinsville on the Ocmulgee River take advantage of city efforts to revitalize their waterfronts while at the same time educating sport divers and the general public about the submerged cultural resources in their own backyards. These projects combine archaeological survey, historical research, and public outreach components in an effort to kindle in the general public a sense of protectiveness, pride, and ownership over their local resources. Many people who visit, work, or live near these waterfront areas today often have only a vague knowledge of

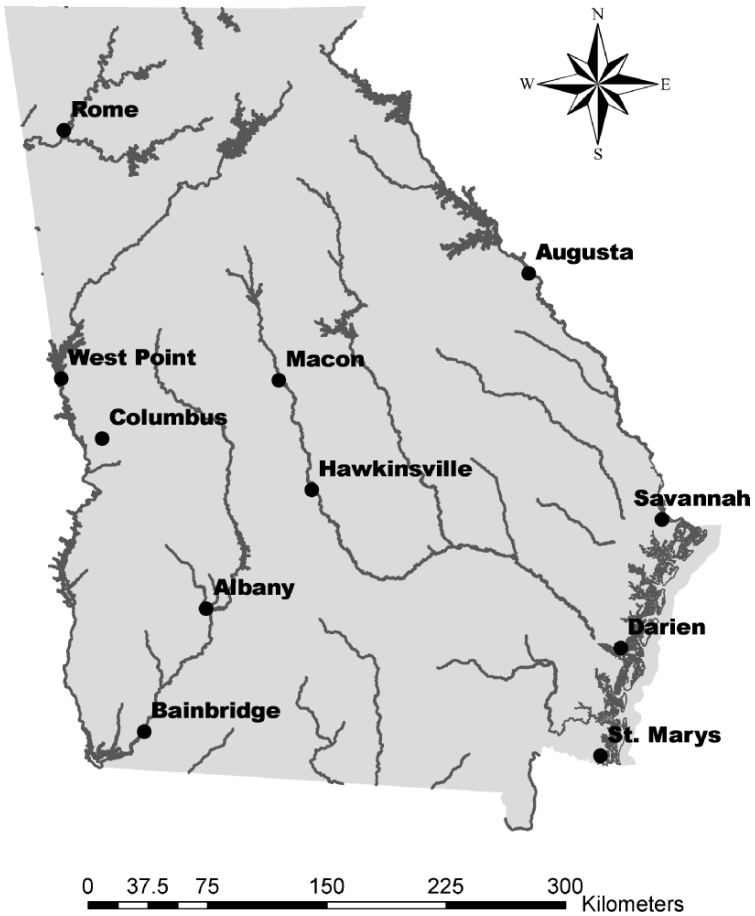

FIGURE 7.1. Georgia's nineteenth-century river towns and current waterfront revitalization efforts (Image by Jason Burns).

the historical significance of these places. Georgia's maritime archaeology program is focused on connecting the past with the present through meaningful interpretation of cultural heritage resources statewide. Revitalization efforts across the state offer the opportunity to bring the past to life and to interpret the maritime history of river towns in a meaningful way.

Georgia's Rivers

From the earliest colonial endeavors to the present, Georgia has always been tied to its rivers. Founded along the banks of the Savannah River in 1733, the state's frontiers expanded from the Savannah south to the Ogeechee River and from the Ogeechee west to the Oconee River. In time these boundaries shifted from

the Oconee to the Ocmulgee River and further west to the Flint River and finally to the Chattahoochee River to form the western boundary of Georgia, while the St. Marys River formed the southern boundary (Chalker, 1970). Georgia's fourteen major river basins (Tennessee, Coosa, Tallapoosa, Chattahoochee, Savannah, Oconee, Ocmulgee, Flint, Ogeechee, Altamaha, Satilla, Suwannee, Ochlockonee, and St. Marys) cut across its five physiographic regions (Cumberland Plateau, Ridge and Valley, Blue Ridge, Piedmont, and Coastal Plain), with most rivers forming in the piedmont and flowing south to the Atlantic Ocean and Gulf of Mexico. These rivers formed the first transportation corridors to the interior and provided suitable outlets for goods moving into and out of Georgia. One invention in Georgia, however, soon transformed the interior forever.

In 1792, Eli Whitney invented the cotton gin at Mulberry Grove Plantation just north of Savannah. This invention, which separated the seed from cotton, meant that the potential productivity of one worker could increase up to fifty times. The resulting technological revolution, coupled with the decrease in cotton prices and the availability of cheap labor, mainly slaves, combined to make the production of cotton "King" in the south (Fleetwood, 1995:83). The soils of the interior of Georgia from the coastal plain through the Blue Ridge supported cotton agriculture as new towns emerged and old towns adapted to process, market, and ship it out. Shipping was done initially on flats, bateaus, barges, and cotton boxes drifted downstream; by the 1820s, however, steamboats emerged as an efficient means to navigate upstream against river currents. Steamers first arrived in Augusta by 1816, in Columbus by 1828, in Macon by 1829, and into Rome by 1836 (Cashin, 1980:71; Chalker, 1970:196; City of Rome, 1985:19; Martin, 1972:14).

As the cotton boom took hold in Georgia, river towns at the head of navigation along the major rivers became collecting points, markets, and distribution centers. Industrial development soon followed as waterpower was harnessed to support textile mills in Augusta, Macon, Rome, West Point, and Columbus. Steamer shipments to Atlantic ports like Savannah, Darien, Brunswick, and St. Marys had competition early. Railroads began to compete with river transportation by 1837 with the completion of the Central and Georgia Railroad from Macon to Savannah (Sullivan, 2003:66). Industrial centers with rail and water transportation played vital roles for the Confederacy in the Civil War as supply points for food, iron works for ammunition, and weaponry and textile mills for clothing (Sullivan, 2003:59). Cotton again fueled the economy after the Civil War.

The post-Civil War textile mill expansion made cities even more prosperous. Fifty-three mills were in operation in Georgia by 1890 as opposed to just thirty-four in 1870 (Sullivan, 2003:130). The industrial growth fueled an urbanization of the fall-line towns as mill villages and allied industries grew up around the mills. Cotton began to decline by the 1920s, however, and never fully recovered after the depression of the 1930s. By the 1950s Georgia had more manufacturing jobs than agriculture jobs and the growth of urban centers was evident by the population explosion of cities like Atlanta, whose population expanded from 65,500 residents in 1890 to 300,000 in 1940 (Sullivan, 2003:153). In the age of the rise of the automobile, people and businesses began to vacate city centers

leaving large abandoned or underutilized sections of once bustling river towns. Historian Edward Cashin (1980:145) summed up the attitude in Augusta in the 1960s and 1970s by saying, "They looked back fondly, sentimentally and faithfully at the old south and at the same time stepped determinedly toward the new south." As Georgia's city leaders looked toward economic prosperity outside of downtowns and waterfronts there already was a burgeoning movement in some areas of the country to revitalize and make relevant city waterfront areas.

Waterfront Revitalization and Maritime Preservation

The waterfront revitalization movement began in the United States in the late 1960s and early 1970s in large port cities like Boston, Baltimore, and San Francisco and spread to European cites such as London and to Australia in Sydney and Melbourne (Hoyle, 2000:3). Today almost any city with a water element (port, ocean, river, lake, canal, or stream) is in one way or another revitalizing their waterfront. Considered to be in the public's best interest as well as playing a role in economic development and revenue generation, waterfront revitalization grew out of four common themes: economic, environmental, social or quality of life issues, and historic preservation (Breen and Rigby, 1996). The environmental movement of the 1970s sprang from the outrage many Americans felt at disintegrating air, land, and water quality. Federal regulations in the United States aimed at cleaning up the environment came with economic incentives and close to fifty billion dollars (US) in federal grants were spent on water projects alone between 1972 and 1992 (Breen and Rigby, 1994:14). Clean water was, and still is, regarded as the basis for a clean environment and water cleanups often play a major role in waterfront revitalization projects for the health of both the environment and the people in surrounding communities.

Economically, deindustrialization of city centers and flight of businesses and people to the suburbs and outlying areas have created large urban areas in need of redevelopment. Businesses shifted to outlying areas as highway systems and rail systems grew to meet their transportation needs, shifting away from waterborne transportation (Breen and Rigby, 1994:10). This shift away from the water left the maritime infrastructure, consisting of wharves, warehouses, barges, and SHIPS, to decay. Waterfront lands also were abandoned as towns treated their rivers as garbage dumps and economic and social barriers.

As communities focus their attention back to their waterfronts, quality of life issues like recreation and tourism become a major factor for revitalization. With the rise of the middle class and the expansion of leisure time people seek out ways to enjoy the waterfronts through jogging, biking, and hiking on trails and greenways, visiting museums and aquariums, or enjoying outdoor festivals at amphitheaters and waterfront venues. All of these factors contribute to the economic bottom line of waterfront revitalization. Georgia residents and tourists spent twenty-six billion dollars on direct and indirect tourism expenditures in 2004 (Governor's Office of Communications, 2005). Direct expenditures include lodging, food, transportation,

recreation, entertainment, and incidentals, while indirect expenditures include purchases of goods and services from travel industry business operators and/or local suppliers. Preservation of waterfront or maritime resources can significantly contribute to these revenue figures.

The historic preservation movement also grew out of the need to preserve a resource that was rapidly being lost or destroyed. A national preservation ethic that arose from the environmental movement coupled with federal tax incentives for reuse of historic buildings paved the way for many downtown and waterfront revitalizations. In Savannah, for example, over seven million dollars (US) has been spent on the rehabilitation of over 7,432 square meters (80,000 square feet) of historic warehouses on River Street (Breen and Rigby, 1994:246). This rehabilitation draws visitors and locals to Savannah's historic riverfront. Heritage tourism and preservation generated two billion dollars in economic revenue for the State of Georgia and created 200,000 jobs in 2001 (Governor's Commission on Georgia History and Historical Tourism, 2003:15). Waterfront revitalization has the ability to affect communities in a variety of ways.

Like most revitalization, waterfront projects have not gone without their critics. Criticisms of these projects usually are of two general types, the first of which includes the very real and complex issue of gentrification in urban areas. As property values rise in revitalized or gentrified districts, poorer residents often are taxed out of the neighborhood, unable to afford to live there anymore (Baumann et al., in press). Collateral to the gentrification problem are the complaints of some area residents over increased traffic and noise as the district's profile is raised and it becomes a popular destination. The second type of complaint focused on waterfront revitalization projects involves the idea that these waterfront areas are actually "invented" places without ties to a past reality in that they create and present a "sanitized image of the maritime past" (Sieber, 1991:128). Festival market places are created along waterfronts to impart a sense of fun and leisure in a place of past work and toil without interpreting the history to new generations. While not claiming to address the full social-economic complexity of these issues, it is toward the second set of criticisms that submerged cultural resource managers have the most to offer city and town planners in terms of shared goals and expertise as they revitalize their waterfronts while also effectively managing the resources.

Submerged Cultural Resourses Management and Waterfront Revitalization

The passage of the United States' National Historic Preservation Act (NHPA) in 1966 tasked every state and territory with the duty of managing its cultural resources including historic buildings, archaeological sites, and traditional cultural properties in cooperation with the federal government. Shipwreck and submerged cultural resources management was addressed by the federal government with the passage of the Abandoned Shipwreck Act (ASA) in 1987, which reaffirmed states' title to certain submerged cultural resources and encouraged individual states to

develop long-term programs to protect, manage, and preserve their submerged cultural resources. Guidelines for the ASA, developed in 1990, identified the basic components of an effective management program, including survey and inventory, evaluation, management of the known resources, protection, and interpretation (National Park Service, 1990).

Submerged cultural resources management involves archaeological survey through remote sensing or diver identification, the protection of archaeological sites through legislation, law enforcement, and public policy development as well as more mundane aspects like permit review, plan implementation, and consultation. Managers strive to protect and interpret sites through a variety of means, but it is through public education about submerged resources and the drive to instill a preservation ethic in these non-renewable resources where most public efforts occur (for a complete description of public aspects of submerged cultural resources interpretation see Spirek and Scott-Ireton, 2003). Often the goals of submerged cultural resources management gel with the goals of other disciplines and partnerships can be achieved to meet both sets of needs.

The goals of waterfront revitalization efforts are to create or allow a level of public access to waterfronts either physically or visibly, to rehabilitate or re-use derelict waterfronts which have a history of their own, and to achieve some economic regeneration or development (Fagence, 1995:137). Through the social improvement of waterfronts and their physical restructuring or refurbishment, submerged cultural resource managers can play a role in interpreting the heritage of the waterfronts to an entirely new generation.

Survey and inventory programs prior to revitalization allow managers to plan for known or unknown cultural resources that may be in the project areas. Historical and archival research about the waterfronts provides a detailed study of a topic which may have been overlooked in revitalization efforts and supplies necessary information for interpretive signage on river walks and pedestrian bridges or overlooks, and for brochures, posters, and museum displays. To instill a sense of ownership of the resources in their backyard, avocational underwater archaeology groups can be charged with doing the research and taking the lead in these efforts. Underwater trails or parks can provide a recreational outlet as well as raising tourism numbers and dollars for local communities. Waterfront revitalization efforts and underwater archaeology projects currently are underway in Georgia in West Point on the Chattahoochee River, Rome on the Coosa River, and Macon and Hawkinsville on the Ocmulgee River.

Georgia's Underwater Archaeology Program

Georgia's formal underwater archaeology program began in September of 2003 with the hiring of the first underwater archaeologist at the Georgia Department of Natural Resources (DNR), Historic Preservation Division (HPD) in the Office of the State Archaeologist (OSA). Prior to that time, management of Georgia's submerged cultural resources came in the form of supporting others in their research, managing

known sites through the NHPA Section 106 process, and developing context studies for the interpretation of submerged resources (see Elliott, 2003; Elliott et al., 2000; Watts, 2006; Wright, 1987). Georgia's late entry into underwater archaeology mirrors the relatively recent rise of terrestrial archaeology in the state.

Historic preservation in Georgia began in the 1950s with the creation of the Georgia Historical Commission. This early organization focused on purchasing historic and archaeological sites and on interpreting the Civil War throughout the state through historic markers (Lyon, 1999:77). With the passage of the NHPA in 1966 and the establishment of the State Historic Preservation Office (SHPO) in 1969 the groundwork was laid for the historic preservation movement in Georgia. By 1973, the SHPO's office had been moved to the DNR and a State Archaeologist position had been created at the State University of West Georgia. The state archaeologist, who was appointed by the governor, was to "direct research on state lands, preserve and display objects, carry out fundamental research and educate the public about archaeological resources" (Crass and Warner, 2004:110). The position, however, was never fully funded and became more advisory in nature. Universities rather than the state carried out early archaeology in Georgia.

Georgia archaeology began in the 1930s with the Works Progress Administration's excavations at Ocmulgee Old Fields in Macon (now Ocmulgee National Monument). This early work eventually led to the creation of the anthropology program at the University of Georgia. University archaeologists dominated the research until the rise of cultural resource management archaeology in the 1970s and 1980s. The professional community of archaeologists that came out of the 1980s and 1990s eventually called for a coordinated statewide archaeology program that led to the creation of the current Office of the State Archaeologist in 1996 (Crass and Warner, 2004:114) This newly created, fully funded position combined the past efforts of the old office with the new functions of compliance, technical assistance, public outreach, and law enforcement, and provided for more staff members and increased funding. The state was able to direct archaeology programs and to effectively manage its resources. The underwater archaeology program was the next step.

Most of the underwater archaeology that has taken place in Georgia has been through the federally mandated efforts of the U.S. Army Corps of Engineers (USACE) Savannah District and its archaeologist Judy Wood. Several harbor-deepening projects in Savannah account for the majority of these projects (Hall, 1993; Krivor, 2003; Ledbetter and Doyon, 1984; Watts, 1996; Wood, 1983). Other USACE districts including Mobile, Alabama, and Jacksonville, Florida, also have carried out projects (Gibson et al., 1980; Mistovich, 1986; Watts, 1995). The Georgia Department of Transportation is another state agency that funds underwater work (Watts, 2005). Archaeologists from East Carolina University conducted some university-based research in the 1980s on the Chattahoochee River in Columbus, Georgia (Watts et al., 1982; Watts et al., 1990). Other research has come in the form of small-scale studies on inland rivers and creeks and isolated permit actions (Anderson et al., 1994; Babits, 1982, 1983, 1984; Elliott, 1988; Elliott, 2001; Watts, 2000; Wright, 1984).

In 1999 with the new statewide archaeology effort underway, the OSA contracted Southern Research Historic Preservation Consultants to study other underwater archaeology programs throughout the United States to begin formulating plans for Georgia's program (Elliott et al., 2000). Context studies focusing on Georgia's inland and offshore waters also were begun (Elliott, 2003; Watts, in press). Finally, in 2002, the Commissioner of the Georgia Department of Natural Resources charged the newly formed Underwater Archaeology Study Council to identify the components of a successful, long-term underwater archaeology program. The council consisted of archaeologists, sport divers, artifact collectors, concerned citizens, and elected officials. Their recommendations included identifying sites on both state and private property, preserving sites and artifacts through stewardship programs, involving students and the public in research and preservation activities, training sport divers in site preservation and reporting as well as ethics and stewardship, and educating schoolchildren and the public in the importance of preserving submerged cultural resources (Underwater Archaeology Study Council, 2002). These recommendations, as well as the guidelines of the ASA, form the core of the underwater archaeology program as it relates to the current waterfront revitalization programs in West Point and Rome. Project elements include public education, inventory, and survey as well as the training of local sport divers to become the stewards of their past.

The West Point, Georgia, Underwater Archaeology Study

West Point lies on the Chattahoochee River in Troup County (see Figure 1). Incorporated in 1831, the Indian trading post grew into a railroad hub with the arrival of the Montgomery and West Point railroad in 1851 and the Atlanta and West Point railroad in 1854 (University of Georgia, 2002:6). West Point flourished as a cotton market and collecting point and relied on its railroads for supplies and communications. During the closing days of the Civil War, the Battle of West Point was fought as the town, its bridges, and infrastructure was sacked and burned. Rebuilding after the war, cotton again ruled the town's economy as two textile mills began production by 1869, utilizing the Chattahoochee River for power (University of Georgia, 2002:6). The textile industry grew and by 1880 the West Point Manufacturing Company, today's West Point Stevens, expanded its mills and began to employ steamboats.

Navigation on the upper Chattahoochee above Columbus was hampered by textile milldams below West Point and was confined to a thirty-eight mile stretch of the river between West Point and Franklin (Frazier, 2004:1). West Point Manufacturing employed five steamers transporting textiles and people from the mills to the railroads in West Point. West Point served as the center of the mill economy in the region throughout the nineteenth and twentieth centuries. Despite a general decline in the textile industry following World War II, West Point rebounded in the 1950s as mills consolidated and merged. Decline in the textile industry in West Point is a relatively recent occurrence as the industry struggles

FIGURE 7.2. Chattahoochee River at West Point, Georgia (Photo by Jason Burns).

to keep up with overseas competition. Census numbers reported a steady population decline in the city between 1980 and 2000, from 4,294 to 3,382 (U.S. Census Bureau, 2000).

The Chattahoochee River in downtown West Point today is a mixture of current and abandoned railroads, public works yards and public buildings (City Hall, Fire and Police Stations), and abandoned bridge rights-of-way (Figure 7.2). A series of bridges has been built in the same general location since the first wooden covered bridge was built in 1838 by former slave and southern bridge builder Horace King (West Georgia Underwater Archaeology Society, 2004). Flooding of the Chattahoochee in 1886, 1901, 1912, 1915, 1918, 1936, 1948, and again in 1961 washed out the bridges and generally altered the maritime landscape until the U.S. Army Corps of Engineers built West Point Lake between 1962 and 1971 for flood control (Willoughby, 1999:163). The remains of over 150 years of history lie on the bottom of the Chattahoochee River at West Point.

Local sport divers in the West Point area (LaGrange and West Point, Georgia, and Valley and Lannett, Alabama) approached the Georgia Department of Natural Resources in September 2002 to volunteer their time to map the resources in the Chattahoochee River. Concerned about uncontrolled artifact collecting and seeking an outlet for local diving, the West Georgia Underwater Archaeology Society (WGUAS) was organized and took the lead in the archaeological effort. DNR arranged for training of the group through the South Carolina Institute of

Archaeology and Anthropology's Sport Diver Archaeology Management Program and its instructor Dr. Lynn Harris. Avocational training is a tool for submerged cultural resource managers to educate local divers and the public about their resources and to instill a sense of ownership of the resources. Divers and local people can then act as the eyes and ears of the community while also serving as a volunteer labor force.

Side-scan sonar operations conducted by DNR in 2002 verified the remains of a stern-wheel steamship (thought to be *Belle Lanier*), the remains of the 1838 Horace King covered bridge (possibly the oldest structure in West Point still partially extant), the remains of the 1866 covered bridge (built to replace the 1838 bridge burned during the Civil War), and an 1885 iron bridge destroyed during one of the many floods. Other site features include the remains of a 1930s-era racing boat, wagons associated with the Civil War destruction of the 1864 railroad bridge upstream and their accompanying mule shoes, as well as artifact debris fields also associated with the destruction of the 1864 railroad bridge.

Investigations in 2003 were hampered by constant water releases from West Point Dam above the city of West Point due to equipment malfunction and by continual electrical generation due to near record rainfall (diving has to be performed in cooperation with the U.S. Army Corps Engineers release of water at West Point Lake). Locally heavy flooding would have been much worse if the dam had not been in place. Fieldwork resumed in 2004 while press coverage of the underwater investigations, coupled with educational lectures and informational sessions held riverside during fieldwork, generated excitement in the local community. Plans to integrate the underwater research into downtown revitalization efforts already were being discussed by city officials.

Early in 2002, the City of West Point in cooperation with the University of Georgia's College of Environment and Design and the Georgia Department of Community Affairs held an intensive planning session or *charrette* involving city leaders, planners, and citizens to "provide a fresh viewpoint on revitalization opportunities" (University of Georgia, 2002:5). Issues that came out of the session included discussions about past failed urban renewal projects and poor roadway designs and traffic flow patterns, as well as recognition of the importance of the Chattahoochee River as a "tremendous scenic asset" with "little recreational access to the waterfront" (University of Georgia, 2002:5). As recommendations emerged from the session, it became clear that the river was an asset to build upon.

Key recommendations included visitor and resident activities along the Chattahoochee River with overlooks, river walks, informational plaques, and educational materials centering on the new riverfront Civic Plaza (University of Georgia, 2002:22). This new plaza is located immediately shoreward of the underwater archaeology site adjacent to West Point's public buildings. Plans also call for the reinstallation of a pedestrian bridge to occupy the site of the washed-out 1885 iron bridge. In August of 2004, the City of West Point acted on these recommendations by accepting the donation of 72 hectares (178 acres) of riverfront land from the Trust for Public Land. This donation will form the basis of a riverside trail system connecting the U.S. Army Corps of Engineers West Point

Lake to downtown West Point (Trust for Public Land, 2004). Integrating the city's revitalization efforts with the underwater archaeology project was a natural progression.

Further archaeological reconnaissance by the West Georgia Underwater Archaeology Society in 2004 and 2005 identified the remains of another steamboat (*C.W. Jones*), three sets of anchors which may mark the locations of other steamboat wrecks, and extensive artifact debris fields that were uncovered during the 2003 flooding. This work also was accompanied by further site looting by sport divers not associated with the group. To assert control over the site, DNR issued the WGUAS a permit for exploration on the site in conjunction with the DNR.

In a proactive approach to management, DNR currently is planning Georgia's first underwater archaeology trail or underwater park to encourage the community of West Point to take a more active role in the management of their submerged cultural resources while hopefully boosting the local tourist and allied businesses economies. The archaeological work also is providing the basis for interpretive signage along the planned trail and for exhibits in a planned transportation museum in West Point. Education programs including public archaeology days, lectures to civic organizations, and teacher workshops are achieving the goals of spreading word about the project and getting the public interested in their own archaeology.

The program in West Point has been a success because all parties involved are encouraged and excited about the possibilities. The DNR is able to manage the public resource through stewardship and to educate the public and local sport divers, as well as provide some economic stimulus. The City of West Point sees great potential in encouraging archaeological work in the river as it only enhances their revitalization efforts. Early involvement in the planning process is the key to success in West Point, but this does not have to be the case in all instances. If a city is interested in interpreting its maritime past through maritime archaeology, the research can be carried out after the fact and added to enhance an already existing waterfront project.

Rome, Georgia, Underwater Archaeology and Maritime History Survey

Located in northwest Georgia at the confluence of the Oostanaula, Etowah, and Coosa Rivers, the city of Rome serves as the seat of Floyd County and always has been a regional center for commerce and transportation (see Figure 1). Founded in 1834 because of its location on the rivers, Rome became a cotton market and developed iron foundries as well as lumberyards and tanneries (Pullen, 2005:2). Following the Civil War, cotton again dominated the industry as textile mills were established. Steamboats were utilized as a means for transportation beginning in 1836 through the 1940s when the last steamer *Leota* sank at her moorings south of Rome in Gadsden, Alabama (Sargent, 1995:26). Decline in the textile and later

carpet manufacturing industry was late in Rome, but the historic downtown and waterfront experienced the same flight of major retail and businesses as other southern cities in 1950s and 1960s. Recognizing the need to revitalize its central business district and preserve its historic resources, Rome citizens took the lead in early revitalization efforts locally and statewide.

Rome was one of Georgia's first communities to adopt a local historic zoning ordinance in 1979 (Morgan et al., 1997:2). By 1981 a downtown development authority program had been established, as well as an historic main street program. In the 1990s, downtown revitalization focused on the construction of a new civic center, library, and joint jurisdictional law enforcement center (Morgan et al., 1997:2). The National Trust for Historic Preservation recognized Rome nationally in 2003 as a recipient of a Great American Main Street Award (Pullen, 2005:4). Rome's recent attention to revitalization turned to its historic waterfront.

In response to a technical assistance request from a citizen in Rome, underwater archaeologists from the Georgia Department of Natural Resources toured the Oostanaula, Etowah, and Coosa Rivers in downtown Rome to assess the potential for an underwater archaeology project. During this tour, downtown revitalization efforts as well as plans for the waterfront were discussed. While examining the location for a planned pedestrian bridge, a previously unknown wrecked or abandoned vessel was identified in the Area of Potential Affect. Plans for avoidance of the resource generated more questions about what else might be located along Rome's waterfront. This survey need coupled with local interest in the waters and the need to educate the public led to the 2004 Rome, Georgia, Underwater Archaeology and Maritime History Project.

This DNR-led effort combined remote sensing surveys, historical research, public education, sport diver education/training and the development of a museum exhibit to tell the story of Rome's maritime history while providing vital information to resource managers planning for the development of Rome's waterfront. Avocational underwater archaeologists from the Florida-based Marine Archaeological Research & Conservation (MARC) team were brought in to conduct magnetometer surveys as well as to train local sport divers in the basic techniques of underwater archaeology. The MARC team also scoured the local archives while conducting public lectures in conjunction with DNR archaeologists. The City of Rome supported the project with the donation of fuel and the use of a twenty-six foot pontoon boat to ferry the divers to different locations in the rivers.

The highly successful project led to the founding of the North Georgia Underwater Archaeology Society (NGUAS), a local underwater archaeology avocational group based in the Rome and Cartersville, Georgia, area. NGUAS and MARC mapped the remains of two wharves, the steamboat *Dixie*, one sand barge, two possible ferries, and the shore-side landing of an early Cherokee river ferry, as well as recorded several isolated finds and other shoreline features (MARC, 2004). The remote sensing survey was responsible for identifying several of these features. Public lectures held in conjunction with the survey generated tremendous interest in the project and provided an outlet for citizens to

share their knowledge of the waterways. A museum exhibit highlighting the work and the findings currently is on display at the Rome Area History Museum in downtown Rome. The results also are being utilized by the City of Rome in preparing interpretive signage for the new river walk and overlooks on the new pedestrian bridge. Research is ongoing as new sites are investigated by the NGUAS. Additionally, this model for research is being utilized in central Georgia on the Ocmulgee River in Macon and Hawkinsville.

Current Projects: Building the Maritime Cultural Landscape Of Georgia

Building on the success of projects in West Point and Rome, the Georgia Department of Natural Resources currently is developing waterfront projects in Macon and Hawkinsville on the Ocmulgee River in central Georgia. Waterfront tours with local city officials have been conducted in Hawkinsville, and public lectures and information sessions have encouraged local people to share their knowledge of the river with DNR. These sessions form the basis for areas to be investigated as known sites are recorded first.

Local sport diver involvement has grown from a few divers to a formal avocational underwater archaeology group associated with the Ocmulgee Archaeology Society (OAS), a local chapter of the Society for Georgia Archaeology. OAS volunteers partnered with Mercer University students in Macon to conduct historical research on the Ocmulgee River. Exploratory dives in downtown Macon revealed artifact scatters and material culture associated with nineteenth-century steamboat landings. Macon is developing the Ocmulgee Heritage Trail, which will stretch 16 kilometers (10 miles) from the Ocmulgee National Monument Native American mound complex through downtown Macon to a site known as the Old Waterworks. This trail is "modeled upon other river-city efforts" and is designed to "attract locals and tourists alike to enjoy the Ocmulgee River" (New Town Macon, 2005). Hawkinsville also is developing a waterfront park which will include a new boat launching area as well as a possible fishing pier and river overlook. The OAS and DNR plan to conduct more surveys and to develop further partnerships on the Ocmulgee River as these towns move forward with revitalization efforts.

Almost every Georgia community that has waterfront access is in the process of developing some type of revitalization effort or is planning for future recreation benefits. Existing river walks in Albany, Augusta, Bainbridge, and Columbus can only benefit from a more overt interpretation of their maritime cultural heritage (Figure 7.3).

Coastal port cities including Savannah, Darien, Brunswick, and St. Marys also are undergoing revitalization efforts. Each of these projects has the ability to contribute to the overall knowledge base of submerged cultural resources in the state. Each of these projects also can serve as an outlet for educating the public about their maritime history while managing resources for preservation and future

FIGURE 7.3. Augusta's river walk and downtown marina on the Savannah River (Photo by Jason Burns).

development in accordance with state and federal preservation law. Combining the efforts of archaeologists and city planners provides the necessary information needed for both parties. Combined archaeological and historical investigations reveal where significant maritime resources are located and provide information for interpretive signage, educational programs, and museum displays. In turn, increased tourism from visitors and local people to the waterfront areas of these towns and cities enhances local economies and provides a much-needed economic incentive for city planners looking closely at furthering maritime revitalization efforts.

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8
Lake George, New York: Making Shipwrecks Speak

Joseph W. Zarzynski

Introduction

Lake George has a rich military and maritime heritage that spans several centuries. The legacy of this incredible history is encapsulated in the hundreds of submerged cultural resources - shipwrecks, marine rails, and waterfront structures like docks and wharves - found in the 51.2 kilometer (32 mile) long waterway located in the Adirondack Mountains of northeastern New York state. The reality is that several groups want a piece of the so-called "shipwreck pie." To archaeologists, these submerged cultural resources are history's footprints. They help answer the many questions that social scientists ask when trying to decipher and interpret the past. To scuba enthusiasts, however, wrecks are opportunities to "Dive Into History." To local, state, and federal government agencies, submerged vessels often equate to complex management strategies that try to balance public access with historic preservation. For Lake George, where recreational and cultural tourism is an integral part of the local economy, the lure of sunken vessels is an emerging asset since they help pack excursion boats and fill lakeside motels. Following the archaeological investigation of these submerged cultural resources a variety of interpretation strategies have been employed. Recently, an emerging partnership, the alliance of underwater archaeologists and multi-media technicians, is at work at Lake George "making shipwrecks speak."

Early Interest in Shipwrecks

Recognition of the potential of shipwrecks to stimulate tourism and generate historical interest at Lake George, often called "the Queen of American Lakes," began as early as 1893. On June 10th of that year, the *Lake George Mirror* newspaper printed an article entitled "The Sunken Bateaux of Lake George." It described four sunken warships visible in the shallows of the lake's clear mountain waters. The four vessels were eighteenth-century bateaux.

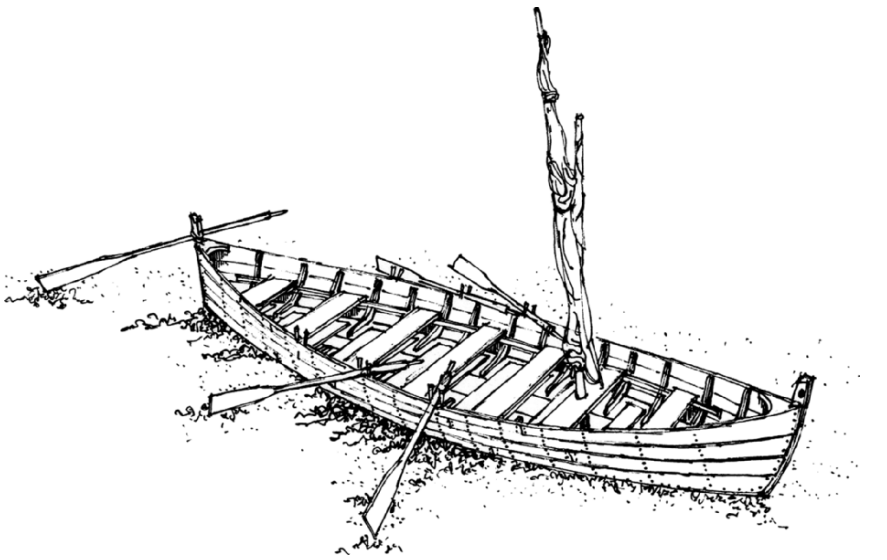

FIGURE 8.1. Artist's depiction of what a typical colonial bateau would have looked like (Illustration courtesy of Mark Peckham).

The colonial bateau (Figure 8.1) played a key role at Lake George in both the French and Indian War (1755-1763) and the American Revolution (1775-1783). The word "bateau" is French for "boat." Its origins, however, show Dutch influence. The bateau was flat-bottomed, 7.62 to 10.67 meters (25 to 35 feet) long, pointed at bow and stern, and constructed of pine planks and oak frames. It could be rowed, poled in shallow water, or sailed if the wind was behind it. An oar lashed off the stern, rather than a rudder, was used for steerage (Hager, 1987:20-27).

In 1758, British and provincial soldiers deliberately sank much of their fleet at Lake George. This mass scuttling of warships was one of the great maritime events in American history. In March of the previous year, the French marched south from the Champlain Valley and crossed ice-covered Lake George to attack the British garrison of Fort William Henry. The fortress held, but the French nonetheless burned 350 bateaux and other larger vessels resting on shore. Thus, the British learned a valuable lesson about protecting their warships over the winter (Bellico, 2001:39-40).

Therefore, in the autumn of 1758 as winter approached and without a fort to protect their fleet (Fort William Henry was destroyed by the French in a second raid in 1757), the British deliberately sank their SHIPS as a cold and wet storage to protect the vessels from the enemy. Known today as "The Sunken Fleet of 1758," the submerged squadron consisted of two row galleys, two radeaux, the sloop *Halifax*, and 260 bateaux (Bellico, 2001:75-76).

The June 10, 1893, *Lake George Mirror* newspaper article reported on several bateaux observed in the shallows of the lake. The news article suggested that some of these sunken bateaux might be raised so that, "Lake George visitors will

have the pleasure of looking . . . [at] crafts built more than one hundred and forty years ago," an early realization of the potential of these shipwrecks to help tell the lake's history and to promote tourism.

Ten years later the salvage of a French and Indian War shipwreck from Lake George met with a disastrous result. On July 2, 1903, a 13.41 meter long (44 feet), 4.27 meter (14 feet) wide, and 2.13 meter (7 feet) deep colonial shipwreck was raised from 4.58 meters (15 feet) of water from the south end of Lake George. This British vessel is supposed to have been one of those sunk by French soldiers during their March 1757 raid. The wooden skeleton yielded several colonial artifacts including a 1743 Spanish coin. Shortly after its discovery, however, the hulk was cut up for souvenirs. A decade-and-a-half ago, several oak frames from this warship were donated to the Lake George Historical Association, a small lakeside historical society and museum. Unfortunately, the timbers were in poor condition due to lack of proper conservation treatment (Bellico, 2001:77).

Over thirty years after the 1903 salvage and destruction of a French and Indian War shipwreck, a more preservation-focused ethic began to take root. The *Lake George Mirror* newspaper of August 18, 1934, published a short article suggesting that a "war bateaux [sic]" be raised and "properly housed" in a Lake George museum. Although not recognizing the difficulties and costs to properly undertake such a venture, the 1934 news story did recognize the importance of preserving Lake George's colonial maritime past.

Another event from the 1930s also shows the public's interest in shipwrecks. A 1969 New York State publication on shipwreck diving noted that in the late 1930s, a homemade diving apparatus was fashioned and a diver explored a group of sunken bateaux in Lake George (Scudiere, 1969:18).

With the invention and spread of scuba, intrepid underwater explorers began to find history on the bottomlands of Lake George. W. Carleton Dunn made several scuba dives in 1953 into Lake George and retrieved artifacts for the Fort William Henry Corporation, a group of businessmen who constructed a replica of Fort William Henry at the south end of the lake. During those dives Dunn reported seeing mounds of rocks sitting upon sunken warships, probably bateaux (W.C. Dunn, personal communication, 1997).

Colonel Lorenzo Hagglund, the underwater explorer who in 1935 found and raised Benedict Arnold's gondola *Philadelphia* from nearby Lake Champlain, also spent time diving in Lake George. His searches at Lake George in the 1950s, however, were unsuccessful as he tried to locate a sunken French and Indian War-era floating gun battery (Bellico, 1992:79).

The 1960s

Modern day interest in Lake George's Sunken Fleet of 1758 began in 1960 when two teenage scuba divers, Fred Bolt and Dick LaVoy, located 10 to 15 bateaux lying in the southeast corner of the lake (Barr, 1960). A couple of months after this find, several sunken bateaux, probably three, were raised (Scudiere, 1969:18). After conservation treatment, one bateau was exhibited for years at the Adirondack Museum in Blue Mountain Lake, New York. The others were put into

archival storage by the state government, the custodial caretaker of these historic warships.

In 1963-1964, archaeological diver Terry Crandall conducted scuba searches in Lake George looking for more colonial shipwrecks. He located and photographed several clusters of sunken bateaux while working for the Adirondack Museum. Crandall's field study was performed under an archaeological permit issued by the State of New York. Crandall's pioneering work in underwater archaeology collected baseline data on these shipwrecks that were used a quarter-of-a-century later by an underwater archaeology group called Bateaux Below, Inc.

On July 27, 1965, the *New York Times* printed an article entitled "Lake George Divers Find 1758 Battle Craft." The story outlined what were called "salvage operations" by over 30 State Police scuba divers who planned to raise "the remains of at least eight bateaux" scuttled in 1758 (Johnston, 1965). Unfortunately, few details of this salvage operation have been found except for some sparse contemporary newspaper accounts. In fact, this salvage actually created an atmosphere that discouraged future archaeological study of Lake George's Sunken Fleet of 1758.

Bateaux Below, Inc.

In 1987, a group of scuba divers trained in underwater archaeology began mapping seven French and Indian War shipwrecks known as the Wiawaka bateaux. This grass-roots project was the genesis for the formation of an underwater archaeology group known as Bateaux Below, Inc., a not-for-profit educational corporation. Their survey of the seven Wiawaka bateaux revealed much about this cluster of eighteenth-century shipwrecks.

The Wiawaka Bateaux (Figure 8.2) consisted of seven vessels, each approximately 9.14 meters (30 feet) long. The shipwrecks rested on a slope in 6 to 12 meters (20 to 40 feet) of water. Rocks used to sink the bateaux were inside the hulls and holes drilled into the bottom planking to facilitate sinking were visible. After four years of archival research and archaeological fieldwork, Bateaux Below completed its study of this site. The group then worked with the New York State Office of Parks, Recreation and Historic Places to get the seven Wiawaka Bateaux listed on the National Register of Historic Places in 1992. In 1996, Bateaux Below in conjunction with the Wiawaka Holiday House erected a blue-and-yellow historic marker on shore that overlooks the seven shipwrecks and helps to interpret the site for the public. The signage reads:

WIAWAKA BATEAUX

7 FRENCH & INDIAN WAR
BATEAUX SUNK HERE IN
1758. LISTED ON NATIONAL
REGISTER OF HISTORIC PLACES
IN 1992.
BATEAUX
BELOW, INC.

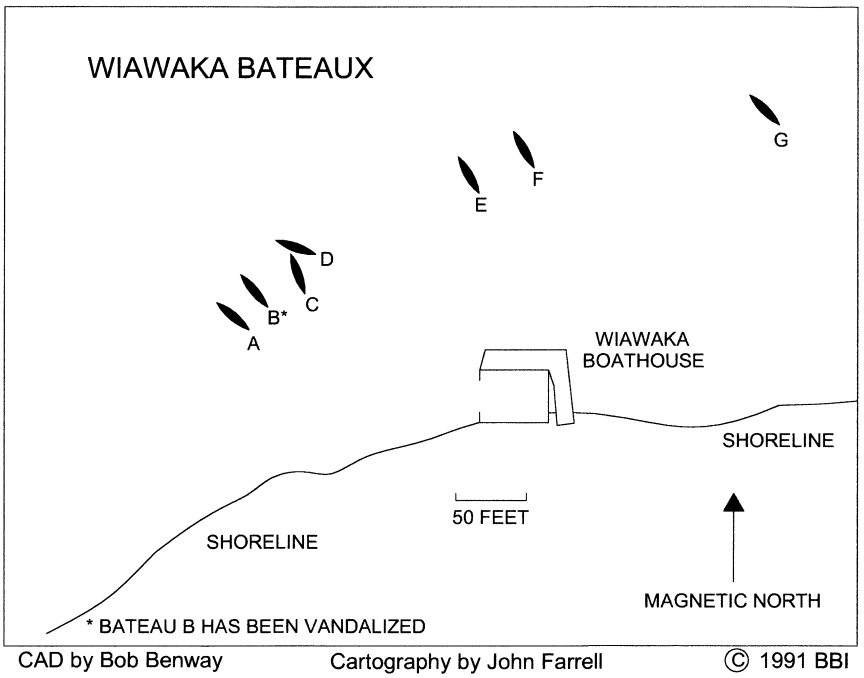

FIGURE 8.2. Site plan of seven 1758 British bateau shipwrecks known as the Wiawaka Bateaux (Image courtesy of Bateaux Below, Inc.).

On June 26, 1990, members of Bateaux Below using a Klein 595 side-scan sonar discovered another significant shipwreck of the Sunken Fleet of 1758, *Land Tortoise*, an intact 15.85 meter long (52 feet) and 5.49 meter (18 feet) wide radeau. This vessel is recognized by the Smithsonian Institution as "the oldest intact war vessel in North America" (Lundeberg, 1995). The radeau sits upright in 32.61 meters (107 feet) of water, well-preserved by its cold, freshwater environment. Unlike many shipwrecks in freshwater bodies in the United States, it is free of zebra mussels.

Radeau, a French word for "raft," is a type of floating gun battery. The shipwreck was studied from 1991-1993 by Bateaux Below under the direction of D.K. Abbass, a Rhode Island archaeologist. A unique aspect of this archaeological study was that the team had no major grant funding, thus project members contributed not only "sweat equity," many also contributed considerable out-of-pocket funding to complete the project.

Since *Land Tortoise* is the only existing radeau-class vessel that has been found, much was learned from its study. *Land Tortoise* is seven-sided with an oak hull and upper pine bulwarks. It is undecked and has 16 oak frames per side. For every hull frame there is a corresponding stanchion to support the upper bulwarks.

Two view holes are located in the bow, one port and one starboard. The radeau has four mooring rings, two forward and two aft, and is fastened with wooden treenails and iron nails or drifts. *Land Tortoise* has 26 sweep holes, 13 port and 13 starboard. Mast steps were found inside, but no rigging was discovered. It was pierced for seven cannons, four on the port and three on the starboard. The radeau's hull is caulked and it appears to be tarred. Because *Land Tortoise* had a short career and was stripped of her armament before sinking, no colonial artifacts were found. The radeau's real wealth is its unusual naval design and its intact structural integrity (Abbass et al., 1992:142-147).

In 1995, *Land Tortoise* was listed on the National Register of Historic Places. In 1998, the sunken warship was designated a National Historic Landmark, becoming the sixth shipwreck with that recognition and joining the Civil War vessels *Maple Leaf* and *Monitor*, the Spanish-American War vessel *Antonio Lopez*, and World War II warships USS *Arizona* and USS *Utah* to hold that honor.

Submerged Heritage Preserves

To share these submerged cultural resources with the public, the State of New York, in partnership with several local government agencies and not-for-profit corporations, created New York's first shipwreck preserves in September 1993. Two shipwreck sites, a 13.72 meter (45 feet) long, 1906-built gasoline-powered launch named *Forward*, and the seven Wiawaka bateau wrecks dubbed "The Sunken Fleet of 1758," opened as an underwater park for divers. The sites are marked by mooring and navigation buoys. Trail lines and signage underwater guide divers as they tour the shipwreck preserves (Figure 8.3). State-produced brochures (Figure 8.4) are available that provide a site plan, vessel history, suggested reading list, regulations, emergency information, and a map to locate the preserve sites.

Over 1997-1998, the *Forward* shipwreck preserve was transformed into "The *Forward* Underwater Classroom." This site remodeling was financed through a small grant from the Fund for Lake George, Inc. A second vessel was deliberately sunk at the *Forward* site and several stations were created where scuba enthusiasts learn about the lake's geology, fish life, vegetation, and color loss at depth. An archaeological recording grid was erected over one shipwreck to simulate an archaeological field study site. At two stations underwater, divers use thermometers and recording slates stationed at different depths to record water temperatures. Furthermore, an on-site secchi disk lets divers measure and record horizontal water transparency.

Also in 1997, "The Sunken Fleet of 1758" preserve was enhanced. A 7.01 meter (23 feet) long, two-thirds scale replica of a colonial bateau was deliberately sunk into the lake. Not only did this exercise test hypothesized methods eighteenth century soldiers used to sink bateaux with the goal of retrieving them, the exercise also had two other goals. The first goal was to allow divers to see what an intact bateau looked like and to compare the replica with 1758 bateaux. The

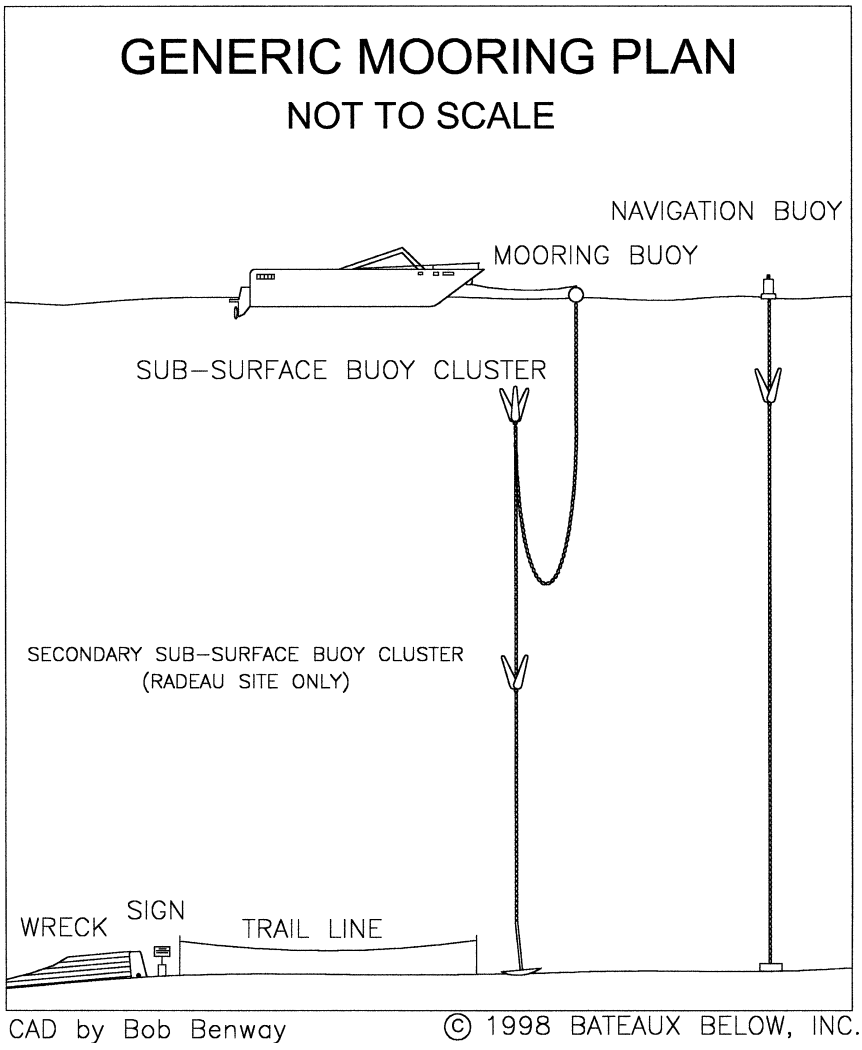

FIGURE 8.3. Generic Mooring Plan for Lake George's "Submerged Heritage Preserves" (Image courtesy of Bateaux Below, Inc.).

second goal was to provide archaeologists a way to examine how a bateau might deteriorate in a freshwater environment. "The *Forward* Underwater Classroom" and "The Sunken Fleet of 1758" are open to diver visitation from early summer into the autumn and can be visited by divers on a first-come, first-served basis.

In August 1994, *Land Tortoise* was added to Lake George's underwater state park. Due to the vessel's historical importance and because it is a deep dive, diver visitation is by registration only. Experienced divers can visit the radeau during three time slots a day from the second weekend in June through the first Monday

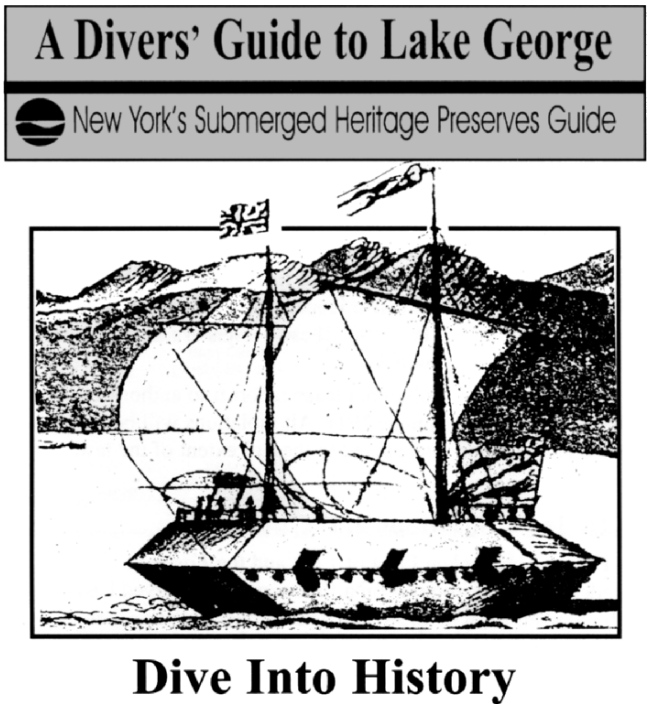

FIGURE 8.4. The banner illustration for Lake George's "Submerged Heritage Preserves" informational brochure (Image courtesy of New York State Department of Environmental Conservation).

in September. Prior to opening the site, a white plastic chain perimeter was erected around the vessel to discourage touching this fragile French and Indian War shipwreck (Zarzynski 2001:81-84).

It is hoped that in the near future the state will open another preserve site to diving. This is a geological preserve called "Maria's Reef." The 182.89 meter (600 feet) long and 18.29 to 22.86 meter (60 to 75 feet) wide limestone outcropping lies in 6.1 to 21.37 meters (20 to 70 feet) of water. "Maria's Reef" would be unique, the first underwater park in New York set up for divers to explore a submerged geological site. The proposed limestone outcropping preserve would have minimal signage underwater, a conscious attempt to retain its natural beauty.

The geological site was mapped in 2001 by Vincent J. Capone of Bateaux Below using an Odom Hydrotrac sonar and a RoxAnn Groundmaster; the latter capable of identifying the type of lake bottom. Divers would have needed many months to replicate what remote sensing accomplished in less than a day and undoubtedly would not have achieved the same degree of accuracy as the high-tech equipment. Scuba teams later were used to finalize mapping details (Zarzynski and Benway, 2005).

The Submerged Heritage Preserves are administered by the New York State Department of Environmental Conservation and are an experiment in public

access for sport divers. Most scuba divers treat these submerged cultural resources with great respect. There has been, however, minor damage to some shipwrecks and even to the preserve hardware. Because this underwater state park has no rangers on site to keep order and protect the sites, divers are on their own good behavior. Fortunately, diver-damage to Lake George's Submerged Heritage Preserves has been minimal.

1758 Military Dock

A submerged colonial waterfront structure, known as the 1758 military dock, is an intriguing cultural resource that was the focus of a recent archaeological investigation. The 1758-built dock's remaining visible section lies in .91 to 2.44 meters (3 to 8 feet) of water at the south end of the lake. This rock-and-wooden structure launched British General Jeffery Amherst's 1759 fleet of nearly 800 warships and 11,000 soldiers in an expedition that resulted in the British seizing two French strongholds in nearby Champlain Valley (Bellico, 2001:85-98). This sunken military dock was studied by Bateaux Below in 2002. Further fieldwork in 2004 revealed three disarticulated dock timbers lying off the submerged structure that were mapped into the site plan. In 1992, Lake George Historical Association and Bateaux Below erected a blue-and-yellow state historic marker at the site. This signage reads:

MILITARY DOCK

DURING THE FRENCH AND INDIAN
WAR, BRITISH AND PROVINCIAL
TROOPS USED A DOCK NEAR
HERE FOR LOADING SOLDIERS,
ARTILLERY, AND SUPPLIES.

LAKE GEORGE
HISTORICAL ASSN

Cadet (ex Olive) Steam Launch

On November 8, 1997, Bateaux Below discovered a shipwreck lying in Lake George off the town of Bolton. The Klein 2000 side-scan sonar used to find the shipwreck was provided by Vincent J. Capone, a sonar expert and a member of Bateaux Below. Several days after the discovery, a scuba team ground-truthed the sonar target. The dive revealed it was a previously unknown shipwreck - *Cadet*, a 14.63 meter (48 feet) long, 1893-built wooden steam launch. That find began a multi-year process of studying and interpreting the vessel, the best-preserved shipwreck of its class found in the northeastern United States. In 2005, seven years after its discovery, the story of this historic vessel, instrumental in the development of Lake George as a resort-era destination, has been told by a variety of interpretive outlets.

Cadet was built in 1893 at the north end of Lake George and originally was named *Olive*. Its owner, N.E. Porter, sold *Olive* to Captain Raphael Potter who used

it to run excursions and to carry supplies to hotels around the lake. In 1898, the vessel was acquired by John Boulton Simpson, one of the founders of the Sagamore Hotel in Bolton Landing. He lengthened and rebuilt *Olive* and renamed it *Cadet*. In 1899, *Cadet* hung up on rocks and had to be pulled off by the steam yacht *Vanadis*. Simpson, apparently not too satisfied with the vessel, sold it. In 1901, *Cadet* was owned by Captain Fred R. Smith. The steam launch was advertised for charter by "day or week" and it operated for several years. *Cadet* eventually disappeared from the historical record, a victim of age and an emerging technology, gasoline-powered vessels. Apparently *Cadet* was stripped of its major equipment, taken to deep water, and scuttled.

In 1999, Bateaux Below conducted a 25-day archaeological study of the shipwreck, completed entirely by volunteers since the group was unable to acquire funding. Archaeologist D.K. Abbass served as Principal Investigator for the field study. The archaeological investigation determined that *Cadet* is a 14.63 by 2.93 meter (48 by 9.6 feet), wooden-hulled steam launch with pointed bow, rounded bilges, and a fantail stern. The watercraft's hull is intact, but *Cadet* has some damage to its stern. Coal found inside the boat was identified as stoker egg anthracite from Lackawanna County, Pennsylvania.

From 2001-2002, Bateaux Below worked with the New York State Office of Parks, Recreation and Historic Preservation and the State Historic Preservation Officer to nominate the *Cadet* shipwreck to the National Register of Historic Places. In 2002, *Cadet* was listed on the National Register, joining the seven 1758 wrecks called the Wiawaka Bateaux Cluster and the 1758 *Land Tortoise* radeau as Lake George shipwrecks with that historic designation.

In 2005, a blue-and-yellow historic marker about *Cadet* (ex *Olive*) (Figure 8.5) was erected in Veterans Park in Bolton Landing, New York. The signage reads:

CADET SHIPWRECK

BUILT 1893 AS STEAM LAUNCH
OLIVE, RENAMED CADET. SUNK
OFF BOLTON, DATE UNKNOWN.
LISTED ON NATIONAL REGISTER
OF HISTORIC PLACES IN 2002.

BATEAUX BELOW

Also in 2005, Bateaux Below and Pepe Productions, a Glens Falls, New York, multi-media company, produced a full color poster exhibit entitled "Lake George's Historic *Cadet* Steam Launch." The two-dimensional display describes the history of the watercraft and the results of the 1997-1999 archaeological fieldwork. Copies of the poster exhibit were donated for exhibit to the Historical Society of the Town of Bolton, the Sagamore Hotel, and to the Town of Bolton. The *Cadet* (ex *Olive*) steam launch project showed how underwater archaeology can uncover and exhibit a previously little-known chapter of Lake George's past (Zarzynski and Benway, 2005).

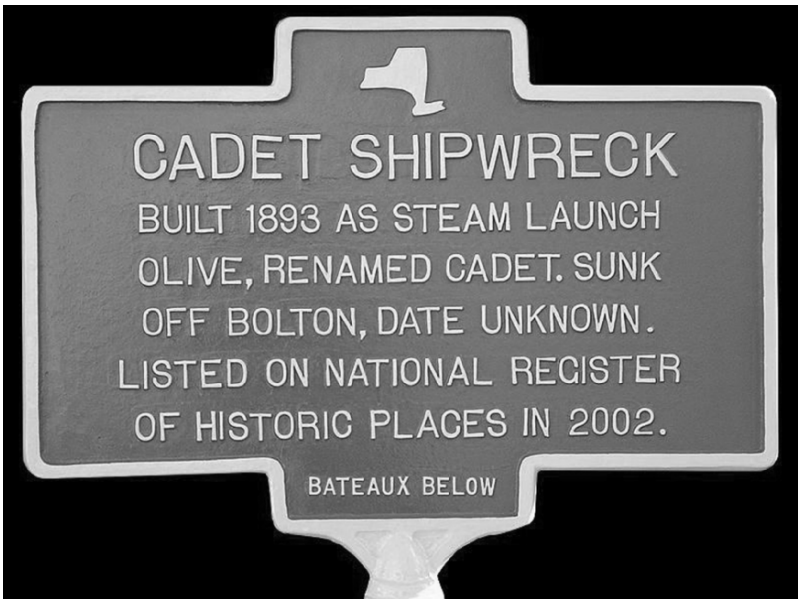

FIGURE 8.5. Photograph of a blue-and-yellow metal historic marker entitled CADET SHIPWRECK (Photo courtesy of Peter Pepe/Pepe Productions).

Underwater Blueway Trail

In 2003, the New York Department of State working with a local municipality, the Village of Lake George, proposed an innovative program for New York state. Formally called the Underwater Resources Protection & Development Project - Blueway Trail Creation, the concept is a heritage and recreational tourism endeavor to create underwater dive sites in six maritime communities around New York state. The six waterways, geographically dispersed around the state, are Lake George, Lake Champlain, Lake Ontario, Seneca Lake, Lake Erie, and the Atlantic Ocean. The concept uses locally driven initiatives in conjunction with State of New York oversight to form a program that presents a quality visitor experience while protecting the submerged resources. Lake George, which has the most experience with shipwreck preserves in the state dating back to 1993, became the locality to help develop this program and to devise a model template for the other waterways. The end result for each of the six waterways in this pilot project is to develop one or two underwater dive preserves with associated shore-side exhibits, a tourist brochure that promotes this project, web sites about the shipwreck preserves, and to create a statewide plan that not only promotes submerged cultural resource protection, but also builds a marketing strategy for the Underwater Blueway Trail. The two-year program received a financial grant to be matched by donated and in-kind services.

Unfortunately, due largely to the slow pace that sometimes is unavoidable with any state bureaucracy, this program got off to a sluggish start. By mid-2005, however, construction of an attractive waterfront structure called the Lake George

Visitor Center began, and the center opened in mid-2006. In addition to being an informational gateway to promote local tourism, exhibit space in this building was created to inform visitors about the Underwater Blueway Trail and Lake George's Submerged Heritage Preserves. If bureaucratic red tape can be cut, the Underwater Blueway Trail could be a dynamic program to not only open shipwrecks for diver visitation, but also to attract non-divers to learn more about New York's maritime heritage.

"The Lost Radeau: North America's Oldest Intact Warship" Documentary

One of the most dynamic methods to interpret shipwrecks for the public is through the video medium. Therefore, on November 30, 2005, Pepe Productions and Bateaux Below collaborated with other partners to release a documentary about a Lake George shipwreck (Figure 8.6). The 57-minute long DVD documentary, entitled "The Lost Radeau: North America's Oldest Intact Warship," is the story of the history, discovery, and underwater archaeological investigation of the 1758 *Land Tortoise* radeau. With technical support from Black Laser Learning and Whitesel Graphics, the award-winning documentary has become a model for how to interpret shipwrecks for the diving and non-diving communities. This partnership currently is in the process of creating several other documentary productions. Furthermore, this team wants to expand its success using state-of-the-art digital technologies to create computer-based exhibits and interactive displays to optimize the interpretation of shipwrecks at Lake George.

Zebra Mussels

With the discovery of zebra mussels in Lake George, found by Bateaux Below divers in December 1999, the Rensselaer Polytechnic Institute's Darren Fresh Water Institute and Bateaux Below initiated a joint venture to eradicate these thumbnail-sized mollusks from the lake. The aquatic invaders came to North America from Europe in 1988, hitching a ride in a freighter's ballast water. These zebra mussels were released into the water around the Great Lakes and quickly spread to other waterways where they colonized hard substrates like rocks, docks, and wrecks. In vast numbers, their weight can collapse fragile shipwrecks and thus they pose a major threat to many shipwrecks in the inland waterways of North America. Since their discovery at Lake George in 1999, over 20,000 zebra mussels have been hand-harvested by scuba divers from three locations in the lake, thus minimizing their spread. Furthermore, concerned lake groups led by the Fund for Lake George, the Lake George Association, the Lake George Park Commission, and the Lake George Watershed Conference implemented a watchdog program to educate lake users and to fight the proliferation of zebra mussels in the lake. This successful anti-zebra mussel campaign is unprecedented and marks the first time human intervention prevented a wholesale colonization by these pesky aquatic nuisances throughout a waterway once they were introduced.

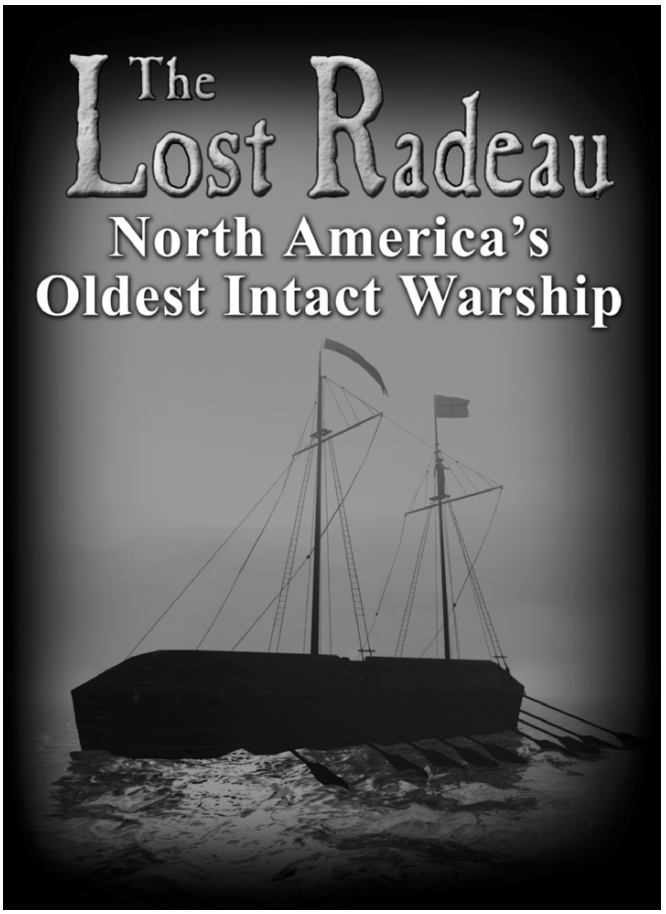

FIGURE 8.6. The DVD cover for the award-winning documentary "The Lost Radeau: North America's Oldest Intact Warship," the story of the history, discovery, and underwater archaeological investigation of Lake George, New York's 1758 *Land Tortoise* radeau (Image courtesy of Pepe Productions).

Challenges

Like other underwater archaeology programs around the United States, the public interpretation of Lake George's submerged cultural resources has met with varied success. Several shipwreck sites have been listed on the National Register of Historic Places, and in 1993 the first shipwreck preserve system in New York was created. Bateaux Below members frequently present lectures on their underwater archaeology projects to local audiences as well as deliver formal papers at state and national archaeology conferences. Bateaux Below trustee Russell P. Bellico is the author of several books, two on Lake George's maritime and military history. Bellico's books have done much to inform people about the

waterway's submerged cultural resources. In 1993, Bateaux Below worked with the Lake George Historical Association to create a permanent exhibit for their lakeside museum entitled "Historic Vessels and Shipwrecks of Lake George." Furthermore, Bateaux Below collaborated with several groups to erect six historic markers around the lake to inform people about the lake's maritime heritage. Likewise, two self-guided tours about the colonial history of the south end of the lake, including numerous references to the waterway's maritime affairs, were developed. One of the best interpretations of the 1758 *Land Tortoise* radeau shipwreck was a project that created a photomosaic of the shipwreck. The 1993-1994 project was undertaken by Bob Benway, a Bateaux Below underwater photographer, and Kendrick McMahan, a computer technician. Two hundred photographs of the shipwreck were assembled into an amazing seamless photomosaic. The result showed the vessel in plan view and created baseline data for cultural resource management of the shipwreck. In the first half of the 1990s, Bateaux Below, the Lake George Historical Association, and New York Sea Grant teamed up to present "Shipwreck Weekend at Lake George." This annual September event brought in several nationally recognized authorities to speak on shipwrecks and underwater archaeology. The conference was well attended, but was difficult to present due to the high costs associated with advertising and housing speakers. It nonetheless was an effective way to inform the diving community about shipwrecks and to promote preservation of submerged cultural resources.

The shortcomings of developing more public interpretation programs are significant. Bateaux Below has not been able to acquire dedicated office or exhibit space in one of the towns or villages along the 51.2 kilometer (32 mile) long lake. This has significantly impacted the group's ability to integrate effectively into the infrastructure of the Lake George community. One of the biggest challenges faced by Bateaux Below at Lake George is working with the state agencies responsible for managing cultural resources found on the bottomlands of state waters. New York State government is a multi-tiered labyrinth of officialdom, with agencies often having overlapping jurisdiction. Nevertheless, many state officials have done an admirable job trying to develop effective management strategies for cultural resources found in state waters.

The recent alliance of underwater archaeologists with multi-media specialists ushers in a new era for the public interpretation of Lake George's maritime heritage and submerged cultural resources. Bateaux Below helped Black Laser Learning, a Pennsylvania-based company, in its development of a series of training DVD productions focused on underwater remote sensing. Bateaux Below and Pepe Productions are developing a dynamic new web site for Bateaux Below and the groups are collaborating on several forthcoming documentary productions with a special emphasis on cutting-edge animation. This foray into multi-media interpretation of underwater archaeology projects is helping make Lake George's shipwrecks "speak."

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9
Diver Awareness Program – *QAR* Dive Down

Mark U. Wilde-Ramsing and Lauren S. Hermley

"The fact that the general public rarely has the opportunity to view shipwreck sites immediately poses problems in persuading them of the importance of something that they cannot see," (Staniforth, 1994:13).

Introduction

Since its discovery in 1996, archaeological site 31CR314 has proven a challenge in submerged cultural resource management (Figure 9.1). As Blackbeard's flagship, *Queen Anne's Revenge*, it represents an internationally recognized discovery in the field of underwater archaeology and an important cultural resource for the state of North Carolina and Carteret County, where it resides. While absolute proof has not surfaced to establish an undisputable identity, interdisciplinary research conducted at the shipwreck site provides no viable alternative candidate, either historically documented, or through the probability of an unrecorded sunken vessel. It is on the strength of the circumstantial evidence that the shipwreck was identified as *Queen Anne's Revenge* (*QAR*) and was placed on the National Register of Historic Places in 2004. Based on this recognition, archaeological site 31CR314 is commonly referred to as the *QAR* site and is promoted as such for an educational, public access program entitled *QAR* Dive Down. Program managers are committed to using interest in this historic shipwreck to heighten awareness of the archaeological process and, ultimately, to seek greater public support and protection of submerged cultural resources.

The *QAR* site is located at a depth of 7 meters (23 feet) below mean sea level, 2 kilometers (1.3 miles) off Fort Macon and 1,372 meters (1,500 yards) west of the present shipping channel of Beaufort Inlet. Marine conditions feature light to moderate inlet currents and water clarity averaging 1.54 meters (5 feet) and at times exceeding 6 meters (approximately 20 feet). Visible wreckage measures 7.62 by 4.57 meters (25 by 15 feet), and consists of 11 cannon, 2 anchors, a grappling hook, numerous iron cask hoops, several rigging elements, a cluster of cannon balls, and a large amount of ballast stone and unidentifiable encrusted artifacts (Figure 9.2). Wreckage extends vertically approximately 1.22 meters (4 feet) above the outlying seabed, with most of the exposed remains rising less than 0.61 meters (2 feet). A third large anchor is by itself approximately 15.24 meters (50 feet) north of the main concentration. Since much of the remaining site has only a thin

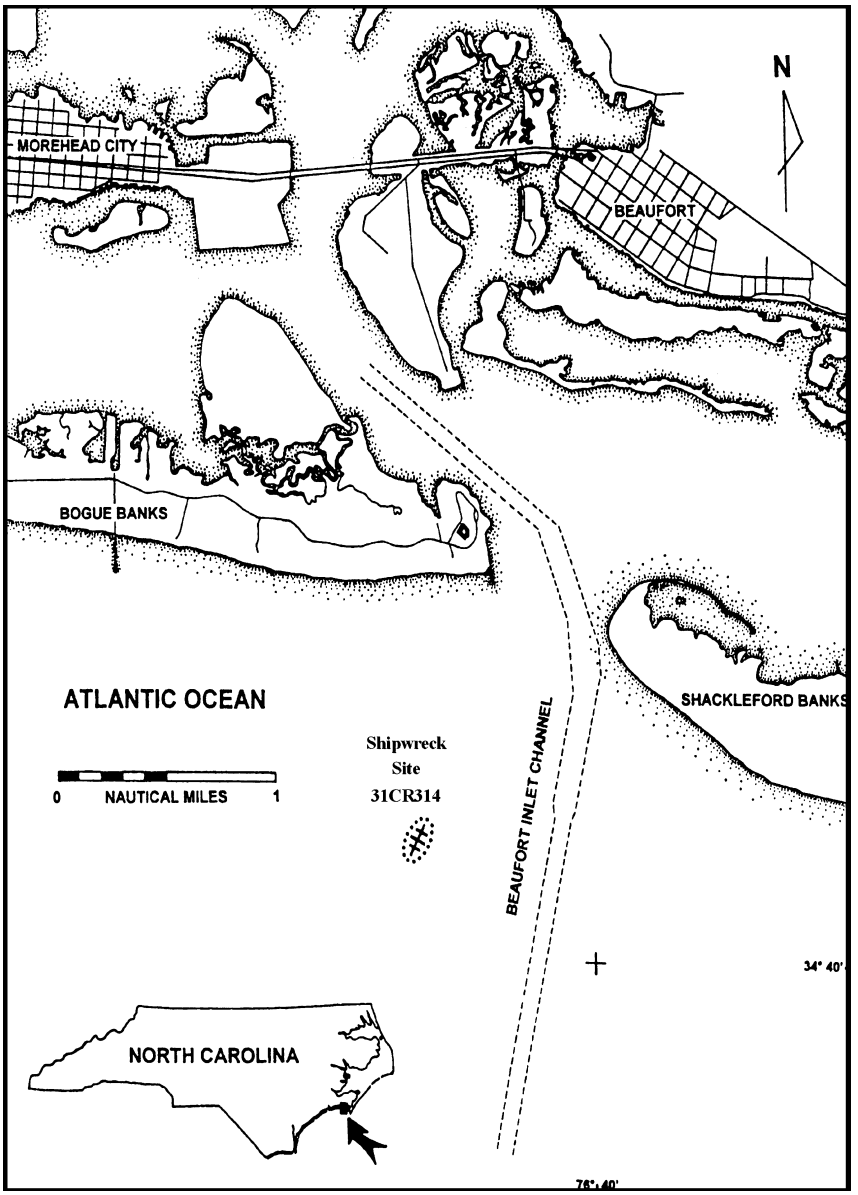

FIGURE 9.1. Location of the *QAR* site (Image courtesy of NC Department of Cultural Resources).

layer of protective sand, other encrusted artifacts occasionally become exposed. This is particularly true of six individual cannon and associated artifacts extending south of the main pile.

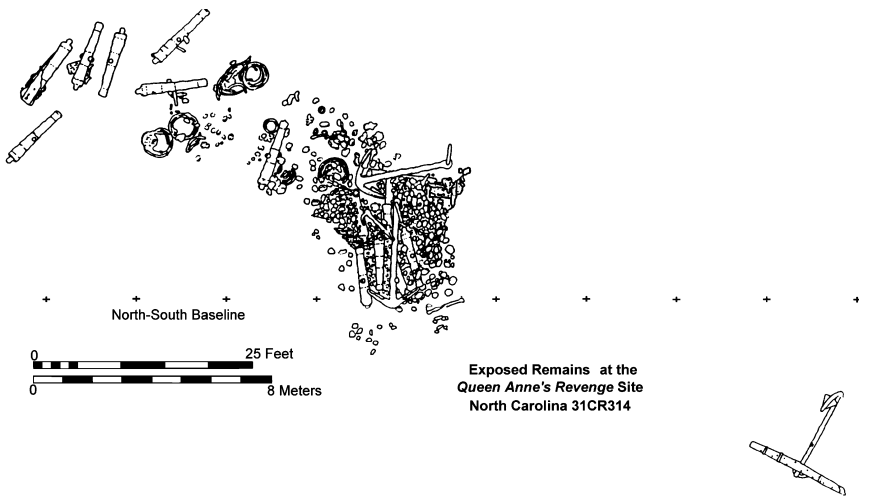

FIGURE 9.2. *QAR* site plan showing exposed remains (Image courtesy of NC Department of Cultural Resources).

Located within State waters near Beaufort Inlet, the *QAR* site falls under the jurisdiction of the North Carolina Underwater Archaeology Branch (UAB) who retains responsibility for its management (NCGS 121 Article 3, 1967). Since its discovery, access to the *QAR* site has been limited exclusively to scientists and archaeologists to ensure protection (NC Department of Cultural Resources, 1997). Public education has been satisfied through various traveling presentations, documentaries and publications, a primary exhibit at the North Carolina Maritime Museum, and in 2000 and 2001, through an innovative internet broadcast aimed at pre-collegiate audiences (Eslinger and Wilde-Ramsing, 2002). With public interest high and exposed remains extensively documented, the UAB decided to examine the possibilities of allowing recreational divers access to the site. While unlimited access was considered too great a threat to site preservation, there are various options for limited access programs that were considered. A thorough assessment explored these options during a comprehensive feasibility study (Hermley, 2004), which then was subjected to internal Department of Cultural Resources analysis, as well as to outside professional review by members of the National Park Service (Russell, 2004), NOAA's Maritime Archaeology Center (Broadwater and Casserley, 2004), and the Florida Bureau of Archaeological Research (Scott-Ireton, 2004). After final evaluation the UAB determined that it was feasible and in the best public interest to implement a recreational diver outreach program beginning Fall 2005. Program strengths are both the unique educational and entertaining experience provided to recreational divers and the opportunity to advocate for the protection of this and other underwater heritage sites through stewardship by increasing public understanding and awareness (Hermley and Wilde-Ramsing, 2005).

Background

Those charged with protection of resources falling within the public domain, including submerged sites, continuously strive to find the best management solutions. Given the advent of recreational diving in the last half century and advances in underwater survey and exploration technology, pressures have increased dramatically on submerged archaeological sites. Users of these public resources fall into groups with various needs and agendas, including divers, fishermen, salvers, scientists, and the tourism industry (Kauru and Hoagland, 1994). To insure that all people are represented in the decision-making process, site managers have increasingly argued that public outreach and education is vitally important. "Without public appreciation of the importance of archaeological sites and information," states one early proponent, "there can be no effective protection of sites." Archaeologist Charles McGimsey (1972:6) continues, ". . . the greater one's knowledge of archaeology, regardless of formal training in the subject, the greater the responsibility to take the initiative to lead, to teach, and to persuade others to do likewise." Some also suggest that rather than rely solely on museum interpretive displays the public should be allowed to observe heritage resources in their original setting, which can strengthen the spirituality and meaningfulness of the experience (Carter and Horneman, 2001:67-68).

Managers must be aware that from a purely archaeological perspective, public access is not a preferred option for those sites that still retain significant, undocumented remains. Public access can reveal site locations and expose areas to looting, while visitation itself brings with it "wear and tear," which in turn can ultimately affect a site's integrity (Cohn, 2003:87). Catering to a general audience can be a serious distraction for archaeologists and take important time away from research. A survey of archaeologists from Great Britain found that while most believed, "that increasing public involvement would improve awareness of conservation issues in archaeology, and was justifiable because of public funding accountability, . . . [they] do not like to think of their excavations as visitor attractions" (Schackley, 1992:338).

Basic managerial options at the *QAR* site are three-fold, with the possibility of combining elements from each: a "public invited" park, a preserve allowing minimal disturbance, and a full-scale archaeological recovery. The 1999 management plan, developed for the *QAR* site, determined that the third option is the preferred course of action, if and when the proper facilities and funding are in place (Wilde-Ramsing and Lusardi, 1999). In the meantime, with exposed remains extensively documented and considered relatively robust in nature, managers of the *QAR* site are able to consider some level of public access. Underwater parks featuring shipwrecks have become increasingly common, especially in areas where recreational diving is popular. The Great Lakes (Vrana and Halsey, 1992) and Florida (Smith, 1991) are prime examples in the United States. In the majority of cases in which sport divers are invited to

explore shipwrecks, managers either deemed them to have been sufficiently documented or archaeologically insignificant.

There are a few instances where archaeologically significant shipwrecks have been successfully opened to public divers. After the survey and initial documentation phase of several eighteenth-century French warships, Parks Canada called for an *in situ* museum, ". . . to offer a different experience in providing direct access to genuine or untouched archaeological resources" (La Roche, 2004:32). From 1987 to 1997 the eighteenth-century warship *Célèbre* in Louisbourg Harbor, Nova Scotia, was successfully opened for controlled public access through dive tours with positive results and minimal damage to the site. Across the Atlantic, Scotland's historic shipwreck visitor schemes involving the *Swan* and HMS *Dartmouth* have provided particularly relevant case studies for the *QAR* site (Robertson, 2003). They involved allowing semi-controlled dive access on these active archaeological sites where groups of up to twelve visitors holding permits and advanced dive training were permitted to dive without direct supervision. Over a period of eight years no damage was noted and, based on informal feedback from participants, the opportunity to dive on a historic shipwreck was overwhelmingly positive. This lead managers to conclude, "It is clear, therefore, that the Schemes have been invaluable in helping break down the sense of exclusion which recreational divers have felt in relation to historic shipwrecks" (Robertson, 2003:82-83).

To help with the many options that managers face, Todd Hannahs (2003:8-16) proposes a decision-making process for those considering opening a shipwreck site to the public, complete with flow charts and evaluation forms. We have employed a similar decision-making process evaluating the factors relating to the *QAR* site, such as dive conditions, site robustness, and historical associations. The result is a diver outreach program, entitled *QAR* Dive Down, that provides controlled public access while protecting the site and allowing for continued scientific study. Hosted by the UAB, the purpose of this program is to illuminate the value of this important shipwreck for the recreational diving community by providing a one-of-a-kind underwater experience. The program simultaneously advocates for the preservation of shipwrecks, and promotes Carteret County and North Carolina as home to this unique cultural resource.

Program Goals

There are numerous goals associated with a public outreach program such as Dive Down, which permits recreational divers to visit an internationally recognized shipwreck. The program achieves these goals by incorporating a variety of methods successfully employed in other programs, as well as by introducing some new features. The identified goals fall into five categories: Education, Entertainment, Site Protection and Preservation, Benefits to State and Local Heritage Sites, and Implications for North Carolina Shipwrecks.

Education

Rather than focusing on a shipwreck and its value to historical archaeologists, Dive Down broadens its scope and exposes participants to the value of a shipwreck as a database for multiple disciplines. Educational goals include not only history and archaeology, but also marine ecology and coastal geology. The program does not train archaeological fieldworkers or amateur historians. Instead, Dive Down provides, through an interdisciplinary syllabus and a unique diving experience, recreational sport divers with a better awareness of shipwrecks as underwater laboratories, worthy of preservation because of the natural and cultural information they hold.

Entertainment

Dive Down is a program for the recreational diving community. As a result, it is critical that we remain conscious of the importance of creating an experience that, while educational, is also entertaining (Figure 9.3). Participants are apt not to become bored or lose interest and are more likely to retain information during an engaging and enjoyable activity. Promoting the recreational aspects of Dive Down also is a powerful marketing tool as it considerably adds to the program's attractiveness. Lastly, by ensuring that the experience is enjoyable, participants

FIGURE 9.3. Diver examining Anchor A1 on the main ballast pile (Photo courtesy of Julep Gillman-Bryan, NC Department of Cultural Resources).

not only are more likely to engage in future similar endeavors, but also will be more inclined to encourage family and friends to do likewise.

Site Protection and Preservation

Site protection is of utmost importance for the *QAR* site since researchers have just begun to realize its rich archaeological record. Having studied the shipwreck and its surrounding conditions since 1996, site managers now are in a better position to consider on-site diver visitation as a potential public use. The site represents a heritage resource that not only is unique and demands high public interest, but is situated in a location exhibiting easy accessibility, reasonably good diving conditions, and striking visible remains. Remains that extend above the seabed have been thoroughly documented through archaeological mapping and photography. Small, recognizable artifacts have been recorded and removed, thus minimizing the temptation for potential souvenir collecting. For the most part, the reference and datum stations presently in place on the site can be used or strengthened to serve as part of a visitor guide system, and as restraining devices to protect exposed artifacts. This system leads the visiting diver around the site, offering site interpretation at select locations while keeping artifacts and the reef's biological community protected from adverse affects of inadvertent human contact.

As site managers, we feel the *QAR* site's archaeological integrity is sustainable during the Dive Down program. To ensure that loss is minimal, the program budget supports periodic site monitoring through visual inspections, video imaging, and an *in situ* conservation program to track the stability of the larger artifacts. A higher level of site monitoring assists in addressing storm-related impacts.

Adverse threats to site preservation are expected to be negligible. Should, however, evidence from monitoring suggest otherwise, remedial steps would be developed and implemented to mitigate problems. In an extreme and highly unlikely situation, site managers reserve the right to terminate the program.

Benefits to State and Local Heritage Sites

While Dive Down is an initiative controlled and administered by the state, there are numerous opportunities for community participation, collaboration, and benefit. The existence of shipwrecks lost in nearby waters has long been a part of the Cape Lookout area, providing both real and intangible benefits to the region.

The program provides for the direct distribution of marketing materials with the intent of encouraging participants to seek additional information about the rich interpretive centers available locally and regionally. Moreover, there is also the opportunity for the various organizations to directly participate by providing meeting facilities and speakers. Through direct involvement, local groups can realize benefits, while enhancing the experience for participants and supporting managerial goals.

Implications for North Carolina Shipwrecks

Our efforts to monitor, study, document, and protect the numerous shipwrecks in North Carolina waters benefit from an increased public awareness of the importance of preservation of these valuable cultural resources. Dive Down not only illustrates to recreational divers the value of a shipwreck, it also encourages them to advocate for the preservation of shipwrecks in their own communities. North Carolina's offshore waters contain one of the largest collections of diveable shipwrecks in the world. With the state's only current diver outreach program being the open access USS *Huron* Shipwreck Preserve (Lawrence, 2003), Dive Down provides an opportunity for the UAB to assume a more pro-active role in encouraging public stewardship of North Carolina's submerged cultural resources.

Another benefit of Dive Down is the merging of two often-conflicting sides of the shipwreck contingency, namely underwater archaeologists and the sport diving community, in a common goal. By focusing efforts on a single, mutually beneficial project that utilizes skills and assets from both sides, it is likely that a new relationship, based on communication and respect, will develop. This represents a potentially important step toward better management and preservation of North Carolina's publicly owned shipwrecks.

Program Specifics

The goals for Dive Down are ambitious, with success hinging on the coordination of a multitude of resources. Only a little over a mile offshore, the *QAR* site is readily accessible to the shore facilities of major dive operations. Carteret County's healthy sport diving industry provides for the availability of boats, dive equipment, and personnel already familiar with local conditions. Equally important is the wealth of educational resources extant in Carteret County. Home to the *QAR* shipwreck project headquarters, the Division of Marine Fisheries' Artificial Reef Program, the marine science programs of three major North Carolina universities (University of North Carolina - Chapel Hill, North Carolina State, and Duke University), Carteret Community College, NOAA regional offices, and the NC Maritime Museum, the county provides an invaluable consortium of expertise and usable facilities.

Dive Down is slated to run from late September through late November each year. The fall months exhibit the best conditions for diving on the site as the prevailing offshore winds yield an overall cycle of calmer sea states. In addition, because this period is a traditionally slower time for Carteret County tourism, necessary resources and personnel are more likely to be available.

Two and a half days are required for the Dive Down program, however, it takes place over three and a half days, allowing an extra day for potentially inclement weather or difficult tides. Water clarity at the *QAR* site generally is dependent on tides with a few hours on either side of extreme high tide providing optimal conditions (Figure 9.4). The program plans for twenty divers twice a week, for a

FIGURE 9.4. Elements of exposed ship's rigging (Photo courtesy of Julep Gillman-Bryan, NC Department of Culture Resources).

period of eight weeks. One group schedule is from Sunday evening through Wednesday, and the other group from Tuesday evening through Friday.

Dive Down emphasizes the interdisciplinary nature of submerged archaeological sites, specifically the *QAR* site. As such, the education segment of the program is divided into four modules: Maritime History, Underwater Archaeology, Coastal Geology, and Marine Ecology. Each module is slated for a specific time during the program and has its own expert presenter(s) and accompanying set of materials. In addition, divers will receive training in skills to necessary for the *QAR* dive. The enjoyment from diving the *QAR* site is not likely to come from the quality of the dive since conditions are rarely comparable to offshore wrecks. Rather, gratification will stem from the unique opportunity to view the sunken remains of a classic colonial shipwreck as a true archaeological site - a personal experience rarely offered to the recreational diver.

Maritime History Module

The History Module provides an overview of Carteret County's maritime history covering the coastal NC colonial economy, the types of SHIPS employed during this time, and the impact of piracy. Additionally, the area's more recent past is discussed, focusing on the American Civil War and events of World War II when shipwreck loss was extremely high in the region.

The purpose of the History Module is two-fold. First, historical context is critical to the *QAR* dive experience. It explains why the ship is located in Beaufort Inlet and the circumstances under which it sank. Second, by illustrating to divers the benefits of being familiar with the history associated with a given vessel, it encourages them to incorporate history into any future shipwreck diving experiences.

Underwater Archaeology Module

Several objectives are achieved with the Underwater Archaeology Module. First, the module provides an overview of the discipline, focusing on the importance of research and the systematic study of a shipwreck. Second, it serves to illuminate the research associated with the *QAR* site, as the purpose of the program is to encourage divers to observe the site from an archaeologist's perspective. Third, the module is a way to dispel the misconception that underwater archaeology is simply the removal of artifacts from a given shipwreck site and thus no different from salvors and divers who do the same. By stressing the fact that *not* removing artifacts is a viable option, *in situ* preservation of submerged cultural resources is advocated. Finally, the *QAR* site exemplifies the difficulties involved in positively identifying underwater archaeological sites. The various ways archaeological evidence is processed and viewed can be openly discussed regarding the identification of 31CR314 as *Queen Anne's Revenge*.

Coastal Geology Module

Conveying the important role of geology in the study of shipwrecks is the goal of the Coastal Geology Module. As an integral part of the site formation process, how the site came to exist in its current condition is tied directly to geological features and processes. This module focuses on the unique geological composition of the North Carolina coastline, emphasizing its dynamic environment and sediment types. The effects of sediment types and their movement on underwater sites are examined, and how these factors contribute to the overall state of site preservation are demonstrated. This module also provides an opportunity to discuss the importance of sand and the advantages of site burial, especially in the case of the *QAR*.

Marine Ecology Module

The Marine Ecology Module has two objectives. The first is to outline the biological activities that affect a wreck site, namely, woodborers, bacteria, and crustaceans. Similar to geology, these factors contribute to site formation processes and carry implications for how artifacts from the *QAR* site are affected by biological elements. Organisms present on the shipwreck are identified and examined for their effects on the shipwreck, as well as at other locations.

The second objective emphasizes that the *QAR* site is a living, near-shore reef. The ecology module introduces participants to the marine life they likely will encounter during their dive. Divers are encouraged to observe particular species, their abundance, and behavior, further contributing to their understanding of the interdisciplinary nature of the site. Awareness hopefully will be raised concerning the importance of reefs, both natural and artificial, as marine habitats.

Diving Component

After completing the four education modules, participants proceed with the diving component. With potentially adverse site conditions, including low visibility, strong currents, and lower temperatures, safety is of the utmost concern, and therefore Dive Down is open only to experienced divers holding advanced certifications. Furthermore, skills emphasized in the diving component necessitate a comfort level in the water and familiarity with equipment typically not present in new divers. To remain consistent with precedents set by the recreational dive industry, completion of the Dive Down Program will result in a NAUI or PADI specialty certification entitled North Carolina Site Diver. Approval from these agencies lends credibility as well as marketability to the program.

A non-disturbing dive on an archaeological site requires the utilization of several integral skills and techniques. The diving component emphasizes the importance of two skills, non-disturbance and observation. During the classroom portion of dive training, participants will be instructed on techniques designed to ensure neutral buoyancy and minimal body movement as they move around the site. Archaeological site diving also requires task management, and divers are asked to make observations and take notes while monitoring their buoyancy and air consumption. Following the classroom portion of the diving component, divers make a practice dive to review their techniques.

Local charter operators are used for dive operations. This arrangement affords numerous benefits, not the least of which are convenience and insurance. Moreover, their knowledge of local conditions and navigation provides an added level of safety and professionalism to the program.

QAR Dive

The dive on the *QAR* site begins with a site review and dive plan. Present on the site are station markers and a guideline to facilitate movement and safety. Participants are divided into ten buddy teams, with a minimum of two supervisory divers in the water at all times. Each dive lasts approximately thirty minutes, with a maximum of four teams on site at once. Divers descend the mooring line and proceed along the guideline, stopping at six to eight pre-designated stations (Figure 9.5).

As an experimental feature, submersible MP3 units are utilized. This addition allows the dissemination of information about prominent site features by providing participants a narrated tour. With this new technology, it is not only possible to

FIGURE 9.5. The North Anchor, A3 (Photo courtesy of NC Department of Cultural Resources).

promote site education and control diver movement, but also to provide a level of sophistication not experienced by the participants on past dives.

The dive is followed by a short debriefing session. The program concludes with the presentation of certification cards, certificates, and closing words. Participants complete an evaluation form to record their experiences throughout the program, and to solicit attitudes regarding the preservation of submerged cultural resources.

Project Funding and Budget

As with any project, funding is of critical importance. Most programs of this nature rely on grants from various funding sources including government organizations and foundations. Initial grants from the Carteret County Tourism Development Board and several private donors covered the feasibility and marketing study and

initial start-up costs. After considering the market for the Dive Down program and conducting a cost/benefit analysis, program developers determined that an annual program involving 320 diver participants over an eight-week period was most appropriate (Hermley, 2004; Wilde-Ramsing, 2005). As proposed the program will run for a limited period to keep demand high, and in anticipation that full-scale recovery will commence within the near future resulting in most or all visible remains from the *QAR* site being removed.

Once implemented, the Dive Down program is designed to be self-funding with fees charged to participants reinvested in the program to achieve sustainability. The ability of the program to be self-funding is a requirement for two reasons. The first and more pragmatic reason is that public funding is not available. While grants are useful alternatives, they require extensive man-hours to obtain. With a full work schedule managing all North Carolina shipwrecks, the UAB is restricted in their ability to devote personnel to pursuing outside funding for site-specific projects or new initiatives.

The second reason for establishing a self-funding program is ethical in nature. Participation in Dive Down is confined to a small percentage of the population, namely divers with advanced certifications. This demographic is clearly notrepresentative of the overall population, thus, the fiscal responsibility should lay with the participants. The ability of Dive Down to exist as a self-funding entity depends on whether the recreational diving industry can support the proposed US$500 fee for participation, which supports program administration and increased site monitoring. Analysis of comparable costs for a NAUI or PADI specialty certification, two half-day dive charters with air tanks off the Carteret County coast, and several meals provided during the program, indicates the total retail value of Dive Down is approximately $350. In order to meet the $500 fee, the recreational diving market is expected to pay an additional $150 per diver. The added values of presenter expertise, the lure of diving a high profile site, and the uniqueness of the experience increases an individual's willingness to pay. An informal polling of local dive shop owners revealed not only a demand for diver access to *QAR*, but a concurrence with the above stated market conditions and fees (Hermley, 2004:36). Furthermore, as Dive Down will be offered for a limited time, namely three to five years and up to 1,500 recreational divers, the cost ensures program attendance levels will benefit from the laws of supply and demand. This is based on the concept of carrying capacities for tourist destinations, which assumes that, "sooner or later a threshold is perceived to decline in desirability" (Martin and Uysal, 1991:267-270). For instance, after an initial peak at the shipwreck *Célèbre*, a dramatic decrease in public visitation was observed (La Roche, 2004:34).

It should be noted that Dive Down has the potential to instill a sense of ownership among divers, and a desire to contribute further toward the protection and preservation of the *QAR* site. While we are hopeful participants will be supportive financially and politically, Dive Down is an educational program with a budget that meets only basic expenses. All fund-raising activities are passive in

nature and conducted through the distribution of information and continuing contact with participants via email and mailings, rather than through overtly asking for contributions.

Project Implementation

On October 28, seventeen leaders from the North Carolina recreational diving community came to Morehead City to participate in a two-day planning event for the proposed public outreach program, Dive Down. By hosting the event, two primary goals were accomplished – feedback was elicited on program marketability and participation, and questions were answered regarding program logistics, cost, and facilitation.

The first evening, participants were presented an overview of North Carolina underwater archaeology and a discussion of the new program. The following morning, divers assembled for a site briefing and dive planning session. After the short ride to the *QAR* site, buddy teams entered the water in ten-minute intervals with no more than four teams diving at any time. Divers observed the site aided by pre-set polypropylene guidelines encircling exposed shipwreck remains. Upon completion of the dive, participants engaged in a debriefing session before touring the Blackbeard exhibits at the NC Maritime Museum.

During informal discussions and scheduled meeting sessions, invaluable insight was acquired from the diving community regarding the implementation of Dive Down. The results from the planning event are summarized below:

1. Overall opinions
   a) Implementation - Given that the *QAR* site is a state resource, North Carolina divers should be given preference during sign-up.
   b) Impacts to the site.
      i) Good buoyancy is needed – an advanced certification plus a "peak performance buoyancy" course is recommended.
      ii) The temptation to remove artifacts is minimal.
2. The Training Dive – rename the "training" dive as a familiarization or practice dive.
3. The *QAR* site dive
   a) Due to its size, limit the number of divers on the site at any given time to three buddy teams.
   b) Given the amount of surge, divers need to be able to stabilize themselves on the site. [Note: Program organizers feel this can be accomplished by installing unobtrusive, non-moving stations capable of sustaining two divers and connected by a lead line system.]
   c) More than two support divers need to be on the bottom to monitor and direct traffic.
   d) No negative comments were made concerning the small size of the wreck site and the short time (30 minutes) that it takes to see it.

4. Promotion and message
   a) Marketing is important to make this a special event given the fact the *QAR* site does not provide the optimal dive environment recreational divers often experience.
   b) Good promotional materials and certificates should highlight the uniqueness of the experience.
   c) A strong connection should be made between artifacts lying on the seabed and the processes of documentation, recovery, cleaning, analysis, and conservation as the artifacts make their way to display in a museum.

The meeting fostered a new dialogue between state archaeologists and the recreational diving community, which is essential for successful implementation of not only Dive Down, but also of similar endeavors involving North Carolina's submerged cultural resources. During the event an element of North Carolina pride and camaraderie emerged among participants. This phenomenon underlies the enthusiasm for Dive Down and provides a positive impact on participation.

The launch of Dive Down in the summer of 2005 met with welcomed success. Marketing and planning efforts proved effective as evidenced by the 75%-100% capacity levels going into the first dive season of twelve planned sessions. Unfortunately, program execution in the fall was nothing short of disappointing. The 2005 hurricane season brought repeated postponements and cancellations, ultimately culminating in the decision to cancel the program entirely because of poor site conditions and customer frustration levels. In an attempt to salvage the program, the project team decided to run a limited number of sessions in spring 2006 for those participants able to reschedule. Surprisingly, what began as a last-ditch effort ended with very positive results, including collection of primary observations that resulted in changes to the initial project design. Using the spring 2006 season as a pilot program, the project team was able to make several key adjustments so that the resulting program is even stronger than initially planned:

1. Reduction in group size.
Initially, the program design called for groups of 20 divers divided into buddy teams with no more than four buddy teams on the wreck at any one time. Unfortunately, as evidenced by both sessions, eight divers together on the site caused a greater deterioration of site visibility than anticipated. Project managers therefore decided to reduce the number of participants per session to raise the overall quality of the experience. Although this change will decrease the revenue generated by Dive Down, participant fees will continue to maintain program self-sufficiency.

2. Session scheduling adjustments.
The fall 2005 season was planned with back-to-back sessions, providing very few options in the event of cancellation. The result was heightened anxiety and frustration experienced by participants, as well as by program managers. For future seasons, less aggressive schedules will allow for greater flexibility when postponements or cancellations occur. While this will lower participation levels, overall participant satisfaction is expected to increase.

3. Dive guides equipped with underwater communication equipment and clearer reference points on the site will replace MP3 units.

Although potential advantages were afforded to the program by the MP3 players, namely the ability to control diver movement while disseminating information, the use of this new technology creates a task management issue with divers, as most are not accustomed to operating in the low visibility and surge they are likely to encounter on the *QAR* site. While safety concerns remain minimal, many divers lack the ability to simultaneously manage diving skills, such as buoyancy and navigation, with efficient operation of the unit. The project instead will use skilled dive guides equipped with underwater communication units instead of the MP3 players. The purpose of the underwater communication is not for guides to speak to divers, but rather for guides to speak to one another and to topside monitors, thus facilitating diver movement around the site. With a detailed dive briefing and more comprehensive site tagging system, site guides can effectively point out areas of interest, as well as monitor the safety and behavior of the divers. Costs are comparable to providing MP3 units, given the availability of topside communication units among participating state agencies and dive charter operators, and guides are readily available to provide this service.

4. More generous scheduling needed for presentations.

The quality and content of the presentations surpassed expectations. The information not only was interesting and relevant, but also was presented in a palatable and concise format. As is often the case, however, presenters in the first session exceeded their allotted time slots. To correct this problem, the project team adjusted the schedule for the second session to allow more time for each presentation. As a result, presenters and participants alike were more at ease, allowing for an expanded question-and-answer exchange and a more relaxed and effective learning environment.

5. Participant reaction coincided with diver skill.

Participant feedback ranged greatly with the majority expressing positive sentiments. Three participants were so enthusiastic they submitted letters asking for congressional support for the *QAR* project, confirming the program's potential for spawning public advocacy. The few participants who expressed less-than-positive reactions cited poorer than expected diving conditions as the cause. Coincidentally, this later group represented the least experienced of those who participated. While diver safety was never an issue, managing basic diving skills is challenging in low visibility and surge, especially for the newer diver. For the more experienced diver these skills are easier, thereby minimizing anxiety and allowing more attention to be placed on site content and observation. For future sessions, more comprehensive screening and an emphasis on diver preparedness should yield participants who are more qualified, therefore increasing overall participant satisfaction levels.

As it turned out, the abbreviated spring 2006 Dive Down season did more than salvage a disappointing first attempt. By running the program with fewer participants, project managers were able to thoroughly evaluate the program, implement and test new strategies, and ensure more effective program execution for future sessions. The initial participation levels and the positive feedback received from

the spring 2006 divers were encouraging. Dive Down is on schedule to continue during fall 2006 and spring 2007.

QAR Dive Down represents a new opportunity to feature North Carolina's underwater archaeological sites. The aim of the program conveys the historical, archaeological, geological, and ecological importance of the *Queen Anne's Revenge* shipwreck site, encourages future preservation and study, and advocates for the appreciation of all North Carolina's submerged cultural resources by encouraging divers to use this multidisciplinary approach for their own individual wreck diving experiences. As the program comes to fruition, successes and failures will be examined and discussed in hopes this and future programs can benefit from lessons learned. Through the Dive Down program the UAB strives to achieve a higher level of management for North Carolina's rich sunken heritage.

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10
Not Just Another Piece of a Boat: Massachusetts' Shoreline Heritage Identification Partnerships Strategy (SHIPS)

Victor T. Mastone and David W. Trubey

Introduction

In the field of underwater cultural resource management, outreach and educational efforts traditionally concentrate on reaching the recreational diving community. The **Shoreline Heritage Identification Partnerships Strategy,** or SHIPS**,** was developed by the Massachusetts Board of Underwater Archaeological Resources to capitalize on the need to respond to casual reporting of coincidental discoveries and the on-going need to inventory shoreline cultural resources. The SHIPS program will be geared toward people who essentially "walk the beaches" on a regular basis and may have an interest in local maritime history. It is a multi-level approach to involving the public at the discovery level in the archaeological process through a local historical society or museum and with the state cultural resource manager. This approach has broader application outside Massachusetts.

Established in 1973, the Massachusetts Board of Underwater Archaeological Resources (MBUAR) is the public trustee of the Commonwealth's underwater heritage, promoting and protecting the public's interest in these resources for recreational, economic, environmental, and historical purposes. As a state agency, the MBUAR is charged with the responsibility of encouraging the discovery and reporting, as well as the preservation and protection, of underwater archaeological resources. Among its specific statutory responsibilities is the compilation and maintenance of an inventory of these resources. The Board is further instructed to cooperate with and seek assistance from a wide variety of public entities "and private organizations and individuals" (Mastone, 2002).

The Newburyport Maritime Society (NMS) is a non-profit organization dedicated to preserving and interpreting the maritime heritage of the lower Merrimack Valley. The NMS owns and operates the Custom House Maritime Museum in Newburyport and Lowell's Boat Shop Museum in Amesbury, showcasing over four centuries of maritime history in the region.

Background

Staff members of the Newburyport Maritime Society (NMS) contacted the Massachusetts Board of Underwater Archaeological Resources (MBUAR) to report finding parts of a shipwreck while casually walking along the beach on nearby Plum Island. Unfortunately, by the time MBUAR staff could arrange a site visit, the vessel remains were completely re-covered with sand and became invisible once again. At various times, the NMS museums also received calls from people reporting similar finds elsewhere and hoping to identify them. Concurrently, the museums received general inquiries about the possibility of viewing and visiting shipwreck sites that were accessible to the non-diver. These events inspired the museums to approach the Board with a specific need and ask MBUAR to develop a cooperative program to address that need.

The idea for a joint effort between MBUAR and local non-governmental organizations (NGOs), such as local historical societies and community museums, was not a new concept. Through both its permit and outreach programs, MBUAR had assisted NGOs with their permitted field investigations and educational activities. An on-going relationship was developing between NMS's museum and MBUAR, including jointly organizing events as part of Massachusetts Archaeology Month since 2002. MBUAR wanted to design a program that would meet both its needs and those of the NMS, creating a true partnership that would have broader geographical application.

The Problem

To create this program, as well as formulate the program as a partnership effort, MBUAR examined NMS's request. MBUAR identified two key issues: 1) the need to offer volunteer service opportunities that encourage non-diver participation; and 2) the need to create a mechanism to provide for sustainable access to these non-renewable resources. Essentially, MBUAR needed to find a way to encourage the participation of casual observers and non-diving maritime history audiences, and to make the public feel they could make a direct contribution to the discovery and preservation of maritime heritage (Figure 10.1). A program needed to be developed that allowed all levels of the general public with little or no archaeological experience to participate in and contribute to an archaeological project. Critical to success, volunteers would collect information, not objects, and MBUAR would provide feedback to the participants.

For MBUAR, was there a way to capitalize on the public's fascination with shipwrecks which would: 1) allow for public participation; 2) fit into the mission; and, 3) have minimal to no costs? Carolann McPhearson, Curator at NMS, described the need simply and eloquently, "It would be strolling with an excuse (beyond walking the dog) and provide some teeth for protection" (Carolann McPhearson, personal communication, 2005).

FIGURE 10.1. The Old Wreck, Salisbury Beach, Massachusetts (Undated postcard on file with MBUAR).

Additionally, the importance of these casually discovered shoreline, particularly beach, remains has tended to be trivialized, even ignored, as significant cultural resources (Figure 10.2). Typically, they are hastily dismissed as simply marine debris or just another piece of a boat. However, these seem to be shortsighted and premature assessments. Murphy (1983), Delgado (1986), and Russell (2005) recognize and demonstrate that beach scatters can be interpreted and can provide valuable archaeological data.

Purpose and Goals

As a state government agency, MBUAR was searching for ways to engage the public and achieve legal mandates within existing resources. The broad goals and principles supporting this approach are:

- Surveying the historical environment around the Massachusetts shoreline to ensure historical and archaeological properties are not lost through neglect or are not inadvertently destroyed.
- Promoting interest, research, and knowledge of maritime resources and heritage.
- Stimulating public awareness, enjoyment, and participation in the maritime archaeological heritage.
- Building partnerships to increase collaboration with MBUAR and among NGOs.

FIGURE 10.2. Frames of an unknown shipwreck in a coastal pond, Mashpee, Massachusetts (MBUAR photo by David Trubey).

Essentially, by increasing even casual awareness of maritime resources MBUAR hopes to stimulate interest in maritime preservation. By capitalizing on participation in local organizations and by providing learning opportunities through them, MBUAR hopes to achieve its management goals of resource identification, protection, and interpretation.

As noted earlier, the stimulus for this program grew from a local request for assistance. Representing the more local view, NMS's goals are:

- Identification and protection of fragile maritime resources.
- Encouraging interest and new memberships in their organization.
- Finding new potential funding source(s) including membership dues, etc.
- Collecting rumors and other information useful to the organization, which contributes to the other three goals, particularly site discovery.

For NMS, important by-products of creating this program include providing a new and additional member service as well as stimulating new memberships.

On the practical level, MBUAR has limited resources (staff, equipment, and funds) to create and support a new initiative. Any new program initiative had to be self-sustaining with minimal program efforts. At the same time, MBUAR wanted to reach and engage the widest possible audience and "recruit" their cooperation in a subtle way. This was not intended to be a proselytizing exercise in historic

preservation. MBUAR needed an activity in which almost anyone and everyone could participate. Creating a formal volunteer or avocational program requires substantial ongoing involvement and resources to be and to remain successful and useful and to contribute to our goals; MBUAR does not have such resources. Any new program or initiative needed to be low tech, low maintenance, and have minimal daily staff effort and involvement. It would depend not only on local partner collaboration with MBUAR, but rely strongly on their ability to engage the public. Combining these factors with the goals, MBUAR created the Shoreline Heritage Identification Partnerships Strategy – SHIPS.

How is SHIPS Different

In formulating SHIPS, MBUAR looked to existing underwater and terrestrial programs as models. On the terrestrial side, avocational programs and groups tend to focus their efforts on specific archaeological sites and the process of site excavation. While site discovery efforts occur, it is typically a minor component of their publicized efforts. To become a participant in such programs requires a level of specialized training and knowledge.

In the field of underwater cultural resource management, most programs concentrate their outreach effort on the recreational diving community. Successful underwater archaeology avocational programs, such as the Maritime Archaeological and Historical Society (2005), the Nautical Archaeology Society (2005; Dean et al., 1992), and the Rhode Island Marine Archaeology Project (2005), tend to be directed to underwater sites in the near shore or offshore, and rarely on shore. Their main audience is the sport diving public. To become a participant requires a level of specialized training and knowledge.

Even for the non-diving, their involvement and experience is tied to these underwater resources. These volunteers participate in projects by serving as historical researchers, conservation technicians, or in logistical support. Typically, enabling them to experience the resource is through remote visitation via remotely operated vehicle cameras and museum exhibits. The tangible connection to history is at least one step removed.

However, in researching its new strategy, MBUAR found two programs focusing on the shoreline that offer the outer ranges of informal to formal programs. At the most casual end, the Dorset (England) Coast Forum sponsors its Timber Reporting Scheme in a manner in which the general public is encouraged simply to report the discovery of ship timbers along the Dorset shore (Dorset Coast Forum, 2005; Gordon LePard, personal communication, 2005). At the other end of the spectrum is Scotland's Shorewatch Project with its intensive archaeological field volunteer program (Shorewatch, 2005; Tom Dawson, personal communication, 2005). These two avocational programs serve as boundaries for MBUAR's approach.

The focus of SHIPS is both casual and local. Casual resource discoveries are viewed as targets of opportunity (Figure 10.3). Service delivery and point-of-contact

FIGURE 10.3. Hull remains embedded in the beach, Manchester, Massachusetts (MBUAR photo by Victor Mastone).

is a local focus using existing institutions – local coordination, local history, and local resource. The program is not intended to create a new organization, but rather to capitalize on existing community-level organizations, such as local historical societies and museums whose primary purpose is maritime heritage. SHIPS is envisioned as a series of local partnerships or territories along the shoreline.

Previous experience for MBUAR has demonstrated that focusing efforts and participation locally is successful. The Bassing Cove Maritime Association, a current MBUAR permittee, and the Scituate Historical Society (SHS), a former MBUAR permittee, developed a strong on-going partnership in interpreting a local shipwreck site through an exhibit at the SHS museum and an educational program with local schools. Additionally, MBUAR has a long history of responding to ad hoc reporting of potential archaeological sites. Unlike other casual discoveries, two individuals (Paul McCarthy and a nineteenth-century river shipwreck in Marshfield, and Dave Whittredge and the early colonial Chebacco Bridge in Essex) not only reported their discoveries, but currently are conducting on-going research at these sites. They are self-motivated and their attention is focused on the

local community. Further, these groups and individuals do not work directly for MBUAR (unpublished files and notes of MBUAR).

How does SHIPS Work?

Through casual observers and local partner NGOs, SHIPS encompasses three types of site discovery and reporting activities: 1) casual discovery of possible resources; 2) verification and preliminary documentation of resources; and, 3) random and systematic surveys working toward a comprehensive inventory. In general, casual observers are people who essentially are walking the beaches and foreshore on a regular basis and may have an interest in local maritime history. While walking the beach/foreshore, they experience a coincidental encounter with a potential resource (Figure 10.4). Ideally, a casual observer completes a reporting form and submits it to the local partner organization, or directly to MBUAR. More likely, a casual observer verbally reports the discovery and the

FIGURE 10.4. Fish weir in Taunton River, Taunton, Massachusetts (MBUAR photo by Victor Mastone).

local partner completes the reporting form. Using its cadre of "trained" volunteers (to be known as Coast Watchers), the local partner encourages casual observations and reporting, manages data collection, recruits volunteers to create local response/survey teams, and ultimately undertakes small-scale shoreline surveys (i.e., walkover or pedestrian surveys).

In-depth investigations and excavations, and to a great extent site interpretation, currently are outside the intended role of SHIPS. There may, however, be future opportunities for greater involvement of individual Coast Watchers and NGOs. When MBUAR staff undertakes detailed field recording of sites, Coast Watchers may be called upon to assist in these efforts. Given the partnership relationship of this program, MBUAR foresees participants eventually taking on projects as permittees.

Training, Education, and Outreach

Wise stewardship of cultural resources requires public involvement that necessarily includes the delivery of specialized information and services. No formal program of specialized training exists for the casual observer. However, SHIPS delivers certain services and products to the casual observer including general lectures on maritime archaeology, a brochure to guide reporting and transmitting of messages, and feedback (often a missing element). Public casual observers would be encouraged at the local institution to take the brochure and undertake their casual activity. MBUAR will periodically perform a brief overview lecture on maritime archaeology in Massachusetts at each participating venue; these will be open to the public. The local NGO partner and MBUAR would provide feedback to casual observers providing an opportunity for the local partner to build a connection with the casual observer to potentially recruit new organization members and to solicit other information (rumor collecting). MBUAR would send a thank-you acknowledgement to recognize the public service, provide a possible artifact identification, and suggest future research venues for those who are interested.

A cadre of trained volunteers will be established at participating institutions. These volunteers would be the main interface between the general public and the MBUAR and would serve two primary functions: 1) to review reporting forms, and 2) to act as a rapid response survey team (Figure 10.5). The services and products delivered to Coast Watchers by SHIPS will include the same items as delivered to the Casual Observer, plus a three-part training course, a basic tool kit, and on-going technical assistance with site recording and reporting.

Depending on their level of experience and interest, Coast Watchers likely will be called upon to conduct informal regional and/or local shoreline surveys to further discover and identify sites. They also will be asked to monitor known sites and report on any changes in their condition. The volunteers will not collect objects, but rather will pass information to MBUAR's staff.

FIGURE 10.5. Volunteers recording a beach site, Manchester, Massachusetts (MBUAR photo by Victor Mastone).

To be included in the Coast Watchers, individuals will need to participate in a three-part training course sponsored by an NGO partner. While individuals would not be required to join a partnering institution to become a Coast Watcher, it certainly would be an unstated objective of participating NGOs. The training module will involve three components: A) an overview of maritime history and archaeology; B) instruction for preliminary historical research (local history guide); and, C) training in basic field techniques and reporting. MBUAR will present Parts A and C, while the local NGO partner will present Part B. This division of labor fosters the partnerships. This brief training module teaches participants to recognize shipwreck components on area beaches and to provide preliminary documentation such as location, photographs, basic measurements,

and the noting of features. Additionally, the training provides guidance on the review and completion of reporting forms.

Tool Kit

In addition to training courses, each Coast Watch team will use a basic field tool kit to conduct very preliminary documentation of discoveries. While MBUAR currently is unable to provide each Coast Watchers team with a tool kit, the following items are suggested materials each team should assemble for its rudimentary field recording of finds. This kit includes:

1. Recording form (Figure 10.6)
2. Map (local topographic sheets)
3. Compass and/or hand-held global positioning system (GPS) unit
4. Wax pencil and mylar sheet or slate
5. Camera (preferably digital)
6. Measuring tape
7. North arrow
8. Scale and photo labels

In addition, the SHIPS program, including the brochure, reporting form, and local contacts, will be described on the MBUAR website. Participating institutions will be encouraged to provide a link to that address.

Conclusion

Archaeological remains, especially from the marine environment, often are fragile and can be damaged even by apparently harmless activities. In its simplest terms, SHIPS engages the public in the discovery phase of archaeology by providing contact information and instructions for reporting and recording shipwrecks or other historic resources. When members of the public find a historic object, SHIPS helps them to report it and record it. For the cultural resources manager, SHIPS provides potentially useful data on probable sites. Its most fundamental objective is best summed up by Scotland's Shorewatch project, "The project brings together individuals and groups to save information about...precious archaeological sites before they are lost . . . " (Shorewatch, 2005).

The goals of SHIPS include fostering collaboration at several levels. At the simplest level, SHIPS attempts to forge a link between the general public and the maritime heritage community. The partnerships among MBUAR and local historical societies and museums serve to connect the various participants. MBUAR is not in competition with any organization. Rather, it cooperates and collaborates with everyone.

The COMMONWEALTH OF MASSACHUSETTS
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251 Causeway Street, Suite 800, Boston, MA 02114-2136

SHIPS REPORTING FORM

SHIPS, **S**horeline **H**eritage **I**dentification **P**artnerships **S**trategy, is a collaborative effort of the Board of Underwater Archaeological Resources with local historical societies and local museums and the public to document historical and archaeological properties along our shoreline. Please complete this form and return it to any of the contact listed below. Thank you for your assistance.

PLEASE TYPE OR PRINT LEGIBLY

REPORTER'S CONTACT INFORMATION	
NAME _____	COASTWATCH VOLUNTEER
MAILING ADDRESS _____	Yes
_____	No
TELEPHONE NUMBER: (Day) _____ (Evening) _____	Want to become one?
EMAIL ADDRESS: _____	

Date: _____
Location: _____
Town: _____
Beach: _____
Coordinates:_____
_____

Environment:
Sandy ☐ Rocky ☐
Muddy ☐ Bog ☐

Is the find:
Concentrated ☐
Scattered ☐
Broken ☐

Level of Exposure:
Fully exposed ☐
Partially exposed ☐
Mostly buried ☐

Tide Exposed at:
Only Low ☐
Middle Ebb or Flow ☐
All of the time ☐

Main material of construction:
Wood ☐
Steel ☐
Iron ☐
Fiberglass ☐

What do you think it is?
Boat ☐
Ship ☐
Wharf ☐
Other ☐

Specify:_____
_____
_____

What are the approximate dimensions of the site?
Length: _____
Width: _____
Height: _____

If the find is wood, does it appear to be:
Hand hewn ☐ | Strong ☐
Machine cut ☐ | Partially deteriorated ☐
Both ☐ | Heavily deteriorated ☐

If there are fastenings, are they:
Wood (pegs, dowels, treenails, etc.) ☐
Metal (nails, rivets, bolts, etc.) ☐
Other: _____

Comments: _____
_____

Rough Sketch:

CONTACTS

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FIGURE 10.6. MBUAR SHIPS Reporting Form.

In the long-term, the SHIPS program will foster joint stewardship of maritime historical resources on a number of levels through the following tasks (adapted from Welsh Historic Monuments, *Caring for Coastal Heritage* 1999:17):

- Seeking information (site discovery and rumor collecting)
- Evaluating information (marine debris or archaeological remains)
- Assessing impacts (of threats)
- Protecting and preserving (all resources)
- Devising mitigation measures (appropriate use)
- Monitoring (site conditions)
- Interpreting (for public benefit and scientific knowledge)

At this stage, however, SHIPS will concentrate efforts on site discovery and monitoring tasks. Because this program is intended to be a low-maintenance volunteer effort, requiring only rudimentary training and skill levels, these tasks are the most appropriate application of these partnerships.

Rather than regarding SHIPS as a unique or parochial approach to Massachusetts' resources, it can be viewed as one of several tools that coastal states might employ to:

1. Accomplish site discovery objectives.
2. Stimulate interest in maritime cultural heritage and preservation.
3. Build local partnerships.
4. Reach a wide audience.

Ideally, this program will serve as a template for other agencies and organizations to use.

The current Massachusetts underwater archaeology program has attempted to bring various interest groups together to jointly manage historic shipwreck properties in state waters. The approach balances traditional uses with contemporary views of the value of these resources. Through the permitting process, an attempt is made to accommodate conflicting commercial and historical values. The exempt shipwreck component allows for continuation of traditional recreational activities in an unregulated setting, a major unanticipated by-product of which is a growing appreciation among the diving community of the adverse effects of collecting. Shipwrecks designated as underwater archaeological preserves will provide a non-destructive recreational outlet, encourage scientific research, and elevate the public's awareness of the state's submerged heritage (Mastone, 2002). SHIPS expands the program's focus into the most heavily utilized region of our coast, the shoreline. By building on local partnerships and reaching a wide audience, SHIPS accomplishes the management goal of site discovery and broadly stimulates interest in maritime heritage preservation. The Massachusetts program depends heavily on active involvement of the public, as Board members, permittees, or casual visitors to the state's resources, to identify, evaluate, and protect these non-renewable resources.

Many people are very interested in these shoreline wrecks and we expect this program will be a way of connecting this audience to the maritime material culture.

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11
Wrecked, Abandoned, and Forgotten?: Public Interpretation of Beached Shipwrecks in the Great Lakes

John R. Halsey

Introduction

Every year thousands of people visit maritime museums, read books, and watch any number of television shows devoted to shipwreck disasters and discovery. Many divers research new discoveries or visit favorite wrecks time and again. In some places, tourists may even view them from glass-bottomed boats (see Halsey and Lindquist, 2003). Maritime archaeologists conduct excavations and surveys to further our understanding of the processes that reduce SHIPS to wrecks, to clarify details of onboard life and routine, or to record the distribution of shipwrecks or pieces of wrecks in a specified area. These may be the most common ways of experiencing shipwrecks, but are they the only ways? There is a class of shipwrecks that in the past has largely escaped the attentions of the public, sport diving, and archaeological communities. They number in the hundreds. They are the beached shipwrecks, those unfortunates blown on shore and often broken to pieces by pounding waves as they lay helpless and exposed on beaches, spreading their furnishings, passengers, and crews all across the Great Lakes (Weichel, n.d.). Others finished their days as hulks or dock extensions. Today, because of their ready accessibility and visibility, archaeologists and interpreters are increasingly turning to the remains of these wrecks that poke through the sand underfoot or rise above the curl of the surf to tell the stories of their working lives and deaths (O'Shea, 2004). What follows are some of those stories now being told. There are many more waiting to be heard, stories that will allow everyone to experience "the wonder and sadness connected with these Great Lakes wrecks" (O'Shea, 2004:114).

Beachcombing for Shipwrecks

Sleeping Bear Dunes National Lakeshore is located on the shore of Lake Michigan in the northwest portion of Michigan's Lower Peninsula. In addition to its mainland holdings the lakeshore also occupies North and South Manitou Islands about 16 kilometers (10 miles) off shore. The corridor between the mainland and the

islands is called the Manitou Passage. Captains who opted to take the Manitou Passage route could save a significant amount of time over those who chose the open lake route to the west of the islands. While the Manitou Passage was a short-cut for vessels traveling up or down Lake Michigan, there were many shoals and rocks to be avoided. Today's sailors have accurate charts, buoys, lighthouses, and other aids to navigation to help them avoid these dangers. Bad weather, fog, smoke from forest fires, and poor seamanship all combined to make the Manitou Passage a dangerous place to sail. As a result, today there are at least 58 vessels known to have wrecked within the boundaries of the Manitou Passage Underwater Preserve (Vrana, 1995), one of 11 state bottomland preserves created by the State of Michigan (Halsey, 1985, 1990:33-35; Vrana and Halsey, 1991). The boundaries of the preserve largely coincide with the boundaries of the national lakeshore.

The majority of shipwrecks in the preserve were wooden sailing vessels or steamers. Fragments of them are to be found today in the sandy beaches. Beginning in the 1980s, national lakeshore personnel saw these remains as an additional resource complementing the magnificent natural scenery of Sleeping Bear Dunes and the existing maritime historical facilities. To aid beachcombers in their understanding of what they were seeing and to protect the wreckage (from, for example, being turned into campfire wood), lakeshore interpreters created a broadside sheet called *Beachcombing for Shipwrecks*. This sheet told what to look for, advised on the safety problems presented by metal spikes and pins, offered tips on how to tell shipwreck timbers from structural debris such as docks, and explained what part of the ship timbers might be from and how old they might be. No map showing the location of known wreckage was provided, instead users were told, "The same natural forces of wind and waves that caused most of the wrecks can quickly uncover a wreck site that has been buried in the sand for over a hundred years. The site may remain visible for weeks or only a few days. Beachcombing for shipwrecks is a treasure hunt for history that offers new possibilities for success." In recent years, low water levels have not revealed any new wrecks, but according to park interpreter Bill Herd, *Beachcombing for Shipwrecks* was one of the lakeshore's more popular undertakings.

This interpretive device successfully utilized the possibility of discovering a real shipwreck (or at least pieces of one) to spice up what otherwise might be just another routine walk on the beach.

Kate Richmond: The Eternal Discovery

The wooden, two-masted, 38.7-meter (127-foot) schooner *Kate Richmond* was built in Cleveland, Ohio, in 1855. Not a particularly lucky vessel, the schooner was heavily damaged by going ashore in 1856. Put back into service, major repairs were required in 1863 and a complete rebuild in 1866. The schooner sank in a storm in 1869 and was out of service for two years. On December 5, 1885, the end finally came for the schooner when it was blown onto the Lake Huron shore of Michigan's "Thumb." The crew escaped in the yawl boat. Salvage attempts were made and

abandoned in 1886. Later, someone burned the wreck and what remained subsided into the beach.

Young Womens' Christian Association (YWCA) Camp Cavell, north of Lexington, Michigan, named after martyred World War I British nurse, Edith Cavell, has served campers and their families for more than 90 years. Today it offers programs ranging from technical tree climbing, to "killer hikes" and horseback riding. Throughout the 1980s shoreline erosion caused by high lake levels exposed the remains of *Kate Richmond* (*Sanilac County News*, 1987). In the years since, the wreck has become a favored attraction for campers. According to camp director Jill Laidlaw and long-time volunteer B. J. Morrison, campers are given a "slightly embellished history" of the ship and its loss and are allowed to "excavate" the now drifted-over wreckage on the swimming beach using their hands and tin cans. Each week during the summer season, as soon as one group is done, the sand returns and *Kate Richmond* awaits the next group of discoverers to give them their own personal shipwreck experience. For the young campers the wreck is all about the excitement of discovery, experiencing at first hand the actual physical reality of a shipwreck, touching wood and iron that is 150 years old. After all that this vessel has suffered, the limited attentions of 4,000 campers a year leave it little the worse for wear and gives Camp Cavell a cachet that cannot be matched at any other camp.

Forty Mile Point: Shipwreck Meets Lighthouse

For all their innate appeal, shipwrecks sometimes come second to other attractions in the vicinity. Forty Mile Point Lighthouse north of Rogers City on the northeast coast of Michigan's Lower Peninsula was first lighted in 1897 near the end of the lighthouse-building period. Forty Mile Point filled in a gap between lights at Presque Isle and Cheboygan (Hyde, 1986:94-95).

In January 1944, the United States Coast Guard took over responsibility for maintenance and operation of the 40 Mile Point Light Station. For the next 27 years, the Coast Guard continued to maintain the light and the surrounding grounds and used the reservation for training, housing, and as a retreat for hunting and fishing. The land and all buildings, except the lighthouse and light and 0.9 hectares (2.4 acres), were conveyed to Presque Isle County on August 16, 1971, by the Bureau of Outdoor Recreation under the "Legacy of Parks" program. The reservation became a county park known as Lighthouse Park. The county assumed responsibility for the upkeep and maintenance of the lighthouse and the reservation, but the Coast Guard continued to be responsible for maintaining the light. On July 19, 1984, the site was placed on the National Register of Historic Places.

Over the ensuing years, the light station became a favorite spot for picnics, swimming, and hiking. Unfortunately, the station, and particularly the lighthouse, began to deteriorate. Several attempts at restoration were made by the county and others with minimal success. The lighthouse was declared surplus and assigned to the Administrator of General Services for disposal in 1996. Subsequently, Presque

Isle County, with the assistance of the 40 Mile Point Lighthouse Society, applied to have the property conveyed to the county under the Federal Property and Administrative Services Act of 1949.

In September of 1998, the county was advised that their application had been approved and accepted. In November 1998, the deed to the property was turned over to the county. Since that time, the county and the 40 Mile Point Lighthouse Society have been working to restore and preserve the entire site. The park is open year-round to the public. One apartment in the lighthouse is occupied by a full-time caretaker; the other apartment has become a nautical museum staffed by Society volunteers and others interested in preservation of the site (40 Mile Point Lighthouse Society, 2005).

Lighthouses have their own devotees and fans drive long distances to see as many lighthouses as possible, much like avocational birders working on their life lists. Lighthouse memorabilia in the form of T-shirts, sweatshirts, baseball caps, and small ceramic models of individual lighthouses are popular souvenirs. Today this lighthouse is one of at least twenty in Michigan open to the public.

On October 19, 1905, the 65.8-meter (216-foot) wooden steamer *Joseph S. Fay* was towing its consort schooner *D.P. Rhodes* downbound from Escanaba in the Upper Peninsula; both were loaded with iron ore destined for Ashtabula, Ohio. They were caught in a violent storm and in the course of trying to find shelter, the towline tore the stern out of *Fay*. The captain was able to maintain power long enough to get the steamer headed to shore. The crew gathered in the forward cabin. *Fay* ran bow-first into a sandbar and the vessel swung broadside to wind. The entire forward cabin was torn loose and it, along with the captain and ten crewmen, were picked up by a giant wave and washed safely ashore 60 meters (200 feet) west of the lighthouse. One man was lost in the disaster. Fully exposed to the wind and fatally fractured, *Joseph S. Fay* broke up in the surf.

A large fragment of *Fay*'s hull became embedded in the beach while most of what survives of the wreck lies offshore. Today, the 40 Mile Point Lighthouse Society offers interpretation through its website (http://www.40milepointlighthouse.org/fay.htm) and also on-site with historic photographs of the vessel and description of the wreck incident posted at an information kiosk. A sign directs interested visitors to the shipwreck location, but there is no interpretation at the actual site of the wreckage, where the viewer is confronted with an imposing and forbidding slab of metal-studded oak planks and frames (Figure 11.1). Tom Stone of the 40 Mile Point Lighthouse Society reports that most visitors take time to visit the wreck, but that the Society has no plans for additional interpretive efforts.

At lighthouse sites, lighthouses are the stars. Although lighthouses seem to be magnets for pieces of unrelated nautical memorabilia such as anchors, buoys, etc., these strays tend to be used more as landscaping objects rather than as the focus of serious interpretive efforts. One gets the definite feeling that were they not here, they would have been discarded and completely lost. However, when shipwreck remains such as *Joseph S. Fay* are a legitimate part of the site's history, they receive fair notice as a member of the "supporting cast" of maritime historical memorabilia.

FIGURE 11.1. A large section of the hull of the steamer *Joseph S. Fay* bristles from the beach near 40 Mile Point, Michigan. Wooden steam-powered and sail vessels being blown ashore and broken up there were common occurrences on the Great Lakes in the nineteenth and early twentieth centuries (Photo by John R. Halsey).

Something to Trip Over

Ludington State Park lies on Michigan's eastern Lake Michigan shore roughly 280 kilometers (175 miles) NNE of Chicago, Illinois. The park offers miles of swimming beach backed by sand dunes and the magnificent Big Sable Point Lighthouse, one of 121 lighthouses in Michigan. The lighthouse lies near the northern end of the park and is open to the public during the summer months. There is no public parking at the lighthouse and access is gained by walking 2.4 kilometers (1.5 miles) from the main parking lot either along the beach or a two-track road behind the dunes. The latter is frequently used by bicyclists. The most interesting (or at least attractive) route is along the beach. About halfway along the beach between the parking lot and the lighthouse, lie the barely visible wooden remains of a shipwreck. During times of normal water levels, the wreckage lies in the surf. In the spring of 2004 and with near-record low water levels, it lay well above and behind the waterline.

The regularization of public visitation to the lighthouse in 2002 following its transfer to the State of Michigan greatly increased foot traffic past the wreck. In the summer of 2003, the Office of Education and Outreach, Michigan Department of Natural Resources (DNR), applied for funding through the Coastal Management Program for, among other activities, creation of an education interpretive panel for the wreck. At this time, the identity of the wrecked vessel was unknown and the Office of the State Archaeologist, Michigan Historical Center,

volunteered its assistance in exposing and, hopefully, identifying the wreck. On April 19, 2004, staff members from the Office of the State Archaeologist, Thunder Bay National Marine Sanctuary, and Ludington State Park spent the day digging, pumping, and sketching and produced enough information to identify the wreck as *George F. Foster* to a high level of certainty. *George F. Foster* was a two-masted schooner built at Newark (now Saugatuck), Michigan, in 1852. Headed from Grand Haven to Chicago, the ship with its load of lumber was blown off course and wrecked at Big Sable Point in October 1872.

Armed with that information, department interpreter Earl Wolf quickly put together the interpretive panel (which cost only US$90 to fabricate) and placed it just to the side of the wreck (Figure 11.2).

Annually, approximately 35,000 visitors pass by the wreck and its interpretive panel. According to Wolf, the walk up the beach to the lighthouse usually is taken by family groups rather than individuals. Alan Wernette, who leads interpreter-guided hikes along the beach, reports that there is an audible hum of excitement when the youngsters are told that they will be seeing a shipwreck. Disney-fueled expectations of a large wooden vessel with tattered sails inevitably succumb to disappointment when confronted by the reality of the humble remains.

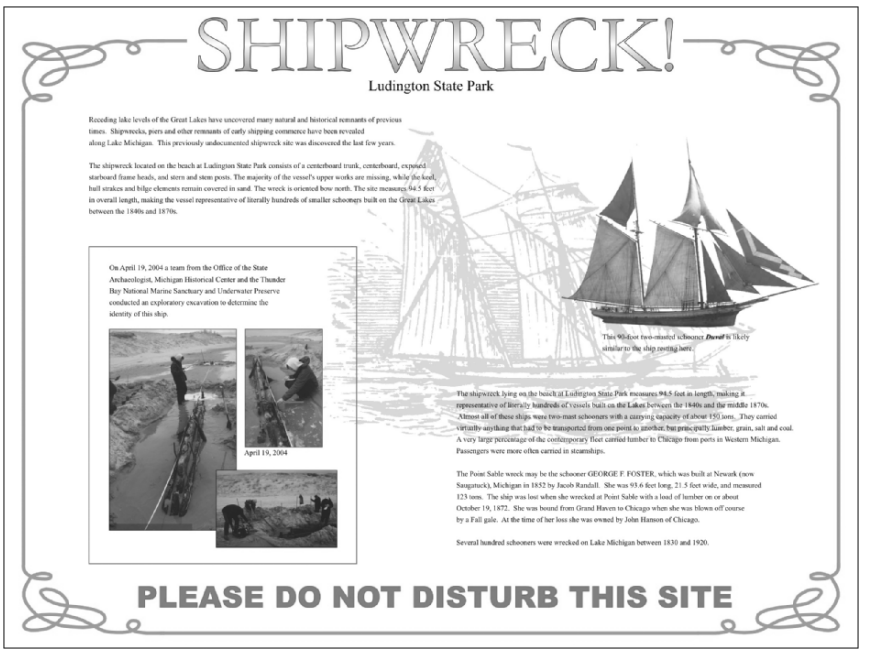

FIGURE 11.2. This interpretive panel briefly tells the story of the schooner *George F. Foster*, lost in 1872 on the shore of what is now Ludington State Park in Michigan. The panel is small enough that it can be removed for the winter season when west winds off Lake Michigan could destroy it (Photo courtesy of Earl Wolf).

Nevertheless, not long after having some of the more subtle aspects of the site pointed out, interest returns. The wreck protruding from the sand evokes a sense of discovery and a range of questions, not all of which can be answered by the limited information on the panel. Visitors want to know more about the wreck's history, what became of the crew, and what will happen to it when the lake returns to its normal levels. It is the immediacy of the presence of physical remains that excites the curiosity. A similarly positive response would not likely be evoked by a panel that presented only generalities about the known or probable presence of unseen submerged wrecks. The investment of a relatively small amount of time and money appears to have had a major impact on the public's appreciation of this beached wreck.

Bullhead Point: Quarry Wharf to Shipwreck Park

The Wisconsin Historical Society has done a remarkable job of bringing the state's maritime history to public attention through its "Wisconsin Great Lakes Shipwrecks" website (www.maritimetrails.org and www.wisconsinshipwrecks.org) and other "non-virtual" outreach efforts. Lying on the west shore of Sturgeon Bay on Wisconsin's Door Peninsula, Bullhead Point juts out abruptly into the bay that, combined with the Sturgeon Bay Canal, creates a continuous NW-SE waterway across the peninsula. In shallow water at the eastern end of the point lie the remains of three wooden SHIPS; the steamer *Empire State*, and the schooner-barges *Ida Corning* and *Oak Leaf*. The following discussion is derived from information in Green (2003) and Green et al. (2002).

Most people today might identify the Door Peninsula as a summer tourist destination and home of numerous cherry orchards, but its first blush of economic importance came as a source of limestone when, in 1834, the federal government opened a quarry in what would become the city of Sturgeon Bay. In 1890 Wisconsin ranked eighth among the country's 41 limestone-producing states, generating US$19 million in revenue. By the early 1900s, there was a limestone quarry directly to the west of Bullhead Point. Most of this Door County limestone went into large construction projects such as piers and breakwaters.

Because the quarry was located so close to the water, transportation by ship was a very economical means of getting the limestone to market. One way of doing this was to use a steam tug to tow a large wooden hull filled with quarried stone. The 64.6-meter (212-foot) *Empire State* was built in 1862 and spent most of its career as a passenger and freight steamer. In 1906, the combination of a Christmas Day fire and advanced age led to the vessel being sold and cut down for stone-hauling. By 1916, hard use had so weakened *Empire State* that it was intentionally scuttled and filled with rock to extend the end of the Sturgeon Bay Stone Company's wharf.

The 51.2-meter (168-foot) schooner-barge *Ida Corning* was purpose-built in 1881 to be towed in "consort" with a steamer and was initially involved with the lumber trade. The enormous unobstructed interior of the hull could be entirely filled with cargo. The eventual depletion of the Great Lakes forests made many

vessels like *Ida Corning* redundant. In 1908, *Ida Corning* was sold to the Sturgeon Bay Stone Company and joined *Empire State* in that company's stone-hauling fleet.

The 39.6-meter (130-foot), two-masted center-board schooner *Oak Leaf* was built in 1866 and apparently carried typical Great Lakes bulk cargoes such as grain, corn, lumber, ore, coal, riprap, gravel, and crushed stone. After an uneventful early career, *Oak Leaf* was rebuilt in 1886. Five years later, the relatively small schooner was no longer economically competitive and was converted to a barge, losing its masts but gaining 9.1 meters (30 feet) in length. *Oak Leaf* in its new form was purchased by the Sturgeon Bay Stone Company.

The dates when *Ida Corning* and *Oak Leaf* were taken out of stone-hauling service are unknown. A local newspaper, the *Door County Advocate*, reports that they both were still active as of 1920. They lay abandoned alongside *Empire State* at the Sturgeon Bay Stone Company wharf in 1928. The stock market crash the next year was their death sentence as working vessels. Local people used the abandoned hulks as fishing platforms for several years after that. Fearful of lawsuits for personal injury, in 1931 the company burned all three SHIPS to the waterline.

After the burning, most local people largely forgot about the three SHIPS at Bullhead Point. Those who did remember confused which name went with which wreck. As the twentieth century drew to a close, the three shipwrecks lay parallel to one another in 0 to 3.6 meters (0 to 12 feet) of water, with the centerboard trunks, frame timbers, and bow assemblies of two vessels rising above the water's surface and easily visible from shore. Both *Empire State* and *Ida Corning* rested partially onshore. Small portable artifacts had long been removed, though bricks, stone, iron fasteners, and upper structural components still could be found within the remaining hulls. Both the lower hull portions of *Ida Corning* and *Oak Leaf* remained significantly intact. Submerged portions of the wrecks were covered with a substantial layer of zebra mussels.

In the fall of 1999, a team of graduate students from East Carolina University's (ECU) Program in Maritime Studies, under the direction Dr. Bradley Rodgers and in collaboration with the Wisconsin Historical Society (WHS), conducted an archaeological survey of the three shipwrecks at Bullhead Point. The underwater archaeologists documented the site with no excavation or artifact recovery. Diagnostic artifacts and construction features were examined, sketched, and left in place. The project generated separate maps for each shipwreck as well as an overall site plan incorporating the point. In 2002, underwater archaeologists from the WHS and volunteers from the Wisconsin Underwater Archaeological Association returned to the site and continued documentation with underwater photographs and video.

After the Great Depression, industry found no subsequent use for Bullhead Point and it functioned mainly as a parking area and turnaround for local fishermen. Because they were clearly visible from shore, the Bullhead Point wreck assemblage provided an excellent focus for public interpretation of the area's historic stone industry and its associated vessels. The site was equally interesting, informative,

FIGURE 11.3. An anchor, a park bench, three shipwrecks, and an interpretive panel combined with a beautiful day in Sturgeon Bay on Wisconsin's Door Peninsula offer the interested visitor an optimal setting for learning about the history of local limestone quarrying and the SHIPS that hauled the product (Photo courtesy of Russell Green).

and accessible to divers, snorkelers, boaters, and pedestrians. In March of 2003, the Bullhead Point Historical and Archaeological District was listed in the National Register of Historic Places. At about the same time, the City of Sturgeon Bay designated Bullhead Point a "shipwreck park," with the addition of benches, a WHS-sponsored historical marker, and improved landscaping (Figure 11.3). And, as if this were not enough, the WHS and Wisconsin Sea Grant jointly produced a plastic dive guide for the site giving historical information on one side and plan drawings of the wrecks on the other side.

The research of the Bullhead Point wrecks and later development of the site as a park demonstrated that there was no other place that so neatly defined the joint importance of maritime trades and the stone quarrying industry that constituted much of Door County's early economic growth, but which was otherwise little known or interpreted.

Schooner in the Sand

Sometime in the late 1830s, a heavy storm blew a 18.2-meter (60-foot) schooner ashore at the extreme northern end of Lake Michigan. Winds off the lake soon covered most of the wreck with sand and it disappeared from view, but not before

being noted by early surveyor William Ives in 1849. In 1990, ten-year-old David Head noticed a ship-like object projecting from the eroding bank of the Millecoquins River while walking the beach with his father. They reported their discovery to local DNR officials who in turn reported it to the Office of the State Archaeologist. A series of serendipitous occurrences led to excavations by maritime archaeologists and students from East Carolina University's Program in Maritime History and Nautical Archaeology in 1991 and 1994, assisted by members of the Hiawatha Sportsmen's Club and the Association for Great Lakes Maritime History. Hundreds of visitors came to view the excavations, amazed at what was exposed in front of them. Some retirees brought lawn chairs and made a day of it.

Preliminary excavations and historical research showed it to be a classic example of a "buoyant hull" type of shipwreck (Delgado, 1997:58), but led to an inaccurate identification of the vessel (Halsey, 1991). Extensive excavation over two seasons and exhaustive historical research have failed to identify this vessel conclusively. Probably built in 1833 - a large 1833 United States penny was found in the foremast step (Barkhausen, 1995, 1996) - it may have been lost in 1839 or shortly thereafter, a guess based on the name and employment period (1836- 839) of New York salt inspector J. M. Allen (Mitchell, 1996) and the shipping label on a box of Chinese tea (Cantelas, 1993:15).

The archaeological excavations produced much information about the working life of the ship and the crew on board (Whitesides, 2003). The bow was of a shape characteristic of early nineteenth-century SHIPS. The deck was missing and the wreck had been partially burned and scavenged for its metal fittings. Archaeologists found metal files, a sail needle, hull scrapers, a broom, and iron kettle still holding pitch that would have been used to caulk seams. They also found numerous fishhooks and knives that may have been personal possessions of the captain and crew used to prepare catch. The excavations revealed layers of barrels deep in the hold; some held the remains of fish while others were empty having originally held salt from Salina, New York.

The Millecoquins Wreck offered a rare opportunity to see the richness and archaeological significance of a beached wreck, making a lie of the erroneous assumption that that there is nothing to learn from beached wrecks because nothing of significance survives; that to be significant, a wreck has to be found in deep open water.

The wreck also showed that however much researchers long to know the name of the vessel and the details of its loss, these details do not affect the archaeological significance present in its structural remains and cargo. Anonymous, this little vessel still meets the eligibility criteria of the National Register of Historic Places. Anonymous, it speaks of rural Michigan's involvement in the regional economy of the entire Great Lakes basin, the Erie Canal, and a global trade network that provided Chinese tea to fishermen in the wilds of the Upper Peninsula. Anonymous, it still tells its own unique story of life, commerce, and loss on the Great Lakes at the dawn of Michigan statehood.

The wreck, its artifacts and its story begged for wider publicity beyond the Upper Peninsula. This need was met through "Schooner in the Sand: Unlocking the Secrets of a Great Lakes Shipwreck," an exhibit held at the Michigan Historical Museum, Michigan Historical Center, Lansing, from January 12 to August 18, 2002. This exhibition highlighted the excavation of the wreck, the pivotal role played by the landowners of this site, and the Hiawatha Sportsmen's Club, which donated the artifact collection to the Office of the State Archaeologist of Michigan. The exhibit told the twin stories of how this ship and its cargo represented the early history of travel, trade, and daily life on the Great Lakes, and how archaeology and historical research can help unlock the mysteries and stories of the region's maritime past. Visitors also had the opportunity to explore a full-sized model of the ship. "Shipboard" experiences included learning the mechanical advantage of pulleys and knot-making on a rolling deck. In 2003, the Center for Great Lakes Regional Culture gave the exhibit its 2003 award for Best Exhibition on Great Lakes Regional Culture. Perhaps as many as 200,000 people visited the exhibition during its run. Many members of the Hiawatha Sportsmen's Club attended the opening of the exhibit with the president of the club declaring in a letter, "It was a truly moving experience, because in some small way we participated in an exhibit for the people of Michigan to enjoy, a new segment of our nautical history" (James Smith to John R. Halsey, personal communication, January 14, 2002). An on-line version may still be seen at: http://www.sos.state.mi.us/history/museum/explore/museums/hismus/special/schooner/index.html.

Today, respecting the wishes for privacy by the property owners, the Millecoquins Wreck is not marked in any way, but it is protected by riprap so that no further damage is expected. A substantial portion of the interior remains unexcavated and could be reopened at some point in the future.

Conclusion

Beached shipwrecks in the Great Lakes region offer a wide variety of interpretive options ranging from hand-out sheets telling beachcombers what to look out for, to major museum exhibits, to small parks focused on wrecks. Not all beached shipwreck sites lend themselves to permanent on-site interpretation due to extreme or highly changeable topographic, climatic, and meteorological conditions, and to remoteness of location or potential for vandalism. The wrecks often appear and disappear with the changing of the seasons. What seems to be an important common feature is that everyday people, not just archaeologists and divers, can or at one time could, see and touch and conjecture about shipwrecks and the past and present realities they represent. The conjunction of interpretation with an *in situ* object is critical. Comprehensive answers to questions raised are seldom there; imagination and personal observation fill in the blanks. Books, movies, and photographs do not seem to have the same ability to evoke the wonder, excitement, and, yes, mystery, that kneeling down and brushing the sand

off a buried hull, feeling the worn wood and projecting pins, does. It is the immediacy of these remains and their generally unhindered accessibility, physically and intellectually, that gives them the unique ability to inform and to tantalize at the same time.

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12
Outreach Beyond the Beach: Management of Historic Shipwrecks on the Outer Continental Shelf

David A. Ball, Jack B. Irion, and Christopher E. Horrell

Introduction

As resource managers, interpreting maritime cultural resources for the public is a difficult enough challenge when direct access to your site is limited to those who can scuba dive or who have access to their own personal boat. Bringing this message to the public when your site lies 65 kilometers (40 miles) offshore and 0.4 kilometers (a quarter of a mile) deep, when it requires large SHIPS and robotic equipment that can operate in pressures that would crush the human body just to visit it, and when you do not even own the site or have the legal authority to protect it from third-party damage, the challenges seem almost insurmountable. However, as the federal agency within the United States Department of the Interior that manages the nation's oil, natural gas, and other mineral resources on the Outer Continental Shelf (OCS) (Figure 12.1), the Minerals Management Service (MMS) strives to do just that by sharing with the public the exciting discoveries that are made as a by-product of exploration for oil and gas offshore.

As the federal agency that administers mineral development on the OCS[1], the MMS must ensure that all activities it permits take into consideration the potential effects these activities may have on environmental resources, including historic shipwrecks. For archaeological resources, this requirement is mandated through several laws, including the OCS Lands Act (OCSLA), the National Historic

[1] Management of the OCS is split into four regions: Alaska, Atlantic, Gulf of Mexico (GOM), and Pacific. Approximately 30% of the oil and 21% of the gas produced domestically comes from the OCS. The agency also collects, accounts for, and disburses mineral revenues from federal and American Indian leases. These revenues totaled over US$9.9 billion in fiscal year 2005 and nearly $153 billion since the agency was created in 1982. In fiscal year 2005 approximately $2.3 billion was disbursed to special use funds, including the Reclamation Fund, the Land and Water Conservation Fund, and the Historic Preservation Fund.

FIGURE 12.1. Overview of MMS managed areas (Image courtesy Minerals Management Service).

Preservation Act (NHPA), Executive Order 11593, and the National Environmental Policy Act (NEPA). The NHPA of 1966 was enacted to recognize that the nation is "founded upon and reflected in its historic heritage" (16 U.S.C. 470 *et seq*., 470[b][1]). By passing this act into law, the U.S. Congress proclaimed that "the preservation of this irreplaceable heritage is in the public interest so that its vital legacy of cultural, aesthetic, inspirational, economic, and energy benefits will be maintained and enriched for future generations" (16 U.S.C. 470[b][4]). Section 106 of the NHPA requires federal agencies to take into account the effect of any proposed federal, federally assisted, or federally licensed undertaking on any historic property that is included in, or eligible for inclusion in, the National Register of Historic Places. At present, no other historic preservation legislation applies to shipwrecks on the OCS (Varmer and Blanco, 1999). The Abandoned Shipwreck Act (43 U.S.C. 2101-2106 [effective April 28, 1988]) applies only to state waters, the National Marine Sanctuary Act (16 U.S.C. 1431, *et seq*.) protects only shipwrecks in National Marine Sanctuaries, and the Antiquities Act (16 U.S.C. 431 *et seq*.) is limited to marine protected areas such as national seashores.

At present, the MMS can only exercise protection of shipwrecks with respect to its permitees and leaseholders. As it stands now, however, the MMS manages archaeological resources with respect to the projects it permits or funds through a combination of efforts which include funding baseline studies to identify known and expected locations of archaeological sites and requiring remote-sensing

surveys and archaeological assessments in areas leased for oil exploration that are believed to have a high potential for containing these resources. As a result, the Gulf of Mexico (GOM) is the most thoroughly surveyed body of water on earth. These surveys, conducted by the oil and gas industry as part of their requirement for obtaining a permit from the MMS, have located numerous historic shipwrecks that are an important part of our underwater cultural heritage. As archaeologists within a public agency, we feel that it is incumbent upon us, as much as possible, to share these discoveries with the public in a way that illuminates the richness of the maritime culture lying off our shores, while protecting their locations to discourage looting. These goals are accomplished through the publication of government-funded studies, through public outreach and education programs, and through cooperation with academic programs. Much of this work focuses on the GOM inasmuch as the vast majority of industry remote-sensing surveys occur there.

The MMS Environmental Studies Program

In 1973, the Environmental Studies Program was started as a way to collect and synthesize environmental, social, and economic data to support decision-making for the offshore oil and gas program (at that time administered through the Bureau of Land Management). The basic goals for the Environmental Studies Program are as follows:

- Establish the information needed for assessment and management of environmental impacts on the human, marine, and coastal environments of the OCS and the potentially affected coastal areas;
- Predict impacts on the marine biota that may result from chronic, low-level pollution of large spills associated with OCS production, from drilling fluids and cuttings discharges, pipeline emplacement, or onshore facilities; and
- Monitor human, marine, and coastal environments to provide time series and data trend information for identification of significant changes in the quality and productivity of these environments, and to identify the causes of these changes.

The MMS website currently hosts over 2,000 reports from studies completed through the Environmental Studies Program. Studies funded for archaeological resources fall under the first goal, establishing information for assessment and management of the resources.

Government-funded Studies

In the GOM OCS Region, over 1,200 historic vessels have been reported sunk in federal waters, and thousands more have sunk closer to shore in state waters. Yet only a few of these have been investigated by archaeologists. In the last ten years several significant discoveries of historic shipwrecks have been made in the GOM,

including two late eighteenth- to early nineteenth-century wooden sailing vessels, a U.S. Navy gunboat from the late nineteenth- to early twentieth century, and a German U-boat from World War II. Since 2001, the MMS has partnered with other federal agencies, academic institutions, and private companies to carry out research on a number of these vessels, located in water depths ranging from 6 to 1,981 meters (20 to 6,500 feet).

Historic Shipwrecks Baseline Studies

With all of these new discoveries comes the responsibility to manage these resources. Part of this is done through the MMS Environmental Studies Program. Findings from these studies are used to measure the effects of industry-related development on the environment of the OCS and to develop regulatory policies. Three studies have been completed, all designed to develop a model of likely historic shipwreck locations in the GOM (Gagliano, 1977; Garrison et al., 1989; Pearson et al., 2003). This model was developed to identify areas where archaeological resources are expected to be located, thereby reducing the number of lease blocks requiring a high-resolution acoustic and magnetometer survey to areas most likely to yield positive results (currently specified in Notice to Lessees and Operators [NTL] 2005-G07). As a result of the last study (Pearson et al., 2003), over 1,200 new lease blocks were added to the list of blocks requiring an archaeological survey and assessment. These new blocks primarily are located off the mouth of the Mississippi River.

Programmatic Studies

The MMS undertakes some studies to better understand a particular issue or to evaluate the success of some aspect of its program. In 2003, an opportunity arose to make a significant contribution to our understanding of the state of preservation, long-term survivability, and identification of a number of vessel casualties of World War II in the Gulf of Mexico. The project came about as the result of a need to understand better the "artificial reef effect" of biological recruitment to man-made structures in the deep Gulf for the purposes of management decisions relating to the abandonment of deepwater platforms. Six casualties of Hitler's U-boat offensive in the Gulf became the perfect laboratory because all had come to rest on the seafloor at varying depths within a few months of one another over 60 years ago.

In 2003, MMS awarded a study to C&C Technologies, Inc., of Lafayette, Louisiana, to conduct research on six historic shipwrecks to ground-truth, document, positively identify, and assess their National Register status in addition to conducting detailed studies of the biological communities they had attracted. The vessels included in this study were the cargo freighter *Alcoa Puritan* (sunk by U-506 on May 6, 1942); the tanker SHIPS *Virginia* (sunk by U-507 on May 12, 1942), *Gulfpenn* (sunk by U-506 on May 13, 1942), and *Halo* (also sunk by U-506 on May 20, 1942); the passenger freighter *Robert E. Lee* (sunk by U-166 on July 30, 1942); and the German submarine U-166 (sunk by PC 566 on July 30,

1942). As a result of this study, National Register nomination forms have been prepared for each of these vessels and at this writing are under review.

The Deep Wrecks Project was developed through the Environmental Studies Program and funded in partnership with the National Oceanographic and Atmospheric Administration's Office of Ocean Exploration, through the National Oceanographic Partnership Program. This project partnered under the management of C&C Technologies with the University of Alabama, Montana State University, the University of Alaska at Fairbanks, the University of West Florida, Droycon Bioconcepts, and the PAST Foundation to carry out an unprecedented multidisciplinary study of these historic shipwrecks at water depths ranging from 76 to 1,981 meters (250 to 6,500 feet) (Church et al., 2005). While the project was still in the field, daily updates were made from the ship to the expedition's website (http://www.pastfoundation.org/DeepWrecks/). The results of this study, when completed, will be disseminated through publicly available reports. One unique aspect of this project is, in addition to the written report, a professionally produced video documentary and additional outreach materials were required as part of the contract deliverables.

Public Outreach and Education Programs

Management of the OCS is split into four regions: Alaska, Atlantic, Gulf of Mexico (GOMR), and Pacific. With the exception of the Atlantic Region, where no drilling has occurred since 1982, each of these regions has developed outreach materials to provide information on offshore environmental resources. These materials (available through the MMS website at www.mms.gov) are developed on a regional level and include educational materials for teachers to use in their classrooms as a way to educate students about the diversity of resources in federal waters, and about how exploitation of oil and natural gas can promote these resources. While most of these materials focus on biological issues, within the last five years the Alaska, Pacific, and GOM regions each prepared outreach materials on historic shipwrecks.

Archaeological outreach in the GOMR actually began in 1997 with the development of a series of web pages on prehistoric and historic resources on the GOMR OCS. Originally designed to provide general information on the MMS GOM Region's archaeology program, this site was overhauled in 2000. At that time, the agency developed a mapped image of the GOM with thematic topics featuring shipwrecks discovered through industry-related surveys. Accessing the MMS GOM Region's archaeology web pages (http://www.gomr.mms.gov/homepg/regulate/environ/archaeological/introduction.html) now provides important information for oil and gas operators working offshore, outreach information on historic shipwrecks, and academic papers prepared for many of these shipwrecks.

The GOM Region also developed seven posters and six supporting educational companions. These resources are multidisciplinary and focus on archaeology, biology, chemistry, geology, and oceanography. Titles include: *Chemosynthetic Communities in the Gulf of Mexico*; *Gulf of Mexico Offshore Oases*; *Islands of Life*; *Whales and Dolphins of the Gulf of Mexico*; *Chemistry in the Gulf of Mexico*;

Geologic Secrets Revealed: The New Millennium in the Gulf of Mexico; and *Historic Shipwrecks of the Gulf of Mexico*.

The "Historic Shipwrecks of the Gulf of Mexico" teacher's companion (Ball, 2001) (Figure 12.2) includes a series of lesson plans on the nineteenth-century sidewheel steamship *Josephine* and was developed in conjunction with the nomination of this vessel to the National Register of Historic Places. This publication followed the format set forth by the National Register's website "Teaching with Historic Places" (TwHP). The TwHP website (www.cr.nps.gov/nr/twhp/) features lesson plans developed to correspond with historic and archaeological sites listed on the National Register of Historic Places. Materials are designed for middle school students learning history, social studies, geography, and other subjects in the humanities and include maps, readings, and photographs. Each exercise is accompanied by questions, and a section is included at the end for

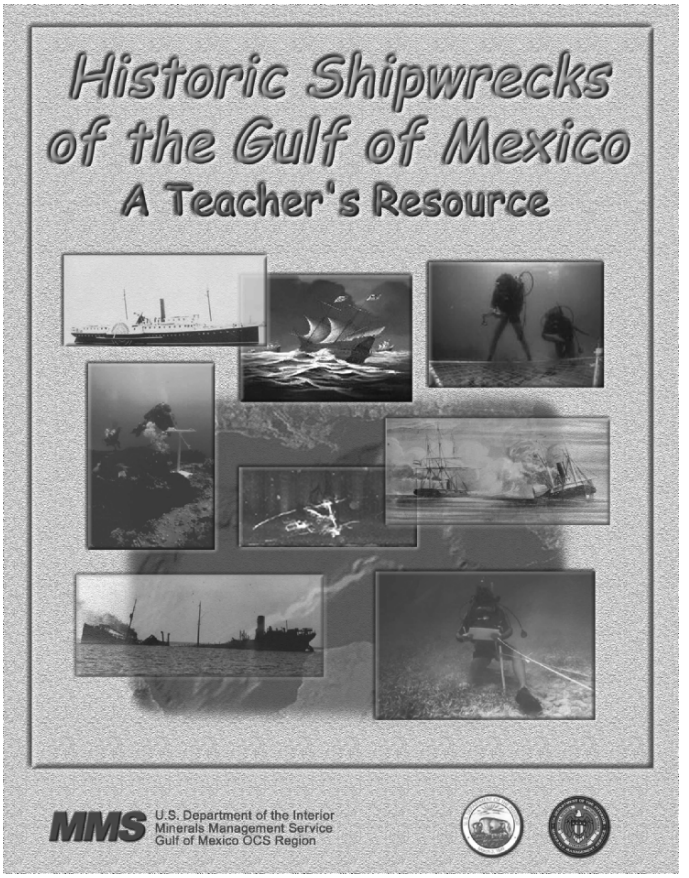

FIGURE 12.2. *Josephine* teacher's companion (Image courtesy Minerals Management Service).

students to conduct further research. The lesson plans for *Josephine* include several readings and map exercises, as well as a hands-on project and a vocabulary list.

Josephine was built by the Harlan and Hollingsworth Company of Wilmington, Delaware, and was completed in 1868. It was built for Charles Morgan and his Louisiana and Texas Railroad and Steamship Company and provided regular service between New Orleans, Louisiana, and Galveston, Texas, from 1868 until 1881. In January 1881, *Josephine* was transferred to the New Orleans to Havana, Cuba, route. The vessel foundered off the Mississippi coast during a severe winter storm on her first return from Havana with no loss of life.

Josephine, which lies in 11.5 meters (38 feet) of water, first was brought to the attention of the MMS as a result of a survey performed by Klein and Associates in 1997. The MMS Seafloor Monitoring Team made two visits to the site, one in 1997 and one in 1999. Side-scan images, video, and photo-documentation were collected revealing that much of the vessel's paddlewheel assembly remains intact. One of the most dramatic features of the wreck is its walking beam engine, a diamond-shaped feature that connected the engine piston to the eccentric of the paddlewheels, which currently lies collapsed against the starboard side of the vessel.

The remarkable preservation of this vessel and the remains of her walking beam engine qualified *Josephine* for listing with the National Register under Criterion C (embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction). Since much of the vessel is believed to remain intact below the mud line, *Josephine* also qualified for listing under Criterion D (has yielded, or may be likely to yield, information important in prehistory or history). The vessel officially was nominated and accepted under both of these criteria on September 21, 2000, by the Mississippi Department of Archives and History's National Register Review Board. It was posted to the *Federal Register* on November 6, 2000.

In 2005, the MMS GOM Region released a poster titled "Historic Shipwrecks of the Gulf of Mexico" (Figure 12.3). This poster complements the MMS GOMR archaeology website and teacher's resource by presenting information on the following themes: Finding Shipwrecks, Colonial Shipwrecks, Nineteenth-Century Shipwrecks, Civil War Shipwrecks, Early Twentieth-Century Shipwrecks, and World War II Shipwrecks. The poster not only highlights shipwrecks discovered as a result of the MMS permitting process, but also draws attention to the technology used to locate these vessels. One of the MMS goals is to develop a series of web pages and an educational unit for each of the themes identified on the poster. These units will be developed as time allows, based on currently funded studies and research. As of this writing, the Nineteenth-Century Shipwrecks unit about *Josephine* is the only one that is completed. Under the auspices of a current study on deepwater shipwrecks, however, a second unit focusing on deepwater shipwrecks from World War II is being developed by the PAST Foundation.

FIGURE 12.3. Historic shipwrecks poster (Image courtesy Minerals Management Service).

Cooperating with Academia

One of the principal means archaeologists with MMS employ to disseminate information about GOM discoveries is encouraging graduate students to develop these discoveries into theses and dissertations. Because MMS is in the unique position of being the repository of a vast amount of survey information, including sonar surveys and remote operated vehicle (ROV) video surveys, we sometimes are able to provide baseline information to students where they otherwise would lack the financial resources to conduct detailed field surveys themselves. To date, nine of the shipwrecks identified through MMS-permitted actions have been the focus of post-graduate work at several universities across the country.

The *Mica Wreck*

The first vessel, known as the Mica Wreck, was developed into a master's thesis by Toby Jones of Texas A&M University (Jones, 2002). The Mica Wreck is a small copper-sheathed sailing vessel, almost 18 meters (60 feet) long, identified in 2001 in 807 meters (2,650 feet) of water during a post-construction pipeline survey. This vessel was damaged unintentionally during construction when a 20-centimeter (8-inch) pipeline was placed across the midships (Anuskiewicz et al., 2002).

As a result of this event, MMS survey requirements were reevaluated and modified to prevent other sites from being damaged in this way.

As part of the mitigation of the site, the operator funded additional investigations of this vessel which included a one-week investigation using the U.S. Navy's nuclear research submarine *NR-1*. The results of this investigation, however, were unable to answer many key questions of the site. At the time of this writing, an additional visit to this site tentatively is scheduled for October 2006. When the fieldwork is complete, this vessel will be nominated to the National Register of Historic Places.

Western Empire

A second master's thesis from Texas A&M, completed by Josh Levin in 2006, provides a detailed historical analysis of the life of the mid-nineteenth-century sailing ship *Western Empire*. Loaded to the gunwales with lumber and caught in a fierce storm, *Western Empire* began taking on water some 322 kilometers (200 miles) offshore. On September 18, 1875, the ill-fated vessel slipped beneath the waves and came to rest on the bottom of the Gulf of Mexico (Horrell and Irion, 2005; Levin, 2006). Discovered during a deep-tow sonar survey for Shell Oil Company in the 1980s, the site remained an enigma until 2003 when the sonar target was investigated with a submersible and remotely operated vehicle.

Through the cooperation of industry, government, and Texas A&M University, Levin was provided archaeological data to augment his historical analysis and to aid in the interpretation of this shipwreck. Future work is planned for this site, as well as further archival research, to make possible a greater understanding of maritime commerce and history in the mid to late nineteenth-century Gulf of Mexico. Once fieldwork and archival research are completed, *Western Empire* will be recommended for inclusion in the National Register of Historic Places.

Casualties of Hitler's U-boat War

The Deep Wrecks Project, described above, provided an opportunity for eight graduate students to participate in the analysis of historic shipwrecks in the deepwater environment. Four of these students are developing theses and dissertations based on research from this project. Morgan Kilgour of the University of Alaska Fairbanks is analyzing the variation of invertebrates by depth and substrate at each of these sites; her findings will be developed into a master's thesis in marine biology. Nicole Morris of the University of West Florida is examining the association of fish at each of these sites; this research will be turned into a master's thesis in biology. James Moore, a Ph.D. candidate at the University of Rhode Island, and Peter Hitchcock, a Ph.D. candidate at Texas A&M University, both are using information from these deepwater shipwrecks toward their doctoral dissertations in archaeological oceanography.

USS *Castine*

Finally, Doug Jones of PBS&J, a contract archaeology firm in Austin, Texas, is preparing a master's thesis about USS *Castine*, a former U.S. Navy gunboat.

Castine was identified in May 2005 during a soon-to-be-completed study to evaluate unidentified side-scan sonar targets in the GOM to confirm their identities and to determine their eligibility for listing on the National Register of Historic Places (Enright et. al., 2006).

Castine was a lightly armed steel gunboat constructed by the Bath Iron Works company of Bath, Maine, in 1892. Her naval career lasted until 1919, having participated in many historic naval battles of the late nineteenth and early twentieth centuries, including the Spanish-American War, the Boxer Rebellion, and World War I. After her military service ended, *Castine* was sold to the New Orleans Menhaden Company for use as a cargo vessel. The vessel sank on December 12, 1924, in about 36.5 meters (120 feet) of water, approximately 32 kilometers (20 miles) off the Louisiana coast, while in tow to the Sabine River. This vessel has been recommended for nomination to the National Register of Historic Places and, at the time of this writing, the nomination is under review.

Conclusion

A great number of historic shipwrecks on the OCS await discovery and documentation. As this chapter has demonstrated, MMS outreach efforts provide a unique opportunity to educate the public about the age, nationality, and function of vessels operating in the Gulf of Mexico through time, their role in the maritime history of the GOM, and their overall importance to the history of our nation. Perhaps the most valuable outreach conduit, which only recently has been tapped, is the MMS's ability to provide survey information, research opportunities, and sometimes actual time in the field to graduate-level researchers. As described, graduate students not only contribute to their prospective fields but also provide an invaluable service to MMS by supplying information to the agency and by aiding in the best management practices for these submerged cultural resources. Through these media, MMS transmits the information gleaned from these historic shipwrecks to the public, thereby facilitating a greater appreciation of these nonrenewable and fragile cultural resources.

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13
Unseen Battlefields: The Japanese Midget Sub at Pearl Harbor

Hans Konrad Van Tilburg

Introduction

In 2002 researchers with NOAA's National Undersea Research Center and the University of Hawaii discovered a small two-man submarine sitting in the darkness of the ocean depths off the south shore of the island of O`ahu (Figure 13.1). This submarine was one of five secret weapons of the Japanese Imperial Navy involved in the historic attack on Pearl Harbor, which heralded America's entrance into World War II in the Pacific. The events of December 7th, 1941, changed the nation and the world, and the two-man submarine is properly understood as a significant historical site and a war grave, worthy of respect, dignity, and our best efforts at *in situ* preservation. It is also a site of great potential for maritime heritage management, a chance for gaining a better understanding of our past, of ourselves, and of our relationship to the sea. This paper presents the background of the site, current research and understanding, and ongoing heritage efforts to bring the benefits of this discovery to the public.

Historical Background

The Japanese Navy was neither the first nor only agency to experiment with midget submersibles as particular types of secret weapons prior to World War II. The Italians had the CA and CB class boats; the British had the X-craft and Chariots; the Germans had Biber and Seehund U-boats. The concept was a familiar one among combatants. The Japanese Imperial Navy, however, did create an extremely capable version. The design role for the midget sub had always been as a fast and stealthy delivery platform for the torpedo. By 1933 the Torpedo Experimental Division at Kure had produced the prototype two-man battery-driven torpedo-shaped craft with a top submerged speed of 24 knots (Kemp, 1999:70).

In 1936 the Kure naval yard produced two experimental prototypes, HA-1 and HA-2 (HA was a designation for several classes of small coastal submarines). Secret testing and trials were conducted during 1936-1940 in the Inland Sea. In November 1940 the craft were formally adopted by the Japanese Navy and given

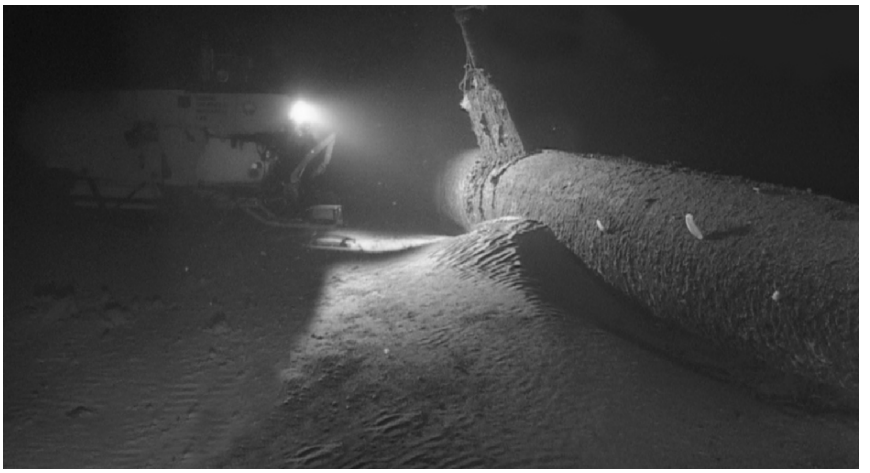

FIGURE 13.1. HURL research submersible *Pisces V* makes the discovery of the Japanese *Ko-Hyoteki* on August 28, 2002. Outward appearance of the site is little changed since the 1941 event (Photo courtesy of HURL).

the name *Ko-Hyoteki* or "A-Targets" in an effort to maintain secrecy. HA-3 through HA-44 were designed to be deployed from the backs of larger C1-type fleet submarines or converted surface SHIPS. These Type-A (first version) midget subs carried two type-97 oxygen-driven torpedoes. War plans prior to WWII were to use the midget subs in open-ocean engagements against the enemy battle fleet in Japanese home waters. These plans changed when the Japanese Navy accepted the *Kido Butai* tactic, the surprise attack on Pearl Harbor. The *Ko-Hyoteki* would now be used against a defended enemy harbor. By December 7th, 1941, approximately twenty Type-A *Ko-Hyoteki* had been built.

The *Ko-Hyoteki* were built to extremely fine tolerances, minimizing weight wherever possible. The all-welded hull of 8 millimeter (0.3 inch) cold-rolled steel (MS44) had a collapse depth of 200 meters (656 feet) and a safe operating depth of 100 meters (328 feet) (Kemp, 1999:73). The Type-A boat was 23.9 meters (78.4 feet) in length, 1.8 meters (6 feet) in beam, and had a conning tower-to-keel depth of 3 meters (9.8 feet). Each sub had a submerged displacement of 46 tons. The conning tower with hatch, periscope, and radio mast was the only superstructure emerging from the cylindrical and streamlined hull. Net guards protected the bow torpedoes, the stern diving planes, and the counter-rotating propellers. There were no torpedo doors, the tubes instead were loaded tail-first from the outside. The hull consisted of three sections bolted together to facilitate construction. The maximum submerged speed of the production versions was 19 knots for less than one hour, with a slow patrol range of 160 kilometers (100 miles) at 2 knots. According to historian Paul Kemp, "the *Ko-Hyoteki* were possibly the most sophisticated and well-designed midget submarines used by any of the belligerents in the Second World War. The designers were working to a clear and precise operational

requirement which they fulfilled." (Kemp, 1999:75). The operational success of the *Ko-Hyoteki,* however, would not match their design potential. The submarines of the Japanese Imperial Navy never were able to engage the enemy fleet as forcefully as initially planned. Subsequent Type-B and C *Ko-Hyoteki* were modified to take on coastal and harbor defensive roles and to operate from shore bases.

Five of the Type-A *Ko-Hyoteki* took part in the surprise attack on December 7th, despite initial concerns on the likelihood of recovering the submarine crews. Japanese C1-type fleet submarines *I-16, I-18, I-20, I-22,* and *I-24* arrived at their deployment areas between 16-80 kilometers (10-50 miles) outside of Pearl Harbor the night before the operation. The five midget subs of the Special Attack Unit had no direct orders to enter the harbor itself, but their commanders had been given plenty of latitude (Burlingame, 1992:51). Larger submarines would ring the island of O`ahu. According to the plan, any SHIPS escaping Pearl Harbor, and any SHIPS arriving as reinforcements from the West Coast, would be sunk by the submarine fleet. The crewmen of the *Ko-Hyoteki* had trained for eighteen months for the attack (Table 13.1).

Following their launch, the five midget subs maintained strict radio silence as they waited for the attack to begin, so it is not clear today how most of them maneuvered in preparation. At least one sub succeeded in penetrating the channel and harbor defenses, only to be rammed by USS *Monaghan* and sunk before it could release its torpedoes. Two others ran ashore outside the harbor entrance (one eventually grounding at Waimanalo Beach and one on the reef outside Keehi Lagoon) and were discovered later. One of the five *Ko-Hyoteki* was sighted shortly before the arrival of the carrier-based aircraft and was sunk by USS *Ward*. The fifth submarine has not yet been found.

In the early morning hours on December 7th, four U.S. Navy minesweepers were performing their regular sweeping duties outside the channel, and USS *Ward* (DD-139), a *Wickes*-class flush-deck "four stacker" destroyer, was on regular patrol. USS *Antares* towing a 500-ton lighter from Palmyra was making her approach to the harbor entrance. At 6:30 AM a crewman on board *Ward* spotted an object astern of the lighter and a PBY seaplane, also on morning patrol, began circling the location. *Ward's* Commanding Officer, William W. Outerbridge, immediately was notified.

TABLE 13.1. Commanders and crewmen of the midget sub attack unit, December 1941.

Submarine	Crew
I-16 midget submarine	Yokoyama Masaji (captain)
	Uyeda Sadamu (crewman)
I-18 midget submarine	Furuno Shigemi (captain)
	Yokoyama Shigenori (crewman)
I-20 midget submarine	Hiro-o Akira (captain)
	Katayama Yoshio (crewman)
I-22 midget submarine	Iwasa Naoji (captain)
	Sasaki Naokichi (crewman)
I-24 midget submarine	Sakamaki Kazuo (captain)
	Inagaki Kiyoshi (crewman)

What appeared to be a conning tower and periscope was sighted behind the barge towed by *Antares,* apparently attempting to follow the vessel into the channel. Observers reported a cylindrical tube about 24 meters (78 feet) long with an oval conning tower. The submarine appeared dark green with moss, indicating it had been at sea for an extended period (Outerbridge, 1941). The PBY dropped smoke pots to mark the contact, and *Ward* opened fire with its #1 gun at a range of 90 meters (295 feet). The initial shot was high. The PBY then made a depth charge attack, and *Ward,* also dropping depth charges and crossing the stern of *Antares*, fired a second shot from its #3 gun which appeared to strike the target directly at the starboard base of the conning tower, but there was no explosion. Fired from less than 90 meters (295 feet), it is doubtful that the shell had time to arm itself. The sub began to descend and moved into the area of the exploding depth charges, leaving behind an oil slick. Unfortunately, *Ward's* actions were not immediately confirmed as a solid indication of an impending attack, and Pearl Harbor command remained unaware of the impending strike until the first Japanese aircraft arrived at 7:55 AM, over an hour after the midget sub had been sunk.

Search and Discovery

Understanding of the role of the Japanese Special Attack Unit began to emerge with the capture of Commander Kazuo Sakamaki's *Ko-Hyoteki* HA-19 at Waimanalo Beach, the first of the submarines to be located. Sakamaki's boat had commenced operations with a number of mechanical problems including a broken gyrocompass (Burlingame, 1992:155). The Commander abandoned the submarine when it struck the reef, swam ashore, and was captured. The *Ko-Hyoteki* was hauled to the beach, secured, and an examination started. Most of the first-hand intelligence concerning the construction of the *Ko-Hyoteki* comes from subsequent examinations of this HA-19 sub. Subsequently, the submarine toured the United States on war bond drives, and today is on display at the National Museum of the Pacific War in Fredericksburg, Texas.

The second of the five midget subs of the Special Attack Unit to be found was recovered from inside Pearl Harbor a couple of weeks after the attack. This was the *Ko-Hyoteki* rammed and sunk by USS *Monaghan* before it had time to release its torpedoes. The submarine sustained a large amount of damage from the ramming and depth charges. The *Ko-Hyoteki* was soon buried in landfill at Pearl Harbor. Subsequently, the vessel was uncovered and re-interred, and still lies buried by coral and sand fill (Delgado, 1988). Identity of crew and submarine remain unknown.

The third sub of the Special Attack Unit was located on June 13th, 1960, during a navy diver training exercise in the vicinity of Keehi Lagoon to the east of Pearl Harbor. The conning tower hatch was open, indicating that the crew may have escaped, although no subsequent record of them has been found. Apparently the submarine was not able to enter the harbor, and both of its torpedoes were in their

tubes. It is now on display as a war memorial at the Japanese Navy submarine school in Eta Jima, Japan. Identity of crew and submarine remain unknown.

The search for the fourth *Ko-Hyoteki,* the Japanese midget sub sunk by the destroyer USS *Ward,* began in 1988 with the joint National Park Service and U.S. Navy project known as Operation Seamark. To date, Operation Seamark is the only large-scale archaeological assessment of the whole battle at Pearl Harbor, including the inner shallow harbor and the Naval Defensive Sea Area (NDSA) outside the harbor's entrance. A side-scan sonar team from EOD-1, under the command of Lieutenant Hank Chace, was assigned the task of searching for the Japanese sub in the deep water defensive sea area outside the harbor using standardized mine and obstruction procedures (Lenihan, 1989:3). Depths in the selected survey area ranged between 230-330 meters (754-1,082 feet). The survey area was delineated by USS *Arizona* Memorial volunteers, the NPS Pearl Harbor historian, and U.S. Navy divers (Lenihan, 1989:6). One high-probability target in almost 275 meters (902 feet) of water was located, but initial attempts to confirm its identity were unsuccessful.

Over the next decade numerous side-scan sonar surveys were conducted by the Park Service, the U.S. Navy, and several private companies. These consistently revealed aircraft, landing craft, barges, SHIPS -a sunken museum of lost and disposed naval material, but no Japanese midget sub. *Pisces IV* and *Pisces V,* manned research submersibles belonging to the Hawaii Undersea Research Lab (HURL, NOAA's National Undersea Research Center at the University of Hawaii), were most useful in documenting many of these sites, since part of their regular training activities were carried out in the Pearl Harbor search area. The area is close to HURL's research facilities at Honolulu Harbor, sheltered from the prevailing northeast trade winds, and pilots had a range of depths and the possibility of surveying previously unknown historical properties. HURL's senior submersible pilot and director of operations Terry Kerby and dedicated others had a longstanding interest in the hunt for the elusive midget sub, and had even come across portions of a dismantled sub, though it was obvious these were lowered to the seafloor and not sunk by USS *Ward.*

Interest and search efforts continued. Between November 8-16, 2000, Dr. Robert Ballard, explorer-in-residence with the National Geographic Society, launched a survey expedition to investigate the approximate 150 targets in the area of the suspected Japanese midget sub. Like previous projects, Ballard had the side-scan sonar results from the 1988 NPS/USN Seamark Project, a selected survey box within the larger NDSA. Ballard also had the remotely operated vehicles *Argus* and *Little Herc*, and small one-man submersibles from American Deepwater Engineering, *Deepworker #8* and *Deepworker #9*, rated to 600 meters (1,968 feet) working depth. The team located a Japanese torpedo, but unfortunately no *Ko-Hyoteki*.

In March of 2002, HURL conducted a towed side-scan sonar survey of areas both within and outside the NDSA, going beyond the original 1988 survey area for the Japanese midget sub. This survey was carried out by Chris Kelley of NOAA Fisheries Service as a test of the side-scan sonar system for bottom fish

habitat characterization. The data produced were equally applicable to the ongoing search for the midget sub, an example of collaboration between natural resource and heritage resource research. Targets from the habitat survey were available for the upcoming HURL submersible test dives.

This led directly to the discovery of the sub sunk by USS *Ward*. Finally, on August 28th, 2002, HURL *Pisces* submersibles located a midget sub in deep water outside the boundaries of the original 1988 survey area. The midget sub appeared upright and intact, in relatively good condition, with a slight list to port. Both torpedoes were still in their tubes, and no extensive exterior damage was visible except for a shell hole at the base of the conning tower's starboard side, corresponding to USS *Ward*'s report (Figure 13.2). No apparent exit hole on the port side was visible, nor was there any evidence of explosion (Wiltshire et al., 2002:38). Silt, corrosion, "rusticles," and sponges were evident on the outside of the hull. Stern dive planes and rudder were in the "up" and "to starboard" positions. The sub rested on hard substrate at its mid-section, where a sandy berm has built up on both sides of the hull. The bow extended unsupported over an area scoured by bottom currents, and scouring was occurring between midships and the stern rudder as well. The *Pisces* subs conducted a non-invasive video survey. HURL and NOAA contacted the United States Department of State and, as advised, protected the site's position as sensitive data. Identity of crew and submarine remain unknown.

FIGURE 13.2. Two type-97 "mini" Long Lance torpedoes still are loaded in their forward tubes. Note the scoured area beneath the bow of the sub (Photo courtesy of HURL).

Evolving Site Management

Since its discovery, resource management agencies have been shaping a joint agency approach to site research and preservation. This collaborative effort is new ground and precedent-setting. Both the National Oceanic and Atmospheric Administration and the National Park Service were involved at the very outset of the project: NOAA because HURL submersibles made the discovery and are the only tools locally available to access the site; and NPS because of the agency's long involvement in the search for the midget sub and the site's strong connection to the Pearl Harbor National Historic Landmark. Both NOAA and NPS have active programs dedicated to the management and preservation of maritime heritage resources. NOAA's Maritime Heritage Program supports field work and management activities at all of its fourteen monument/sanctuaries and employs maritime archaeologists and historians who specialize in Pacific and WWII topics. NPS's Submerged Resources Center is tasked with the inventory and evaluation of submerged resources across the National Park system, and has been a familiar presence in maritime archaeological research and preservation of WWII wrecks at Pearl Harbor and other locations for over two decades.

NOAA and NPS are not, however, the only programs involved in the Japanese midget sub site. The Navy's Office of Naval Research took an early interest in the site and supported field work and the construction of specialized survey equipment. HURL and the University of Hawaii, and particularly operations director Terry Kerby and biologist Chris Kelley, devoted years to the search for the sub and continue to contribute in the analysis of data, historical research, and site monitoring. Additionally, in 2005, a representative from the Naval Historical Center's Underwater Archaeology branch began participation in site dives and in sharing data.

In September 2002, NOAA, HURL, and NPS agreed upon an initial research design for the Japanese midget sub site, a plan emphasizing long-term management goals. Not surprisingly, public response to the story of the sub's discovery included, "Are you going to bring it up?" - a natural expression of interest and excitement. Without a full understanding of the site and the issues involved, however, such strategies are premature. NOAA, HURL, and NPS moved forward with a precautionary approach. *In situ* preservation policy is the preferred alternative concerning preservation efforts at the site. The precautionary approach minimizes all impacts to a site or property while gathering the data necessary for site preservation. Until the completion of a management plan based on the scientific assessment of the condition of the vessel and surrounding environment, only non-excavation research and surveys of the wreck site are authorized:

Science goal: To gather the appropriate data for long term preservation and site management of the Japanese midget sub.

Preservation goal: To protect and preserve the Japanese midget sub site as a significant maritime heritage resource and war grave for the benefit of present and future generations.

As with many submerged archaeological sites, ownership and jurisdiction issues influence research and preservation efforts. Ownership was clarified in the February 2004 agreement between the U.S. Department of State and the Government of Japan, stating: the U.S. owned and controlled the midget sub; the site should be respected as a war grave as well as an historic resource; and the site should be protected and managed in accordance with international law, U.S. historic preservation laws, and the U.S. Policy for the Protection of Sunken Warships (as of January 19, 2001). Research design and preservation goals must conform to this agreement between the U.S. and Japan. Status as a war grave has special meaning to those familiar with World War II resources and the honor and respect observed for such sites. For example, human remains are treated with particular reverence and are protected from all undue disturbance or exploitation.

Assessment of resources under federal preservation laws, such as the National Historic Preservation Act (NHPA), is guided by nomination to the National Register of Historic Places. Due to its proximity and association with Peal Harbor, NPS agreed to initiate the Register nomination process for the site, while NOAA supports the science and research missions. Both NPS and NOAA, along with the Department of Justice (DOJ), State Department (DOS), and the Department of the Navy (DON), currently are addressing the issues of specific legal jurisdictions and future protective measures. Heritage work in this case definitely has taken an inter-agency spin.

Science on the Site

Conditions at the midget sub site are challenging. Bottom currents in the vicinity generally set to the westward, but they can be variable and at times in excess of one nautical mile per hour. Site access is, of course, limited to the availability of the *Pisces* research submersibles. Remotely operated vehicles or drop cameras are not advised, as there are potential entanglement hazards and preservation of site integrity is most important (Figure 13.3).

Nonetheless, in support of gathering data for long-term preservation goals, NOAA, NPS, and HURL are pursuing specific scientific objectives.

1. Conduct corrosion potential measurements on the exterior hull of the submarine to determine condition of hull metal and general integrity of the midget sub in the marine environment.
2. Deploy and retrieve a SeaBird environmental probe near the submarine to record dissolved oxygen, temperature, pH, salinity/conductivity, and oxidation reduction potential.
3. Test sediment and corrosion samples for iron content and combine data with environmental parameters for indirect measure of hull integrity.
4. Conduct non-disturbance limited interior survey of the midget sub in order to assess siltation (weight distribution/stability), structural integrity, internal corrosion, artifact inventory, and positive identification.

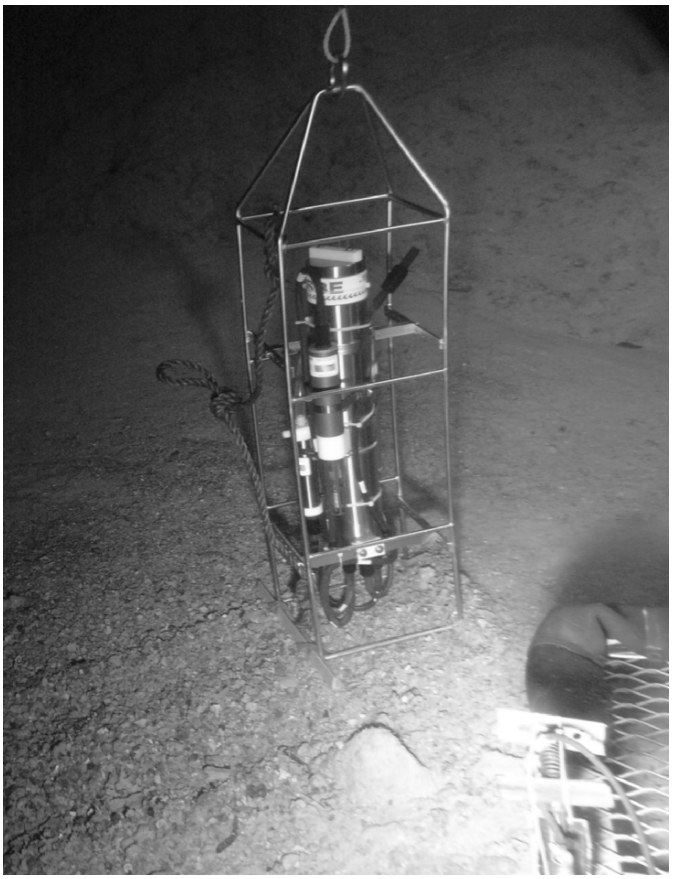

FIGURE 13.3. Science at the heritage resource site: SeaBird ocean profiler collecting various parameters to initiate long-term study and preservation management plan (Photo courtesy of NOAA NMSP).

5. Collect visual record of the scour areas beneath the submarine for the assessment of stability and substrate conditions.
6. Monitor the site for evidence of harm or potential harm from human activities (e.g., dumping, disposal, dredging, anchoring, looting, and unwanted salvage).
7. Conduct exterior digital photo survey of midget sub from a variety of angles (plan, elevation) for evaluation of change over time.

These objectives focus on retrieving data that will be most useful to understanding site formation processes and the integrity of the midget sub's structure and setting on the sea floor, while minimizing impacts to the sub itself. The project benefits from the National Park Service's long involvement with the wreck of USS *Arizona,* and the development by the NPS Submerged Resources Center and partner researchers of a minimum impact method for measuring corrosion rates of steel shipwrecks. Initial data from the midget sub site suggests a deterioration rate

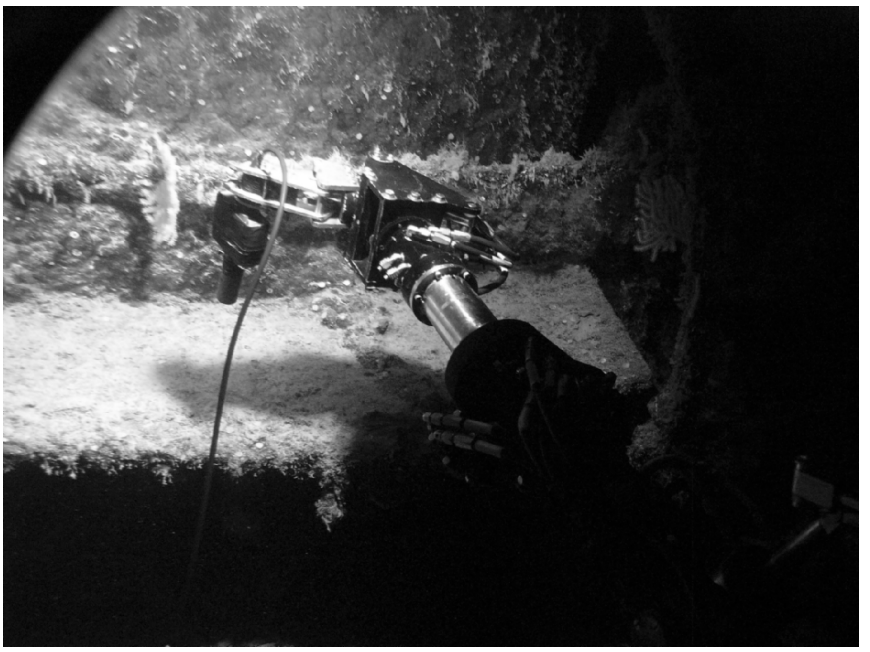

FIGURE 13.4. GMC silver-silver chloride reference electrode measuring corrosion potential (e-corr) in millivolts near the concretion surface (Photo courtesy of NOAA NMSP).

of approximately 0.5 mpy (mille-inch per year) (Figure 13.4). This estimate, compared to the original thickness of the hull (8 millimeters or 0.3 inches), is approximately equivalent to a 10% loss of hull thickness over 60 years. This assumes, of course, that the observed deterioration rate has not changed radically over the decades. It must be noted here that the evaluation of corrosion data and structural integrity is currently ongoing and results at this time are preliminary.

Education and Outreach Mission

Heritage managers have an obligation to manage resources for the benefit of the public at large, and this includes education and outreach efforts beyond data collection and analysis. The Japanese midget sub at Pearl Harbor presents both unique potential and critical obstacles to this effort. Clearly, due to the site's location, real-time public access is not currently practical.

Prior to the site's discovery, general information about the midget sub was available only through a few video documentaries and some specialized books. Specific naval documents, such as descriptions of Sakamaki's HA-19, were available to government agencies. Sakamaki's sub itself is on display in Fredericksburg, Texas, but has been stripped of all interior equipment. More recently, the Naval Historical Center's website made available selected historic images of Sakamaki's sub, as

well as the Type-A midget submarines recovered in 1941 and 1960. The Australian War Museum's web site offers images and information on Type-A subs which were involved in an attack on Sydney Harbor, May 31st, 1942.

Since the site's discovery, web-based materials and access have increased. HURL placed a description and images of the site on its web pages, and NOAA recognized the site online as a part of the Preserve America initiative and as part of research conducted by NOAA's Maritime Heritage Program. Much more can be done, however, in terms of sharing information about the site with the public, and the full potential of the project to engage opportunities in education and outreach has not yet been realized.

Education efforts imply standards and curriculum and the more formal structure of academic institutions, while outreach efforts suggest more general access and taking advantage of multiple formats for informal learning opportunities. The Australian War Museum's on-line offerings include elements of curriculum-based material, such as exercises for young school children in understanding and discussing oral histories compiled from some of the survivors of the attack, and an exercise in labeling the equipment of the sub's interior. Are there more possibilities for integrating the Pearl Harbor site into academics? Attempting to answer the question, "Did these submarines have a chance of carrying out their intended missions?" opens the door to an interdisciplinary investigation blending history and technology, an investigation that can benefit from specific archaeological and historical research. For site preservation issues, oceanographic and environmental data are necessary to understanding the site's integrity and stability. Physical and biological data need to be measured and modeled. These are academic tasks that ultimately contribute to site interpretation and preservation.

Outreach efforts imply less formal structure, as opposed to academic curricula. But how can resource managers engage the public in a site which they will never physically visit? Information on the internet allows many people to gain access to the site in a "virtual" setting. What are the limits of this heritage technology? Can the experience of diving and discovery be recreated for the armchair traveler (Figure 13.5)? Digital archaeology and the "virtual" experience seek to do exactly that. By combining photographs from the deep-water site with measurements of Sakamaki's sub of the same type in Texas, constructing an accurate virtual site may be possible, ultimately creating an interactive product replicating the dive in the *Pisces* submersible, the search on the bottom using onboard sonar, and the investigation of the midget sub itself. Interactive hot links could make available a wealth of information on the construction, history, and current status of all parts of this heritage resource. These are all possibilities for the future.

Maritime Heritage and Ocean Stewardship

Maritime heritage managers would be remiss in their duties if they did not emphasize preservation of heritage resources as part of their public message. On the other hand, marine resource managers would be remiss in their duties if they did not

FIGURE 13.5. HURL's *Pisces IV* conducting survey work near the stern dive planes of the *Ko-Hyoteki* (Photo courtesy of NOAA NMSP).

emphasize preservation of natural resources as part of their public message. The two mandates are not mutually exclusive. NOAA's Marine Sanctuary Program focuses on critical resources in a comprehensive manner. The National Marine Sanctuary Act (NMSA) specifically targets ". . . areas of the marine environment which have special conservation, recreational, ecological, historical, cultural, archaeological, scientific, educational, or esthetic qualities . . ." for protection and conservation management. In this way the NMSA sets the stage for linking heritage and natural resources because archaeology and ecosystem are both included in the mix. But how close are maritime archaeologists to their biological sciences brethren?

Frankly, we have been working for a number of years towards better preservation and protection of historic and archaeological sites underwater. But plainly the larger issue before the public is conservation of marine resources and creating an awareness of ocean stewardship. The dire status of our collective marine resources has been highlighted in recent reports (Pew Commission report, U.S. Oceans Commission report). Our ocean environment has been exploited to an extent only now becoming clear. Improving ocean stewardship is a broad and critical mandate. In this role maritime heritage can be a means to an end, but the connections between preservation management of sites and conservation

management of the marine environment must be made clear. *How does the Japanese submarine site near Pearl Harbor contribute to the broader message of ocean stewardship?*

The answer involves an explicit understanding of our perception of ocean space itself. For many people the ocean is a wild and untamed place, borderless and chaotic. Archaeologists return from its depths bearing images of the past as if they had been to the dark side of the moon. The ocean is portrayed as an unknown and unknowable space. Some authors sell books about modern-day pirates based on this premise. But this is not the only paradigm that exists. As geographer Philip Steinberg demonstrates in *The Social Construction of the Ocean* (2001), the "untamed and unknowable" paradigm is a human creation and comes to us from our own history, when control of ocean space ended a few leagues off shore, when few salvage divers ventured further than the very shallow depths. This paradigm has been all too suited to an "out of sight, out of mind" approach to our ocean environment. We cannot value what we do not know.

What does this have to do with linking maritime heritage and ocean stewardship? We can no longer afford to treat the world's oceans as a global dumping ground. Hazardous waste and chemical munitions (and SHIPS) do not magically disappear once they are committed to the deep. All of our impacts, intentionally disposed material and accidental shipwrecks alike, land somewhere. Yes, the technical challenges of ocean exploration and survey are immense, but we are quickly growing more capable of "seeing" into the ocean, and this includes learning more about our many human connections to the sea. The ocean is a knowable space, a space with value. There is no reason we should be so surprised that a vessel which sank 65 years ago is still there. Heritage resources demonstrate this newer paradigm by placing underwater locations into historical context, by recognizing historical value in ocean space. The Japanese midget sub site is not a disconnected image floating in the void, but rather is a battlefield. USS *Ward*'s first shell is down there, as well as pieces of depth charges and smoke pots, all in the vicinity of the sub. The site retains historical value even though it is covered by hundreds of meters of water. In fact, as a submerged site, it may have greater integrity than its terrestrial counterparts. It is a major part of the Pearl Harbor story, and part of our Pacific maritime heritage. Indiscriminate disposal of waste near this battlefield would obviously not be appropriate. Hallowed ground should not be desecrated, even if that ground is submerged.

More can be known about the marine environment and our historical connections to specific submerged artifacts and locations. We would be remiss in our work if we did not take advantage of the connections between maritime heritage resources and ocean stewardship, for we all strive against the paradigm of the ocean as a dark and unknowable place. The effort to become better ocean stewards includes protection of maritime heritage resources. That is the broader lesson of the Japanese midget sub at Pearl Harbor.

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14
The View from the *Hunley* Recovery Team

David L. Conlin

Editorial Note: The National Park Service was one of the first federal agencies in the U.S. to confront active management of submerged sites. Guided by a preservation mandate, the National Park Service developed an in-house team with a mission to provide direct support to park managers and partners responsible for stewardship of submerged areas. Because there were few precedents and little experience in stewardship management of submerged sites, the agency directed the team to concentrate on developing management models specific to national park needs and appropriate for general application throughout the National Park System. Submerged site management concerns have changed through time, as have the strategies and approaches for addressing them. An example of an NPS project is the following description and introduction by David Conlin that highlights NPS' involvement in the *H.L. Hunley* project.

Diving to recover the Confederate submarine *H.L. Hunley* began on May 5th 2000, five years and two days from the date that the submarine was first discovered by Clive Cussler's team of Ralph Wilbanks, Wes Hall, and Harry Pecorelli. In the five years following its discovery, the issue of ownership had been resolved; a memorandum of agreement between state and federal authorities had been drafted and signed; an intensive assessment of the site had been undertaken and published; an assessment of *Hunley*'s victim, the Union sloop-of-war USS *Housatonic*, had been made; a state of the art conservation lab had been built; an international team of experts had been assembled to discuss recovery plans and conservation implications; a directed survey to answer engineering questions had been successfully completed; permits had been applied for and granted; media had been organized; and a team of archaeologists, conservators, engineers, professional divers, and scientists assembled. The project aimed a cast of hundreds at a remarkable piece of world history less than 12.2 meters (40 feet) long and 1.2 meters (4 feet) high; 96 days later, at 8:40 am on August 8, 2000, *Hunley* broke the surface for the first time in 136 years. By 6:00 pm, the submarine was safely in the conservation facility in North Charleston, South Carolina.

While 96 days may seem like a short period, the complexity of the project was such that it would take many volumes to adequately describe it all and to do justice to the work that all of the individuals, organizations, and agencies

performed. Instead it makes sense to concentrate on the basic findings of the recovery fieldwork.

The *Hunley* site was at a depth of approximately 9.1 meters (30 feet), about 4.8 kilometers (3 miles) east-northeast of the tip of the north jetty off Charleston, South Carolina. Diving conditions onsite ranged from extremely poor to atrocious most of the time with low-to-zero visibility the norm and currents of up to two knots running at times. Following its burial, the sediments surrounding the submarine had been disturbed three times: once in 1995 around the forward hatch and port dive plane, once in 1996 when approximately 40% of the submarine was uncovered for documentation purposes, and once in 1999 when previously unexamined areas on the starboard side were uncovered during a survey of the submarine's physical integrity and hull thickness. By design, the areas of the bow and stern, thought to contain potentially fragile structures such as the propeller and torpedo spar, were left untouched during the projects in 1996 and 1999 (Figure 14.1).

Fieldwork began with the initial excavation of overlying sediments and the documentation of features not exposed in either 1996 or 1999. The primary areas of concern were the bow and stern regions and to these areas the recovery team devoted the majority of its time. The team proceeded with the straightforward assumption that as they excavated closer to the hull, the probability that they would encounter archaeological materials would increase (Figure 14.2). Magnetic data from the 1996 remote-sensing survey showed outlying lobes to the *Hunley* anomaly that they felt might correlate to archaeological materials and this was found to be the case at the bow.

As the archaeologists carefully excavated sediments surrounding the hull, the other partners in the recovery of *Hunley*, the offshore engineering firm Oceaneering, proceeded with the unenviable task of clearing away tons and tons of sediments that had to be removed prior to installation of the suction piles and the recovery truss (Figure 14.3). All excavated material was either run through a screen on the surface or was collected in a mesh bag on the bottom for sorting on the surface. Another part of the documentation effort was taking hull profiles *in situ* in the low and zero visibility environment in which the team was working.

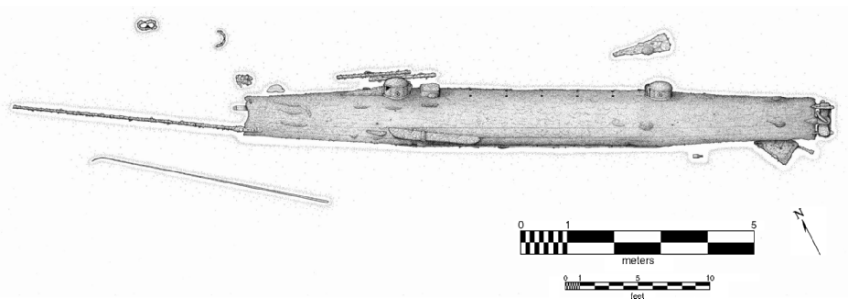

FIGURE 14.1. *H.L. Hunley* site plan (Drawing by James Hunter, Friends of the Hunley; image courtesy of the Naval Historical Center's Underwater Archaeology Branch).

FIGURE 14.2. Archeologist Matt Russell mapping the stern of *H.L. Hunley* (Photo by Brett Seymour, courtesy of NPS).

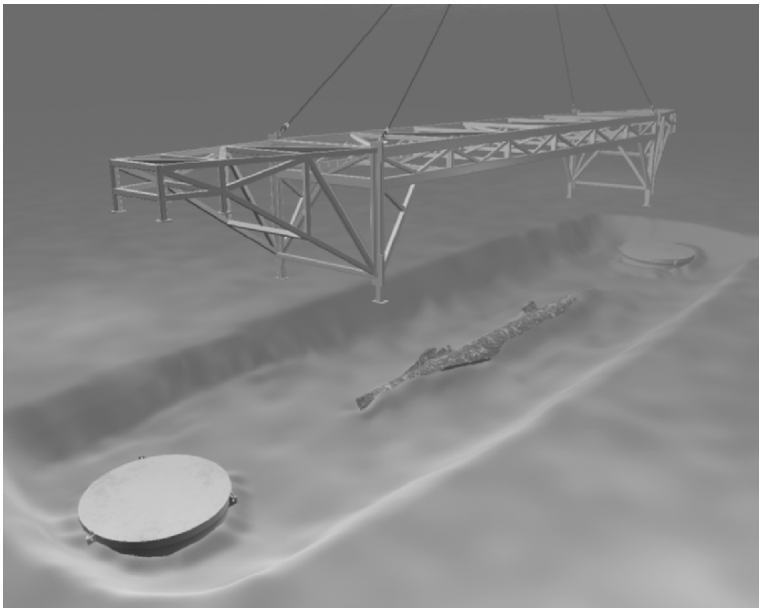

FIGURE 14.3. *H.L. Hunley* in its excavation trench prior to recovery showing the lifting truss and suction piles (Computer simulation by Mike Skrab, Oceaneering Advanced Technologies; image courtesy of Friends of the Hunley).

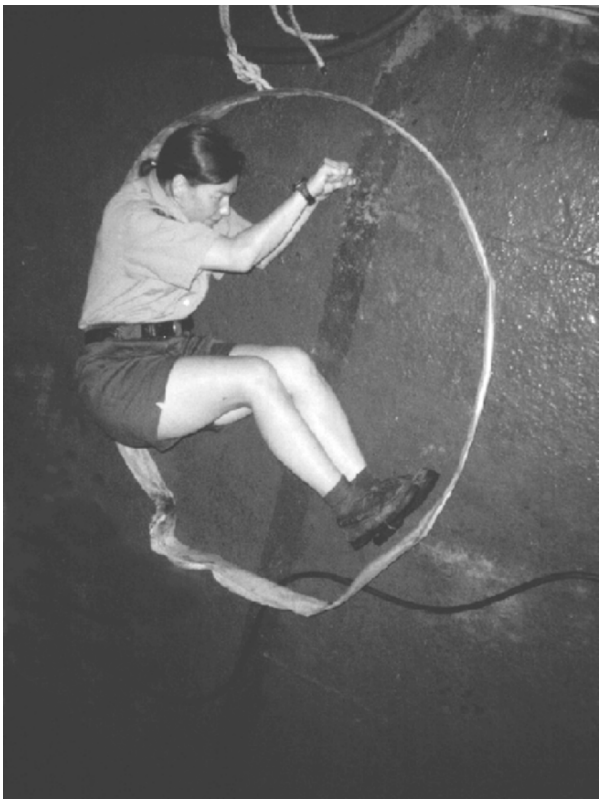

FIGURE 14.4. Archeologist Claire Peachey in one of the fiberglass molds of *Hunley*'s hull showing how very small the submarine was (Photo by Brett Seymour, courtesy of NPS).

Needing to move quickly, the team made molds of the hull at specific stations using fiberglass plumber's tape (Figure 14.4). Project principals wanted to make sure that they had documented the hull prior to lift as insurance against some sort of catastrophic failure. Happily, *Hunley* came up complete and the considerable efforts involved in taking the molds were not necessary.

In addition to the hole in the forward conning tower documented during the 1996 assessment, the team found another small hole in the bow on the starboard side and a much larger hole in the stern starboard side. What caused these holes is not clear, but it seems reasonable to speculate that the hole in the cast iron conning tower, and possibly the hole in the starboard bow, may be the result of small arms fire from sailors aboard *Housatonic* during the attack.

On May 24th, while excavating along the tip of the bow, project archeologists found what turned out to be the iron torpedo spar. Conjecture had been that it was made of wood, was mounted on the top of the bow, and possibly was missing. This proved not to be the case and the 5.5 meter (18 feet) long hollow pipe helped

FIGURE 14.5. The nut and bolt that had to be removed for the project to proceed (Photo by Brett Seymour, courtesy of NPS).

explain one of the anomalous lobes present in the 1996 magnetic data. After three days of cutting and deconcreting, the team finally was able to turn the nut off the bolt on the spar attachment yoke - a remarkable testament to the submarine's degree of preservation (Figure 14.5). The following day archeologists sheared the bolt and were able to remove the spar. This paved the way for setting the forward suction pile and the eventual recovery of the submarine.

Other surprises were a viewport in the forward conning tower; a set of small dive planes or "planettes" forward of the primary dive planes that were intended, presumably, to prevent entanglement by lines; the remains of what may be the attack reel on the starboard side forward of the forward hatch, along with a quantity of rope that probably was used as a trigger lanyard for the spar torpedo; a cutwater for the aft conning tower; and two tubes, presumably the snorkels that had fallen off and come to rest on the starboard side. In fact, with the exception of a section of the port propeller shroud and its associated support, all of the submarine and its accompanying fixtures were recovered in this project. Taken altogether, *Hunley* was an exceptionally graceful, beautifully hydrodynamic vessel that represents mature technology and the height of scientific and technical expertise.

As with most archaeological projects the recovery team finished with some answers but many more questions (Figure 14.6). Ultimately the recovery provided very little direct evidence of the primary cause of the loss of *Hunley*. The events that occurred inside the submarine in the few minutes before and after the attack may have produced some material evidence, but this is almost certainly contained within the hull. Hopefully the interior excavation will provide some answers to

FIGURE 14.6. The National Park Service's Contribution to *H.L. Hunley*'s Recovery. Left to Right: Project Photographer Brett Seymour, Deputy Project Director Matt Russell, Deputy Project Director Claire Peachey, Project Director Dave Conlin (Photo courtesy of NPS).

the questions posed above and to questions not yet considered. In addition to examinations moving into a more tightly bound context, one should not forget that the submarine is but one component to a multicomponent archaeological site, a Civil War naval engagement where both of the antagonists are represented archaeologically. In years to come, further documentation and examination of the area surrounding *Hunley* and *Housatonic* may well provide additional information about the events that occurred on February 17, 1864.

In contrast to contemporary assumptions about an agrarian South and a technologically sophisticated North, the *Hunley* attack shows that, faced with a military disadvantage, technological inventiveness can flourish and be effectively

deployed to take advantage of conditions of surprise and initiative. This perspective stands in direct opposition to how many may view the American Civil War. The Confederacy's construction and deployment of *H.L. Hunley* reflects an underlying American preoccupation with technology as a response to conflict, while its continued employment, despite two catastrophic sinkings, resonates with widely held national values of courage, self-sacrifice, and determination in the face of adversity. Because the submarine was developed and deployed largely in secret, there are few historical documents associated with it, making archeological investigation the best way to augment the scarce documents that address this pivotal moment in world history (Figure 14.7).

In the broadest sense, the *Hunley* recovery, far from being a straight salvage operation, was an attempt to explore new avenues of multidisciplinary research

FIGURE 14.7. NPS photographer Brett Seymour is lowered on a stage from *Karlissa B* to photograph *Hunley* during the final phase of the recovery (Photo courtesy of NPS).

that have applicability to underwater archaeology. As a piece of science, the project will bear fruit for many years to come in marine technology, geology, biology, microbiology, conservation science, as well as archeology. Beyond that, the project demonstrates just how much can be accomplished when individuals and agencies with vision and drive cooperate in service to the resource. Recovery was the first step in a long journey of discovery for those involved with the submarine and those who stand to learn from the project. While the recovery work has ended, a talented, world-class team continues with the excavation of *Hunley*'s interior and the pursuit of answers to questions that eluded those involved with bringing the world's first successful submarine home after 136 years.

15
People Power this Submarine: *H.L. Hunley* within the Context of Public Archaeology

James W. Hunter, III

> *[H.L.] Hunley* touches a chord in people that makes "public archaeology" public in the truest sense.
>
> – *Daniel J. Lenihan*

Introduction

H.L. Hunley is one of the most remarkable shipwrecks recovered from the ocean floor. It was a secret weapon and scientific marvel of the American Civil War and the first submarine to sink an enemy warship in combat. It is also the only Civil War-era submarine (and one of only a handful of Civil War-era shipwrecks in general) to undergo thorough scientific investigation and conservation. The ongoing study of *H.L. Hunley* has prompted scientists from several different backgrounds and disciplines to collaborate and develop new investigative techniques and methods of stabilization. More importantly, the submarine and the endeavor to study and preserve it fascinates and educates people of all backgrounds and ages and challenges them to appreciate history and to delight in science.

Well before *H.L. Hunley*'s recovery from the sea in August 2000, it was already an object of considerable public interest. As early as the 1870s famed circus owner and consummate showman P.T. Barnum offered $100,000 to anyone who could locate and raise the submarine for display in his traveling show (Hicks and Kropf, 2002:94-95; Walker, 2005:4). Science fiction writer Jules Verne is thought to have integrated elements of *H.L. Hunley*'s final mission into his most famous book, *Twenty Thousand Leagues Under the Sea* (Hicks and Kropf, 2002:90-91). In the span of 131 years, between its loss in 1864 and discovery in 1995, several attempts were made to locate the experimental craft — and some searchers even claimed they had placed a hand on it. Others, including men who had served aboard the vessel, celebrated and memorialized it and its crew in published recollections and other written works. Although interest in the submarine waned during much of the twentieth century, it was never entirely forgotten.

H.L. Hunley's discovery and subsequent recovery catapulted it back into the public consciousness. Since then, it has become the subject of veneration, scientific inquiry, educational opportunity, controversy, and dispute. Through it all, the effort to present the tiny pioneering submarine to the world has remained at its core a story of people.

H.L. Hunley's Design, Development, and Operational History

In stark contrast to its current status as an object of public ownership, interest, and funding, *H.L. Hunley*'s origins were rooted firmly in private investment and enterprise. The nucleus of the submersible boatbuilding program that produced the submarine comprised a coalition of New Orleans machinists and businessmen, all of whom were equally motivated by fervent nationalism and a desire for prize money for destroying enemy warships (Wills, 2000:48). *H.L. Hunley*'s precursors *Pioneer* and *American Diver* were developed by a New Orleans group that consisted of practical engineers (machinists) Baxter Watson and James McClintock, attorney and New Orleans Deputy Collector of Customs Horace L. Hunley, John K. Scott, Robert Ruffin Barrow, and Henry J. Leovy. McClintock, Watson, Hunley, and four members of an organization of underwater "torpedo" (contact-mine) manufacturers called the Singer Submarine Corps were the driving force behind *H.L. Hunley*'s subsequent development and construction at the Park & Lyons Machine Shop in Mobile, Alabama (Duncan, 1965:64; Ragan, 1999a:26; Wills, 2000:48, 59).

The vessel's hull was fashioned from sections of rolled plate steel that were riveted together to form a rough cylinder. It was deepened and lengthened through the addition of two expansion strakes and tapered ends comprised of riveted quarter plates and castings (Figure 15.1). The commander and seven crewmen operated the submersible: the crew sat side-by-side on a wooden bench affixed along the port side of the vessel and turned a hand-cranked propeller featuring an innovative reduction gear system. The commander was responsible for steering the submarine and deploying the weapons system. Each end of *H.L. Hunley* was equipped with water ballast tanks that could be flooded by valves and pumped dry with hand pumps. Fixed iron keel weights were bolted to the underside of the hull and could be released in the event the submersible needed additional buoyancy to rise in an emergency (Maria Jacobsen, personal communication, 2006).

The submarine's commander monitored the surrounding water depth with a mercury gauge mounted on the forward bulkhead. Two cast-iron conning towers, each featuring heavy hatch covers with interior locking mechanisms and watertight rubber gaskets, were the only means by which the crew could enter and exit the submarine. A number of small glass viewports were located on each conning tower, and an additional ten glass viewports were located along the top of the hull. Collectively, these "windows" to the exterior allowed ambient light to enter the hull and, with the addition of candlelight, illuminate the central crew compartment. Cast-iron covers called deadlights could be closed over the upper

FIGURE 15.1. Conrad Wise Chapman's 1863 painting of *H.L. Hunley* in Charleston, South Carolina. This painting is perhaps the most accurate depiction of the submarine produced during the Civil War (Image courtesy of Museum of the Confederacy).

viewports from the interior of the submarine and contributed to its distinction as a weapon of stealth (Quinn and Corriea, 2005:6; Maria Jacobsen, personal communication, 2006).

Immediately aft of the forward conning tower was a ventilator box. This mechanism, commonly referred to as a "snorkel box," contained a hollow shaft positioned athwartships through its center. Each end of the shaft formed a 90-degree elbow, which in turn was attached to a 1.2 to 1.5 meter (4 to 5 feet) snorkel tube fitted with stopcocks that prevented water from entering the hull when the vessel ran submerged. A force bellows attached to the interior hull immediately beneath the ventilator box allowed the crew to replenish the vessel's air supply. Two cast-iron lateral fins, or "dive planes," were positioned on each side of the hull, approximately in line with the vessel's expansion strakes. Movement of a lever inside *H.L. Hunley* adjusted the dive planes, which were used to control the submarine's inclination as it dove and ascended through the water. Horizontal control of the vessel's rudder was made possible via a vertical steering rod located in the commander's area at the extreme forward end of the crew compartment (Maria Jacobsen, personal communication, 2006).

Following successful testing in Mobile, the submarine was shipped to Charleston, South Carolina, by flatcar in August 1863 at the request of Charleston's military commander General P.G.T. Beauregard. Beauregard hoped the submarine could

help break the naval blockade that was then preventing access to the city's harbor. In addition to the blockade, Charleston was suffering a severe military siege that included almost daily artillery bombardment of the city's civilian population (Wills, 2000:62).

Once in South Carolina, the submarine's crew had to adapt to their new operating environment, and as a result were slow to initiate attack sorties. Impatient with what he perceived as McClintock's timidity, Beauregard ordered the submarine seized within days of its arrival and replaced its civilian crew with Confederate Navy personnel. A short time after this transition, the boat was accidentally lost with fatalities in Charleston Harbor. Conflicting reports exist concerning this incident, which occurred while the submarine was moored in Charleston Harbor near Fort Johnson on August 29, 1863. One version suggests the wake of a passing vessel flowed into the submarine's open hatches, swamping the vessel and sending it to the bottom. Another claims a mooring line that attached *H.L. Hunley* to the Confederate steamer *Etowan* snapped, causing the submarine to sink rapidly (Bak, 1999:82-86; Ragan, 1999a:69-73; Wills, 2000:64 66). A version of the incident related by Colonel Charles Olmstead states *H.L. Hunley* "became entangled in some way with ropes, was drawn on its side, filled, and went down" (U.S. War Department, 1890:551).

H.L. Hunley crewman Lt. Charles Hasker, who managed to escape the submarine as it plunged to the bottom of the harbor, was a first-hand witness to the incident and likely provided the most reliable account. According to Hasker, the submarine's commander at the time, Lt. John Payne, accidentally stepped on the dive plane lever while standing in the open forward hatch. This caused the submarine to dive and water flooded into the hatches while they were still open (Stanton, 1914; Fort, 1918). Whatever the circumstances surrounding the accident, it appears to have been the result of human error and led to the deaths of five of *H.L. Hunley*'s crew, most of whom were volunteers from the Confederate SHIPS CSS *Chicora* and CSS *Palmetto State* (Bak, 1999:82; Ragan, 1999b:128; Wills, 2000:64-66).

The submarine's first sinking, and subsequent loss of five of its crewmembers, badly shook the confidence of those who survived the incident. Neither Payne nor Hasker wanted anything more to do with it (Walker, 2005:26). By contrast, Beauregard still believed *H.L. Hunley* could break the Union blockade, and immediately initiated efforts to recover the vessel from the bottom of Charleston Harbor. Two salvage divers, Angus Smith and David Broadfoot, were contracted to remove the submarine from the black mud of the harbor and hoist it to the surface. Shortly after *H.L. Hunley*'s recovery, the bodies of its unfortunate crew were removed, and the submarine was cleaned and disinfected (Bak, 1999:86; Ragan, 1999a:73-79; Ragan, 1999b:129-130; Walker, 2005:26).

On September 19, 1863, Hunley petitioned Beauregard for control of the submarine and promised the military commander he would furnish a crew "well acquainted with its management" from the ranks of the vessel's designers, builders, and financiers in Mobile (Hunley, 1863). Beauregard granted Hunley's request and, as promised, Hunley assembled his new crew in Mobile and arranged for them to travel to Charleston.

During the fall of 1863, the selected crewmen from Mobile arrived in South Carolina. On the morning of October 15, the new crew squeezed into the submarine and prepared to embark on several practice dives. During the first dive, Hunley, acting as vessel commander, made an error in regulating the water contained within the forward ballast tank. As a consequence, the boat buried its bow in the harbor mud, stuck fast, and partially flooded, killing the entire crew of eight (Beauregard, 1878; U.S. Naval War Records Office, 1902:692; Bak, 1999:97; Ragan, 1999b:138-139; Wills, 2000:66).

In the wake of the second round of salvage and recovery, the surviving members of the group buried their fellow submariners at Charleston's Magnolia Cemetery (Bak, 1999:101; Ragan, 1999b:146; Wills, 2000:68). They also memorialized Hunley's efforts by naming the submarine after him. Shortly thereafter, Confederate Army Lt. George Dixon petitioned Beauregard for control of the vessel and received it. He assembled another volunteer crew, which ultimately included himself as submarine commander, army Lt. William Alexander as First Officer, naval personnel James A. Wicks, Arnold Becker, Joseph Ridgaway, C. Lumpkin(s), Frank Collins, and an unknown individual who may have had the last name Miller. J.F. Carlsen, a Corporal in the Confederate Army, joined *H.L. Hunley*'s crew when Alexander received orders to report to another project in February 1864 (Jacobsen, 2005:4-13). The group moved their operations to Battery Marshall on Sullivan's Island, where between November 1863 and February 1864 they endured cold, inclement weather to cast off on night cruises in the waters off Charleston.

On the night of February 17, 1864, *H.L. Hunley* silently approached USS *Housatonic*. The 62.5-meter (205 feet) long, 1,240-ton vessel had joined the blockade against Charleston in September of the previous year. By the time crewmen aboard *Housatonic* determined *H.L. Hunley* was not a log, porpoise, or other harmless object, the submarine closed the gap and the Union vessel's heavy guns could not be trained low enough to defend it. As *Housatonic*'s crew slipped the anchor chain and backed the engine in an attempt to avert the attack, *H.L. Hunley* detonated an explosive charge against the sloop-of-war's starboard side just abaft the mizzenmast; five minutes later, *Housatonic* lay completely submerged. As the Union blockader slipped beneath the waves, five of its crewmen perished, either as a result of the blast or by drowning. Because *Housatonic* was anchored in only 7.6 meters (25 feet) of water, the remainder of its crew was able to scramble to the relative safety of the sunken vessel's rigging (National Archives and Records Administration, 1864; Bak, 1999:126-131; Ragan, 1999b:192-197; Wills, 2000:69-74; Walker, 2005:35-37).

The Confederate garrison at Battery Marshall reported witnessing a prearranged signal from *H.L. Hunley* the night of the attack (Cardozo, 1866:124; U.S. Naval War Records Office, 1902:335). It is possible these men saw the same blue light reportedly observed by one of *Housatonic*'s crewmen from the sunken vessel's rigging (National Archives and Records Administration, 1864). Convinced the light was a signal from the submarine, they answered it and awaited the vessel's return. Two days later, there was still no sign of Lt. Dixon and his crew. Eventually, the

Confederates learned that, in addition to destroying *Housatonic*, *H.L. Hunley*'s crew avoided capture after the attack (Ragan, 1999b:198). However, the submarine's crew never returned to tell their tale. The fate of these pioneering submariners and their experimental craft was the subject of debate and conjecture for years after *H.L. Hunley*'s disappearance (Wills, 2000:76). Theories abounded: some speculated the submarine was mortally damaged by the attack and perished with *Housatonic*. Others hypothesized the vessel and its crew were swept out to sea during a gale that arose shortly after the engagement. Although many individuals and institutions searched for the tiny vessel, *H.L. Hunley*'s final resting place would not be discovered for 131 years.

H.L. Hunley (Re)Enters the Public Realm

In 1995, a team of archaeologists funded by best-selling author Clive Cussler's National Underwater and Marine Agency (NUMA) discovered *H.L. Hunley* after a 14-year search. At the time of discovery, Cussler and NUMA were conducting their survey in partnership with the South Carolina Institute of Archaeology and Anthropology (SCIAA) (Hall and Wilbanks 1995; Murphy et al., 1998:2). Not surprisingly, the submarine's discovery was feted as one of the most important shipwreck finds in history and received considerable public and professional acclaim. It also sparked controversy as several different parties scrambled to claim ownership. Ultimately, *H.L. Hunley* would become a highly politicized shipwreck in much the same manner as the wrecks of CSS *Alabama*, USS *Somers*, USS *Tecumseh*, and the War of 1812 vessels *Hamilton* and *Scourge* had during previous discovery and recovery efforts (Murphy et al., 1998:5).

From the outset, legal title to the submarine was thought to reside with the United States government, which claimed it as a prize of war (Murphy et al., 1998:5, 7-8). However, documents acquired from the estate of Horace Hunley's business partner Henry Leovy cast doubt on federal ownership. These archival sources revealed Leovy had inherited Hunley's one-third ownership of the vessel following his death in October 1863 (Hicks and Kropf, 2002:160). Consequently, and contrary to the federal government's assumption, *H.L. Hunley* was built and operated as a privateer — not a commissioned Confederate vessel — and was only partially directed by military officials during its brief service career. Based on this information, and the submarine's close proximity to the seaward end of Charleston Harbor's jetties [which extend beyond the 4.8-kilometer (3 mile) contiguous zone under federal jurisdiction, but are located within 3.2 kilometers (2 miles) of the wreck site], the State of South Carolina considered *H.L. Hunley* abandoned property within its territorial waters. Significant public interest in the submarine and its role in South Carolina history prompted South Carolina elected officials to file legislation in Columbia (South Carolina's capitol) and in Washington, D.C., that transferred title to their state. This move to claim ownership occurred less than two months after the submarine's discovery (Murphy et al., 1998:5, 7-8; Hicks and Kropf, 2002:159-162).

To complicate matters, public opinion in Alabama strongly advocated *H.L. Hunley*'s eventual return to Mobile, where it was designed, constructed, and underwent initial sea trials and weapons tests. Immediately following news of the submarine's discovery, a congressional delegation was dispatched to Washington, D.C., to stake a claim on Alabama's behalf. The attempt was thwarted by the narrowest of margins: former Congressman Mark Sanford of Charleston registered South Carolina's bill in the U.S. Congress mere days before the Alabama delegation presented its version. For months afterwards, politicians from both states wrestled for control of the submarine, while Charleston and Mobile fired editorial salvos at one another via the press. Journalists Brian Hicks and Schuyler Kropf aptly summed up the inter-state rivalry spawned by *H.L. Hunley*'s discovery as "another war between the states" (Hicks and Kropf, 2002:159). Eventually, Alabama lost interest in hosting the submarine. Its delegates instead diverted their energy to support federal management of the vessel (Murphy et al., 1998:8).

As debate over *H.L. Hunley*'s ownership raged, concern about its protection while *in situ* prompted the U.S. Coast Guard to create a 2.6-square kilometer (one-square mile) Restricted Navigation Area (RNA) around the site based on general location information supplied by NUMA. The RNA was established in August 1995 and remained in effect until the submarine's recovery five years later. Diving, dredging, salvage, and similar activities were strictly prohibited within the security zone; any vessel caught anchored or underway inside the boundaries of the RNA could be seized and the owner fined US$25,000. In addition, the U.S. Navy installed a remote camera atop a local lighthouse to monitor the site around the clock (Murphy et al., 1998:7; Hicks and Kropf, 2002:168).

Ultimately, legal title to *H.L. Hunley* was determined to reside with the United States General Services Administration (GSA); however, GSA wished to transfer responsibility for the submarine to another federal agency better equipped to manage it. GSA's first offer was to the Smithsonian Institution, which expressed interest in exhibiting *H.L. Hunley* but ultimately deferred management to the Department of the Navy (Heyman, 1995). On July 13, 1995, GSA offered the submarine to the Naval Historical Center (NHC). The NHC was the logical choice to manage *H.L. Hunley.* In addition to its role as the official history program of the U.S. Navy, NHC features an Underwater Archaeology Branch that advises the Department of the Navy in matters related to historic preservation of U.S. Navy ship and aircraft wrecks. In short order, GSA and NHC initiated transfer of management responsibility for *H.L. Hunley*. Transfer of full accountability for the submarine was another matter entirely. During the transfer process, GSA attorneys realized they risked violating the National Historic Preservation Act of 1966 if full custody was granted to the Navy (Beres, 1995; Murphy et al., 1998:8). Subsequent events resolved this issue.

GSA's offer to transfer *H.L. Hunley* to the Smithsonian alarmed South Carolina legislators who had been fighting to keep the submarine in their state. The result was the South Carolina Hunley Commission, a nine-member body responsible for facilitating recovery, excavation, and conservation of the submarine and its associated artifacts; developing *H.L. Hunley*-related exhibitions and other forms of

educational outreach; and administration and acquisition of funding for all phases of the project. South Carolina's Governor, Speaker of the House, and President *Pro Tempore* of the Senate appoint the nine individuals that comprise the Hunley Commission. Ultimately, it became the primary legal authority in all matters concerning South Carolina's interest in the submarine, and assumed authority over the State Historic Preservation Officer and Office of the State Archaeologist (Cook, 1995; Murphy et al., 1998:6-7; Hicks and Kropf, 2002:159-160).

Six months after *H.L. Hunley*'s discovery, Clive Cussler transferred the site's coordinates to NHC. The head of NUMA initially refused to disclose the submarine's numbers out of concern it would be looted and irreparably damaged by treasure hunters and/or unscrupulous wreck divers. Cussler's insistence that the coordinates would be granted to *H.L. Hunley*'s rightful owner only when a comprehensive plan for its protection and preservation was established rankled some, but probably spared the submarine unwarranted disturbance (Murphy et al., 1998:9; Hicks and Kropf, 2002:157). Between May and October 1995, several individuals, groups, and agencies attempted to obtain the coordinates. It is entirely possible that any one of these entities could have, either intentionally or unwittingly, caused irreparable damage to the wreck site before measures were enacted to protect it.

Receipt of *H.L. Hunley*'s coordinates motivated NHC to take several important steps, the first of which was to restrict access to sensitive information that could encourage site looting. Section 304(a) (2) of the National Historic Preservation Act (NHPA) provided NHC with the authority to prevent sensitive data dissemination. Under this policy the submarine's coordinates were exempted from Freedom of Information Act (FOIA) and similar requests. At the state level, *H.L. Hunley*'s coordinates and other sensitive information were entered into the South Carolina State Site File, which afforded it additional protection once it was assigned a State Site File number. Under Section 54-7-820(A) of the South Carolina Underwater Antiquities Act of 1991, *H.L. Hunley*'s coordinates were no longer considered public record, nor were they subject to FOIA (Murphy et al., 1998:9-10).

In August 1995, NHC initiated yet another important step: a meeting of the Federal Oversight Committee responsible for the submarine. The meeting resulted in two significant outcomes: 1) All federal agencies reached consensus that NHC should continue to uphold title to the submarine and apply federal preservation laws to it; and 2) The Advisory Council on Historic Preservation (ACHP) offered to draft a programmatic agreement that brought *H.L. Hunley* under the aegis of the NHPA. The latter formed the nucleus of the official Programmatic Agreement signed by representatives of the ACHP, Department of the Navy, GSA, South Carolina Hunley Commission, and South Carolina State Historic Preservation Office the following year. The final document was the result of numerous revisions and months of negotiation, but ultimately satisfied all parties involved. It provided a means for the Navy to fulfill its Section 106 requirements under the NHPA, and settled the ownership and disposition issues that had loomed over the submarine since its discovery. Essentially, the

agreement granted ownership of the submarine to the United States government, but allowed the State of South Carolina custody in perpetuity (Murphy et al., 1998:9-12).

In a February 20, 1996, letter to the Hunley Commission, NHC's Director outlined what parameters and goals were necessary to conduct a thorough archaeological survey of *H.L. Hunley* and recommended the survey be a joint federal and state effort (Dudley, 1996). Based on these suggestions, members of SCIAA's Underwater Archaeology Division, the National Park Service's Submerged Cultural Resources Unit (now Submerged Resources Center), and NHC's Underwater Archaeology Branch conducted an assessment of the site in May and June 1996. The survey revealed *H.L. Hunley*'s hull had retained its overall structural integrity. The only noticeable damage was a missing viewport from the forward conning tower, a hole in the bow on the starboard side, and a large gash on the starboard stern (Figure 15.2). The assessment team concluded *H.L. Hunley* exhibited a high level of integrity and preservation; however, this did not preclude it from recommending the submarine undergo controlled recovery and removal from Charleston Harbor. While it was generally understood *in situ* preservation should be the preferred alternative to excavation in many circumstances, the potential threat posed to the submarine by unauthorized salvage and looting made it a notable exception to the rule (Murphy et al., 1998:119).

FIGURE 15.2. Diver next to *H.L. Hunley*'s forward conning tower prior to the submarine's recovery. Note the hole in the approximate position of the conning tower's front port side viewport (Photo courtesy of Friends of the Hunley).

Recommendations outlined in the 1996 site assessment required significant amounts of money if their execution were to be an unqualified success. Although funding was available from various federal and state programs, the sum that could be obtained from these sources was not enough to ensure completion of everything stipulated in the site assessment. For the project to proceed, it required its own charitable support organization. Consequently, the Hunley Commission created Friends of the Hunley (FOH), a non-profit 501(c)(3) corporation responsible for raising and administering funds for the recovery, excavation, conservation, and exhibition of the submarine. Since its inception in 1997, FOH has worked tirelessly to ensure the success of the recovery, excavation, and preliminary conservation phases of the project, and continues to seek and administer funding for ongoing archaeology and preservation initiatives.

With *H.L. Hunley*'s location known, its condition assessed, and major ownership and funding issues resolved, all that remained was to bring it home. On August 8, 2000, the historic craft was recovered from its watery grave. In the years leading up to the recovery, a large team of professionals from NHC's Underwater Archaeology Branch, National Park Service's Submerged Resources Center, SCIAA, NUMA, FOH, Oceaneering International, Inc., and various other organizations and individuals, devised an innovative recovery plan described in much greater detail in David Conlin's chapter in this volume.

Once an extensive on-site investigation was completed, *H.L. Hunley* was hoisted from the mire of the seabed off Charleston. The public presence at the event was overwhelming. Literally thousands of people attended the recovery in nearby watercraft, and thousands more cheered the submarine from Charleston's shores and bridges as it was towed back to the city aboard a transport barge (Figure 15.3). Untold numbers witnessed the event on national and international television broadcasts (Hicks and Kropf, 2002:205-209). The recovery project successfully concluded when the submarine was secured in a specially designed tank at the Warren Lasch Conservation Center (WLCC), a 4,273-square meter (46,000-square foot) retrofitted warehouse located on the former Charleston Naval Base in North Charleston. The WLCC became *H.L. Hunley*'s "home" and witnessed several major project milestones, including the excavation and documentation of the hull, forensic investigation and burial of the crew, and initial efforts to conserve the submarine and its associated artifacts.

Science, A Submarine, and Civic Involvement

H.L. Hunley's arrival at the WLCC effectively ended one phase of the project and ushered in the beginning of another. It also introduced an entirely new dimension of public involvement. As evidenced by the sheer number of people who followed and attended the submarine's recovery — directly, or via television, Internet, or printed press — public interest in, and scrutiny of, the project already was considerable.

The submarine is a tangible symbol of a Confederate heritage still deeply cherished by many southerners. A massive outpouring of support for the project

FIGURE 15.3. A flotilla of watercraft escort *H.L. Hunley* home following its recovery, August 8, 2000. Downtown Charleston is in the background (Photo courtesy of Friends of the Hunley).

in the form of monetary donations and volunteers has emerged via local, regional, national — even international — Civil War reenactment groups and those closely affiliated with southern heritage issues. Not surprisingly, *H.L. Hunley*'s association with a conflict and cause venerated by so many served as a source of discomfort for others. In 2000, the National Association for the Advancement of Colored People declared a boycott of South Carolina to protest the presence of the Confederate battle flag over the Statehouse dome in Columbia. The planned recovery of the submarine in August of that year raised the specter that it too might become part of the controversy. Fortunately, the Statehouse issue was largely resolved by July 2000 and the recovery project received predominantly positive coverage in the media (Hicks and Kropf, 2002:200-201). With very few exceptions, the Hunley Project continues to garner positive press.

Of course, individuals not affiliated with Confederate heritage groups also comprise a significant number of project volunteers and donors. This latter group includes history buffs, veteran submariners, naval architecture enthusiasts, and men and women of all ages and backgrounds looking for a unique way to help educate and serve their community. In many respects, volunteers comprise an enthusiastic, driving force for the project. During the excavation, several were employed with tasks that included screening for small artifacts, ferrying equipment, and entering information into the project database. One, a former shipyard worker, helped drill out the hull plate rivets that allowed archaeologists access to

H.L. Hunley's interior. Today, volunteers continue to serve the project by conducting tours of the submarine and assisting with facility maintenance and fund-raising activities; a handful still assist the archaeological team with database management and other miscellaneous tasks.

Monetary and in-kind donations also have been contributed by a variety of corporate sponsors and private individuals. Donated items include a computed X-ray system and other analytical equipment necessary for monitoring levels of dissolved oxygen, pH, conductivity, oxygen reduction potential, and electrochemical parameters in *H.L. Hunley*'s storage tank. Another company generously offered an industrial touch-screen computer used to control these monitors and to graphically depict the data they acquire (Mardikian, 2004:139-140). Project archaeologists have employed at least four different types of 3D laser mapping and scanning devices, all of which were supplied *gratis* by a West Coast company that specializes in survey services and equipment. Most recently, the forensic investigation of the submarine and its crew has benefited tremendously from the kind contributions of a foundation started by best-selling author Patricia Cornwell. Cutting-edge technology donated to the project from several different benefactors has enabled archaeologists to assess the hull's structural integrity following recovery; to gain access to *H.L. Hunley*'s interior in a manner that was safe, scientific, and would not damage the submarine or its associated artifacts; and to acquire precise provenience information that has since been used to render a detailed, three-dimensional digital site plan.

When excavation of the submarine's interior commenced on January 21, 2001, it was perhaps the first archaeological investigation to be witnessed live on a global scale (Hicks and Kropf, 2002:217). Three cameras mounted above the submarine's storage tank and associated mezzanine transmitted live images of the archaeological work via the Internet. Each camera depicted the activity from a different angle, and updated the broadcast images every few seconds. To date, the Web-cams have chronicled and transmitted the Hunley Project's progress worldwide twenty-four hours a day, seven days a week. The only exceptions to this nonstop coverage have been an occasional technical glitch or intentional transmission breaks associated with the removal of human remains—the latter carried out in accordance with U.S. Navy regulations regarding respectful treatment of deceased servicemen and women (U.S. Naval Historical Center, 2001).

From the outset, one of the goals of the Hunley Project was to inter the remains of the submarine's final crew with full military honors. However, one of the obvious problems that stemmed from permanent burial of each crewman was that these remains would no longer be available for study and identification. The skeletal assemblage comprising *H.L. Hunley*'s crew constitutes a very unique and well-preserved osteological collection from the American Civil War era; consequently, each set of remains underwent comprehensive analysis by some of the most noted forensic anthropologists in the world.

Because the skeletal remains of the servicemen recovered from *H.L. Hunley* were so exceptionally well preserved, an integral part of the forensic investigation was an

attempt to reconstruct how each crewman may have looked. For this purpose, forensic anthropologists created a set of replicas of the eight crania and mandibles. These casts were then sent to a forensic artist to serve as a base for reconstructing the head shape and face of each man (Figure 15.4). The facial reconstruction process was a collaborative effort between the artist and noted forensic anthropologists affiliated with the Smithsonian Institution (Jacobsen, 2005:13).

The project's forensic genealogist was responsible for conducting research into the genealogical background of each man who served aboard *H.L. Hunley*. The focus of this investigation was threefold: first, to identify the servicemen who were aboard the submarine during its last mission; second, to trace each crewman's personal history and ancestry; and finally, when possible, to locate direct maternal descendants or relatives of the crew who can provide mitochondrial DNA to positively identify each set of remains recovered from *H.L. Hunley* (Jacobsen, 2005:4-5).

On April 17, 2004, a little over 140 years to the day the submarine disappeared, *H.L. Hunley*'s final crew was buried at Charleston's Magnolia Cemetery in a plot next to the two previous crews who perished aboard the vessel. The burial required nearly a year of planning and countless hours of effort on the part of

FIGURE 15.4. Facial reconstructions of *H.L. Hunley*'s crew, based on current forensic, archaeological and genealogical data (Photo courtesy of Friends of the Hunley). *From top, left to right*: Lt. George E. Dixon, Seaman Arnold Becker, Quartermaster C. Lumpkin(s), Seaman Frank G. Collins, Corporal J.F. Carlsen, crewman Miller, Boatswain's Mate James A. Wicks, and Quartermaster Joseph F. Ridgaway.

FIGURE 15.5. The funeral procession for *H.L. Hunley*'s third and final crew, April 17, 2004 (Photo courtesy of Friends of the Hunley).

project staff and volunteers. An estimated 40,000 people attended the funeral procession and ceremony, some from as far abroad as Australia, Japan, Denmark, Germany, France, and Great Britain (Figure 15.5). Among the participants were descendants and relatives of *H.L. Hunley* crewmembers James A. Wicks, Joseph Ridgaway, and Frank Collins, dignitaries from the U.S. government and U.S. Navy, and many submariners from around the world, all of whom came to pay their respects to the pioneering submarine crew (Quinn and Correia, 2004:3; Jacobsen, 2005:13-14).

Project Contributions to Education and Public Outreach

Education and public outreach have been at the core of the Hunley Project since its inception. Since 1999, Friends of the Hunley has established collaborative efforts with high schools, colleges, universities, and other institutions of higher learning to supply unique, hands-on training to students. Many of these students study archaeology or archaeological conservation; however, a significant number are associated with related interdisciplinary fields such as osteology, materials science, coastal geology, and forensic science. Student interns employed at the WLCC have come from all over the United States, and from as far abroad as Sweden, France, Uruguay, and Chile. Colleges and universities that have estab-

lished collaborative learning programs with FOH include the Medical University of South Carolina, College of Charleston, Coastal Carolina University, Clemson University, University of South Carolina, University of Tennessee Knoxville, Universidad de Chile, Institute of Conservation at Gothenburg University (Sweden), Uruguay's Comisión del Patrimonio Cultural de la Nación (National Heritage Office), and the Sorbonne University in Paris, France.

FOH has also worked to develop educational materials (including documentaries, books, interactive CD-ROMs, and Internet-based learning modules) for elementary, junior-high, and high school students. Since the beginning of excavation in 2001, project archaeologists and conservators have participated in live classroom education broadcasts developed by South Carolina Educational Television, the State of South Carolina's Public Broadcasting television network. Between 2,500 and 3,000 children affiliated with various schools, churches, youth groups, and daycare centers visit the WLCC annually.

Docent-led tours are held every weekend and on select weekdays that allow the public to visit the WLCC, ascend a 100-square meter (1,076-square foot) mezzanine and see *H.L. Hunley* in its treatment tank (Figure 15.6). Patrons can also peruse a small-scale exhibit featuring artifacts associated with the submarine and its crew. Since tours began in 2001, approximately 300,000 people, comprising a broad audience that includes both U.S. and international citizens, have visited

FIGURE 15.6. A public tour takes in history and archaeology firsthand at the Warren Lasch Conservation Center (Photo courtesy of Friends of the Hunley).

the laboratory. The sheer number and variety of individuals who visit *H.L. Hunley* annually speaks volumes about sustained public interest in the effort to scientifically investigate and preserve the submarine, as well as its local, regional, national, and international significance.

Ultimately, the ongoing effort to archaeologically investigate and conserve *H.L. Hunley* will lay the foundation for a much larger public outreach and education goal: the creation of a museum that will permanently exhibit the submarine and its associated artifacts. Charleston is one of the nation's oldest port cities and played a critical role in the American Civil War. Ideally, museums should reflect and promote the surrounding area's unique cultural and natural assets. According to a report by the South Carolina Department of Parks, Recreation and Tourism, the main reason visitors come to Charleston is for heritage tourism, and those tourists' primary activities are visiting historical structures and museums. Travel industry experts define heritage tourism as "traveling to experience the places, artifacts and activities that authentically represent the stories and people of the past" (Hargrove, 2002:10). The planned *H.L. Hunley* museum would be applicable to both activities, giving it a strategic alignment with Charleston's existing tourism-based economy.

State and local leaders quickly realized the opportunities inherent in the deveopment of a museum that represents *H.L. Hunley*'s unique role in maritime history. In 2001, the State of South Carolina showed its commitment to the museum project by investing in the purchase of the Southern Maritime Collection, which includes a vast array of important Civil War-era maritime artifacts. The state tasked the Hunley Commission with the collection's stewardship and ultimate display.

Several communities within the Charleston area offered to develop the proposed maritime museum with *H.L. Hunley* as its centerpiece. In response to this overwhelming interest, the Hunley Commission opened a formal bid process to determine the location that would best ensure the success of the future *H.L. Hunley* Maritime Museum. The historical significance of *H.L. Hunley* and its artifacts, and the notable success of public tours of the submarine in its current laboratory setting, compelled three South Carolina cities to offer to host the new museum. In the end, the Hunley Commission selected the City of North Charleston as the museum's future home. This decision was based on a variety of factors, including funding incentives for ongoing conservation efforts, museum construction, and land grant options. Most importantly, the Commission emphasized overall vision for the facility when weighing the various proposals.

A museum is successful based on its ability to deliver an emotional experience through the use of innovative design and interactive elements. The *H.L. Hunley* story is one of emotion, mystery, courage, and intrigue. In addition to a strong incentive package, North Charleston's decision to contract with Ralph Applebaum Associates to design the museum was a key factor in the Hunley Commission's selection of the city's proposal. Ralph Applebaum is one of the nation's leading museum developers, and the Commission felt his participation would help ensure the museum's success by presenting a powerful and unforgettable experience to its guests.

The City of North Charleston is now part of the journey to unlock the submarine's history and to preserve and exhibit its legacy of maritime achievement. In 2003, the Mayor and the City Council of North Charleston unanimously voted to approve funding for the museum's construction. Since that time, North Charleston has supported ongoing conservation efforts with annual donations and has committed to continue doing so until *H.L. Hunley* is conserved and delivered to its museum. The Hunley Commission and the City of North Charleston will utilize the remaining years needed to conserve the submarine to develop and construct a well-planned, world-class museum. Currently, a Vision Committee, which includes scientists, historians, and others associated with the project, is being formed to provide their perspectives of *H.L. Hunley*'s story to the museum development team.

Conclusion

H.L. Hunley's significance cannot be understated. Historically, it was the first submarine to sink an enemy vessel in combat, and its success in this endeavor revolutionized war at sea and helped launch the modern era of submarine warfare. Philosophically, it embodies the pioneering spirit of American inventiveness, as well as the collective and individual courageousness of those who manned it before, and during, its final mission against USS *Housatonic*. Archaeologically, *H.L. Hunley* is a one-of-a-kind, nonrenewable resource that already has revealed significant information about Civil War-era technology, material culture, and lifeways. In addition to providing tantalizing insights into the lives of those who served aboard the submarine, conservation and subsequent analysis of the hull and the items contained within it will reveal details about the broader culture that conceived, designed, built, and launched this pioneer of international maritime history.

From a historic preservation standpoint, the submarine's discovery raised the issue of states' rights over historic shipwrecks significant to their heritage versus federal sovereignty over government-owned wreck sites in state waters. It also revealed the problems faced by state and federal agencies charged with protecting and managing submerged sites, the dangers of politicizing historic properties, and the need to find common ground between exploration and research and site protection and preservation. Although initially fraught with controversy, the effort to recover, excavate, conserve, and exhibit *H.L. Hunley* ultimately forged strong, lasting alliances among state and federal agencies, institutions and organizations, businesses, and numerous individuals.

In the context of naval warfare, *H.L. Hunley* was an invention that changed the world. Today, the submarine, through the cooperative endeavors of preservationists, historians, archaeologists, conservators, various specialists charged with its study and preservation, and members of the general public, is securing yet another place in history. In the tradition of those who last entered *H.L. Hunley* on a cold night in February 1864, the efforts and contributions of countless people continue to propel

the pioneering submarine towards completion of the voyage it embarked on 142 years ago.

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16
Entering the Virtual World of Underwater Archaeology

Gordon P. Watts and T. Kurt Knoerl

Introduction

Traditional public access to underwater archaeological resources has been limited by a variety of factors. The environment of submerged cultural resources restricts public access to those who are trained and competent to function underwater. Those certified to dive represent a very limited percentage of the American public. While museums, television programs, and publications reach a much larger and broader spectrum of the population, even those avenues have limitations. Today the internet provides unlimited access to the American public and offers an exciting opportunity to bring the world of underwater archaeology to virtually every element of our society. With the technology that exists today and that which will be available tomorrow, the non-diving public can be brought into the virtual world of underwater archaeological research.

Certainly the internet already has far-reaching consequences. In the short span of the last thirty years it has revolutionized both commerce and culture. But what promise does it really hold for underwater archaeology and its relationship with the general public? If today's access is exciting, tomorrow's potential is little short of overwhelming.

Traditional Public Access to Archaeology Underwater

Underwater archaeological research often is obscured from the general public by the environment. Investigations beneath oceans, sounds, rivers, and lakes are carried out in a limited visibility environment generally unsuited for public access or observation. A very limited number of excavations, like that performed within the cofferdam-encircled remains of the Revolutionary War British transport *Betsy* at Yorktown, Virginia, provided public access to underwater sites by means of a pier, interpretive exhibits, and educational personnel. Even with the cofferdam

that isolated *Betsy* from the York River, however, public observation of archaeological activity on the wreck was restricted by almost 6 meters (20 feet) of dark water. Only the project staff, students, volunteers, and a limited number of dive-certified visitors were able to share in the recovery of information and artifacts from the wreck.

At sites such as USS *Monitor*, sunk some 25 kilometers (16 miles) off Cape Hatteras, North Carolina, in 70 meters (230 feet) of water; CSS *Alabama,* sunk off the Normandy Peninsula in 60 meters (200 feet) of water; or even CSS *H.L. Hunley*, found in only 9 meters (30 feet) of water off the South Carolina coast, public access is virtually non-existent. With the exception of underwater archaeologists and specifically trained "technical" divers conducting research under permits from the National Oceanic and Atmospheric Administration (NOAA) on the remains of USS *Monitor* and French volunteer divers working on CSS *Alabama*, those important sites are inaccessible to the general public because of their hazardous environments and archaeological sensitivity. Unlike *Monitor* and *Alabama*, public access to *Hunley* is available as the vessel now is in an environmentally controlled conservation tank in the Warren Lasch Conservation Center in North Charleston, South Carolina (See Hunter and Conlin, this volume).

Other, less sensitive shipwreck sites are open to the diving public and access is encouraged. The Florida Division of Historical Resources established eleven historic shipwrecks throughout the state as Underwater Archaeological Preserves in response to nominations from the public. In the Florida Keys National Marine Sanctuary, NOAA designated nine shipwreck sites for diver access and provided interpretation as part of a shipwreck trail that extends from Key Largo to Key West. Both the State of Florida and the Florida Keys National Marine Sanctuary produced interpretive exhibits and diver education slates that identify features of each site and provide historical data about the vessels.

While developed access to shipwreck resources provides an important educational and recreational outlet for the diving public, the percentage of the American public exposed to those submerged cultural resources is small. SHIPS like USS *Monitor*, CSS *Alabama*, and CSS *Hunley* are historically significant enough to generate interest in television programs. Programs about USS *Monitor*, CSS *Alabama*, and CSS *Hunley* have brought each vessel's history and the on-site archaeological research to audiences numbering in the hundreds of thousands. Television programs about submerged cultural resources significantly expand public access, but provide a somewhat limited and quickly dated perspective. Reruns increase accessibility but scheduling limits access to specific time frames.

But what of the other, much larger but possibly less significant inventory of historic shipwrecks? One benefit of television programs is their stimulation of interest in museum exhibits and other forms of documentation. Museums provide public access to underwater archaeology through exhibits and educational programs that focus on the historical and archaeological significance of shipwrecks. Using artifacts, images, interactive exhibits, and programs, museums bring the historian's and archaeologist's work into direct contact with the public. Unfortunately, museum exhibits and programs also reach a limited percentage of

the American population. That contact is expanded by publications that are developed in conjunction with exhibits, but the dissemination of information still is limited.

Publication is one of the most important obligations of the archaeologist. In most cases publication of a scientific report on an extended investigation of a complex site can require years of research and writing. When popular treatments of the investigation are published, they frequently are produced by authors other than the principal investigator, and publication often precedes the post-excavation analysis that links the archaeological findings to an historical context. The scientific publications that provide that link are not particularly suited for public consumption, and rarely benefit from wide circulation. Unless the archaeological site is particularly important or has been widely publicized, even popular treatments rarely receive wide distribution. Excavation and recovery of King Henry VIII's warship *Mary Rose,* sunk in the Solent in 1545, is a classic example of the often necessary time lag between on-site work and publication of scholarly and popular treatments. To further compound this problem, many scientific and popular volumes are priced out of the general public market as publication and distribution costs have risen rapidly.

Entering a Virtual Underwater World

While television productions, museum exhibits and programs, scientific and popular publications, and limited public access to submerged cultural resources will remain important venues for contact with our maritime heritage, a much broader point of public interaction already exists. That interface is the internet. While internet access does not represent direct contact with the resource, it offers many exciting advantages to be exploited, and the potential for public contact is virtually unlimited.

A number of internet sites already provide public access to underwater archaeological projects. Most of those provide insight into ongoing investigations, museum exhibitions, or management programs. An excellent example is the site for the Confederate submarine CSS *Hunley,* developed and maintained by the Friends of the Hunley (http://www.hunley.org/). Like most internet sites for shipwreck projects, the *Hunley* site contains information on the history of the vessel, and documentation of the archaeology, recovery, and conservation of the hull. A downloadable animation of the recovery scenario and an interactive photographic image of the interior of the submarine add a unique touch to the data presented to the public (Figure 16.1). The interactive mosaic of the interior of *Hunley* is one of the best examples of the virtual interface currently on the internet.

Historical and underwater archaeological research on the Civil War blockade runner *Denbigh* can be found at the Texas A&M University web site. The *Denbigh* site provides historical background for the ship that includes information about its construction, the ship's officers, crew, and cargo. The archaeological investigation

FIGURE 16.1. Friends of the Hunley website access to "Inside the *Hunley*" interactive panorama looking aft (Photo courtesy of Friends of the Hunley).

is documented with both a description and images of the on-site work. Computer generated illustrations of the hull's midships and machinery provide a three-dimensional reconstruction of *Denbigh*'s engineering space (Figure 16.2). An animated, computer-generated sectional illustration of a steam cylinder and valve chest provides a clear indication of how that machinery functioned. Although not accessible on the site, a computer-generated animated image of *Denbigh* underway illustrates how computer programs can be used to effectively recreate events now found only in the historical and/or archaeological record.

While the *Monitor* National Marine Sanctuary web site includes information about sanctuary programs and regulations, information about *Monitor*'s history and research at the site also can be found (http://monitor.noaa.gov/). Expeditions to the site that resulted in the recovery of significant elements of the ship's structure, such as the propeller, engine, and turret, are well documented and illustrated. Information about *Monitor*-related educational programs and museum collections are interactive. Perhaps the most interesting interactive element of the site is a plan of the wreck that is tied to photographic images which provide insight into elements of the surviving structure (Figure 16.3).

More and more websites utilize video and animation with sound as means of communication. The *Raid on Deerfield: The Many Stories of 1704* website (http://www.1704.deerfield.history.museum/) is a comprehensive look at the

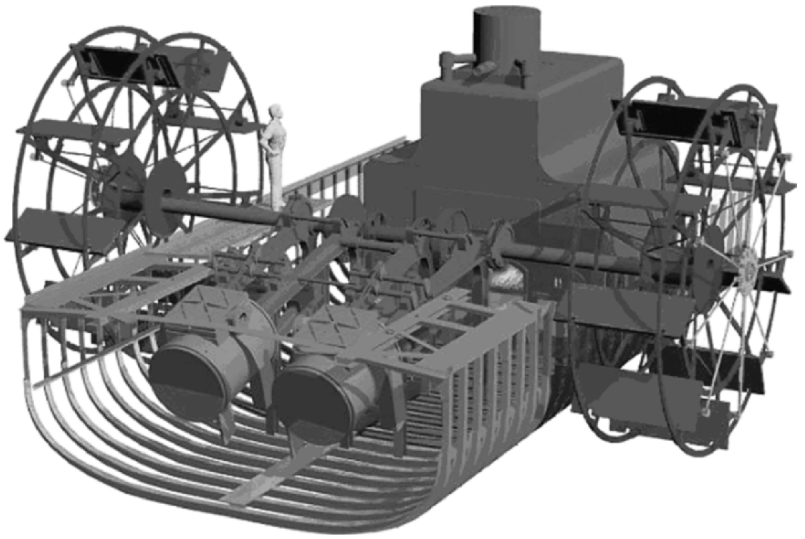

FIGURE 16.2. Computer model of the engineering space of the Civil War blockade runner *Denbigh* by Andy Hall (Image courtesy of Institute of Nautical Archaeology at Texas A&M University).

1704 Indian attack on Deerfield, Massachusetts. An effective video introduction precedes numerous interactive elements that discuss the five cultures involved in the event (Figure 16.4).

A similar trend also can be seen in the increasing number of live web broadcasts. One example is the webcast conducted in the Thunder Bay National Marine Sanctuary by the partnership of the National Oceanic and Atmospheric Administration, the National Undersea Research Center for the North Atlantic & Great Lakes, and University of Connecticut's Information Technology Services. Live underwater and shipboard video was transmitted via the web to the University of Connecticut and from there to students in West Hartford, Connecticut. While this type of event is beyond the means of many institutions, it does represent a trend toward the televisualization of the web in the not too distant future (Babb et al., 2002).

In addition to site-specific shipwreck projects, information on almost all maritime research and educational programs can be found on the internet. One of the oldest and most informative internet sites is operated by the Institute of Nautical Archaeology (INA) at Texas A&M University. The INA site (http://ina.tamu.edu) offers detailed information about four decades of research activity, current investigations, artifact conservation, publications, membership, and links to other sites. One of the links is to the Department of Anthropology at Texas A&M (http://anthropology.tamu.edu/). That site provides information about courses of study, student research projects and resources, staff, staff activity, and career opportunities in the associated fields of research, management, and education.

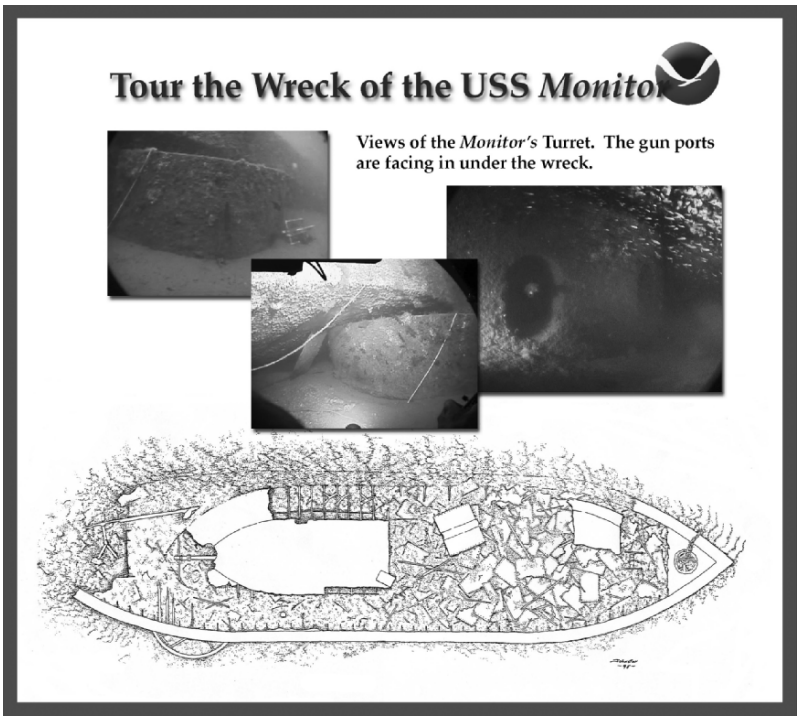

FIGURE 16.3. Interactive map of the *Monitor* site with associated feature illustrations on the NOAA *Monitor* National Marine Sanctuary website (Image courtesy of National Oceanic and Atmospheric Administration).

The INA/TAMU site is a valuable resource for potential students, students and professionals already in the field, and to the general public. Other university programs at the University of Rhode Island, East Carolina University, Florida State University, and several overseas institutions have web sites that provide insight into their programs.

In a partnership with the University of Rhode Island History department, coauthor Kurt Knoerl is working to develop the online Museum of Underwater Archaeology (MUA) that provides internet access to research conducted on underwater archaeological sites (Figure 16.5). The two initial sites in the virtual museum are the sloop *Industry*, a British supply vessel sunk off St. Augustine, Florida, in 1740, and the Confederate commerce raider CSS *Alabama*, sunk off Cherbourg, France, in 1864 (Figure 16.6). Visitors to the URI-based site can explore the history of those SHIPS and archaeological investigation of the wreck sites, and can find a wide variety of additional sources of information. Images of artifacts from the wreck sites, historical documents, and information on the conservation of recovered materials can be downloaded (Figure 16.7).

Many state agencies with responsibility for submerged cultural resources develop internet sites. Most provide information on state laws and regulations,

FIGURE 16.4. The interactive "Raid on Deerfield" internet website utilizes several forms of new media including a video introduction to the site (Image courtesy of Pocumtuck Valley Memorial Association/Memorial Hall Museum).

survey and assessment requirements associated with the NHPA Section 106 Review Process, personnel, and agency management and research activity. At the Florida Department of State, the Division of Historical Resources maintains a website that features the activities of the Bureau of Archaeological Research (http://dhr.dos.state.fl.us/archaeology/). Among the more traditional sources of information on the website is the 1733 Spanish Galleon Trail. The Trail website (http://dhr.dos.state.fl.us/archaeology/underwater/galleontrail/) affords net visitors an opportunity to explore the history and archaeology of thirteen shipwreck sites associated with the Spanish Plate Fleet of 1733. Those vessels were lost along the Florida Keys during a hurricane and their remains have been designated a shipwreck trail for divers visiting the Florida Keys National Marine Sanctuary. While most of the wreck sites have been damaged by treasure hunting activity, they provide divers with an opportunity to examine surviving hull structure, ballast piles, and replica cannon scatters. The website also contains information on the Emanuel Point ship, one of the earliest sixteenth-century Spanish shipwrecks in North America, as well as information on the vessels included in the Underwater Archaeological Preserve program, developed with assistance from volunteer divers from throughout Florida. Plans are underway to create new web sites for each of the Preserves that will include interactive underwater virtual tours for internet visitors to access the shipwrecks without getting wet.

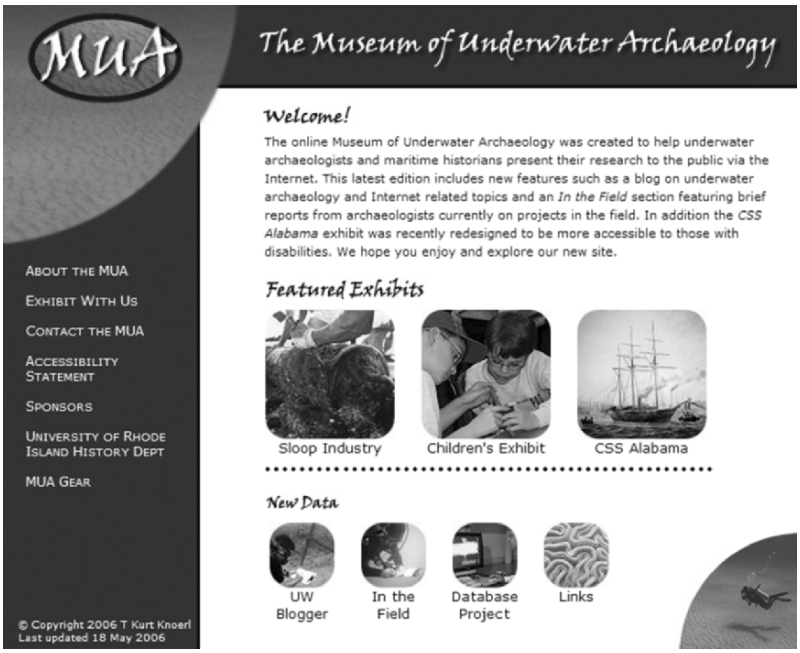

FIGURE 16.5. Home page of the online Museum of Underwater Archaeology (Image courtesy of The Museum of Underwater Archaeology).

In North Carolina, the Underwater Archaeology Branch of the Department of Cultural Resources maintains a web site associated with the responsibilities of the Office of Archaeology (http://www.arch.dcr.state.nc.us/ncarch/underwater/underwater.htm). The Underwater Archaeology Branch posts information on laws and regulations, the research they conduct, and their submerged cultural resource management activities such as the investigation of the remains of an early eighteenth-century vessel which may be *Queen Anne's Revenge*, abandoned near Beaufort Inlet by the pirate Blackbeard in 1718. While a limited number of diving volunteers assisted with work at the wreck site itself, thousands of people visited the wreck via the internet and explored the history of Blackbeard and the archaeology and historical research associated with the *Queen Anne's Revenge* project.

Like state agencies, U.S. federal agencies with submerged cultural resource management responsibility also maintain websites to disseminate information. The National Park Service (NPS) Submerged Resources Center maintains a website (http://www.nps.gov/applications/submerged/index.htm) to provide information about regulations concerning diving in park properties, NPS research projects, associated publications, and accessible digital images. Similar information about fourteen National Marine Sanctuaries managed by the National Oceanic and Atmospheric Administration can be found at their website (http://www.sanctuaries.nos.noaa.gov/). Like the NPS website, the NOAA site contains information about

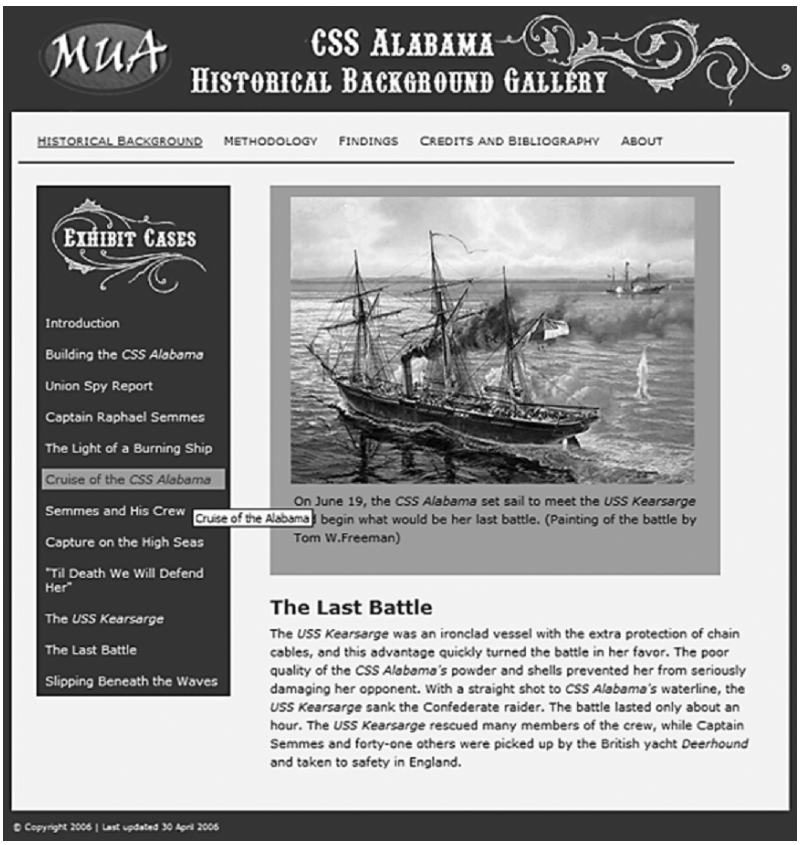

FIGURE 16.6. A screen shot from the historical background section of the online Museum of Underwater Archaeology exhibit on CSS *Alabama* (Image courtesy of The Museum of Underwater Archaeology).

regulations concerning sanctuary personnel, diving in sanctuary properties, NOAA research projects, sanctuary publications, and accessible digital images of sanctuary resources. NOAA's Maritime Heritage Program posts detailed information on its program and activities (www.maritimeheritage.noaa.gov).

Exploiting the Virtual Underwater World

While the internet sites available to the public today are both informative and popular, they also suggest what will be possible in the future. Today, well-funded, technically advanced web site production is not typically a funded component of underwater archaeological investigations. However, as support for that aspect of research becomes a more integral part of project funding, and technology and training advance, the cost of building effective websites will decrease,

FIGURE 16.7. A screen shot from the methodology section of the online Museum of Underwater exhibit on CSS *Alabama* (Image courtesy of The Museum of Underwater Archaeology).

thus enhancing the potential for bringing all aspects of underwater archaeology directly to the public.

At the time of this writing, more than seventy-five percent of all American homes have internet access. As of October 2005, sixty-three percent of those homes were connected to the internet via broadband. That number is expected to top seventy percent by February 2006 (Web Site Optimization, 2006). This provides underwater archaeologists who wish to provide public access to their research an unprecedented opportunity for exposure.

To utilize the web as a means of educating the public, underwater archaeologists must understand its changing technical nature. The continuing growth of broadband access into the home illustrates, from an infrastructure standpoint, the internet is still in flux. Technology continues to develop at a frantic pace. The actual software and coding required to produce web pages also continues to evolve. Therein lies perhaps the greatest challenge to the underwater archaeologist and submerged cultural resource manager. Most underwater archaeologists have

not been trained in the areas of web coding, design, layout, graphics editing, flash animation, or any of the other numerous technologies available to today's web programmer.

Those who have mastered some basic skills find they can quickly fall behind as HTML (Hypertext Markup Language, the basic coding language of the internet) is replaced by XHTML (a more standards-based approach), and as programming moves toward using other, more sophisticated models of coding such as Cascading Style Sheets and the Document Object Model. Even the software designed to aid in web development continues to evolve, making some tasks easier but simultaneously requiring a basic understanding of the new trends in programming. Underwater archaeology students in particular, who are busy learning the skills necessary to be good underwater archaeologists (and good scuba divers as well), now must add a host of computer-related technical skills to their already full academic plates. The good news, however, is that many of today's students are acquiring internet skills at an early age and soon will enter college with an infinitely more comprehensive understanding of the complexities of the technological age.

Last, but by no means least important among the challenges for web-bound underwater archaeologists, is the potentially high cost of web development. The cost of training classes, software, server support, and professional web design firms can run into the hundreds if not thousands of dollars. High profile sites such as USS *Monitor* and CSS *Hunley* attract financial support at levels far above those available to the average underwater archaeologist. In fact, even many state agencies employ only one or two individuals who must work on an extremely small budget to maintain their agency's technological capabilities. While many state underwater archaeologists have state-run websites, many often lack the time or money to keep their websites up to date. Consequently, the vast majority of underwater archaeological investigations never make it to the web where the tax-paying public can see their dollars at work.

Putting aside issues of time, money, and training, the changing nature of the web presents yet more problems in terms of presentation of information to the public. Printed material, books, magazines, and journal articles use fairly standardized ways of presenting information. Hundreds of years of publishing have resulted in certain conventions now taken for granted. Most books contain title pages, a table of contents, page numbers, text that does not extend to the very edge of the page, publishing information, and in some cases an index and footnotes. Many of these are taken for granted but their use was not always standard.

Unlike books, web pages have not yet reached a state of equilibrium. More and more, some elements do seem to be developing as standard items on a webpage, such as site maps, search boxes, and left-side navigation links. Despite these trends, however, experimentation with layout continues. A further complication for the internet-inclined underwater archaeologist comes from the fact that currently, different web browsers (the software that interprets how to display a web page on the screen) can display the same page quite differently. Attempting to obtain acceptable results across browsers such as Internet Explorer (IE), Netscape,

Firefox, and Safari can be a maddening experience. Even the current widespread use of Microsoft's Internet Explorer does not prevent problems. Different versions of IE can display web pages differently. Even the most current version of IE does not comply with all of the standards accepted by other browsers (Wyke-Smith, 2005:4).

The Other Side of the Virtual Coin

Because internet access is available to a wide audience, those advocating treasure salvage over archaeology can have a public voice as far-reaching as that of professional archaeologists, thus competing for the public's attention and support. But such openness also can have a beneficial impact. Several excellent and ethically committed avocational organizations such as the Marine Archaeological Research & Conservation (MARC) (http://www.marinearcheology.org/) group and the Maritime Archaeological and Historical Society (MAHS) (http://www.mahsnet.org/), maintain websites offering an opposing viewpoint and providing valuable assistance to the professional community. Professionally trained underwater archaeologists must follow suit. While they may begin by using the internet as a means to reach a wider professional audience, they can not nor should not ignore the general public. Like it or not, archaeologists need to publish the results of their research on the web with a wider audience in mind. This is only fitting as the general public generally supports most archaeological research through their tax dollars. Indeed it is an archaeologist's moral obligation to make their work available to the public. A survey of *International Journal of Nautical Archaeology* articles over the last decade revealed only one was dedicated to the use of websites as a means for distributing site report information to the general public. Written almost ten years ago, that article saw the potential in using the internet to reach a wide audience in a cost effect manner (Hall et al., 1997).

The internet offers the world for an audience. It provides an opportunity unprecedented in history. Faced with so many websites and points of view to examine, the general public not only needs the presence of professional archaeologists on the web but they also need to know how to tell the difference between scholarly work and biased propaganda. The Center for History and New Media at George Mason University, in partnership with the *American Journal of History*, provides peer reviews of hundreds of historical websites along with tools and suggestions for discerning scholarly works from less credible sites.

Sites are evaluated on traditional scholarly standards. Reviewers examine the strength of a site's thesis, its use of primary sources, its objectivity, and other criteria similar to those used for evaluating print journal articles. In addition, they review a site's use of new media. How well does a site make use of the multi-sensory nature of the web? Is the navigation clear and useful? Is it current? Can the audience tell who is behind the project? Underwater archaeologists need to follow this example and set standards for website review as well as teach their students and the public how to critically judge sites for themselves. Too many teachers have stated they will

not let their students cite websites in their assignments because, "there is too much garbage out there on the web." A better alternative to running away from the problem is to teach students how to separate fact from fiction.

The Future of Underwater Archaeology on the Web

We began this chapter discussing some high-profile web sites such as those for *Alabama*, *Hunley*, and *Monitor*, and how the internet could bring underwater archaeology to a wider public audience than any other medium. But where will this medium take us in the future? To answer this we must recognize one enduring fact about the internet: despite the original intentions of its first designers, the web literally has a life and destiny of its own. Our current ideas about the future are vague guesses at best, as we are locked into past conceptions and linear thinking. Innovations often are unforeseen and take us in completely unexpected directions. Some near-term possibilities and their possible implications, however, are perhaps easier to see.

Several components of the internet are evolving at the same time. Infrastructure (the wires, satellites, fiber optic cables, switches, and routers that make up the physical and logical elements of networks), software (which includes web browsers, XHTML, and various website editing programs), and presentation hardware such as personal computers (PC), cellular phones, and hand-held devices are all developing and morphing into items unimagined only a few years ago.

Bandwidth speeds certainly will increase, thus freeing web developers from the restrictions of lengthy download times. Many web designers already have begun to code purely for broadband with the anticipation that dial-up users with slow 56K connections will make the transition to faster and cheaply available technologies such as DSL and cable modems. The increasing prevalence of broadband connections at work, topping eighty-seven percent as of November 2005, whetted the public's appetite for broadband in the home (Web Site Optimization, 2006). Increasing speed will allow websites to offer more bandwidth-intensive videos and live web transmissions supplementing, rather than replacing, traditional text.

"I can't read on the web," is a common complaint by web viewers. Many users prefer to print out long passages of text rather than scroll or click their way through articles. The poor contrast and resolution of most computer screens compared to printed material has led some designers to adopt the philosophy of building pages with small chunks of text or lists. But here scholars and commercial designers part company when it comes to web design. Some web visionaries argue for the development and increased use of visualizations of data and history, suggesting computers have been more of a graphics tool than a processor of words. They promote a more prominent place for diagrams, maps, and other visual means within the discipline of history (Staley, 2003:3). This argument equally could apply to anthropologists and underwater archaeologists. In fact, the visual nature of material culture and spatial analysis seems particularly well-suited to display on the internet.

Others argue that we must hold steady to prose while screen technology catches up with the human eye and that we must not opt for the least common denominator (Cohen and Rosenzweig, 2005). Certainly screens will continue to improve, so while video usage will increase it is unlikely to replace text that can be created, edited, and posted far faster than editing a new video. More than likely, video will become more prevalent with underlying layers of text and still images for those who wish more in-depth coverage.

Designers easily can get caught up in the creative process when building web pages. Web sites that provide free code to make sites more interactive abound but developers are increasingly paying attention to the impact that code is having on the special needs of some disabled viewers. A variety of special tools such as screen readers for the blind and special track balls and keyboards for those with motor control problems require clean, concise code. Several simple techniques such as embedding image descriptions in the code, careful navigation, and limiting the use tables goes a long way to making their experience much more enjoyable. While this type of coding requires more effort it is the most responsible way to reach an even wider audience. The Human Factors International website provides a powerful tool that illustrates how inaccessible and accessible web pages sound through a screen reader for the blind or visually impaired. That website alone should be enough to convince most developers to take the time to incorporate accessibility into their web page design (see http://www.humanfactors.com/downloads/chocolateaudio.asp).

This is not to say that content creation will always be difficult. While there always will be a learning curve for producing web pages, especially interactive ones, future students will grow up reading online (Daniel Cohen, personal communication, 2005). Many members of the current generation of high school freshman cannot remember a time when there was no internet. Elementary school children are instructed in using presentation software such as Microsoft's PowerPoint, despite vocal and occasionally heated opposition to its overuse (Tufte, 2006). Skills many current designers acquired late in life will be part of the standard foundation for all students. Aiding in this effort will be better content building software. Commercial products such as Adobe's Dreamweaver and PhotoShop will no doubt continue to evolve and will have to compete with other products offering WYSIWYG (What You See Is What You Get) simplicity.

Another change impacting the public's interaction with the internet is the move toward standards-based web browser development. The World Wide Web Consortium (W3C) was founded in 1994 in an effort to develop internet protocols or rules to be used as a standard for web development (W3C, 2006). Adherence to these protocols by all browsers would ensure a consistent result when viewing a website. While some browsers do not yet comply with these rules the industry is moving in that direction which is good news for web developers. Coding for one set of rules will simplify and shorten the amount of effort spent in developing new websites. Taken together, faster bandwidth, better software, education, and web protocols will lead to the resolution of many problems currently plaguing the internet and these advantages will no doubt be available to underwater archeologists.

Perhaps the most important element that will power future growth and development of advanced interactive websites is the database. The web is an ocean of information. Billions of pieces of information are available online. But are they truly available? As of 2004, the Google search engine contained more than four billion web pages in its index (Google, 2006). Even a simple search on Google for the word "shipwreck" returns over 1.7 million entries. Finding a needle in a haystack seems an easy trick compared to truly making use of so much online information. Yet the future trend toward standards in database construction seeks to allow for the interoperability of various databases. What this means in a practical sense is that databases created following agreed-upon standards can be linked and used to create larger organized datasets.

Harnessing databases into useable segments will power every major advance in web technology in the future, from virtual reality displays to artificial intelligence. True power lies in the ability to access information as needed. The MUA at the University of Rhode Island is working toward the creation of an online bibliographic database of underwater archaeological site reports from around the country. The idea is to take disparate sets of data maintained by various state and federal agencies and code them following proper standards. Anyone wishing to search on a topic or region to see what work has been done would be able to find that information in one location. But even more useful would be the ability to append that database to others, following the same standard but for different topics, such as terrestrial archaeology, commerce, or migration. Questions that could not even be asked, let alone answered, prior to the creation of such databases would now be possible. New information will be born out of this ability to create complex queries. Researchers will only be limited by their ability to compose their questions.

When we think of internet connections, we typically think of web pages stored on servers flowing into the personal computers in our homes and offices, sometimes through hard wires, sometimes through localized wireless networks. It is important to realize that our current modes for accessing the internet already are far more diverse than that, and are growing at a geometric rate. Hand-held devices, cellular phones, and laptop computers are all part of a trend of moving away from the PC as a primary means of viewing the internet.

Web designers, including those who create content for underwater archaeologists, are somewhat limited by the small amount of screen space available on the average PC. As the outlets for display increase it may be that websites will be liberated from these constraints. Imagine websites created specifically for the purpose of being viewed on large-screen television, like computers that allow the viewer to see high-definition web casts. Consider too how in truth, the reverse might have a greater impact on our lives. Future internet sites might allow a viewer at home to don a set of goggles and sensory clothing and take an immersive three dimensional virtual reality tour of a shipwreck site. The virtual visitor may perform a swim through the wreck complete with the sound of water and air bubbles. They might stop to touch a timber and in doing so call up information about its purpose through diagrams, historic photos, or an audio and video commentary by the principal archaeologist on the project.

Perhaps the user will wish to travel back in time and watch a computer simulation of the vessel in its working state. A three-dimensional model of the engine that may just have been seen as a deteriorated element of the wreck would now be shown in working order with explanations of how the parts functioned together. The vessel's history would provide meaningful context to what had previously seemed merely a jumbled mass of rotting wood and rusting metal. Moving ahead again the viewer might witness a reenactment of the wrecking event itself.

Seen from the bottom of the sea, the wreck would descend and settle on the ocean floor, and through time-lapse images, the viewer would watch the ship deteriorate before their eyes. Returning to the present state of the virtual reality shipwreck, they would come to a section that appears not to have been excavated. At the virtual archaeological tour guide's suggestion, they could access a virtual dredge and by waving it over a delineated test unit, expose layer after layer and receive comments about what can be learned from the exposed contents. For those who cannot take part in actual underwater archaeological excavations, such virtual reality experiences will bring them as close as possible to the real thing, and may foster an appreciation for what the work really entails and what can be learned from such investigations.

The database containing all the required information could be utilized by exhibit designers and archaeologists to make such computer-generated narratives possible. But even more importantly, the existence of such databases and the tools to access them will allow visitors to construct their own stories as they decide which elements of the wreck, what portions of its history, engineering, or cultural evidence they want to examine. A simple query will become an act of creation. While databases are not narratives on their own, search capabilities offer researchers a way to use previously disconnected sets of arbitrary data and to move one step closer to creating their own narrative based on their own goals (Manovich, 2001:227).

How, then, do we take advantage of the opportunities presented by the internet? Fortunately much of the necessary data is, or can be, collected during traditional underwater investigations. Video footage, still photography, maps of test units, hand drawings, and field notes are all part of current recording practices. Underwater archaeologists must begin to recognize that internet-publishable documentation of their work can include more than the information collected from the wreck, the associated artifacts, and the conclusions drawn from their analysis. It should also document the data collection process. Sharing the experience of how data was recovered is important in recreating the entire experience for the general public. Evidence of that interest can be seen in the field schools in underwater archaeology so popular with sport divers who want to do more than just swim around wreck sites. They want to experience and touch history for themselves in meaningful ways.

Students and volunteers express pride in knowing they have joined in the recovery of data and contributed to the historic record in an ethically sanctioned manner. The understanding and excitement generated by virtual shipwreck surveys

may inspire more volunteers to get involved with actual projects and motivate the general public to support protection of existing and newly discovered sites. Only a small fraction of the population has the training and resources to dive and work on actual shipwreck sites. For everyone else, the internet may well offer the most exciting opportunity for sharing the excitement of discovering our maritime heritage that is preserved beneath the waves.

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