INTELLECTUAL TREASURE HUNTING

MEASURING EFFECTS OF TREASURE SALVORS ON SPANISH COLONIAL SHIPWRECK SITES

by

Melissa Rae Price

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Director of Thesis: Dr. Jennifer McKinnon

Major Department: Program in Maritime Studies of Department of History

This thesis examines the impacts of treasure salvors and looters on the Pillar Dollar Wreck (site # BISC00035) in Biscayne Bay, Florida, and explores three comparative shipwrecks from the 1733 fleet, *El Populo*, *San José*, and *San Pedro*, which wrecked off the coast of Florida and were likely from a similar time period as the Pillar Dollar Wreck. The intention of this thesis is to develop a methodology for measuring the effects of cultural impacts, particularly treasure salvage and looting, on Spanish colonial shipwreck sites in the Florida Keys. There is no current basis for quantifying such effects.

Further, this thesis presents the first focus on the history of the Florida Exploration and Salvage (now Recovery) Program. The information presented in this thesis is used to identify what was learned from treasure salvor endeavors on Spanish colonial shipwreck sites in the Florida Keys and examine what an academic investigation of the treasure salvor industry can reveal about what is lost or gained through commercial exploitation of Spanish colonial shipwrecks in the Florida Keys by treasure salvors. Site formation process studies provide the theoretical framework upon which this thesis is founded, creating an understanding of the

processes that created and altered the four shipwreck sites. This study adds to the database of knowledge about site formation processes on Spanish colonial shipwrecks in the Florida Keys.

Finally, cultural heritage management is a relevant topic that is currently at the forefront of maritime archaeology. This thesis contributes to the database of information concerning protection of sites and specifically explores management issues related to treasure salvage of Spanish colonial shipwrecks in the Florida Keys.

Key Words: Treasure salvage, Florida Keys, Pillar Dollar Wreck, 1733 fleet, Spanish colonial shipwrecks, site formation processes, cultural impacts, artifact analysis, cultural heritage management

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Melissa Rae Price

APPROVED BY:

DIRECTOR OF THESIS: _____
(Jennifer McKinnon, Ph.D.)

COMMITTEE MEMBER: _____
(Bradley Rodgers, Ph.D.)

COMMITTEE MEMBER: _____
(Lynn Harris, Ph.D.)

COMMITTEE MEMBER: _____
(Della Scott-Ireton, Ph.D.)

CHAIR OF THE DEPARTMENT OF HISTORY: _____
(Christopher Oakley, Ph.D.)

DEAN OF THE GRADUATE SCHOOL: _____
(Paul J. Gemperline, Ph.D.)

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Abbreviations

ACUA Advisory Council on Underwater Archaeology

AIA Archaeological Institute of America

ARPA Archaeological Resources Protection Act

BAR Bureau of Archaeological Research

DHR Division of Historical Resources

ECU East Carolina University

FKNMS Florida Keys National Marine Sanctuary

FMSF Florida Master Site File

NRHP National Register of Historic Places

NOAA National Oceanic and Atmospheric Administration

NPS National Park Service

SAA Society for American Archaeology

SHA Society for Historical Archaeology

SEAC Southeast Archaeological Center

SFCMC South Florida Collections Management Center

1 Introduction

1.1 Research Questions

The intention of this thesis is to develop a methodology for measuring the effects of cultural impacts, more specifically state-sanctioned commercial treasure salvors and illegal looting, on Spanish colonial shipwreck sites in the Florida Keys and the Caribbean. Currently, there is no basis for quantifying such effects on these sites. Thus, this thesis addresses the following questions:

1. What can the academic investigation of the treasure salvor industry and looting activities reveal about what is lost or gained through commercial and illegal exploitation of Spanish colonial shipwrecks in the Florida Keys?
2. What are the impacts of commercial treasure salvors and illegal looting on Spanish colonial shipwreck sites in the Florida Keys and how can these impacts be quantified?
3. What have we learned about the past from commercial treasure salvor endeavors on Spanish colonial shipwreck sites in the Florida Keys?
4. How can this knowledge assist in the future management of Spanish colonial shipwrecks in the Florida Keys?

To understand and answer these questions, the Pillar Dollar Wreck (site # BISC00035) in Biscayne Bay, studied during East Carolina University's (ECU) 2014 fall field school, and three ships associated with the 1733 fleet wrecked off the coast of Florida serve as case studies. A wealth of information is available about the 1733 fleet and the Pillar Dollar Wreck, providing useful comparative data to address the above research questions. The aims of this thesis are to:

- Identify the natural and cultural impacts on selected Spanish colonial sites in the Florida Keys
- Review literature on archaeologists' and treasure salvors' publications to identify what can be learned from each publication type
- Review all aspects of the history of the Exploration and Salvage Program in Florida
- Conduct a literature review on site formation processes and their relationship with Spanish colonial shipwrecks in the Florida Keys
- Develop a methodology for quantifying and interpreting treasure salvor impacts on Spanish colonial shipwrecks in the Florida Keys
- Explore management issues related to treasure salvage of Spanish colonial shipwrecks in the Florida Keys

1.2 Background

Florida, with its rich collection of underwater shipwrecks, serves as the main area of study. The state has a unique history of underwater archaeology, wrecking and salvage, looting, and state-sanctioned commercial treasure salvage, which provides for a useful comparison of activity related to Spanish colonial shipwrecks in the Florida Keys. Unfortunately, little of this history was recorded and existed as undocumented oral history held with managers and treasure salvors. Nevertheless, in the 1920s, shipwreck and treasure salvage began to gain ground and the state of Florida considered what should be done with the state's historic shipwrecks (Roger Smith 2014, pers. comm.). Trustees of the Internal Improvement Trust Fund issued the first lease for treasure salvage in 1932 for a wreck site associated with the 1715 Spanish fleet, which wrecked near Vero Beach (Florida Bureau of Archaeological Research, Division of Historical

Resources [BAR, DHR] 1994). Under contract, the state expected the Real Eight Company to record their finds and to provide a percentage of the finds to the state. The treasure salvors were responsible for filling out forms and daily logs of activities to be reported to the state (Mary Glowacki 2014, pers. comm.). The state acquired some artifacts for public display from these salvage contracts, however, the agreements basically led to a mass consumption of maritime heritage. These state-operated contracts ultimately led to modern issues and questions with regards to who owns the past and whether the past should be offered for contract to commercial entities (BAR, DHR 1994).

1.3 Salvage versus Archaeology

Various terms have been used interchangeably to describe the actions of treasure salvors. Archaeologists have for decades discussed the definitions of individuals who interact with shipwreck sites. In an article entitled "The World's Worst Investment: The Economics of Treasure Hunting with Real-Life Comparisons," Peter Throckmorton (1990) used the terms "treasure hunter" and "salvor" interchangeably, noting that "treasure hunters" work within salvage companies. Throckmorton noted that salvors' goals were counter to historic conservationists. He wrote that "treasure hunters" mindlessly destroyed scant resources and negatively affected the tourism industry in areas such as the Caribbean (Throckmorton 1990:75–76). Donald H. Keith and Toni L. Carrell (2009:106) in "Going, Going, Gone: Underwater Cultural Resources in Decline," used the term "treasure salvage" to describe the actions of those individuals who recovered artifacts considered to have commercial value. These activities were not conducted to an archaeological standard and Keith and Carrell recognized them as a threat to the archaeological record. Although some archaeologists make a distinction between treasure salvors and treasure hunters, many others consider salvors to be simply legally sanctioned

treasure hunters (Hall 2007:1–2). In Florida, legally sanctioned treasure salvors receive Exploration and Salvage permits to work under the supervision of state officials and a qualified archaeologist, but their goals involve making a profit from the sale of archaeological materials rather than recovery and permanent curation (BAR, DHR 1994). Salvage permit or not, treasure salvors and looters remove artifacts for personal and economic gain, which is counter to current archaeological ethics models (Society for American Archaeology 1996; Society for Historical Archaeology 2015).

For the purpose of this thesis, a number of clarifications regarding semantics are first made. To designate legally permitted, commercially driven excavations that took place in Florida from the 1930s onward, "treasure salvage" is used. Those individuals who did not obtain a permit for excavation from the state are referred to as looters. Another group distinction includes "adventure divers," designating individuals who did not conduct large-scale treasure salvage operations and were more likely to collect objects as they recreationally dived on sites prior to laws that protected historic shipwrecks in state waters. Further definitions are in Appendix X.

1.4 Salvage Law

Florida's shipwreck salvage movement really began and accelerated in the 1950s, with salvage law enacted in 1958 (Murphy 1990:6). In reaction to this, Florida hired its first underwater archaeologist to oversee exploration and salvage activities in 1964. Starting in 1967, the Division of Archives, History, and Records Management retained responsibility for protecting Florida's cultural heritage, including its underwater heritage. State-owned properties and territorial waters, covering three nautical miles out to sea, could not be salvaged without a contract from the Division, and state field agents oversaw salvage activities (Bederman 1998:106). Although much of the 1733 fleet was under the jurisdiction of Florida, some treasure

salvors filed admiralty arrests, in which they claimed title to historic shipwrecks (Elias 2000:48). Some treasure salvors also appealed to override previous state contracts, in which the state kept a percentage of artifacts from treasure salvors and requested a return of artifacts initially given to the state as part of those contracts (Wilder 2000:96).

Admiralty law, also known as maritime law, is a body of law that encompasses maritime issues and is observed by all nations (Bederman 1998:103). In the United States (U.S.), the federal courts hold jurisdiction over admiralty law and, therefore, admiralty claims for shipwrecks. Many treasure salvors claim title to historic shipwrecks based on the law of finds and/or salvage law, both of which fall under admiralty law (Bederman 1998:107).

Salvage law originated with the sea laws of Mediterranean seaport cities, when a salvor could claim a reward for rescuing a ship's cargo. The U.S. Supreme Court, taking note from these ancient maritime laws, developed basic principles of maritime salvage in 1969. The Supreme Court noted that salvage involved rescuing a ship or its cargo from impending peril on the sea by recovering property from loss (Wilder 2000:92). As in ancient times, the amount a salvor is rewarded depends on multiple factors. The depth of the wreck, the amount and value of cargo saved, and risk to the salvor all have an impact upon the reward (Wilder 2000:93–94). Salvage, in the modern sense, is defined as a service that is given voluntarily to relieve or save property from impending peril at sea or in other waters. Those who salvage are under no legal obligation to do so but usually receive some sort of compensation for their trouble. It is important to note that the basis of salvage law is compensation for one's efforts, rather than title to the property saved.

The law of finds, on the other hand, concerns claiming goods or property that has no owner. The law of finds was rooted in U.S. common law, known colloquially as "finders

keepers." The finder must of course prove that no one has owned the property or that the property has been abandoned. The law of finds usually applies only if an owner has publicly announced that he or she abandoned ownership, or if the property in question was recovered from an ancient shipwreck in which an owner may no longer exist. In the U.S., problems arise when a treasure salvor, attempting to claim title to a shipwreck in federal waters, takes his or her issue to federal court and claims entitlement under the law of finds. If unsuccessful, the person can claim salvage law under the Judiciary Act of 1789 (Wilder 2000:93–94). As an example, Mel Fisher sued the U.S. for title to the Spanish colonial shipwreck *Nuestra Señora de Atocha* and possession of the cargo through the law of finds (Wilder 2000:96). Laws concerning the preservation of shipwrecks surfaced as a result of the salvage efforts taking place on historic shipwrecks (Roger Smith 2014, pers. comm.).

1.5 Florida Exploration and Salvage Program

In Florida, the fact that the federal government could override the state's rights to shipwrecks opened many litigation issues between treasure salvors, the state, and the federal government, which caused Florida's Exploration and Salvage Program to be largely disassembled between 1977 and 1983 (BAR, DHR 1994). From 1983 to 1987, the federal government continued to provide titles of shipwrecks in state waters to treasure salvage companies. In 1987 the state hired a new underwater archaeologist to oversee the underwater program. During that year, the government passed the Federal Abandoned Shipwreck Act and granted states legal title to shipwrecks, ending the admiralty jurisdiction of sites and the issue of treasure salvors seeking to override state contracts. The Abandoned Shipwreck Act of 1987 went into effect in April of 1988 and declared that the United States owned abandoned vessels located in its waters, embedded in reefs protected by the state, and placed on or eligible for the National

Register of Historic Places (NRHP) (Wilder 2000:102). This deemed both salvage law and the law of finds inapplicable to wrecks protected under the Act, but existing admiralty claims remained. Confusion still surrounds admiralty law because there is no explanation for how to "void" admiralty arrests (Mary Glowacki 2014, pers. comm.). For example, owners of admiralty arrests can sell or relinquish their titles, but there is no clear instruction for what to do when an admiralty arrest holder dies.

Around 2006 in Florida, the Exploration and Salvage Program (now the Exploration and Recovery Program) underwent revisions in which "contracts" were phased out and "permits" were supplied to salvors instead (Mary Glowacki 2014, pers. comm.). Two laws under *Florida Administrative Code* govern actions on historical shipwrecks on state property: Chapter 1A-31, concerning commercial salvage on shipwrecks, and Chapter 1A-32, concerning archaeological excavations (Florida Department of State 2015a). There are two phases under the 1A-31 permit process for individuals attempting to commercially salvage historical sites on state lands. The first phase is a permit given for "exploration." To apply for such a permit, the applicant must supply a research design and is only allowed to conduct non-invasive investigations, such as remote sensing. The second phase concerns the "recovery" permit, which allows for the excavation of a site and collection of artifacts and requires that an archaeologist be present during those activities. The state has only supplied one recovery permit since 2009 and it was given as a result of an admiralty arrest lawsuit. Though the state no longer supplies "contracts," admiralty claims allowed for some contracts to continue to be renewed each year. Most of these contracts are no longer worked, but merely held much like unused real estate. Currently, 16 separate salvage companies hold permits and contracts off the Atlantic coast of Florida (Figure 1).

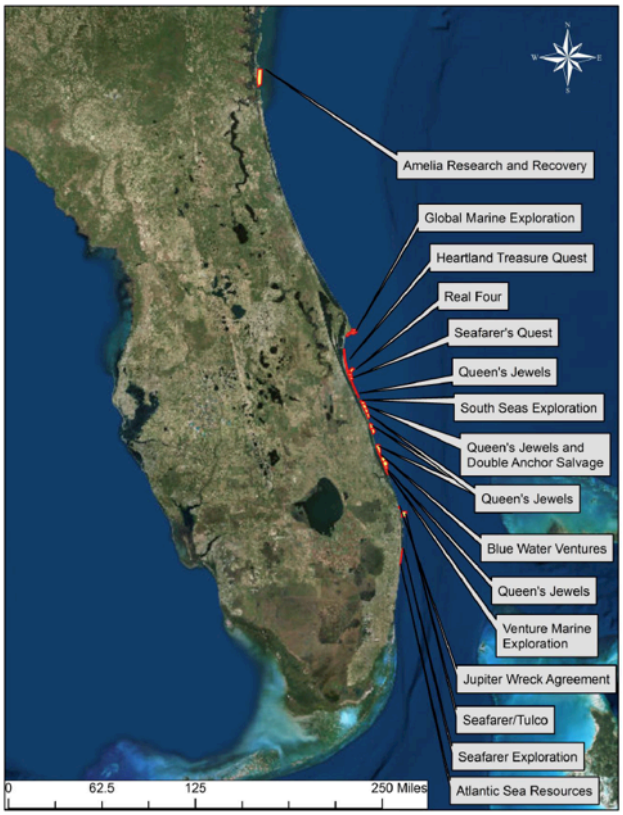


Figure 1. Current permits and contracts held in Florida (BAR, DHR 2015).

1.6 Case Study: The Pillar Dollar Wreck

The Pillar Dollar (BISC00035) site, located on a shoal in the southern boundary of Biscayne National Park, provides the primary case study of site formation processes and the effects of treasure salvors and illegal looters on Spanish colonial shipwrecks in the Florida Keys (Figure 2). The Pillar Dollar Wreck is thought to be a "galleon" that was part of one of the Spanish *flotillas* or fleets from the late 18th century. Illegal treasure salvors have continuously looted the Pillar Dollar Wreck since the 1960s, recovering cannon, pillar dollars, and artifacts from the nearby reef (Meylach 1971:293). Further, this is likely the site that was involved in the U.S. vs. Hampton, S. Hood, and W. Hood 1986 court case concerning illicit activities on a state-owned wreck site (National Park Service [NPS] 1986).

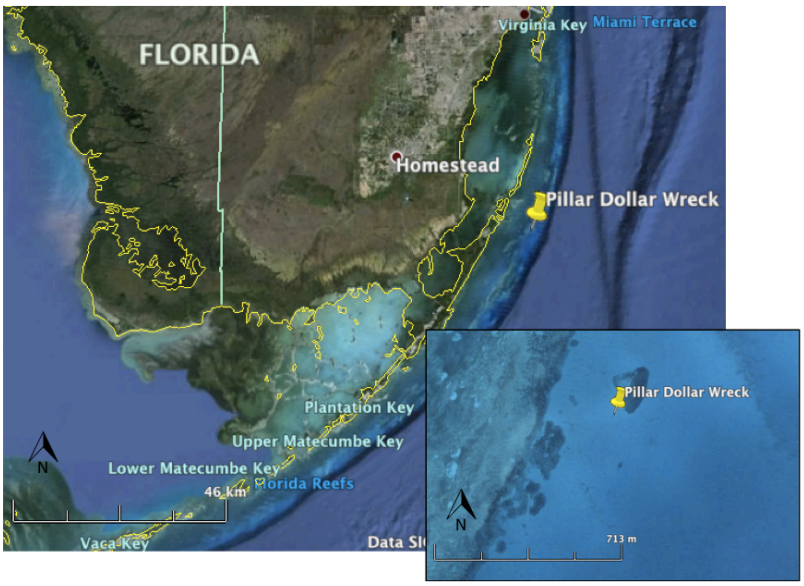


Figure 2. Pillar Dollar Wreck location (Google Earth).

In the late 1980s, Kenneth Wild and David Brewer, working for the National Park Service (NPS) surveyed Florida's underwater cultural resources and proposed that the Pillar Dollar Wreck be monitored and protected (Pomeroy 1987:1). Regardless of its location in a National Park and its subsequent protection under the Archaeological Resources Protection Act (ARPA), the site has been continuously disturbed.

Reports noted the site consisted of scattered ballast stones and a few structural timbers partially covered by sand (Broward 1985:4). Situated in a dynamic environment, the site was constantly exposed and covered by sand as a result of surge and currents. Regular inspections of the site continue and Biscayne National Park Cultural Resource Manager Charles Lawson showed interest in learning more about how treasure salvors have impacted the site, prompting a 2014 field project (NPS 2015).

1.7 Comparative Studies: The 1733 Fleet

In 1733, a Spanish plate fleet carrying silver, cochineal, indigo, copper, ceramics, and other general cargo encountered a hurricane on its return journey to Spain from Havana

(McKinnon 2007:86). As a result, 19 of the 22 vessels were wrecked along an 80-mile stretch of the Florida Keys (Figure 3).

Spanish salvors at the time were able to reclaim most of the cargo from the wrecked vessels, and some vessels were even refloated and towed to Havana; the rest were burned to the waterline. Between the 1930s and the 1970s, adventure seekers and treasure salvors relocated 13 of the wrecks. The state oversaw some of the contracted salvage operations but illicit activities took place on the sites regardless (BAR, DHR 2004). Still, archaeologists were not able to study the wrecks in full until well after treasure salvors had impacted the sites tremendously. In 1977, field agents of the state of Florida, Roger Smith and James Dunbar, mapped and surveyed shipwrecks from the 1733 fleet and produced the first archaeological reports (Smith and Dunbar 1977; McKinnon 2007:88). Similarly, students from Indiana University and Florida State University (FSU) studied the sites in 1988 in order to examine their potential for nomination to Florida's Underwater Archaeological Preserve Program (McKinnon 2007:88). These reports and site plans provide comparative data to the 1977 documents and reveal changes the sites underwent in the years between. State archaeologists using Florida Coastal Management Program grant monies surveyed the sites again in 2004 in order to provide updated documentation on their condition (BAR, DHR 2004). These data and reports provide comparative data to past site reports, as well as treasure salvor publications. The goal is to further examine changes to the sites and understand the human and natural processes that acted and continue to act upon them.

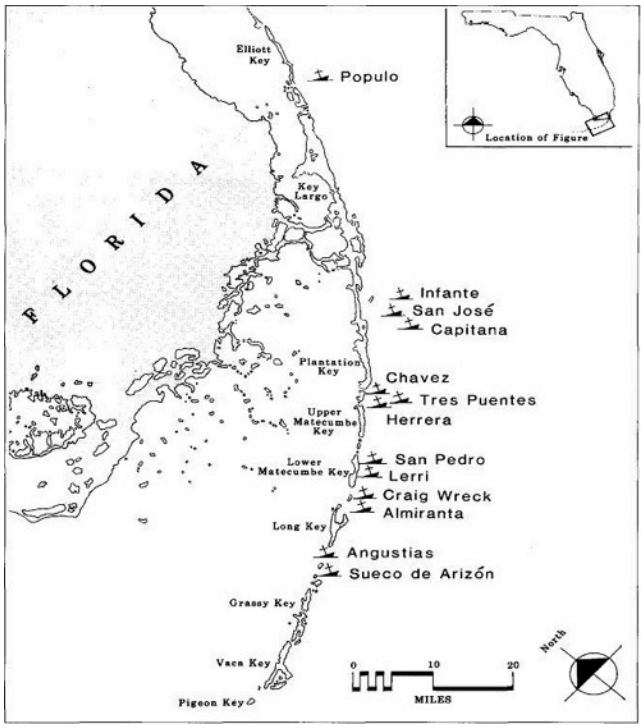


Figure 3. Shipwrecks from the 1733 fleet (Smith et al. 1990).

Some of the 1733 fleet shipwreck sites, as previously mentioned, were involved in various litigation issues that took place during the latter half of the 20th century in Florida (Weller 2001a:103–113). Those sites, such as *San Pedro*, *Capitana*, and *El Infante*, provide examples of the issues concerning shipwreck salvage rights and other legal issues between the state, the federal government, and treasure salvors. One of these wrecks for which Exploration and Salvage Contracts were permitted, *San Pedro*, is used as a case study of site formation processes acting upon Spanish colonial shipwreck sites in the Florida Keys. Furthermore, *El Populo*, for which no Exploration and Salvage Contracts were issued, is examined due to its proximity to the Pillar Dollar Wreck and because it provides a different history of impacts. *San José*, for which contracts were also issued, is used as a final comparative study for site formation processes.

1.8 Background Literature

Background literature related to the research presented in this thesis involved multiple concepts. The first review was an examination of ethics in archaeology as set forth by the Society for American Archaeology (SAA), the Society for Historical Archaeology (SHA), the Archaeological Institute of America (AIA), the Advisory Council on Underwater Archaeology (ACUA), and UNESCO's Convention on the Protection of the Underwater Cultural Heritage. Ethics are integral in understanding the difference between archaeology and treasure salvage. The second section was a review of what archaeologists have written about treasure salvor endeavors. Articles that specifically focus on the difference between treasure salvage and archaeology, define terminology, or discuss issues related to ethics were reviewed to provide a baseline for understanding the differences and conflicts within the professions (for example, Murphy 1983; Throckmorton 1990; Cockrell 1998; Hall 2007; Keith and Carrell 2009).

The site formation processes literature review included examining a number of publications that focused on natural and cultural impacts to shipwreck sites (for example Muckelroy 1978; Murphy 1983; Keith and Simmons 1985; Schiffer 1987; Ward et al. 1999; Gibbs 2006). This served as the basis for the theoretical and methodological framework for research conducted on the Pillar Dollar Wreck and the 1733 fleet. Keith Muckelroy (1978) detailed various site formation processes, such as extracting filters and scrambling devices. Though his model was narrowly focused on a singular wreck site, the 1664 Dutch East Indiaman *Kennemerland*, it was applied to four sites in the Florida Keys: *El Populo*, *San José*, *San Pedro*, and the Pillar Dollar Wreck. Martin Gibbs' 2006 model of site formation processes appeared in the *International Journal of Nautical Archaeology* and expanded upon Muckelroy's model,

adding an element of cultural processes at work upon sites. Gibbs' discussion of post-impact salvage and third-party interactions with sites was particularly useful.

Another background review included examining publications concerning the geography and environment of Florida to provide context to and facilitate understanding of natural processes influencing shipwrecks in the Florida Keys (for example Stephenson and Stephenson 1950; Ball et al. 1967; Perkins and Enos 1968; Davis et al. 1993; Smith et al. 1997; Gearhart et al. 2011). An overview of hurricanes, currents, and tides in the area was included in this review. A final review of publications concerned site formation processes on Spanish colonial shipwreck sites specifically. Publications examined included Keith and Simmons (1985), Murphy (1990), and Smith, Scott-Ireton et al. (2006).

1.9 Methodological and Theoretical Approach

1.9.1 Literature Review

Among the methods used in this research was the collection of multiple data sets. The first set of literature included state-held collections located at the Division of Historical Resources and State Archives in Tallahassee, Florida. State artifact inventories for the 1733 fleet were obtained from the senior archaeologist at the State Archaeological Collections Center managed by the Division of Historical Resources. All data pertaining to artifacts recovered from *San José*, *San Pedro*, *El Populo*, and the Pillar Dollar Wreck were entered into an Excel spreadsheet to create pie charts representing percentages of artifact categories collected by treasure salvors. This data was compared to the categories collected by archaeologists.

Treasure salvor and archaeological publications such as reports, artifact inventories, daily logs, and legal documents were also examined. Other sources of data included Exploration and Salvage Contract applications submitted for the wreck area, which exist as microfilm in the State

Archives. These forms of treasure salvor publications were examined to determine the types of categories included in them. The categories were entered into SPSS software and compared to categories included in professional archaeological publications.

Other literature included management publications. For example, the state of Florida, the Florida Keys National Marine Sanctuary (FKNMS), and NPS all have separate management plans for their cultural resources. The plans were reviewed to provide further understanding of the ways in which cultural resources were managed by various entities in Florida.

Further data collection involved examining the Florida Master Site File (FMSF) in Tallahassee for information pertaining to the 1733 fleet and the Pillar Dollar Wreck. These files provided information about site investigations and reports, salvage operations, and other details involving the wrecks.

Since they are located within the boundaries of a national park, the Southeast Archaeological Center (SEAC) holds all data and reports related to the Pillar Dollar Wreck and *El Populo*. Types of materials reviewed included site reports and interpretations, case incident reports pertaining to the Pillar Dollar Wreck, and Pillar Dollar Wreck artifact inventories.

Personal communication with those individuals involved with the Exploration and Salvage (now Recovery) Program was another method of data collection. Communication was conducted via email correspondence and meetings with the Bureau Chief/State Archaeologist and the Underwater Program Supervisor/State Underwater Archaeologist to gain a full understanding of the history of the program.

1.10 Archaeology: The Pillar Dollar Wreck

The archaeological component of this thesis involved the excavation and mapping of the Pillar Dollar Wreck, with the intention of collecting data related to site formation processes. The

excavation took place during ECU's Program in Maritime Studies 2014 field school. Under a permit from SEAC, the month-long archaeological investigations sought the following goals:

1. Determine the vessel type, period, and cultural affiliation
2. Study the distribution of the site
3. Attempt to understand the possible reasons for wrecking
4. Examine the cultural and natural impacts on the site
5. Study the condition of the wooden structure and artifacts
6. Examine construction details specific to cultural or temporal affiliation and provide possible wood identification via timber samples
7. Examine the artifact composition and context
8. Suggest management recommendations for future protection of the wreck

Pertaining to this thesis, the goals also aimed at determining if any useful information could be gained from the site after looting and treasure salvage activities. Due to these activities that have occurred at the site since the 1960s, researchers considered context of features and artifacts were likely not preserved.

Research on the site took place from 8 September 2014 to 3 October 2014 and began with locating and establishing the perimeter of the site through probing and hand-fanning. Using two datum points, a 40 meter (m) long baseline was installed along 260/80 degrees and 2 m by 6 m units were emplaced perpendicular to the baseline on features of interest. The units were excavated using a water induction dredge with the spoil passing through 1/4 inch mesh bags; the contents of these were later sorted by hand. Vertical control was not a concern due to previous looting on the site, but the team planned to stop dredging if original context was discovered. After dredging, each unit was mapped using baseline offsets and annotated sketches and later

placed on an overall site map at a 1:20 scale. The team recorded scantling and goniometer measurements of the timbers and created profile drawings of the frames and keel. The team also collected timber and ballast samples.

The adjacent reef was surveyed using 20 m search areas designated with pinflags. One team searched for points of interest on the reef while a snorkel team took GPS coordinates of those points. Artifacts of interest, such as a spike and bar shot, were photographed and mapped in relation to the site and left in place.

A number of small artifacts collected from the site were given a field specimen number and stored in salt water for later examination, photography, and conservation. Artifacts collected included ceramics, brick, clay, bone, glass slag, and concreted iron fasteners. With the conclusion of fieldwork, all collected artifacts were transported to ECU's Conservation Lab for cleaning, desalination, consolidation, and further typological and functional study (East Carolina Conservation Laboratory 2015). All artifacts were inventoried according to SEAC and South Florida Collections Management Center (SFCMC) regulations upon completion of processing and submitted to SEAC, along with all paperwork and photographs associated with the artifacts.

Artifacts not collected included ballast stones, wood fragments, and broken iron concretions. These were reburied on site in a designated unit. With the conclusion of the project, the dredge was used to return the spoil pile sediment back onto the site to pre-excavation level of sediment coverage. A few modern artifacts, such as a coffee mug, a PVC pipe, and an illegal cinder block mooring, were removed from the site and discarded.

Data collected during the field school was synthesized and interpreted to provide knowledge about the natural and cultural impacts on the site. The results of the fieldwork were

presented in the form of a site report submitted to SEAC as required by the permit (McKinnon 2015), and a database that details artifact information is in Appendix H.

1.11 Conclusion

This thesis is the first attempt at developing a specific methodology for quantifying the effects of treasure salvors and looting on Spanish colonial shipwreck sites in the Florida Keys. Furthermore, it provides the first focus on the history of the Florida Exploration and Salvage (now Recovery) Program. At present, issues surrounding cultural heritage management are at the forefront of maritime archaeology. The intention of this thesis is to contribute to a better comprehension of the exploitation of sites and their use by different stakeholders. The outcome of this research will contribute to knowledge of protection and management of historic shipwreck sites in future.

2 Review of Publications

2.1 Introduction

This chapter begins with a review of professionally accepted ethics concerning archaeology. Archaeologists undergo training and follow a set of strict guidelines, outlined by various professional organizations, when studying cultural heritage. Reviewing ethics is the first step in comprehending the context of archaeologists' views on treasure salvage. Following the ethics discussion is a review of publications by archaeologists that concern treasure salvage. This review provides an understanding of the general consensus of archaeologists' perspectives on treasure salvage. Third is a discussion of the theory of site formation processes, using a number of publications including Muckelroy (1978), Gibbs (2006), and Murphy (1983). The theoretical model of site formation processes discussed in this chapter is integral in comprehending natural and cultural influences on the shipwrecks examined in this thesis. A fourth review concerns the geography and environment of Florida, which is essential to and a factor of the study of site formation processes. Finally, formation processes specifically related to Spanish colonial shipwrecks is examined via a number of publications (Keith and Simmons 1985; Murphy 1990; Smith, Scott-Ireton et al. 2006). Concluding the chapter is a summary of the difficulties of distinguishing between natural and cultural processes on archaeological sites.

2.2 Ethics in Archaeology

In 1996, the SAA Executive Board adopted the Eight Principles of Archaeological Ethics and strongly suggested professional archaeologists abide by them. The principle of stewardship determined that the archaeological record is irreplaceable and should be conserved and protected long-term for the good of the public. The concept of accountability required that all affected

cultural groups be consulted during projects and that the general public be made aware of the research. The principles noted that commercialization of objects contributes to the destruction of the archaeological record and is discouraged in all aspects. Archaeologists must foster public education and outreach and strive to publish reports or publicize finds. Similarly, archaeologists should preserve collections, records, and reports and ensure that all are available to the public and other researchers. Finally, archaeologists must have adequate training, experiences, equipment, etc. when undertaking a project, as archaeology is an inherently destructive process (SAA 1996).

SHA maintains ethical principles similar to those of SAA. SHA's principles focus more narrowly on historical archaeology and include the archaeologist's responsibility to respect individual and collective rights of others and to treat others with dignity and respect, especially when studying other cultures or past human behavior. Further, archaeologists must collect data as accurately as possible to create reliable data sets and site documentation. SHA principles echo the belief that no artifact should be bought or sold for private gain and archaeologists must not place commercial value on artifacts (SHA 2015).

On their website, ACUA details the principles underwater archaeologists should follow. ACUA's ethics code includes a statement concerning treasure hunters, noting that those individuals who claim to use archaeological methods or employ an archaeologist to oversee treasure hunting endeavors are not conducting archaeology if collected artifacts are sold or go to private collections as payment for investment. Treasure hunting and commercial salvage are not ethical from an archaeological standpoint according to ACUA. Further, looting, unauthorized excavation, and the unscientific search for commercially valuable artifacts on shipwrecks destroys the archaeological record, natural resources, and marine environment (ACUA 2011).

AIA adds to ACUA's principles by stating that archaeologists should report threats to or plunder of archaeological resources. Archaeologists must also refuse to participate in the trade of undocumented antiquities. AIA adopted a code of ethics in 1990 and approved a Code of Professional Standards in 1994. The Code of Professional Standards is an in-depth discussion of how archaeologists should conduct their work, including responsibility for the protection of the archaeological record and responsibilities to the public and colleagues (AIA 2015).

Further discussions of ethics in archaeology can be found in UNESCO's Convention on the Protection of the Underwater Cultural Heritage, which the U.S. has not yet ratified (2001). The main principles concern countries' responsibility to protect and preserve underwater cultural heritage and to foster scientific research and public access of information. In situ preservation should be considered the first option when managing underwater cultural heritage, and commercial exploitation of sites should not be permitted. Finally, proper training of underwater archaeologists should be promoted, as well as conformity to moral principles already applied to cultural heritage on land (UNESCO 2001; Odyssey Marine Exploration 2010).

2.3 Archaeologists on Treasure Salvors

Several key publications by archaeologists concern treasure salvage, and reviewing these publications helps to build a general consensus about archaeologists' viewpoints on these activities. Throckmorton (1990) discussed treasure salvage in "The World's Worst Investment: The Economics of Treasure Hunting with Real-Life Comparisons." In this article he described non-archaeological endeavors as treasure salvage, using the terms "looters," "treasure hunters," and "commercial salvors" interchangeably (Throckmorton 1990:75–76). He states that salvors "smash what they like" and that "treasure hunting" destroys scant resources (Throckmorton 1990:82). Salvors were described as profit-minded adventurers and "incompetent treasure

grubbers" who made up the salvage business and damaged sites that may not actually contain "treasure" (Throckmorton 1990:82). Throckmorton (1990:79) argued that treasure salvage was an "industrial process" conducted by those who were historically and culturally ignorant, emphasizing that archaeological sites were nonrenewable resources. He also equated treasure salvage of archaeological sites to strip mining; treasure salvors, for example, "rip things up, take the valuables, and smash the rest" (Throckmorton 1990:80). Throckmorton (1990:75) distinguished treasure salvage from archaeological endeavors and defined archaeologists as professional and competent scientists. It was the archaeologist's responsibility to protect sites from non-archaeological endeavors; that archaeologists must act as the "police" of cultural heritage (Throckmorton 1990:82). In this way, archaeologists were the answer to the treasure salvage predicament.

In "The Fig and the Spade: Countering the Deceptions of Treasure Hunters," Jerome Lynn Hall (2007:2) introduced the "treasure hunter" as a threat to cultural heritage on a local, regional, national, and international level. These individuals were characterized as white, business-minded men with no professional archaeological background. Throughout the text, the author used the terms "salvor" and "treasure hunter" interchangeably and defined salvors as "legally sanctioned treasure hunters." Salvors are those who conducted their activities at the expense of the archaeological record, claiming artifacts were in peril and had to be removed from the underwater environment (Hall 2007:1–2). Salvors possessed the funds and technology to access sites, while archaeologists relied heavily upon corporate and government funding (Hall 2007:3). Salvage was a for-profit business that rarely conformed to methodical archaeological processes; salvors were obligated to make a profit for their shareholders, causing archaeological standards to suffer (Hall 2007:6). Salvors did not conduct archaeology because sites were not

excavated with precision, and artifacts were not documented or preserved. Salvors also rarely distributed information about archaeological discoveries (Hall 2007:4). Further, salvors were not subject to professional or scientific accountability and many "treasure hunters" sold their finds to private collections, ultimately withholding general public access to information (Hall 2007:3). Salvors could conduct archaeology only if they employed a professionally trained archaeologist as a principal investigator and made all information and artifact assemblages accessible to the public (Hall 2007:4). For these reasons, archaeologists had "deep, legitimate grievances with the treasure hunting community" (Hall 2007:6). Archaeologists operate within scientific standards, documenting excavation and disseminating information to the public (Hall 2007:4), and unlike salvors, archaeologists are accountable to ethical standards and represent the public interest (Hall 2007:5).

Wilburn A. Cockrell, the State Underwater Archaeologist for Florida from 1972 to 1983, discussed treasure salvage in his article "Why Dr. Bass Couldn't Convince Mr. Gumbel: The Trouble with Treasure, Revisited, Again" (1998). Cockrell (1998:85) defined archaeologists as professionals who did not excavate sites for profit or privately owned public heritage, such as artifacts. The author used the terms "salvage," "treasure hunting," and "looting" for non-archaeological endeavors on historic sites, noting that looters removed artifacts without any governmental control, as opposed to salvors. Treasure salvage was not professionally legitimate and salvors attempted to undermine this claim by collaborating with states and applying for salvage permits or seeking help from archaeologists (Cockrell 1998:90). Most archaeologists, however, were apprehensive to be associated with treasure salvors (Cockrell 1998:86-87).

Both archaeologists and "treasure hunters" destroy sites, but there is an inherent difference in how archaeologists approached excavations. Archaeological destruction was

distinguished from treasure salvor destruction in that archaeologists focused on data acquisition and adhered to scientific standards; treasure salvors damaged sites for personal profit (Cockrell 1998:89). In Florida, when salvors received permits to recover artifacts from historical sites, a portion of artifacts remained with the salvor and the rest were relinquished to the state (Cockrell 1998:90). Through the Exploration and Recovery Program (formerly Exploration and Salvage Program), Florida received a percentage of artifacts from treasure salvors; the artifacts served as payment to the state for permitting salvors to legally work historic, publically owned sites. In this instance, artifacts became the currency for treasure salvors, who were considered subcontractors or employees of the state (Cockrell 1998:91). Conversely, archaeologists advocated for public control of artifacts, which Cockrell labeled as "publically-owned antiquities." The agreement between the state and salvors ultimately caused the mining of a nonrenewable cultural resource under government supervision (Cockrell 1998:93). Overall, treasure salvage damaged sites and ruined the sites' archaeological integrity (Cockrell 1998:94-95).

In "Going, Going, Gone: Underwater Cultural Resources in Decline," Keith and Carrell (2009:105) examined underwater cultural resources, arguing they were in decline due to extensive salvage and natural degradation processes. Archaeological objects lost in submerged environments were "held in trust for all humankind." The authors argued that the exploitation of underwater sites was exacerbated by SCUBA technology, effectively making sites easily accessible to divers and salvors alike (Keith and Carrell 2009:106). Commercial treasure salvage companies considered underwater sites as fair game, though similar sites on land were protected by governments. "Treasure hunters" viewed sites as having marketable value, while "curio seekers" sought to collect trinkets. On the other hand, cultural resource managers sought to leave sites *in situ* and archaeologists sought to protect and study sites for their importance as "precious

time capsules" (Keith and Carrell 2009:107). The authors mentioned various instances in which archaeological resources were lost to salvors, as was the case with *El Nuevo Constante*, a 1766 cargo ship that was dredged in 1980 (Keith and Carrell 2009:122). The salvors kept coins and ingots and discarded all other artifacts, most of which were damaged as a result of dredging. Further, treasure salvage books, such as Martin Meylach's *Diving to a Flash of Gold* (1971), merely focused on gold, jewels, and treasure but failed to address the field of underwater archaeology (Keith and Carrell 2009:125). Archaeological reports were slow to be published up to the 1990s and were "anticlimactic," but treasure salvor exploits were rarely published in anything other than newspaper articles.

Larry Murphy (1983:83) noted in "Shipwrecks as Database for Human Behavioral Studies" that modern treasure salvors and looters threatened the shipwreck database. Shipwrecks were considered a resource to contemporary salvors and a mine of historic relics to modern-day salvors (Murphy 1983:66). Many early shipwrecks, especially those of European origin, were often well documented, causing treasure salvors to use this as justification for salvaging historic shipwrecks (Murphy 1983:68). Artifacts were collected in a biased way by salvors, especially from treasure galleons. Few 'base' artifacts were collected, as was exhibited with the salvage of 1733 fleet. Salvors collected artifacts they considered economically profitable, selling or dividing the artifacts before they could be academically studied; this ultimately presented a biased view of the artifact collection overall. Antiquarians find it difficult to attempt to analyze artifact collections with no provenance, creating an issue in formulating hypotheses concerning human behavior (Murphy 1983:80).

R. Duncan Mathewson is an archaeologist who worked with Mel Fisher and his salvage company Treasure Salvors, Inc. His publications about his experiences with treasure salvors

introduced a different perspective to the various definitions for salvors and how archaeologists viewed treasure salvage. In *Archaeology on Trial* (1998), Mathewson (1998:97) described the excavation of the 1622 Spanish vessel *Nuestra Señora de Atocha* as commercial salvage conducted by "shipwreck salvors." He equated underwater treasure salvage to terrestrial salvage archaeology, which often takes place before land development (Mathewson 1998:101). Prior to Mathewson's work on *Atocha*, Fisher's team consisted of "treasure divers," but the author worked to train the divers in archaeological techniques, such as mapping and recording measurements (Mathewson 1998:98). Furthermore, record keeping dictated that the excavations were not merely a "treasure hunt." Treasure Salvors, Inc. succeeded in curating and presenting artifacts and publications to the public, something archaeologists did not always accomplish successfully (Mathewson 1998:100). Mathewson (1998:101) believed treasure salvors had resources and time to search for and recover artifacts from sites, viewing them as a means for locating shipwrecks and disseminating cultural heritage to the public.

The author divulged that at the time, he was the only archaeologist who agreed to work with treasure salvors and that most archaeologists considered themselves "diametrically opposed" to treasure salvors (Mathewson 1998:97). Archaeological consultation to treasure salvors was a growing trend at the time Mathewson's article was published (Mathewson 1998:102). He distinguished himself from academic and government archaeologists, who considered his work on *Atocha* as a "treasure hunt" (Mathewson 1998:100). Mathewson (1998:101), nevertheless, agreed with other archaeologists that the public owned cultural heritage and that archaeologists' primary concern was to preserve archaeological information. Echoing other archaeologists, he also noted the destructiveness of the profession; archaeologists were responsible for careful excavation in order to collect and later interpret data. Treasure salvors rarely excavated slowly

and methodically, concerned mainly with recovering valuable artifacts (Mathewson 1998:100). Because of this, a full-scale scientific excavation was not possible on *Atocha*; instead, an "archaeological salvage program" was implemented. While the work on *Atocha* was not an "ideal archaeological expedition," it was not a "treasure hunt" (Mathewson 1998:101). Mathewson (1998:103) suggested that cultural value was always a concern during *Atocha* excavations and that his work on the site helped transform a treasure hunt into a project that was more archaeological in nature.

Jesse Ransley (2007:233), an archaeologist, provided a differing view on maritime archaeologists and argued it was important to recognize that professional archaeologists did not have authority over access to material remains of the past. Contrary to what other archaeologists' wrote, they should not be considered sole "guardians of the archaeological record" (Ransley 2007:221–222). The purpose of Ransley's article was to facilitate a further discussion about the responsibilities and social implications of maritime archaeologists.

Driven by the idea of professionalism, professional maritime archaeologists tended to marginalize other groups and appropriate the right to define communal heritage (Ransley 2007:230). It is important not to marginalize people, however, outside of the professional maritime archaeological realm in the rush to protect sites from development or industry-driven imperatives. Personal dogmas involving how we conceptualize professional versus amateur archaeologists have also caused problems with marginalization of nonprofessional archaeologists (Ransley 2007:234). Most telling are the terms used for these nonprofessionals: hobbyists, wreckers, salvage divers, and treasure hunters. Treasure hunters are seen as destroyers of heritage, who actively seek out objects of value. This puts them at direct opposition with ethical and professional archaeologists because those professionals are seen as the caring protectors of

heritage. Further, being an amateur archaeologist has almost become synonymous with ethically dubious "treasure hunting" activities (Ransley 2007:231).

Public heritage implies that the approach to archaeological resources should be both communally minded and responsible (Ransley 2007:233–234). The facilitation of alternative engagements, i.e., nonprofessional archaeologists, with the past is useful and valid. Ultimately, Ransley's (2007:235) article was a reflexive examination of archaeologists' approach to heritage management and the notions upon which the system is formulated.

2.4 Site Formation Processes Literature Review

Site formation processes were a methodology developed out of Michael Schiffer's behavioral archaeology, born out of the New Archaeology or processual paradigm in the 1970s to 1980s. These processes serve as the theoretical model for this thesis. The comprehension of natural and cultural processes is integral to interpreting the underwater environment and the impacts of natural processes on shipwrecks. Archaeologists must comprehend and subtract formation processes from the site in order to make accurate interpretations about human culture.

In *Formation Processes of the Archaeological Record,* Michael Schiffer (1987:5) argued that the past does not come to archaeologists unchanged. An archaeologist's primary task is to "untangle events and processes that contribute to the observed variability in the contemporary properties of the archaeological record" (Schiffer 1987:5). Schiffer (1987:7) recognized two formation processes: cultural (c-transforms), in which humans are the agency that act upon a site, and non-cultural (n-transforms), in which the agency is the natural environment. Noncultural processes act on materials and sites at all times and exhibit patterns and regularities in the archaeological record that can be analyzed by archaeologists (Schiffer 1987:11). Formation processes are identifiable because of their predictable physical effects (Schiffer 1987:265).

Expressed as laws, n- and c-transforms are unrelated to past human behaviors and create variability in the archaeological record (Schiffer 1987:23). Archaeologists must subtract variability in order to collect relevant data (Schiffer 1987:265).

Muckelroy in *Maritime Archaeology* (1978) determined that archaeologists have an inaccurate view of the past when examining shipwrecks. What was once a coherent ship has been re-ordered through site formation processes, and common processes can be identified (Muckelroy 1978:215). Shipwrecks have common features, and in order to make archaeological conclusions about a site, archaeologists must first grasp natural and cultural processes (Muckelroy 1978:157). Muckelroy (1978:165) presented depositional and post-depositional processes acting upon shipwrecks in his iconic flow diagram (Figure 4). This model illustrates extracting filters and scrambling devices to explain how a shipwreck is distributed over time. Extracting filters are those processes that cause material loss on sites: wrecking, salvage operations, and disintegration of perishables. Extracting filters depend on the environment in which the ship wrecked and the actual wrecking event itself. Scrambling devices are those processes that change the organization of the ship in its original state from the moment of shipwreck until the ship becomes a part of the seabed (Muckelroy 1978:169). Seabed movement, such as waves and currents, affect the distribution of artifacts and cause heavier objects to "work" to the bottom and become buried by sediments (Muckelroy 1978:176–177). For example, sites in shallow areas close to shore are more likely to scatter as a result of wave action. Archaeological endeavors are also scrambling devices because the site is systematically excavated for the collection of data (Muckelroy 1978:182).

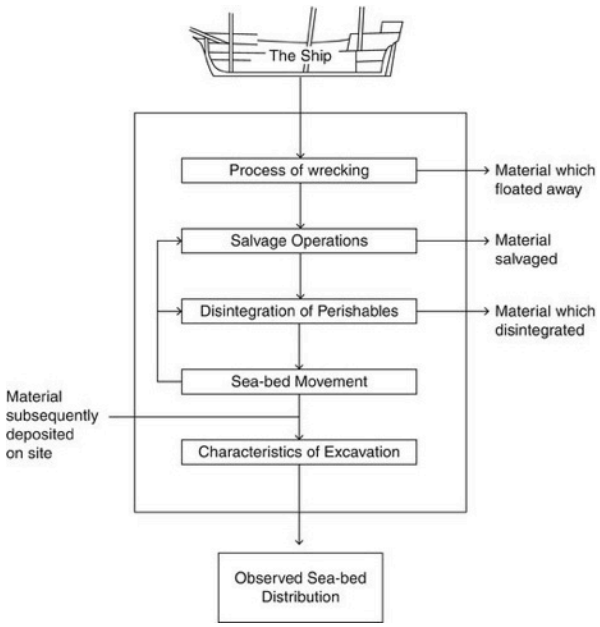


Figure 4. Muckelroy's evolution of a shipwreck (Muckelroy 1978:158).

In "Shipwrecks as Database for Human Behavioral Studies," Murphy (1983:76) argued that understanding noncultural site formation processes allowed archaeologists to predict environmental impacts. Understanding transformational factors helped archaeologists distinguish the natural from cultural for "analytical purposes." The case study and comparative sites used for this thesis are located in shallow water, an aspect of environmental studies that Murphy discussed in his article. Treasure salvors claimed Spanish shipwrecks in shallow water were too scattered and, thus, maintaining provenance was unwarranted (Murphy 1983:78). Jumbling of sites was more likely attributed to modern salvage of Spanish colonial shipwrecks in the Florida Keys, lack of excavation control, and bias in what was recovered. Cockrell and Murphy (1978:176–177) examined formation processes on a shipwreck on the Florida Atlantic Coast and determined that the site, contrary to popular belief, settled fairly quickly into its surroundings, with heavier artifacts migrating through the disturbed substrate, protected from future wave and current action. Coins were more likely to migrate to the base of the sand column, rather than wash ashore. Other studies took place on wrecks from the 1715 fleet to determine if there were,

in fact, patterns in the artifact distribution of a supposedly jumbled site and found that clear clustering patterns were exhibited (Murphy 1983:78). Meaningful distributional data existed for all sites, and shallow water sites may have exceptional preservation (Murphy 1983:79, 82). Further, wave disturbance on submerged sites was limited by sea level: the deeper the site, the less of an impact waves had on it (Murphy 1990:52). Artifacts with a greater specific gravity than surrounding sand, that were deposited in sand deeper than the wave base, traveled to the wave base and stabilized (Murphy 1990:53). A lack of sand wear on heavy artifacts was proof of artifact stabilization on the sea bottom (Murphy 1990:16).

Donald H. Keith and Joe J. Simmons III (1985) expanded on site formation processes using Muckelroy's flow diagram. The authors reversed the model (Figure 5) to create an inductive reconstruction of the Molasses Reef Wreck (Keith and Simmons 1985:420). Working backwards to examine the distribution of the site, the authors made inferences in order to create an accurate history of the ship. An important contribution in this report on the Molasses Reef Wreck was findings that contradicted Muckelroy's statement that human impacts on shipwreck sites are minimal (Keith and Simmons 1985:424). Muckelroy (1978:268–269) noted that ships most often salvaged in antiquity were those in shallower waters closer to shore where they were easily accessible. Keith and Simmons extended Muckelroy's model by actively searching for effects of modern treasure salvage on the 16th-century Molasses Reef shipwreck and codified those distinctions.

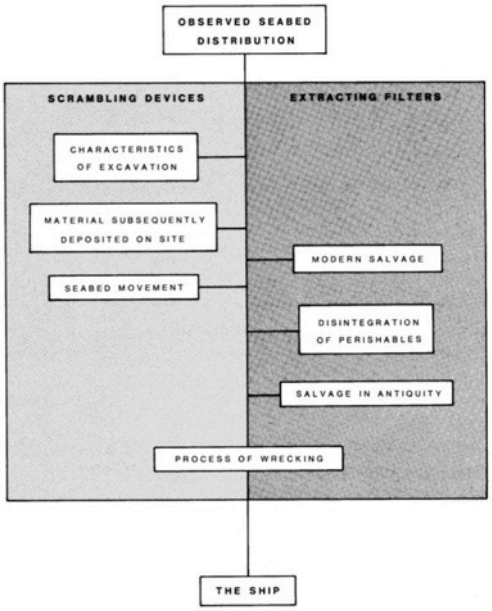


Figure 5. Keith and Simmons' reversed model (Keith and Simmons 1985:421).

I.A.K. Ward, P. Larcombe, and P. Veth (1999:563) discussed a new approach to site formation studies by focusing on environmental aspects at play on sites. The authors sought to create a universal model of site formation that addressed physical, biological, and chemical deterioration processes (Ward et al. 1999:569). Physical deterioration is the first and dominating process, with biological and chemical processes happening afterwards at a slower rate. Physical deterioration includes impact from waves or storms, currents, and movement of sediment, promoting loss of structural integrity (Ward et al. 1999:565-566).

Wooden wrecks are more influenced by physical and biological processes (Ward et al. 1999:564). Currents and water movement create localized scour and affect settlement rates of the vessel and artifacts. Further, substrate composition influences degradation of a wreck: coarse substrates in shallow areas are considered high energy and cause a quicker and more drastic loss of material while softer substrates in deeper waters preserve material (Ward et al. 1999:565). Ward et al. discussed the hydrodynamic environment, which concerns water flow on the site,

noting that tides and currents vary with storms and can affect sites. A storm may erode sediments or suspend particles in the water column, later redepositing sediments on the site. As a wreck is repeatedly exposed and covered, rate of deterioration increases as the site is oxidized (Ward et al. 1999:566). Biological processes, such as burrowing organisms, bacteria, fungi, and physicochemical conditions deteriorate organic materials on a site (Ward et al. 1999:563). Marine borers and biota are already present in the environment at the time of wrecking, and deterioration increases as a result of the presence of nutrients; exposed wreck remains are particularly susceptible to aerobic organisms. Chemical deterioration, especially concerning iron, causes concretion and erosion (Ward et al. 1999:567).

Archaeologist Martin Gibbs (2006) also expanded upon site formation processes and focused on human aspects of impact, especially during the wrecking process. In his article "Cultural Site Formation Processes in Maritime Archaeology: Disaster Response, Salvage and Muckelroy 30 Years on," Gibbs (2006:4) sought to contribute to and expand upon Muckelroy's flow diagram, calling for a "process-oriented framework" and a synthesis of data pertaining to site formation processes. Gibbs further explored the cultural aspect of the site formation equation and added more detail to Muckelroy's flow chart (Figure 6). There are two types of shipwreck: catastrophic shipwreck and intentional deposition (Gibbs 2006:7). Catastrophic shipwreck is the unintentional loss of a ship, and intentional deposition describes ships that were abandoned or purposely scuttled. Both types of events create identifiable signatures in the archaeological record.

The actions of those onboard a ship before, during, and after the shipwreck event may leave telltale signs in the archaeological record. Gibbs' examination is psychological in nature, discussing the actions of people during the following phases of shipwreck: pre-impact threat,

pre-impact warning, impact, recoil, rescue and post-disaster. These phases embody the disaster-response model and can be seen below (Gibbs 2006:7–8).

Gibbs' Disaster-Response Model:

1. Pre-impact stage: The period before the disaster event

    A. Pre-impact threat: The possibility of disaster is identified

    B. Pre-impact warning: Disaster is imminent

2. Impact stage: During the disaster event and immediately afterwards

3. Recoil stage: After immediate threat to life is over

4. Rescue stage: The group is removed from danger

5. Post-trauma stage: Medium to long-term responses to the disaster

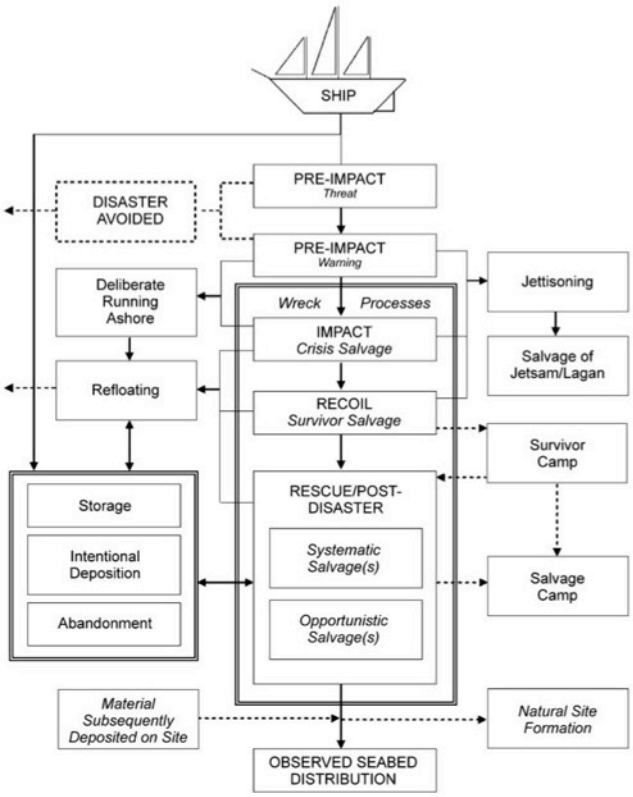


Figure 6. Gibbs' model of site formation processes (Gibbs 2006:16).

For each stage in the model, Gibbs (2006:8–15) discussed possible actions of those onboard the ship and provided correlating imprints to expect in the archaeological record. Contemporary salvage was likely to take place during the rescue stage and the post-trauma stage (Gibbs 2006:13). Stages of removal (Muckelroy's extracting filters) are systematic, allowing generalizations to be drawn about historic salvage efforts (Gibbs 2006:15). Gibbs (2006:17) also discussed contemporary salvage during and after the wrecking event, arguing there was not previously an attempt to analyze general processes of historic wreck salvage. There are various types of salvage: crisis salvage focused on easily accessible cargo and opportunistic salvage was the non-organized recovery of materials (Gibbs 2006:14). Systematic historic salvage accessed all levels of the shipwreck, was structured and formal in approach, and was likely to cause significant quantities of materials to be removed (Gibbs 2006:17). Each type of salvage could occur soon after the wrecking event and continue to the present day. Historic salvage inherently involved economics in that a salvor considered whether it was worth it to invest time, resources, or money into salvaging a shipwreck.

2.5 The Geography and Environment of Florida

Since the wrecks investigated for this thesis are located in the Florida Keys, understanding the geography and environment of this area is crucial before examining formation processes on specific sites. Florida is a peninsula that lies between the Gulf of Mexico and the Atlantic Ocean. Much of it consists of coastline and because of this, the state has tropical and subtropical weather (Florida Museum of Natural History 1997). The Florida Plateau, or continental shelf landmass, is the submerged portion of the peninsula and constitutes porous karst limestone that sits atop bedrock (Stephenson and Stephenson 1950:356). It slopes gently on the Gulf of Mexico side and has a steeper slope on the Atlantic side (Smith et al. 1997:2).

Steeper slopes are more hazardous for navigation because there is the danger of running aground in storms as ships are pushed landward.

The Keys are a 325 km long chain of 1,700 islands that extends southwest from the Florida Peninsula. Florida is the location of the third largest reef tract in the world, which extends from the platform edge and beyond the eastern side of the Keys and stretches from Miami to the Dry Tortugas (Figure 7) (Ball et al. 1967:586). The Keys have generally high-energy shorelines with strong currents and onshore winds (Smith et al. 1997:2). Winds are influenced by the North Atlantic Trade Winds and low pressure systems that pass through the Westerly Wind Belt to the north (Smith et al. 1997:4). Winds are primarily southeasterly in the spring and summer and southwesterly in fall and winter. Currents are affected by various factors including breaking waves and tides, wind, and thermohaline circulation (Ball et al. 1967:596). Further, local and regional topography control tidal and surf action (Figure 8). Tides on the east coast of Florida are semi-diurnal, with two nearly equal high and low tides each day (Stephenson and Stephenson 1950:395).

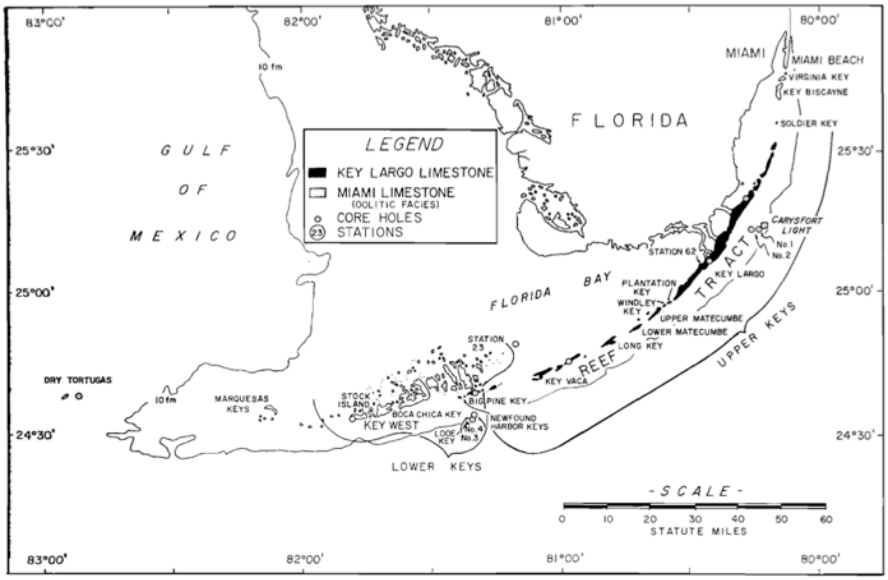


Figure 7. The Florida Keys (Hoffmeister and Multer 1968:1488).

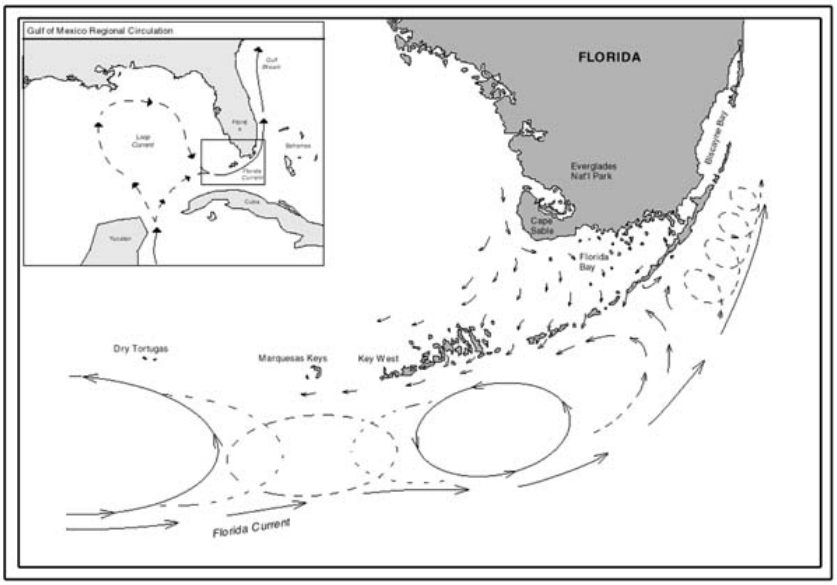


Figure 8. Currents in the Florida Keys (NOAA 2010).

Peppered with reefs and sand bars, the Florida Straits, the stretch of water between the Florida Keys and Cuba, are a well-known and precarious ship trap. The Florida Straits were a widely used, albeit dangerous, shipping route that connects the Gulf of Mexico with the Atlantic Ocean (Figure 9). It was frequented because of the Gulf Stream, which begins at the tip of Florida and flows along the east coast of North America and into the North Atlantic (Gyory et al. 2001). The section of the Gulf Stream that passes through the Florida Straits is known as the Florida Current (Ball et al. 1967:591). Sailing ships capitalized on this current and ships were able to reach up to four knots. Ships made their last stop in Havana before picking their way through the Straits and many Spanish ships ran aground in shallow areas on their return trips to Spain (Murphy 1990:14).

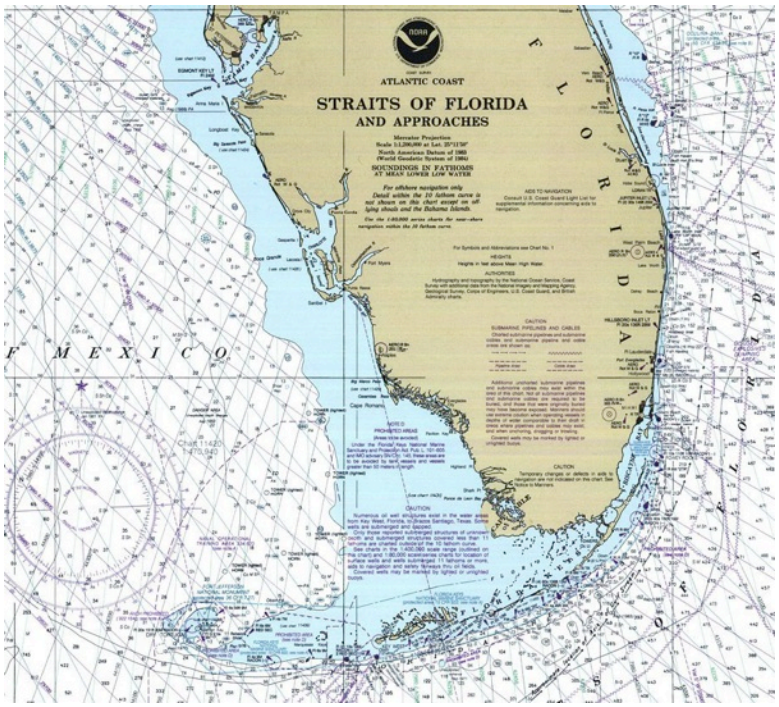


Figure 9. The Straits of Florida (Florida Center for Instructional Technology 2008).

Adding to the precariousness of the Straits is the frequency of tropical storms and cyclones that occur around Florida. Hurricane season in the Atlantic, Caribbean Sea, and Gulf of Mexico takes place from early June to late November (Rappaport and Fernandez-Partagas 1995). Hurricanes typically approach Florida from the southeast. Though many large hurricanes have affected the Keys, six are discussed here to illustrate the types of impacts storms can have on shipwreck sites. In 1960, Hurricane Donna passed over the Florida Keys in a northwesterly direction with winds at 140 miles per hour, causing large-scale sand movement and sedimentation on the islands (Perkins and Enos 1968:710). Water collected in south Biscayne Bay, raising tide levels five to six feet above mean sea levels. Tides in the south side of the Keys were between 6 feet at Key Largo to 13 feet at Matecumbe Key. Hurricane Betsy passed over the Keys in 1965, moving in a due-westerly course with winds between 120 and 140 miles per hour. The hurricane caused high tides and tidal surges (Perkins and Enos 1968:712). The upper Keys, including Biscayne Bay, received severe high tides and flooding. Extensive damage to the reef

tract resulted from both hurricanes to the reef tract, fragmenting and removing corals. Examples were recorded of massive coral heads being overturned in patch reef areas and coral rubble collected along reef lines, with outer reefs sustaining the most damage (Perkins and Enos 1968:716). Sand shifts buried sea grass and upright algae (Perkins and Enos 1968:713). Hurricane Betsy caused erosion and recycling of sediment underwater; sediment moved predominantly shoreward as a result of wave action and high tides (Ball et al 1967:587). Storm currents moved large amounts of sand on outer reefs (Ball et al 1967:595).

Hurricanes not only cause damage to the underwater environment, they also affect submerged archaeological sites. For example, in 1992 Hurricane Andrew caused strong storm surge and enough seabed movement to expose multiple sites and reveal artifacts (Davis et al. 1993:36). During storms, sand particles and lighter objects suspend in the water column as heavier objects remain on the bottom, covered later as particles settle out again (Murphy 1990:15). Archaeologists on the Pillar Dollar Wreck noted sand moved off the site as a result of Hurricane Wilma in 2005; eventually the site was reburied (Choate 2006). After Hurricanes Katrina and Rita in 2005, the Bureau of Ocean Energy Management Regulation and Enforcement conducted a survey of 10 shipwrecks to understand the effects of the hurricanes on submerged archaeological sites. The study found that exposure was the most common effect on historic sites, with some hull breakage on at least one site (Gearhart et al. 2011:7). Other effects of hurricanes on artificial reefs (purposely sunk vessels) included structural failure, lateral displacement, rolling, and vertical displacement (Gearhart et al. 2011:10). The study further found that effects of hurricanes were felt as deep as 61 m, with strong and rapidly fluctuating bottom currents present at depth (Gearhart et al. 2011:99). There was less structural damage to historic sites than expected, especially when compared to damage on artificial reefs, suggesting hurricane damage

to shipwrecks is more pronounced on recently sunk vessels with more intact hulls (Gearhart et al. 2011:102). Further, buried wooden hulls were protected from hurricane damage (Gearhart et al. 2011:104). The effects of hurricanes on the case study sites used in this thesis is discussed in Chapter Six, and more information about historic hurricanes can be found on NOAA's website (National Oceanic and Atmospheric Administration 2012).

2.6 Site Formation Processes on Spanish Colonial Shipwrecks

Site formation processes specific to Spanish colonial shipwreck sites in the Florida Keys occur because of their location and the nature of the cargo that these ships carried. Salvage in both antiquity and modernity is an especially significant process impacting Spanish colonial shipwrecks in the Florida Keys. Many of these ships carried precious metals, stones, porcelain, and other goods from the New World to Spain. When a ship grounded as a result of a storm, it was often immediately salvaged if it could not be repaired and refloated (Benson 2002:2). Vessels in shallow water were more easily accessible and more likely to be salvaged.

While salvage in antiquity is more difficult to pinpoint, especially without a historical record, the effects of modern salvage are easier to examine and identify since salvage leaves distinct signatures in the archaeological record. Keith and Simmons (1985) discussed the impacts of modern salvors on the Molasses Reef Wreck in the Turks and Caicos Islands. The authors determined that natural processes could be predicted to some extent but that the actions of modern salvors were less predictable and increased deterioration of the site (Keith and Simmons 1985:424). They noted the difficulty of attributing absence of artifacts to salvage in antiquity or modern salvage. Modern salvage on the Molasses Reef Wreck was evidenced by the presence of modern cultural material and the fact that items were removed from the site over a period of five years (Keith and Simmons 1985:422). Evidence of propwash deflectors and homemade

explosives was also present on the site, a trademark of treasure salvors who attempt to find "treasure" on Spanish colonial shipwrecks in the Florida Keys. In these ways, salvage is both an extracting filter and a scrambling device.

Murphy (1990:51) argued the use of propwash deflectors interfered with stratigraphic excavation and equated this technology to the use of bulldozers on terrestrial sites. Drawing upon both Muckelroy's and Schiffer's models of site formation processes, the author provided a unique look into the effects of treasure salvage in his Douglass Beach report. This site was subjected to state-sanctioned treasure salvage, a cultural site formation process that left distinct marks on the site in the form of haphazard excavations and holes in the seabed (Murphy 1990:3). As a result of salvors' use of propwash deflectors on the site prior to 1977, stratigraphic integrity was lost; in areas of more careful stratigraphic excavation, archaeologists were able to determine actual stratigraphic observations.

Smith, Scott-Ireton et al. (2006:2) discussed site formation processes on a suspected 18th-century Spanish ship in the Hawk Channel in the Florida Keys. The Mystery Wreck was salvaged in the 1970s with propwash deflectors and airlifts (Smith, Scott-Ireton et al. 2006:3). Treasure salvors acted as both extracting filters and scrambling devices after moving ballast in order to access buried areas and removing an anchor in the process. The site has also been subject to sand scouring and wave actions (Smith, Scott-Ireton et al. 2006:11). The ship, like many Spanish colonial vessels, grounded in the shallows and was not refloated but was salvaged in antiquity and then abandoned. The wreck settled onto a coral reef instead of in sand and integrated into the environment, becoming an artificial reef in the form of a concreted mass of ballast. Exposed portions of the hull deteriorated as a result of currents and marine organisms, such as toredo worms (Smith, Scott-Ireton et al. 2006:18). The site was slowly covered by hard

and soft corals, which protected some areas of the site. Modern salvors began to remove ballast from the outside edges of the wreck because they were easiest to move (Smith, Scott-Ireton et al. 2006:11). Modern salvors collected artifacts over a number of years, leaving little to be found on the site (Smith, Scott-Ireton et al. 2006:17). The Mystery Wreck illustrates processes that impact Spanish colonial shipwrecks in the Florida Keys.

Donna J. Souza (1997), using the theoretical framework of both Muckelroy and Schiffer, discussed formation processes on various sites in the Dry Tortugas in her doctoral dissertation entitled *The Persistence of Sail in the Age of Steam*. Though her thesis focuses on 19th-century ships, the section describing formation processes on the Pulaski site is useful. The site is the remains of a 19th-century shipwreck located on Pulaski Reef in a shallow, high-energy environment (Souza 1997:55). It was subject to changes in sea level and current, especially during storms. Site formation processes noted on this site included strong currents that removed materials, marine organisms and bacteria that decomposed organics, and sediment shift, which created scouring on the structure (Souza 1997:60–61). The site was scattered over a wide area as a result of seabed movement and strong currents during inclement weather that exposed it regularly (Souza 1997:63). In terms of cultural impacts, the ship was most likely salvaged soon after wrecking because of the lack of cargo or ballast found on the site. Souza (1997:66) noted that archaeologists investigating the Pulaski Reef site proved to be a modern scrambling device through the use of a suction dredge to remove overburden and map the site before backfilling it.

2.6.1 Difficulties of Distinction

One challenge inherent in the study of site formation processes is differentiating between natural and cultural impacts (Murphy 1990:xvi). This challenge can be mitigated through the systematic examination of the site, comprehension of the local geography and environment, and

a thorough understanding of site formation literature. It is also difficult to determine the cause of loss of materials through salvage in antiquity versus modern salvage; for instance, how can archaeologists determine if artifacts disintegrated, floated away, or were salvaged? The historical record can help to determine this in some instances. Without manifests or lists of objects salvaged, it can be difficult to determine what was once included in the original cargo. Extensive manifest and salvage records exist for the 1733 fleet, though they are not completely accurate because of smuggling and illegal trading that took place during the time period. These ships were extensively salvaged both in antiquity and in the 1960s and 1970s and, because of their detailed historical record, are a fitting subject of study for this thesis.

2.7 Conclusion

This chapter presented the various background literature concepts that provide a thorough foundation upon which this research is framed. Ethics are inherent in professional archaeology and supply context to archaeologists' viewpoints on treasure salvage. It is important to understand these modern impacts on sites, a phenomenon that has increased exponentially as a result of SCUBA technology and is particularly relevant to the study of Spanish colonial shipwreck sites in the Florida Keys. The theoretical contributions of Muckelroy (1985), Schiffer (1987), Keith and Simmons (1985), Murphy (1983), Ward et al. (1999), and Gibbs (2006) each provide a platform for comprehending site formation processes that affected the sites studied for this thesis. Added to this theoretical model, an understanding of Florida's geography and environment further bolsters the comprehension of natural influences on shipwrecks. Finally, studies conducted within the vicinity of Florida on Spanish colonial shipwrecks add to the intellectual backdrop of formation processes and present a list of impacts that can potentially influence the four shipwrecks studied in this thesis (Souza 1997; Smith, Scott-Ireton et al. 2006).

3 Historical Background

This chapter discusses the history of the Pillar Dollar Wreck and the history and context of the 1733 fleet lost in the Florida Keys. The Pillar Dollar Wreck (site #BISC00035) provides a case study of cultural impacts on 18th-century Spanish shipwrecks in Florida because it was subject to treasure salvage and looting in the 20th century. Archaeologists and NPS officials also visited and surveyed the site over the years, including ECU's Program in Maritime Studies in fall 2014 under a permit with NPS SEAC (permit 2014-001). The 1733 fleet that wrecked along an 80-mile stretch of the Florida Keys provides a useful comparative study of cultural impacts. The fleet was relocated during a time when the state was unsure of how to manage these cultural resources; as a result, treasure salvors impacted the sites both legally (under state supervision) and illegally. In reaction to treasure salvor impacts, archaeologists surveyed the sites initially in 1977 and again in 1984, 1988, and 2004 (Smith and Dunbar 1977; Broward 1984; Indiana University et al. 1988; BAR, DHR 2004).

3.1 The Pillar Dollar Wreck

The Pillar Dollar Wreck is within the southern boundary of Biscayne National Park, east of Key Largo, Florida. The shipwreck lies 8 m below the surface close to a patch reef. In its dynamic environment, the site is exposed and covered by coarse sand as a result of surge and strong currents. The patch reef rests below the surface at 3 m and consists of hard and soft corals and a variety of marine plants and animals (Figure 10). Divers were known to frequent the reef in search of lobster or stray artifacts as early as the 1960s as reported by a treasure salvor (Meylach 1971:293).

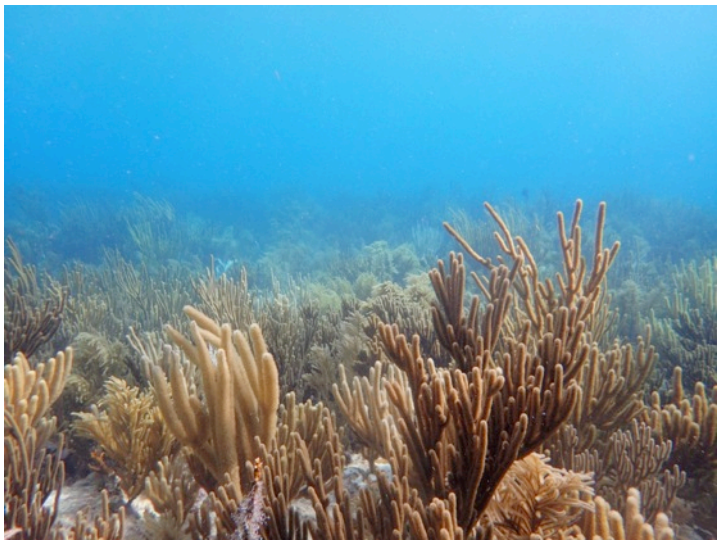


Figure 10. Patch reef near Pillar Dollar Wreck (ECU Program in Maritime Studies 2014).

The identity surrounding the Pillar Dollar Wreck is convoluted and shrouded in mystery. The Pillar Dollar Wreck is conjectured to be a *galleon,* perhaps part of a Spanish flotilla from the late 18th century (Meylach 1971:293). Adventure divers continuously looted the Pillar Dollar Wreck from the 1960s and its name is based on Spanish pillar dollars found at the site over the years. The Pillar Dollar Wreck is mentioned in various treasure salvor publications such as Meylach's *Diving to a Flash of Gold* (1971), Carl Ward's *Shipwreck in the Florida Keys* (2014), and Robert Weller's *Galleon Alley* (2001a). These publications, coupled with various archaeological assessments, constitute the few sources that provide insight into the identity of the wreck. Meylach provided readers with the location of the site and listed artifacts that treasure salvors removed in 1963, which included two cannon and a number of pillar dollars that dated between 1770 and 1778. Other artifacts recovered from the nearby reef included iron spikes, hinges, pewter, spoons, pottery, glass, a boarding cutlass, candlestick holders, and slave bracelets (Meylach 1971:293). According to Weller (2001a:96), the ship wrecked around 1768, though no explanation for this date is provided and it is earlier than his suggested dates of the pillar dollars.

3.2 The 1733 Fleet

In order to understand the context of the comparative shipwrecks from the 1733 fleet, the history of Spanish plate, or *plata*, fleets must first be discussed. The Spanish word *plata*, or silver, was synonymous with the various Spanish treasure *flotas* (fleets) that sailed in the Caribbean in the colonial era. *Plata* referred to the cargo that many of the Spanish fleets carried from the New World to Spain. *Flotas* consisted of merchant vessels and galleons that provided protection to the fleet, which was at constant risk of attack by pirates and privateers. From the 1520s, French corsairs raided Spanish shipping, causing the Spanish vessels to travel in fleets to protect their cargoes (Andrews 1978:64). Other countries attacked Spanish vessels in an attempt to undermine the Spanish monopoly on trade in the New World.

Between 1567 and 1572, the waters of the Atlantic and Caribbean flooded with corsairs, and it was pertinent for Spanish ships to travel together to protect Spain's trade monopoly (Andrews 1978:97). This method of shipping truly began in 1526, when the Spanish Crown required all ships destined for the New World to travel in conveys of at least 10 vessels (Avery 1997:159). Fleets were further bolstered beginning in the 1550s when the *Casa de Contratación de las Indias* (Indies House of Trade) organized convoys more frequently (Avery 1997:157). Until the 1550s, however, fleets did not sail regularly and many ships still travelled alone. In 1552, when hostilities between France and Spain were more pronounced, the fleet system matured as a result of increased French animosity in the Caribbean (Andrews 1978:65). The *flota* consisted of a flagship, or *capitana*, and a vice-admiral, or *almiranta*, which carried soldiers and 100 tons less cargo to make them more nimble in the water and to defend against enemies (Andrews 1978:66–67). Defense of the fleet relied on the heavily armed galleons, which carried valuable cargo (Avery 1997:161).

Two fleets became well established by the 1560s: the *Tierra Firme* (South America) and the New Spain (Mexico) fleet (Avery 1997:159). Together, they transported cargos of clothing, food, and European household goods and luxuries to trade with Spain's New World colonies. Departing from Seville, the fleets made for the Canary Islands for supplies, then followed the trade winds towards the Caribbean, entering southeast of Puerto Rico. The two sailed together to the New World each year and then branched off near Dominica, one fleet heading to *Tierra Firme* and the other to Veracruz in Mexico (Avery 1997:160–161). One group sailed with the *capitana,* the other with the *almiranta*. Once loaded, the ships of the New Spain fleet sailed along the Gulf of Mexico and the western part of Florida before making for Havana. The *Tierre Firme* fleet sailed through the Yucatan channel and around the western part of Cuba to Havana (BAR, DHR 2005). They rejoined in Havana at the end of the journey and sailed together as one large convoy back to Spain, making use of the Gulf Stream through the Straits of Florida (Figure 11).

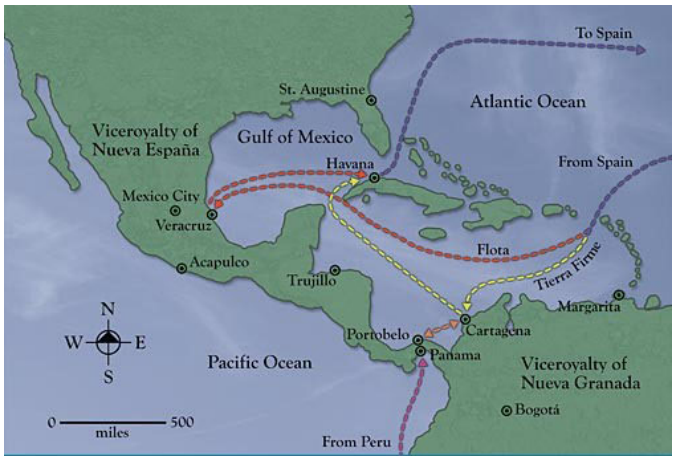


Figure 11. Trade routes of the Spanish *flotas* (BAR, DHR 2005).

The fleet declined steadily after 1620 due to wars with the Dutch and French, with one convoy sailing in 1635 (Avery 1997:161). Total tonnage shipped to the New World declined from 1600 to 1720 and the number of ships in each convoy decreased at the same time, though

there was an increase from 1665 to 1680. From that period onward, only 13% of cargo sent to the New World was shipped in a convoy; other cargo was individually shipped. Though the *flotas* were restored in 1754, they were eventually abandoned in 1789 (Avery 1997:162).

Throughout the history of the fleet system, several disasters around the coast of Florida that claimed many lives and cost the Spanish empire large sums of money. One such disaster occurred in 1733 and resulted from a hurricane that caught a convoy as it traversed the Straits of Florida (Smith et al. 1990:11). The 1733 fleet began in Spain, sailing under the command of Don Rodrigo de Torres on 2 August 1732 for the New World (McKinnon 2007:86). The New Spain fleet consisted of 4 armed galleons and 18 merchant *naos* built in various European nations (Table 1) (Smith et al. 1990:11).

Table 1. 1733 fleet leaving Spain according to a treasure salvor publication (Weller 2001a:18–20).

San Pedro
El Gran Poder de Dios (*Poder*)
Nuestra Señora de Belén y San Antonio de Padua (*Herrera*)
Nuestra Señora de Los Reyes, San Fernando, y San Francisco de Paula (*San Fernando*)
El Rubí Segundo (*El Rubí*, *Capitana*)
San Francisco
Nuestra Señora del Carmen y San Antonio de Padua (*Chavez*)
San Ygnacio (*San Ignacio*)
Nuestra Señora del Rosario y Santo Domingo (*Murguia*)
El *Aviso*
San Joseph y las Animas (*San José*)
Nuestra Señora de las Angustias y San Raphael
Nuestra Señora de los Dolores y Santa Isabel (*Tres Puentes*)
San Phelipe (*El Lerri*)
Nuestra Señora de Balvaneda (*El Infante*)
El Populo (*Pinque*)
Nuestra Señora Rosario, San Antonio, San Vicente Ferrer (*Sueco de Arizón*)

The fleet reached Veracruz in early October and stayed until trade was completed (Weller 2001a:17). It did not leave on time for Havana because of delays in receiving and loading cargo, but it finally departed by the end of May and arrived in Havana in mid-June. Despite the fact that

hurricane season had already begun, the vessels were then refitted and loaded with more cargo and passengers. The return journey was projected to take six to eight weeks. The New Spain fleet embarked from Havana, Cuba on Friday, 13 July 1733. Travelling through the night, the fleet approached the present-day Florida Keys when winds from the east grew in strength. The Captain-General sensed the impending hurricane and became concerned about the fate of the fleet; he ordered the convoy to turn around and sail for Havana. The winds, however, were too strong and by the end of the day, most of the ships were wrecked onto reefs or driven into shallows. Survivors of the wrecks went ashore and built shelters from debris that washed up on the beaches (McKinnon 2007:86). Their survivor camps were spread between the wreck sites (Smith et al. 1990:11).

Only one ship, *El Africa*, which joined the fleet later in its journey, made it back to Spain relatively undamaged after the hurricane (Benson 2002:2). *Nuestra Senora de Rosario*, which also joined the fleet later in its journey, returned to Havana. Spanish admiralty officials in Havana, fearing for the safety of the fleet after the hurricane, sent a sloop to determine the fate of the convoy before *Rosario* returned to Havana to relay the events of the hurricane. Before Havana's sloop returned, Spanish officials sent nine rescue vessels loaded with food, supplies, divers, and salvage equipment to the area where the wrecks were last sighted. Salvors began work immediately and created multiple maps (Figure 12) in order to keep track of the locations of the wrecks (McKinnon 2007:86). Table 2 lists the vessels that ran aground.

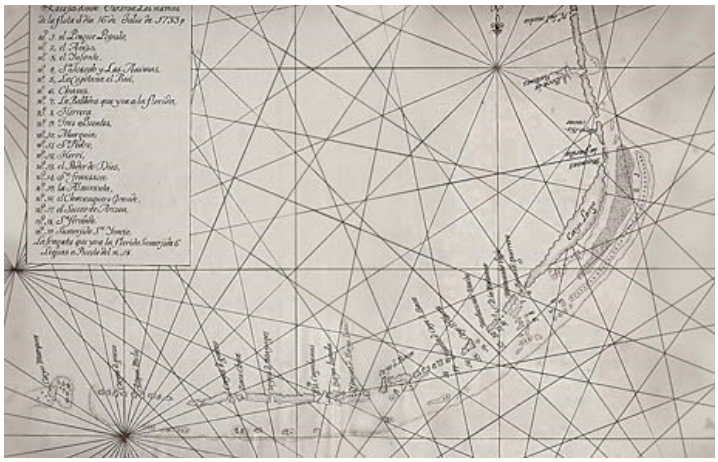


Figure 12. Spanish salvors' 1733 chart (BAR, DHR 2005).

Table 2. List of 1733 vessels that ran aground according to a treasure salvor publication (Weller 2001a:61).

El Aviso
Murguia
San Francisco
El Populo
La Capitana
Chavez
San Pedro
Fragata Situada (*El Floridana*)
El Poder de Dios
Sueco de Arizón
Tres Puentes
El Lerri
Balandrita
Angustias
San Fernando
El Infante
San Ignacio
El Africa
La Almiranta
San Francisco
San José
Herrera

3.2.1 Salvage in Antiquity

Salvage efforts were recorded in detail for later submission to the king of Spain. Within three months of the hurricane, royal officials in Havana reported that all registered treasure, as

well as unregistered treasure, was recovered (Smith et al. 1990:11). The salvage operations continued for a year and the final count of goods that were salvaged totaled well over what the original manifests claimed to carry onboard the convoy (McKinnon 2007:86). For example, the total listed on the manifest was 12,286,253 *pesos* in coin and bullion; however, after salvage operations the total came to 12, 571,747 *pesos* in coin and bullion (BAR, DHR 2004). Spain required merchants to register cargo to prevent smuggling (Deagan 2007:98–99). Much contraband trade continued to take place; merchants smuggled cargo in an attempt to avoid taxes. A ship could contain almost as much contraband cargo as registered cargo (Wilkinson 2000). If caught, smugglers had to pay double taxes on the merchandise (Deagan 2007:98–99). The manifests for three of these ships, *El Populo*, *San José*, and *San Pedro*, and what the Spanish salvaged soon after the hurricane are included in Appendix G.

3.2.2 Salvage in Modernity

After the ships were burned to the waterline and salvaged by the Spanish, they were largely forgotten until the 20th century, when adventure seekers and modern treasure salvors relocated them. There is often a mistaken notion that most shipwrecks around Florida are laden with treasure: gold, silver, precious stones (Cockrell 1998:90). While some finds were particularly lucrative in terms of treasure salvage, like the 1715 Spanish fleet shipwrecks, most of the vessels that wrecked around Florida were salvaged in antiquity (BAR, DHR 1994). Regardless, treasure salvors targeted such sites in the hopes of locating specie. Modern treasure salvors and thrill seekers used Spanish salvors' maps, magnetometers, and information from fishers to locate and dive shipwreck sites. Chance discoveries over decades lead to what has become well-organized treasure salvage around Florida's waters; this includes authorized and unauthorized endeavors. Since the 1930s, Florida permitted shipwrecks to be commercially

explored and salvaged under agreements with the state, though this has ultimately led to many problems, such as a mass consumption of maritime heritage. According to Smith et al. (1990), much of the archaeological integrity of the sites was compromised as a result of treasure salvage operations.

Modern treasure salvors relocated and recovered artifacts from 13 shipwrecks from the 1733 fleet (Table 3). In 1937, hardhat diver Art McKee learned of a shipwreck's location from a fisherman (McCarthy 1992:38). Upon diving the site, he found a 1721 gold *escudo* and wrote to *Archivo de Indias* in Seville, receiving a 1733 Spanish salvor's chart in return. According to this document, McKee and the fisherman had relocated *El Capitana* (Fine 2006:154). Inspired by Spanish salvors' charts, soon other treasure salvors searched for the rest of the shipwrecks associated with the fleet. There was a frenzy to find each shipwreck before others could salvage the "treasure" and by 1960, five active salvage groups were searching for the 1733 fleet (Fine 2006:156). By the late 1960s, 13 wrecks were relocated.

Table 3. List of 1733 fleet shipwrecks relocated and salvaged in the 1960s and 1970s (Smith et al. 1990:11).

San Pedro
El Lerri
La Almiranta
La Capitana
Herrera
San Francisco
Tres Puentes
El Infante
Chavez
Angustias
San José
El Populo
Sueco de Arizón

Confusion developed as to the identity of the wrecks when they were first relocated because the Spanish salvors' maps labeled the wrecks differently and some vessels had multiple names

(McKinnon 2007:86). Salvage operations and later archaeological surveys, however, helped to positively identify the shipwrecks. Salvors' maps, comparisons of anchors, cannon sizes, and examinations of artifacts from each site helped to accurately identify the wrecks (Smith et al. 1990).

3.3 Conclusion

Understanding the historical context of Spanish shipping in the colonial Caribbean allows for a comprehension of why modern treasure salvors sought shipwrecks from this time period. The ships carried valuable cargos, though they were most often salvaged at the time of the wrecking event. Regardless, much of the archaeological integrity of Spanish colonial shipwrecks in Florida was compromised as a result of modern treasure salvage; the Pillar Dollar Wreck and 1733 fleet provide examples of this. Further, treasure salvors noted there was nothing of interest on the Pillar Dollar Wreck, though the 2014 archaeological field project revealed otherwise (see Chapter Six) (Ward 2014:11).

4 Methodology

This thesis utilized various methodological approaches in the study of treasure salvor publications, the examination of artifacts recovered by treasure salvors and archaeologists, and the survey of site formation processes on *El Populo*, *San José*, *San Pedro*, and the Pillar Dollar Wreck. This chapter first discusses the methodology for collecting and comparing treasure salvor and archaeological publications, using a number of categories placed into SPSS software. Second, the approach for examining natural and cultural site formation processes on the four shipwrecks is examined. Following is a discussion of the methodology for examining and quantifying artifact lists pertaining to the shipwrecks chosen for this study, which involves using Excel to determine percentages of artifacts collected. Finally, limitations to this research are outlined and their potential impacts considered.

4.1 Comparing Treasure Salvor Reports to Archaeological Reports

A number of laws, both federal and state, dictate the categories to include in archaeological reports or how archaeological projects are conducted. Chapter 1A-46 Archaeological and Historical Report Standards and Guidelines are applied to archaeologists and other parties, such as treasure salvage companies, who attain permits to survey and recover artifacts from sites in Florida. These guidelines served as a starting point for the creation of standard report categories that could then be applied in a quantifiable manner to treasure salvor publications.

Other standard categories were generated from Florida Statute Chapter 267, which dictates how archaeological sites on state property should be treated (Florida Department of State 1995). Most archaeological projects in the U.S. also follow Section 106 guidelines under the

National Historic Preservation Act (1966), which pertain to actions performed, assisted, permitted, or licensed by a federal agency that may affect historic properties (Florida Department of Transportation 2004:2–3). Section 106 requirements are mirrored in Florida Statutes Chapter 267 and suggest a number of sections be included in archaeological reports (Table 4) (Florida Department of Transportation 2004:9–28).

Table 4. Section 106 suggested categories to include in archaeological reports (Florida Department of Transportation 2004:9–28).

Title Page
Table of Contents
Lists of Figures and Tables
Executive Summary
Introduction
Physical Environment
Research Design
Methods
Results
Summary and Conclusions
References Cited
Appendices

Categories selected for the analysis of treasure salvor publications were based on Section 106, Florida Administrative Codes, and Chapter 267. Based on these guidelines, a typical archaeological report includes an abstract, an introduction, an account of the site, detailed methodology of excavation and data collection, a discussion of site formation and interpretation, and a conclusion. The list of standard categories applied to the analysis of treasure salvage publications and archaeological publications used in this study is illustrated in Table 5.

Table 5. Standard categories used to analyze treasure salvor publications.

Category
Title Page
Table of Contents, Figure Lists, Table Lists
Introduction
Site Orientation and Location
Physical Environment
Site Formation Processes

Methodology
Results
Interpretations
Recommendations
Summary/Conclusion
Site Map
Scaled Photos, North Arrows
Sources for Maps/Historical Photos
Artifact Counts or Artifact Measurements
Bibliography/References Cited
Appendix

Treasure salvor publications related to the 1733 fleet or from other areas around Florida were chosen for analysis (Table 6). Early dive logs and other data sheets submitted to BAR were not included in analysis because they were the earliest examples of contract and permit reports and were not comparable to the other types of publications. These early examples of reports are discussed in Chapter Five.

Table 6. Treasure salvor publications used in analysis.

Year	**Author**	**Title**
1971	Martin Meylach	*Diving to a Flash of Gold*
1998	Molinari	1998 Final Permit Report FKNMS(UR)-37-94
1999	Molinari	1999 Final Permit Report FKNMS(UR)-37-94
2000	Weller	FKNMS 99-068 Permit Report for *San Fernando*
2001a	Weller	*Galleon Alley: The 1733 Spanish Treasure Fleet*
2001b	Weller	FKNMS 99-068 Permit Report for *San Francisco*
2002	Molinari	2002 Final Permit Report FKNMS99-045
2003a	Molinari	Preliminary Permit Report FKNMS-99-045
2003b	Molinari	Final Permit Report FKNMS-99-045
2004	Molinari	Final Permit Report FKNMS-99-045
2005	Sinclair et al.	2005 Report S-32 and S-23
2007	Mel Fisher Center, Inc.	2007 Report E-89P
2013a	Stemm et al.	"The Deep-Sea Tortugas Shipwreck, Florida: A Spanish-Operated *Navio* of the 1622 *Tierre Firme* Fleet. Part 1, the Site"
2013b	Stemm et al.	"The Deep-Sea Tortugas Shipwreck, Florida: A Spanish-Operated *Navio* of the 1622 *Tierra Firme* Fleet. Part 2, the Artifacts"
2014	Gerth and Kingsley	"The Deep-Sea Tortugas Shipwreck, Florida (1622): Afro-Caribbean Colonoware & Maritime Slavery"
2014	Ward	*Shipwreck in the Florida Keys*

Fifteen archaeological reports, some consisting of popular books targeting a general audience, were selected for analysis and comparison to treasure salvor reports. Both early and more recent archaeological reports concerning Spanish colonial shipwreck sites in Florida were chosen for analysis, along with a selection of reports from areas outside of Florida (Table 7). Categories included in the reports are listed in Appendix T.

Table 7. Archaeological publications used for comparison to treasure salvor publications.

Year	Author	Title
1977	Smith and Dunbar	"An Underwater Archaeological Survey of Eight Spanish Merchant Naos of the 1733 New Spain Fleet"
1985	Wild and Brewer	"Underwater Archaeological Survey and Site Assessment of Biscayne National Park"
1987	Skowronek et al.	"The Legare Anchorage shipwreck site, Grave of HMS *Fowey*, Biscayne National Park, Florida"
1988	Indiana University et al.	"A Proposal to Establish an Underwater Archaeological Preserve in the Florida Keys"
1996	Arnold	"The Texas Historical Commission's Underwater Archaeological Survey of 1995 and the Preliminary Report on the Belle, La Salle's Shipwreck of 1686"
1999	Smith et al.	"The Emanuel Point Ship Archaeological Investigations 1992-1995"
2001	Nash	*Cargo for the Colony: The 1797 Wreck of the Merchant Ship Sydney Cove*
2002	Benson, ed.	"The *Capitana* Project: Final Excavation Report"
2002	Westrick	"A Preliminary Report on a Spanish Plate Fleet Shipwreck Site in the Florida Keys: *El Infante, Nuestra Señora de la Balvaneda*, 1724-1733"
2003	Indiana University	"San Pedro Underwater Archaeological Preserve State Park: 2003 Reef Restoration and Cannon Recovery Project"
2006	Smith, Moates et al.	"Archaeological Investigations of the Brick Wreck (8MO1881) off Vaca Key, Monroe County, Florida"
2006	Smith, Scott-Ireton et al.	"Archaeological and Biological Examination of "The Mystery Wreck" (8MO143) off Vaca Key, Monroe County, Florida"
2007	Nash	*Shipwreck Archaeology in Australia*
2009	Shefi et al.	"Archaeological and Biological Examination of The Bronze Pin Wreck (8MO1879) off Grassy Key, Monroe County, Florida: an Interim Report"
2015	McKinnon	"Archaeological Investigations of the Pillar Dollar Wreck (BISC-35) in Biscayne National Park, Florida"

To analyze publications, each category included in the standard report was placed into SPSS Statistics as a variable; variables were also created for "Report Name" and "Type of

Report" (i.e. treasure salvor, archaeological, treasure salvor popular publication, archaeological popular publication). The data for each treasure salvor and archaeological report were then placed into the program, receiving a "1" if it contained each standard report category and a "0" if it did not contain each report category. It should be noted that the quality of information in reports varies: whereas a number of reports contained site maps, some were more detailed or useful than others.

This analysis was conducted on the 15 archaeological publications and the 16 treasure salvor publications. Frequencies were run on the datasets to determine the categories included in each report type. All treasure salvor publications (including the three books) underwent cross tabulation with archaeological publications to determine what percentage of reports included the standard categories, the results of which is discussed in Chapter Seven.

4.2 Site Formation Impacts on the Shipwrecks

Part of the research for this thesis involved examining the natural and cultural site formation processes acting upon the Pillar Dollar Wreck and comparative shipwrecks from the 1733 fleet. In order to conduct this study, all documentation that could be retrieved concerning the chosen shipwrecks was examined. This included popular treasure salvor publications and reports, archaeological reports, survey logs, and FMSF information. Photographs included in publications were examined to understand change to the sites over time. Special attention was paid to cultural activities conducted on sites, such as the use of propwash deflectors, movement of ballast, and installation of datum points or mooring lines. Lists of natural and cultural impacts were generated for each site and a specific flow diagram detailing site formation processes on Spanish colonial shipwreck sites in the Florida Keys was created. Information for the diagram was drawn from previous theoretical models discussed in Chapter Two.

4.3 Artifact Quantification and Analysis

The methodology for quantifying types of artifacts treasure salvors collect from Spanish colonial shipwreck sites in the Florida Keys involved generating and comparing artifact lists for *El Populo*, *San José*, *San Pedro*, and the Pillar Dollar Wreck. The types of artifacts collected by archaeologists were compared to those recovered by treasure salvors; lists were generated from permit reports, treasure salvor books, division records between the state and contracted salvors, and master inventory lists of artifacts stored in state collections. Division records are particularly revealing in this study because treasure salvors chose which artifacts they kept. Before dividing artifacts, the state assigned points to each object – the higher the points, the more weight the artifact held in division percentages. For example, according to *San Pedro* division records, a Majolica plate received 100 points and fasteners received 0.1 points (Florida Department of State, Division of Archives, History and Records Management 1976:7). Further examples of this point-based system are included in Appendix V.

Typically, the state received 25% of the artifacts, with the remaining 75% going to the salvor or company. Sometimes, treasure salvors relinquished to the state more than 25% of the collection, particularly if it consisted of a high number of "undesirable" objects, or those objects that the treasure salvors deemed less economically "valuable" such as ceramic fragments or iron fasteners. An exception to the 75/25 percentage allotments occurred after Tom Gurr lost the case against the state for salvage rights on *San José*, in which he argued the site lay outside of state waters (FMSF, BHP, DHR 2014b). Gurr subsequently agreed to split all future artifacts with the state 50/50 so he could apply for a salvage contract and continue work on the site (Florida Department of State, Division of Archives, History and Records Management 1976).

Artifact lists for *San José* and *San Pedro* were extensive; categories were created to combine similar types of artifacts and create a more streamlined data analysis. The categories were based on type and function, as well as categories used by the state in accessioning artifacts into permanent state collections. The categories were as follows:

Ceramics
Glass
Building material
Lithics
Coins
Decorative objects
Fasteners
Shot
Miscellaneous metal
Wood/plant remains
Leather/shell/bone
Cannon
Anchors
Fittings
Encrustations
Other

For this study the ceramics category included porcelain, earthenware, Mexican ware, crockery, olive jars, pearlware, Guadalajara Polychrome, marine ware, pottery, figurines, and pipe stems. Fasteners included nails, spikes, and bolts. Lithics included ballast, modified stone, unmodified stone, ground stone, slate, flint, and coal. Building materials included brick and tile. Shot included cannonballs, lead shot, musket balls, and bar shot. Decorative objects included jewelry, buttons, religious objects, and belt buckles. Miscellaneous metal included lead, iron, bronze, slag, and sheathing. Fittings included sailmaker's palms and general objects that were associated with rigging, or ship fittings. Other objects included tools, metal dishes, and utensils. All artifact lists for each of the wrecks were re-organized into the 16 categories, the information for which is included in Appendix U. Each re-categorized artifact list was then placed into an

Excel spreadsheet and pie charts displaying percentages of collected artifact types were generated. The results of this analysis are presented in Chapter Seven.

4.4 Limitations

Various limitations were presented during the process of data collection for this thesis. Attempting to quantify treasure salvor and looter impacts on shipwrecks involved examining lists of artifacts held by the state and those held by treasure salvors. The problem, however, lies in the fact that not all artifact lists are created equal: some artifacts may be missing or discarded and lists are not always complete or available. Similarly, in antiquity, cargo was often smuggled on board or for private sale and not listed on original manifests. Since the sites contain different concentrations of artifacts and are visited by various groups, there is much variation in the dataset already. This is the reason site formation processes are important in this type of study: artifact lists must be applied within the context of the site's overall story. Further complicating the study was the fact that much information concerning the 1733 fleet was missing, including photographs and video of sites, reports and publications, and artifact lists. Individuals often failed to report accurate data about artifacts on sites or what was collected, and information concerning the current whereabouts of artifacts was difficult to find, especially artifacts that went into private ownership.

Complicating the analysis of treasure salvor reports is the fact that contract and permit report requirements have changed over time as underwater archaeological standards changed. Initially, treasure salvors did not have to report in-depth their activities on sites. Furthermore, some sites were salvaged in the 1950s and 1960s before the state managed underwater resources closely, which created a loss of data since there were no requirements to report actions on

historical shipwrecks. Once the state gained control of underwater sites, illegal looting continued to take place, further causing a loss of data concerning artifacts and site formation processes.

The nature of archaeological methods has also changed: archaeologists are less likely to collect large numbers of artifacts, especially if funding and storage facilities are not available. With this in mind, comparing lists of artifacts that archaeologists collect today to what treasure salvors collected in the past creates skewed results.

Other limitations included the author's own bias against treasure salvage and the commercialization of artifacts. Although an attempt was made to approach this study in a neutral manner, these limitations must be considered when examining research presented in this thesis.

5 Review of Treasure Salvor Publications

One argument from archaeologists is that treasure salvors do not conduct their work to scientific standards. To investigate this statement, this chapter presents various types of publications pertaining to Florida shipwrecks chosen for analysis in this thesis. Publications involving the 1733 fleet and Pillar Dollar Wreck, as well as reports submitted to the state of Florida in fulfillment of Exploration and Salvage Contracts and permits, were examined. Adventure books about the 1733 fleet and the Pillar Dollar Wreck were also included in this study as they provided useful information about cultural site formation processes on the sites.

5.1 Popular Publications

Written by treasure salvors who both legally and illegally salvaged the sites from the 1960s to 1970s, popular treasure salvor publications were written for a general audience and detailed the various salvage activities conducted on underwater sites in Florida. The type of information presented in the books was not meant to provide details of site measurements or artifact counts, but instead to introduce readers to treasure salvage.

In 1971 Martin Meylach, a small-scale treasure salvor in Florida during the 1960s and 1970s, published *Diving to a Flash of Gold*, which detailed his exploits as a salvor. Both archaeologists and treasure salvors cited this publication because it contained early, and sometimes the only, information about select shipwrecks in Florida. Written as an adventure novel, Meylach included bearings for locating sites (Figure 13), working photographs of divers, photographs and sketches of artifacts (Figure 15), maps of the locations of some of the wrecks, and a larger pullout nautical map marking wreck locations. The publication was written as a captivating story meant for a general audience interested in treasure salvage, especially as related

to the 1733 fleet. Meylach included a short chapter about conserving artifacts and briefly discussed methods of locating and excavating sites. Table 8 lists the categories included in the publication.

Table 8. Categories included in *Diving to a Flash of Gold* (Meylach 1971).

Category
Table of Contents
Acknowledgements
Weather and Underwater Conditions
Annotated Artifact Sketches
Chart of Wreck Locations
Sketched Wreck Location Maps
Marine Life Hazards
Adverse Diving Conditions
Salvage Methods
Notes on Preserving Finds
Index
Working and Artifact Photos, Unscaled

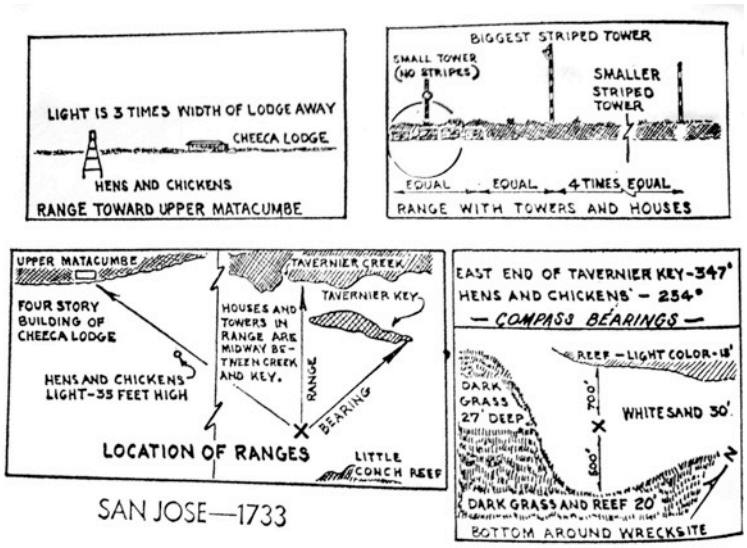


Figure 13. Example of sketched map wreck location (Meylach 1971:308).

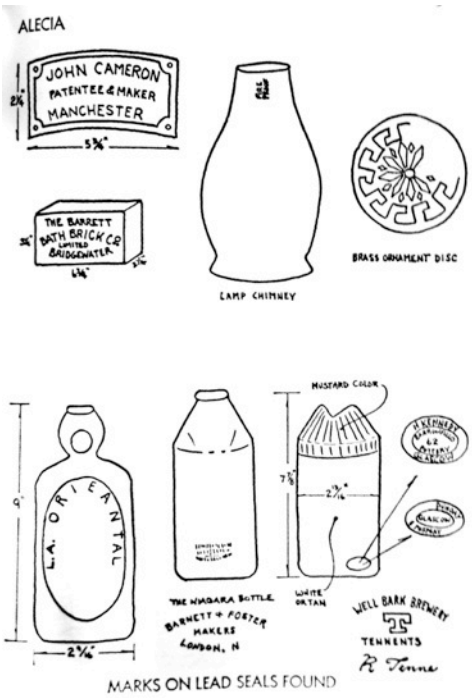


Figure 14. Example of sketched artifacts (Meylach 1971:283).

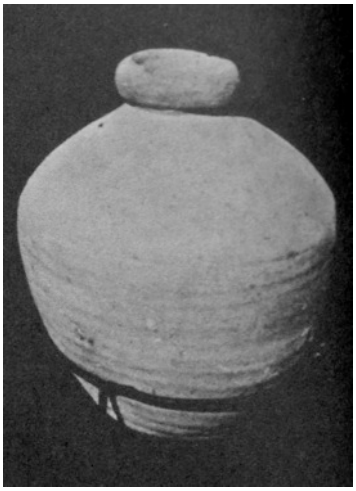


Figure 15. Example of artifact photo (Meylach 1971).

Robert Weller's *Galleon Alley: The 1733 Spanish Treasure Fleet* (2001a) is another example of an adventure novel concerning treasure salvage. This publication focused on the 1733 fleet and provided the history and wrecking event of each vessel based on documents obtained from the *Archivo General de las Indias* Seville, Spain. This book contained a wealth of artifact photographs labeled with the name of the wreck from which an object was collected,

such as “Bronze Religious Medallions recovered from *Herrera*. St. Joseph with the Christ Child” (Figure 16) and “Tonalaware Figurines: An assortment of utility vessels- cups, bowls, etc. for the ‘future housewife’” (Figure 17). Weller disclosed where artifacts that were considered valuable ended up, such as gold coins or rings, but the ultimate whereabouts of smaller, less commercially valuable artifacts were not disclosed; details of conservation were also excluded. The publication contained working photographs, images of historical documents, and location information for the wrecks (Table 9). Photographs did not contain scales, and photographs of sites did not contain directional markers.

Figure 16. Example of artifact photo from *Galleon Alley: The 1733 Spanish Treasure Fleet* (Weller 2001a:149).

Figure 17. Example of artifact photo from *Galleon Alley: The 1733 Spanish Treasure Fleet* (Weller 2001a:150).

Table 9. Categories included in *Galleon Alley: The 1733 Spanish Treasure Fleet* (Weller 2001a).

Category
Title Page
Acknowledgements
Table of Contents
Foreword
Historical Background
Site Location Charts
Historical Salvage Maps
Working Photographs
Artifact Photographs (Unscaled, Limited Provenance)
Epilogue
Index
References
Glossary
Appendix

Carl Ward's *Shipwreck in the Florida Keys* (2014) described his team's relocation and subsequent artifact recovery on *El Populo*. Much like daily dive logs, it described day-to-day activities of treasure salvage. It was the closest publication to a treasure salvor report on *El Populo* and helped archaeologists understand cultural impacts on the site. Table 10 illustrates the categories included in the publication.

Table 10. Categories included in *Shipwreck in the Florida Keys* (Ward 2014).

Category
Title Page
Introduction
Credits
Table of Contents
About the Author
Prologue
Photographs (Some Scaled)
Dates of Activities
Scaled Drawing of Bronze Cannon
Epilogue
Map of 1733 Fleet Shipwreck Locations

Shipwreck in the Florida Keys included little scientific data about *El Populo* in the form of measurements of timbers, artifact provenance, or site maps. It included a drawing of a recovered bronze cannon and a map of 1733 fleet shipwreck locations. The book was a daily log of dive activities, listing dates and what the team collected each day; no final count of artifacts or no standardized unit of measurement (the author collected "bucketfuls" of conglomerates) was used (Ward 2014:176). Although the book did not discuss where artifacts went after they were collected or what conservation techniques were used, the author mentioned that some artifacts were kept as personal collections and others were gifted to friends. Photographs of "valuable" artifacts were included, but each photo contained a limited description and no provenance, as illustrated in Figure 18. In some photographs, the author included a ruler for scale, as shown in Figure 19.

Obverse and Reverse of 8 Reale Pillar Dollar - 1732

Figure 18. Artifact photograph from *Shipwreck in the Florida Keys* (Ward 2014:41).

Figure 19. Artifact photograph from *Shipwreck in the Florida Keys* (Ward 2014:25).

5.2 Exploration and Salvage Reports

In the beginning of treasure salvage in Florida, the state instituted a contract system, with contracts being issued for either exploration or salvage (Mary Glowacki 2014, pers. comm.). After field agents accompanied salvors in fulfillment of contracts with the state, notes, dive logs, and preliminary inventories were produced for sites. This new provision of having field agents accompany salvors was instituted in 1965 with Chapter 65-300, Acts of 1965 (Appendix A) (Trustees of the Internal Improvement Fund 1966). Early "reports" consisted of artifact inventories, reports of survey areas, and dive logs submitted to the Bureau of Historic Sites and

Properties (later Division of Historical Resources). In the 1970s, salvors were given a Record of Daily Activities for Commercial Underwater Exploration or Salvage Contracts provided by the Bureau of Historic Sites and Properties (Bureau of Historic Sites and Properties 1974). The log, which was required to be completed during the year's activities, provided directions for completion, which included contract information, a crew list, and work conducted on the site. Logbooks for exploration contracts typically included survey methods while logbooks for salvage contracts included lists of artifacts recovered. The full instructions from the logbook can be found in Appendix B, along with a sample contract from 1969 for salvage in the area of *San José*, Appendix C.

Eventually, the contract process was replaced with a stringent permitting process, which resulted in treasure salvor reports becoming more detailed. In 1992, the state of Florida passed an Administrative Code that outlined permit report requirements under Chapter 1A-46 Archaeological and Historical Report Standards and Guidelines (Florida Department of State 2015b). Under those guidelines (attached in Appendix D), each report was required to have the following sections:

1. General description of the project
2. Archival research
3. Research design
4. Archaeological fieldwork and methods
5. Historical fieldwork and research
6. Archaeological results and conclusions
7. Historical results and conclusions
8. Florida Master Site File supplemental documents

Currently, there are two laws that govern the use of publicly owned archaeological and historical resources on state-owned lands and in state waters: Chapter 1A-31 and Chapter 1A-32, *Florida Administrative Code* (Appendix E). These requirements serve as a system of control for the protection of state cultural resources. Chapter 1A-32 concerns archaeological research permits and dictates that historical sites may be surveyed and excavated by museums, universities, and colleges. An accredited archaeologist must perform the activities and all collected materials are conserved and become property of the state. Permits are issued to professional archaeologists who must submit site forms, artifacts, and reports, which follow Chapter 1A-46 Guidelines, within a year of fieldwork completion. Permit requests require an application form (Appendix F), a map of the project area, a research design, and resumes of Principal Investigators and Field Directors (Florida Department of State 2015b).

Chapter 1A-31 concerns surveys conducted by commercial salvage companies and requires supervision by the state. Salvors are permitted to survey an area and may only excavate an area under an archaeologist's supervision; the state awards part of the collected artifacts to the salvor or salvage company (Florida Department of State 2015a). Under Chapter 1A-31, there are two types of permits: exploration permits and recovery permits (Florida Administrative Code 2013). Exploration permits allow for the collection of remote sensing and visual information regarding shipwrecks, but do not allow for excavation or artifact collection. If an anomaly is located, the permit may be modified to allow for minimal disturbance to the area to determine the presence of historical artifacts. The permit also allows for the delineation of site boundaries, evaluation of potential significant characteristics, and identification of the sources of anomalies. Recovery permits are issued after site location under an existing exploration permit and allow for the collection of archaeological materials, some of which are turned over to the salvor or salvage

company. With each type of permit, FMSF forms must be completed and submitted along with survey logs, and reports, which follow Chapter 1A-46 Guidelines (Florida Department of State 2015a).

The following discussion provides examples of treasure salvor "reports" from the 1960s onward and illustrates how they varied over time and reflected changes in permit requirements. One of the earliest examples of a report was in the form of notes from Ann Kitching about activities conducted in 1965 as part of Lease #2032 (Figure 20). Kitching submitted a list of daily activities in the survey area to the Bureau of Historic Sites and Properties (Kitching 1965). Daily operation logs provided a more standardized format for reporting activities on submerged sites. There are numerous examples of these logs over the years, some of which are included in this chapter. Examples of daily operation logs from 1969 and 1970 show how the forms changed over the span of one year (Figures 21 and 22). A 1971 daily activity log submitted by Southern Research and Salvage Operations for Exploration Contract E-18 (Figure 23) reveals an example of a treasure salvor's annotated anchor sketch. Salvage contract dive logs were the same format for exploration contracts but included information about artifacts that were collected during each dive, such as in 1973 for Salvage Contract S-11-A on *San José* (Figure 24). Ronald Molinari, a dentist in Florida, held multiple Exploration and Salvage Contracts over the years and submitted reports to the Division of Historical Resources as recently as 2005. Figures 25 and 26 depict exploration contracts for 1974 and 1977 respectively; the format was still the same over those years. In 1981, however, a survey activity log submitted by John Noland for an exploration contract on *Tres Puentes* revealed a different format (Figure 27). Molinari, in conjunction with Island Treasure, Inc., submitted a field data sheet of his own design as a result of his 1986 Exploration Contract E-69 (Figure 28).

1965

May 20 On dock before 7AM left 7:45AM 9AM off House of Refuge, sandy water but boys found sand dollars and wanted container for snake. 10:45AM on Gilbert's Bar shoal. 1:30PM back at dock, good landing. Webb did not go, was to meet Mr. Scott. Inquired about out-board motors. Mercury, Stuart Tackle & Marine. Mr. Scott would call President of Mercury. Go ahead, we handle Evinrude & Johnson. parts due this week. So, may fish. Several want to buy rods. Might as well!

May 21 Seas to be rough, so I took the day off. Webb at wheel, just went out and back.

May 22 At dock before 7AM thru at 10:30AM Went to see Ocean and found it rough. Have Magnet-o-meter, according to Mr. Scott, big plans, many sights, question rumors. See you Monday!

May 23 Two couples on cruise.

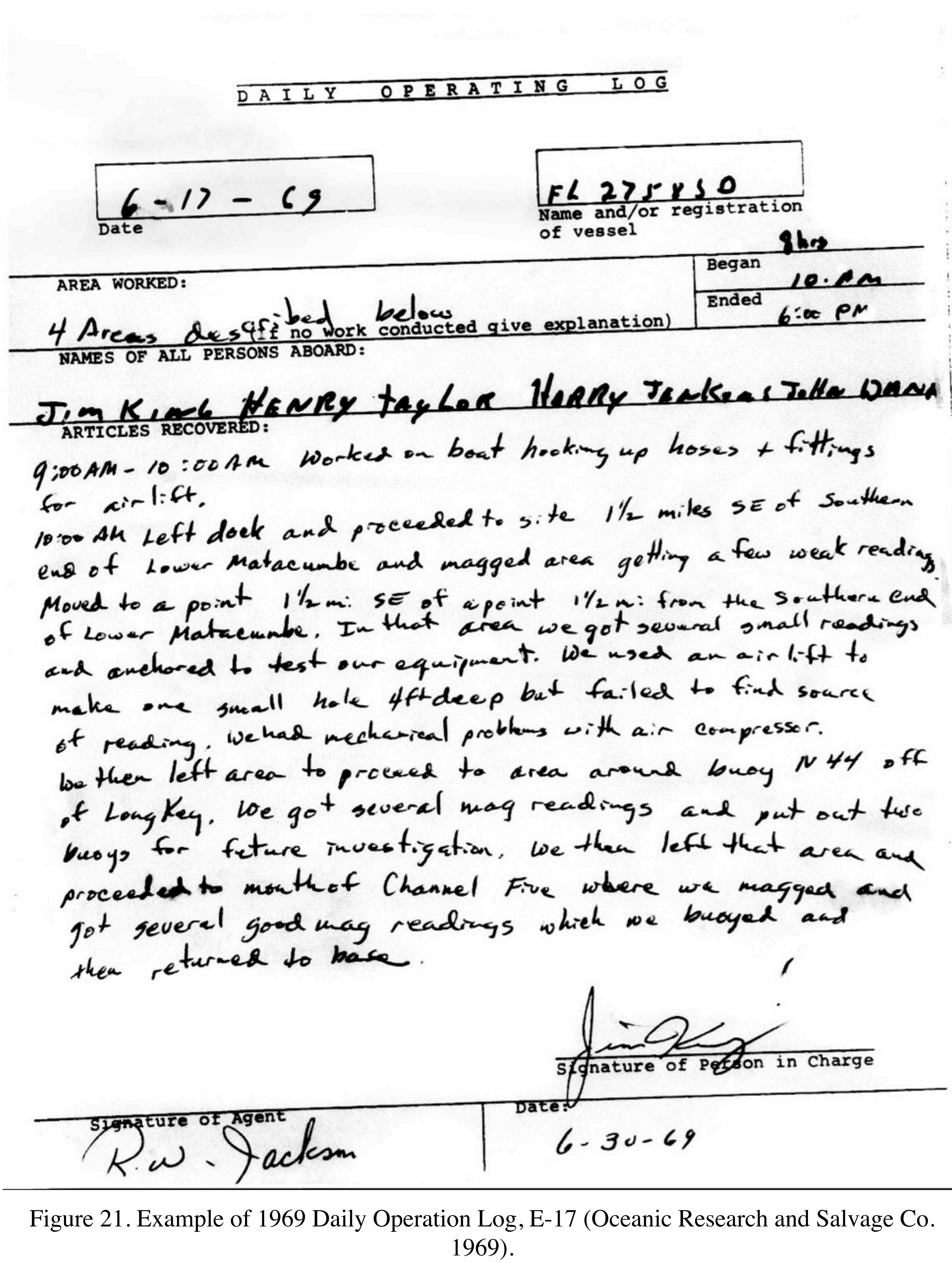
May 24 7AM Got gas and under way 8:30AM 10AM off Stuart Beach. Doud in water, made several stops, returning to Seminole Shores. Scotty went in once for lesson. 11:30AM Seminole Shores, outer reef. Doud and Webb looked it over. Found Ocean stones. Mike at wheel, returning. Radio Jazz Terrible! docked 1:30PM.

May 25 7AM Compressors running. Off for Stuart Beach and N. of House of Refuge. 4 ft. Seas. Doud over, sandy water 9 - 10:30AM fished, trolling E. and back of inlet. Dolphin, bonita. Docked 11:30AM Jazz on radio, all the way. Webb at wheel. Scotty part time. Webb said Scott wants water checked daily.

May 26 7AM left dock 8 - 9:45AM off pier 10:15AM House of Refuge and 2 mi. N of Stuart Beach. 12 at inlet. Scott and Doud swam to South reef 12:30. docked at 1:30PM

May 27 7AM left dock 9:45AM off shore St. Lucie County. Jorgensen site, started prop wash 10:20AM 4 Areas If line got slack, scotty would take up on it. one stern line. Mr. Scott swam out to boat about 10AM for less than 45 min. aboard. Told crew he did not care whether anything was found or not but it would be nice. He, Webb, Doud and the boys were in the water. Only the boys checked the holes, sometimes, before moving to another spot. Webb hit the sack for about an hour, returning. Doud nearly all the way back. Docked at 4:55PM Another beautiful day lost for work in Martin County. The generator is in after repairs.

Figure 20. Example of 1965 Lease #2032 Report (Kitching 1965).



DAILY OPERATING LOG

6-17-69

Date

FL 275 8 S D

Name and/or registration of vessel

Began 10. AM

Ended 6:00 PM

9 hrs

AREA WORKED:

4 Areas described below (If no work conducted give explanation)

NAMES OF ALL PERSONS ABOARD:

Jim King Henry Taylor Harry Jenkins John Dana

ARTICLES RECOVERED:

9:00 AM - 10:00 AM Worked on boat hooking up hoses + fittings for air lift.
10:00 AM Left dock and proceeded to site 1½ miles SE of Southern end of Lower Matacumbe and magged area getting a few weak readings. Moved to a point 1½ mi. SE of a point 1½ mi: from the Southern end of Lower Matacumbe. In that area we got several small readings and anchored to test our equipment. We used an air lift to make one small hole 4ft deep but failed to find source of reading. We had mechanical problems with air compressor. We then left area to proceed to area around buoy N 44 off of Long Key. We got several mag readings and put out two buoys for future investigation. We then left that area and proceeded to mouth of Channel Five where we magged and got several good mag readings which we buoyed and then returned to base.

Jim King

Signature of Person in Charge

Signature of Agent

R. W. Jackson

Date:

6-30-69

Figure 21. Example of 1969 Daily Operation Log, E-17 (Oceanic Research and Salvage Co. 1969).

BUREAU OF HISTORIC SITES AND PROPERTIES
DIVISION OF ARCHIVES, HISTORY AND RECORDS MANAGEMENT
DEPARTMENT OF STATE

Daily Activity Log

E-17A
Contract No.

Date Nov. 7, 1970 Work Initiated 12:45 Terminated 5:30

Area or site explored for salvagable abandoned property or (if salvage contract) site salvaged or other activity (see Explanation of Entries).

Inshore from the ballast pile of the "San Pedro"

Weather and Sea State 15-20 MPH winds, Water quite cold.

Vessel FL2753SD Crew Henry Taylor, Chet Triplett

Summary of Daily Activities:

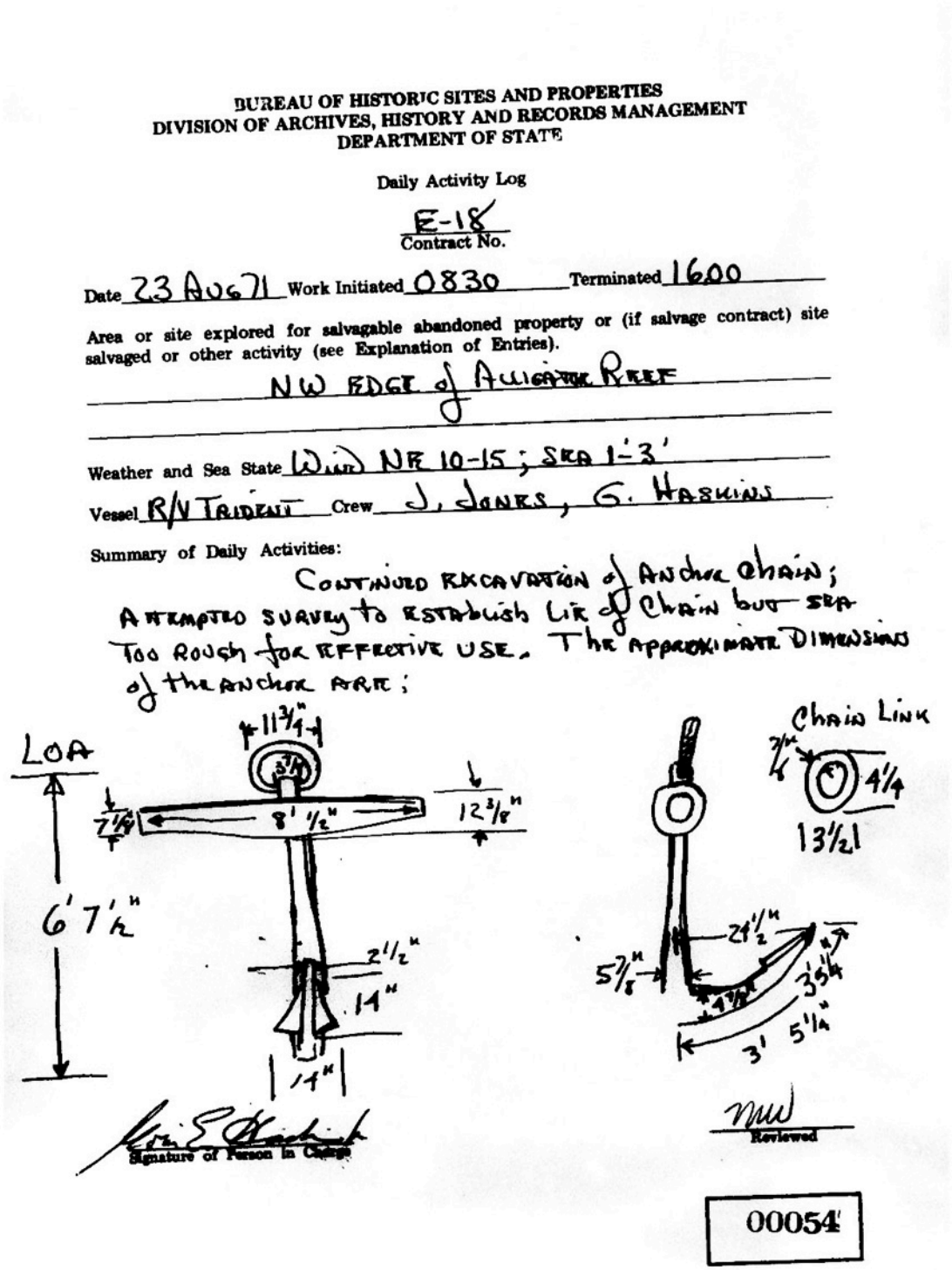
Airlifted above area. No significant finds.
Spikes + ballast only items uncovered.
Engine left bank severely overheating.

Signature of Person in Charge

Reviewed

0008

Figure 22. Example of 1970 Daily Activity Log, E-17-A (Oceanic Research and Salvage Co. 1970).



BUREAU OF HISTORIC SITES AND PROPERTIES
DIVISION OF ARCHIVES, HISTORY AND RECORDS MANAGEMENT
DEPARTMENT OF STATE

Daily Activity Log

E-18
Contract No.

Date 23 AUG 71 Work Initiated 0830 Terminated 1600

Area or site explored for salvagable abandoned property or (if salvage contract) site salvaged or other activity (see Explanation of Entries).

NW EDGE of ALLIGATOR REEF

Weather and Sea State WIND NE 10-15; SEA 1-3'

Vessel R/V TRIDENT Crew J. JONES, G. HASKINS

Summary of Daily Activities:

CONTINUED EXCAVATION of Anchor chain; ATTEMPTED SURVEY TO ESTABLISH LIE of Chain but SEA TOO ROUGH for EFFECTIVE USE. The APPROXIMATE DIMENSIONS of the ANCHOR ARE;

LOA
6' 7 1/2"
11 3/4"
8' 1/2"
12 3/8"
2 1/2"
14"
14"
Chain Link
4 1/4
13 1/2
21 1/2"
5 7/8"
3 5/4"
3' 5 1/4"

Signature of Person in Charge

Reviewed

00054

Figure 23. Example of 1971 Daily Activity Log, E-18 (Southern Research and Salvage Operations 1971).

BUREAU OF HISTORIC SITES AND PROPERTIES
DIVISION OF ARCHIVES, HISTORY AND RECORDS MANAGEMENT
DEPARTMENT OF STATE

Daily Activity Log

N/A
Contract No.

Date 5/30/73 Work Initiated 0900 hrs Terminated 1830 hrs

Area or site explored for salvagable abandoned property or (if salvage contract) site salvaged or other activity (see Explanation of Entries).
RUDDER AREA - INSHORE

Weather and Sea State E-SE Winds 15 MPH 3-4' SEAS

Vessel EL CAPITAN Crew J. NOLAND, H. CLAUSAN, P. CARLETON, H. TAYLOR, J. HYLAN, AGENT ENGLISH

Summary of Daily Activities:

10 NAILS
5 pc. GRILL (IRON)
21 POT. SHERDS
1 SLATE
1 LEATHER SHOE

#1508 6" SHEAVE (WOODEN)
1509 2 REALE
1510 pr SMALL SILVER CUFF LINKS
1511 2½ WOODEN BUTTONS
1512 4 PIECES WOODEN SPOON

Signature of Person in Charge

Reviewed

000021

Figure 24. 1973 Field Notes and Preliminary Inventory for shipwreck *San José* (Undersea Mining Corporation 1973).

BUREAU OF HISTORIC SITES AND PROPERTIES
DIVISION OF ARCHIVES, HISTORY AND RECORDS MANAGEMENT
DEPARTMENT OF STATE

Daily Activity Log

E47A
Contract No.

Date 7/26/74 Work Initiated 8:30 3:30 Terminated 1:30 4:30

Area or site explored for salvagable abandoned property or (if salvage contract) site salvaged or other activity (see Explanation of Entries).

Weather and Sea State clear & calm

Vessel 19' Sea craft Crew Jim, Clay, Ronald Molinari

Summary of Daily Activities:

(1) We drifted with the mag dragging across the sand bottom up & down, back & forth criss crossing many times the area which was evidently being worked last week. Two children were in the water looking for visual signs. We found many broken lobster traps, sand dollars, & sea biscuits but nothing else

(2) It started getting rough late afternoon & we visually worked inside of the sandbar off Tavernier Key

R. E. Mol
Signature of Person in Charge

Reviewed

00001 5

Figure 25. Example of Daily Activity Log for E-47-A (Molinari 1974).

BUREAU OF HISTORIC SITES AND PROPERTIES
DIVISION OF ARCHIVES, HISTORY AND RECORDS MANAGEMENT
DEPARTMENT OF STATE

Daily Activity Log

E-51-b
Contract No.

Date 10 July 1977 Work Initiated 09:45 Terminated 15:30

Area or site explored for salvagable abandoned property or (if salvage contract) site salvaged or other activity (see Explanation of Entries).

Area I

Weather and Sea State Fair - Seas smooth to a light chop

Vessel Marie Crew Goin Haskins, Dawson Chaney, John Berrier

Summary of Daily Activities:

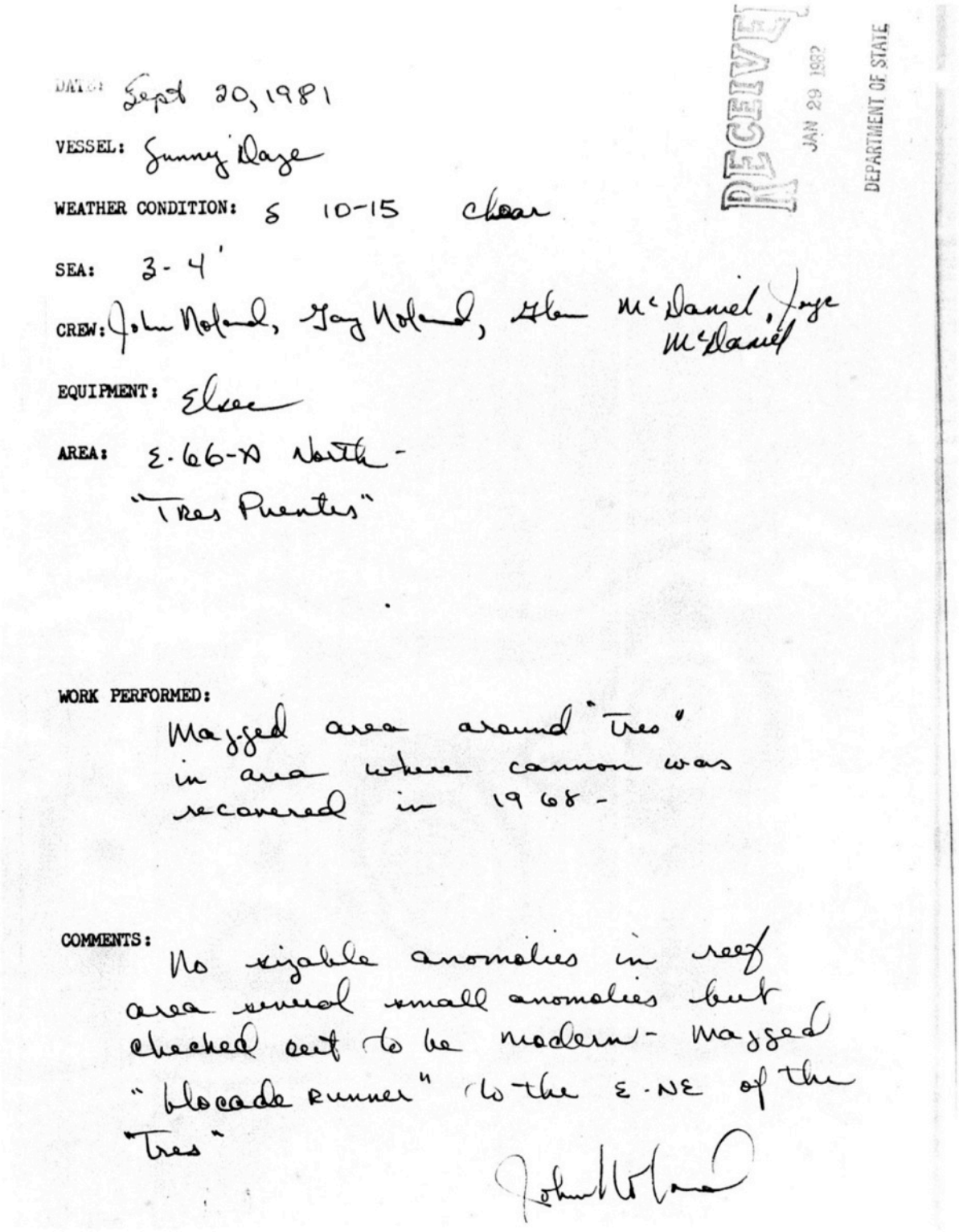
Performed magnetic survey of extreme East Corner using Proton Magnetometer. After about 4½ hours of survey the magnetometer became very noisy. After several attempts and efforts to fix same, the crew returned to port. The magnetometer will have to be sent back to Texas for repairs. Work is underway to employ the ASQ-3 Flux-gate magnetometer.

Signature of Person in Charge
Goin E. Haskins Jr.

Reviewed

0 025

Figure 26. Example of Daily Activity Log for E-51-B (Haskins 1977).



DATE: Sept 20, 1981

VESSEL: Sunny Daze

WEATHER CONDITION: S 10-15 clear

SEA: 3-4'

CREW: John Noland, Jay Noland, Glen McDaniel, Jorge McDaniel

EQUIPMENT: Elsec

AREA: E-66-A North - "Tres Puentes"

WORK PERFORMED:

Mapped area around "Tres" in area where cannon was recovered in 1968 -

COMMENTS:

No sizable anomalies in reef area except small anomalies but checked out to be modern - mapped "blockade runner" to the E-NE of the "Tres"

John Noland

RECEIVED JAN 29 1982 DEPARTMENT OF STATE

Figure 27. Survey activity sheet for E-66-A on *Tres Puentes* (Noland 1981).

ISLAND TREASURES, INC.
P.O. Drawer 599
Tavernier, FL 33070
(305) 852-3082

1 of 1

Date 1/4/86

FIELD DATA

Site leases area E 69
Base Points
Instruments
Engine Time & RPM
Bottom Diameter of Hole
Top Diameter of Hole
Sea State & Weather 2-3'

Contract No. E 69
Work Vessel Reef Rat
Time Left Dock
Time Returned
Time on Site
Recorder Ron
Crew Ron, Mike, Joe Carl
Additional

HOLE NUMBER	LOCATION COORDINATES	NOTES	TAG NUMBER	DESCRIPTION
10[10] Am	heading 30°			
	starting point			
	a) micro tower KL ranges will		offshore end Rodriguez	
	b) tallest radio Tower Tavernier		(staged) w/ inshore end Tavk	
	basically attempted to stick to 74°		From here to stakes	
	on Pickles reef			
	43265.5	start pt.		RECEIVED
	14111.4			JAN 21 1986
	62298.6			
	30570.2			Bureau of Archaeological Research
	ck pts along way			
	43264.2		d) 10[50]	
	(a) 14112.1 75°		43258.6 75°	
			14114.2	
	(b) 43262.1 75°			
	14113.1		e) 10[55]	
	(c) → 1045 Am 80°		43256.4 70°	
	43261.0		14114.8	
	14113.5			

Figure 28. Field Data sheet for E-69 (Island Treasure, Inc.1986).

Reports within the last 15 years were more detailed and included more than dive activity logs. Weller, for example, submitted a final permit report in 2000 that consisted of a survey overview, map of survey area, and magnetometer data for the shipwreck *San Fernando* from the 1733 fleet (Weller 2000). Weller also produced a final report in 2001 as part of the requirements for the same permit for another shipwreck from the 1733 fleet, *San Francisco*, the site plan of which is shown in Figure 29 (Weller 2001b). The report discussed survey areas and techniques for attempting to locate *San Fernando* and included brief descriptions of his survey of sites such as the Brick Wreck (Figure 30) and the Bronze Pin Wreck, two wrecks for which archaeological reports were published in 2006 and 2009 respectively (Smith, Moates et al. 2006; Shefi et al. 2009). The Brick Wreck, reported to FKNMS in 2002, was believed to be a mid-19th -century schooner (Smith, Moates et al. 2006:1–2). The Bronze Pin Wreck, known to the state since 1988, was a 19th century sailing ship (Shefi et al 2009:1).

Table 11. Categories Included in FKNMS 99-068 Permit Report for *San Fernando* (Weller 2000).

Category
Survey Overview
Survey Location Map
Magnetometer Data

Table 12. Categories Included in FKNMS 99-068 Permit Report for *San Francisco* (Weller 2001b).

Category
Introduction
Survey Location Map
Survey Location Coordinates
Site Introduction
Artifact and Site Photos (Unscaled, Limited Provenance)
Sketched Site Map

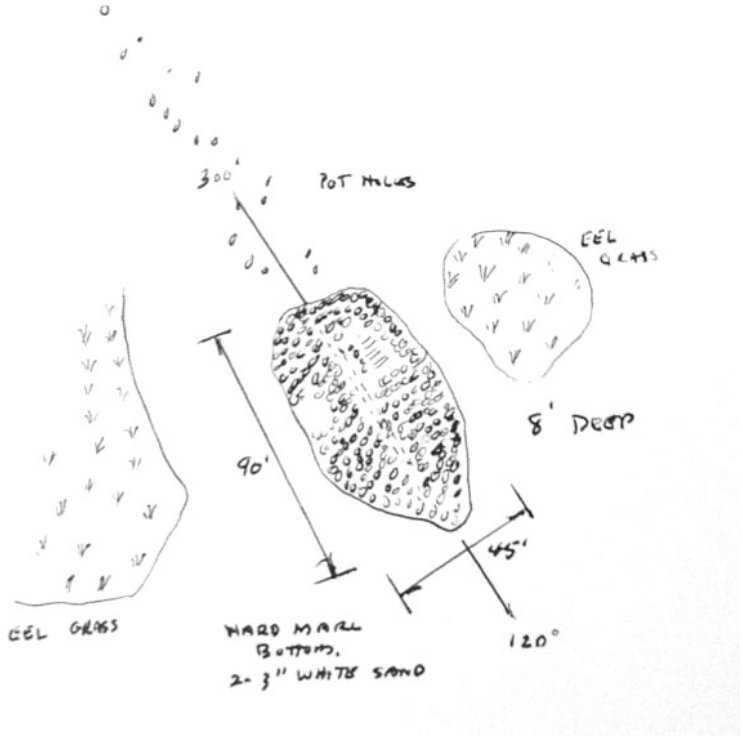


Figure 29. *San Francisco* site plan from Permit FKNMS 99-068 (Weller 2001b).

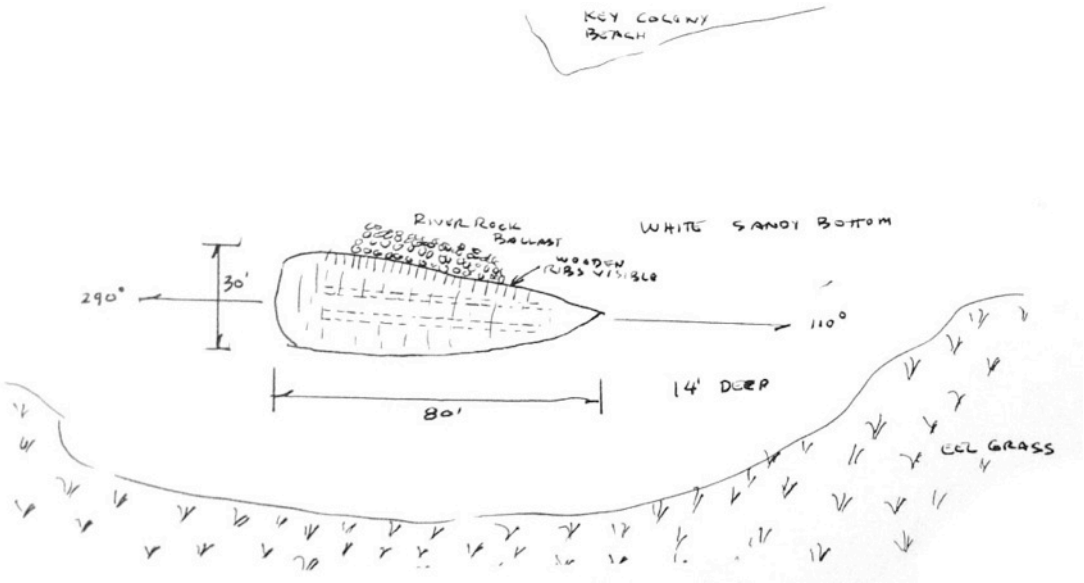


Figure 30. Brick Wreck site plan from Permit FKNMS 99-068 (Weller 2001b).

Molinari held permit FKNMS(UR)-37-94 on *San José* and submitted a summary progress report for the years 1996 to 1997, which included a survey overview and artifact list. A final report was submitted in 1998 for the same permit (for years 1996 to 1997) and again in 1999 for

the years 1997 to 1998. The categories included in these reports are shown in the following tables. Molinari's final report for permit FKNMS99-045 submitted in 2002 for excavations conducted from 2001 to 2002 was extensive, consisting of the categories listed in Table 15.

Table 13. Categories included in 1998 Final Permit Report FKNMS(UR)-37-94 (Molinari 1998).

Category
Introduction
Artifact List
Working Photographs
Discussion of Ceramics
Other Observations
Bibliography
Excavation and Artifact Analysis Proforma

Table 14. Categories Included in 1999 Final Permit Report FKNMS(UR)-37-94 (Molinari 1999).

Category
Title Page
Table of Contents
Summary Report of Operations
Ballast Rock Dispersion Data and Map
Discussion of Ballast on Site
Scaled Artifact Photos
Artifact List
Bibliography
Excavation and Artifact Analysis Proforma

Table 15. Categories Included in 2002 Final Permit Report FKNMS99-045 (Molinari 2002).

Category
Title Page
Table of Contents
Introduction
Overview
Description of Excavations with Grid Charts
Working Photos
Methodology for Mapping Site
Discussion of Selected Artifacts
Scaled Artifact Photos
Discussion of Iron Nail Dispersion on Site
Excavation and Artifact Analysis Proforma
Salvage Activity Log

Molinari submitted both a preliminary and final report to the BAR in 2003 to cover the period from May 2002 to May 2003 for work on *San José* under permit FKNMS-99-045. He also submitted a final report for the same permit in 2004 for the period of June 2003 to July 2004 on *San José*. Most of Molinari's reports for *San José* were similar in format and fairly in-depth compared to other treasure salvor reports (see Weller 2000 and 2001b) for the early 2000s. Molinari included excavation logs and site sketches in all of his reports, providing some of the most detailed reports not co-authored by an archaeologist.

Table 16. Categories Included in Preliminary Permit Report FKNMS-99-045 (Molinari 2003a).

Category
Title Page
Introduction
Artifact List
Scaled Artifact Photos
Excavation and Artifact Analysis Proforma
Salvage Activity Log

Table 17. Categories Included in Final Permit Report FKNMS-99-045 (Molinari 2003b).

Category
Title Page
Table of Contents
Introduction
Overview
Description of Excavations
Working Photos
Artifact List
Discussion of Selected Artifacts
Scaled Artifact Photos
Endnotes
Bibliography
Excavation and Artifact Analysis Proforma
Salvage Activity Log

Table 18. Categories Included in Final Permit Report FKNMS-99-045 (Molinari 2004).

Category
Title Page
Table of Contents
Description of Excavations

Artifact List
Scaled Artifact Photos
Methodology
Excavation and Artifact Analysis Proforma

The Mel Fisher Center, Inc. provided the state with a 2005 report for salvage permits S-32 and S-23, covering excavations on Florida East Coast shipwrecks (Sinclair et al. 2005). Archaeologist J. James Sinclair contributed to the report, which is fairly detailed. A yearly report for 2006 to 2007 was submitted as a result of Exploration Permit E-89P on a tract of submerged land offshore of Brevard County (Mel Fisher Center, Inc. 2007). To attain a recovery permit for limited excavation of points of interest in the permit area, salvors were required to submit a report and provide reasons for subsequent excavation.

Table 19. Categories included in 2005 Report S-32 and S-23 (Sinclair et al. 2005).

Category
Title Page
Acknowledgements
Table of Contents, Figure Lists, Table Lists
Introduction
Copy of Salvage Contract
State of Florida's Archaeological Guidelines
Archaeological Guidelines for Salvage Contracts
Guidelines for Conducting Excavation and Artifact Recovery
Environmental Protection Information
Site Location Maps
Standard Operating Procedures
2005 Season Activity Summary
Artifact Assemblage Lists
Unique and Notable Items
Conclusion
Bibliography
List of Artifacts Donated to State of Florida
Copies of all Daily Log Sheets

Table 20. Categories included in 2007 Report E-89P (Mel Fisher Center, Inc. 2007).

Category
Title Page
Table of Contents, Figure Lists, Table Lists

Introduction
Site Orientation and Location
Copy of Contract
Methodology
Research Design
Charts of Anomalies
Activity Log
Summary/Conclusion
Site Map of Exploration Contract Area

Odyssey Marine Exploration's archaeological papers provide another example of recent treasure salvor publications. Founded in 1994, the company searches for and recovers treasure, artifacts, cargo, and mineral deposits (Odyssey Marine Exploration 1998b). Odyssey Marine Exploration hires trained archaeologists, technicians, and other scientists as part of their team. Archaeological papers are available in hard copy and on the company's website and are relevant to the examination of treasure salvor reports because they discuss Spanish colonial shipwrecks. The papers available on the website were published as recently as 2014 and discuss excavations conducted in the Dry Tortugas on a suspected 1622 *navio* from a Spanish fleet (Odyssey Marine Exploration 1998a).

Odyssey's papers are similar to archaeological reports because they contain abstracts, introductions, and photographs of artifacts, though not always to scale. The paper titled "The Deep-Sea Tortugas Shipwreck, Florida: A Spanish-Operated *Navio* of the 1622 *Tierre Firme* Fleet. Part 1, the Site" (Stemm et al. 2013a) contains a scaled pre-disturbance site plan of the wreck, post-excavation site plans, and a distribution analysis of various artifact types. The paper contains photos of artifacts *in situ*, marine life on the wreck, and working photos of the crew. It also included site dimensions, information about site environment, and datum locations, as well as discussions about artifact distribution and ballast analysis, a discussion of methodology, site formation processes, and a bibliography. Other papers, including "The Deep-Sea Tortugas

Shipwreck, Florida: A Spanish-Operated *Navio* of the 1622 *Tierre Firme* Fleet. Part 2, the Artifacts" (Stemm et al. 2013b) and "The Deep-Sea Tortugas Shipwreck, Florida (1622): Afro-Caribbean Colonoware & Maritime Slavery" (Gerth and Kingsley 2014) contained sections similar to archaeological reports. The following tables list the categories included in each paper.

Table 21. Categories included in "The Deep-Sea Tortugas Shipwreck, Florida: A Spanish-Operated *Navio* of the 1622 *Tierre Firme* Fleet. Part 1, the Site" (Stemm et al. 2013a).

Category
Abstract
Introduction
Site Orientation and Location
Methodology
Marine Environment
Artifact Distribution
Site Formation Processes
Summary/Conclusion
Notes
Site Map
Scaled Artifact Photos
Bibliography/References Cited

Table 22. Categories included in "The Deep-Sea Tortugas Shipwreck, Florida: A Spanish-Operated *Navio* of the 1622 *Tierra Firme* Fleet. Part 2, the Artifacts" (Stemm et al. 2013b).

Category
Abstract
Introduction
Methodology
Results
Artifact Distribution
Artifact Counts/Measurements
Summary/Conclusion
Notes
Acknowledgements
Scaled Artifact Photos
Bibliography/References Cited

Table 23. Categories included in "The Deep-Sea Tortugas Shipwreck, Florida (1622): Afro-Caribbean Colonoware & Maritime Slavery" (Gerth and Kingsley 2014).

Category
Abstract
Introduction

Typology/Discussion
Interpretations
Marine Environment
Artifact Distribution
Summary/Conclusion
Notes
Scaled Artifact Photos
Historical Photos with Sources
Acknowledgements
Bibliography/References Cited

5.3 Conclusion

This chapter presented categories found in various types of treasure salvor publications, including adventure books, dive logs, and preliminary inventories initially submitted to uphold salvage contracts, as well as more recent reports and papers. Treasure salvor reports have changed over time and their format has not been entirely systematic, as illustrated by the examples of reports presented here. The structure of reports has changed since the 1960s, when the height of treasure salvage took place; originally, dive logs and preliminary inventories were sufficient, but when the state began to require field agents to accompany treasure salvors in 1966 the reports became more in-depth (Roger Smith 2015, pers. comm.). Requiring logs was one way the state sought to monitor activities in contract areas in Florida. Early contracts for exploration and salvage contained basic information about participants, weather and site conditions, and activities in contract areas. Logs for salvage contracts were more specific in that they contained preliminary inventories of artifacts collected during each dive.

Once the state phased out contracts and began to distribute permits, report requirements became more stringent. Historical context of sites and more in-depth summaries of recovery activities were included, as with Molinari's reports from 1996 to 2004 (Molinari 1998, 1999, 2002, 2003a, 2003b, 2004). The fact that logs and reports have changed over time is a testament

to the success of the state in requiring more stringent guidelines in its effort to protect underwater cultural heritage. The publications presented in this chapter will further be examined and compared to archaeological publications in Chapter Seven.

6 Site Formation on the Pillar Dollar Wreck and 1733 Fleet

This chapter presents natural and cultural site formation processes that formed and then altered the Pillar Dollar Wreck and comparative shipwreck sites from the 1733 fleet. Impacts on the sites were drawn from treasure salvor and archaeological publications; impacts on the Pillar Dollar Wreck were further examined through personal observations during fieldwork in 2014. Cultural impacts on the sites, specifically those from treasure salvors, looters, and archaeologists, are examined according to Muckelroy's (1978) scrambling devices and extracting filters. Objects that were moved, recovered, or added to the sites are discussed; a summary table of natural and cultural impacts are presented for each wreck. This chapter concludes with the presentation of a site formation process flow diagram specifically tailored to Spanish colonial shipwrecks in the Florida Keys. This diagram was created by the author and was based on Muckelroy's (1978) model of site formation (see Chapter Two) and provides a more accurate and predictive model for depositional and post-depositional processes.

6.1 Pillar Dollar Wreck

6.1.1 Introduction

The Pillar Dollar Wreck is a case study that provides a glimpse into natural and cultural processes on Spanish colonial shipwrecks in the Florida Keys. The site was continuously disturbed as a result of treasure salvors and illegal looters and served as the subject of study for a number of archaeological surveys (Broward 1985; Pomeroy 1987; Weller 2001a; Ward 2014). The most in-depth survey took place in 2014 and consisted of a full pre-disturbance survey and

excavation of selected locations on the site. The methodology and results of this field project are presented here.

6.1.2 Treasure Salvage

Treasure salvage on the Pillar Dollar Wreck is discussed in various treasure salvor publications, though these are not completely clear regarding the historic and archaeological details about the site. Weller reported that Art Sapp and Bobby Savage relocated the Pillar Dollar Wreck using a magnetometer in 1965 and recovered pillar dollars that dated between 1760 and 1764 (Weller 2001a:96–97). Pillar dollars were eight *reale* coins minted in Mexico between 1732 and 1772 and were prized by treasure salvors. A coin in good condition could be sold for at least $1,000 (US) (Ward 2014:101). There is confusion concerning the dates for the coins recovered from the Pillar Dollar Wreck; Meylach reported the coins from the site dated between 1770 and 1778 (Meylach 1971:293). Sapp and Savage did not recover other artifacts and believed the ship was salvaged in antiquity (Weller 2001a:96–97). Weller's brief mention of the Pillar Dollar Wreck included a photograph of an anchor that was reportedly recovered from the site by treasure salvors (Figure 31); no other information was provided about when or who recovered the anchor. The iron anchor was pictured resting outside of a lodge on Lower Matecumbe Key (Weller 2001a:8). Ward (2014:11) mentioned that he and others salvaged the Pillar Dollar Wreck in 1966 but found "nothing of interest." Ward (2014:47) suggested the site to other unnamed salvors, who collected a number of spikes from it in July 1967. Meylach, Weller, and Ward provided the most information concerning treasure salvage on the Pillar Dollar Wreck, though it is likely others visited the site as well.

Figure 31. Iron anchor supposedly recovered from the Pillar Dollar Wreck (Weller 2001a:8).

6.1.3 Archaeological Work

In 1984, archaeologists for SEAC conducted a survey of Biscayne National Park to assess known sites and to determine potential underwater cultural resources within the National Register-nominated offshore archaeological district (Wild and Brewer 1985). The Pillar Dollar Wreck was included in the survey and the archaeologists determined *in situ* remains were likely present because the site was covered with a meter of sand (Wild and Brewer 1985:iii). The only visible remains noted by the archaeologists were ballast scatter and charred structural timbers. The archaeologists also probed the area and found material below the overburden (Wild and Brewer 1985:36).

In 1985, a student at FSU, John Broward, conducted a general site survey of the Pillar Dollar Wreck over a period of one day to determine recent cultural impacts (Broward 1985:2–3). Broward determined site boundaries, installed permanent PVC-pipe datum points to map features and artifacts, took photographs, and recorded distance measurements to the reef. Broward (1985:4–5) noted egg rock ballast, small artifacts on the reef, and a cinder block with a black line attached to it that was absent of marine growth, suggesting the illegal mooring was relatively new. One of Broward's site maps is illustrated in Figure 32 and his reef map and site plan are included in Appendix N and O respectively.

In 1986, NPS rangers apprehended three men near the site with SCUBA gear, excavation equipment, and a bucket of encrusted artifacts. The men were indicted and taken to federal court in the U.S. vs. Hampton, S. Hood, and W. Hood case concerning illicit activities on a state-owned wreck site. The case asserted that the divers were in violation of Title 36 of the Code of Federal Regulations, Section 2.1, which states that possession of cultural artifacts in National Parks is prohibited. They were also in violation of Title 16, United States Code, Section 470, ARPA. Under this act, no person may excavate or remove artifacts from federal lands. The men pled guilty, and were required to pay a fine and relinquish their equipment, vessel, and trailer. The encrustations were, in fact, hull spikes from a shipwreck, which dated between the 17th and 18th centuries. The artifacts, an example of which is illustrated in Figure 33, were curated and stored in SEAC permanently (NPS 1986). A list of those artifacts can be found in Appendix P.

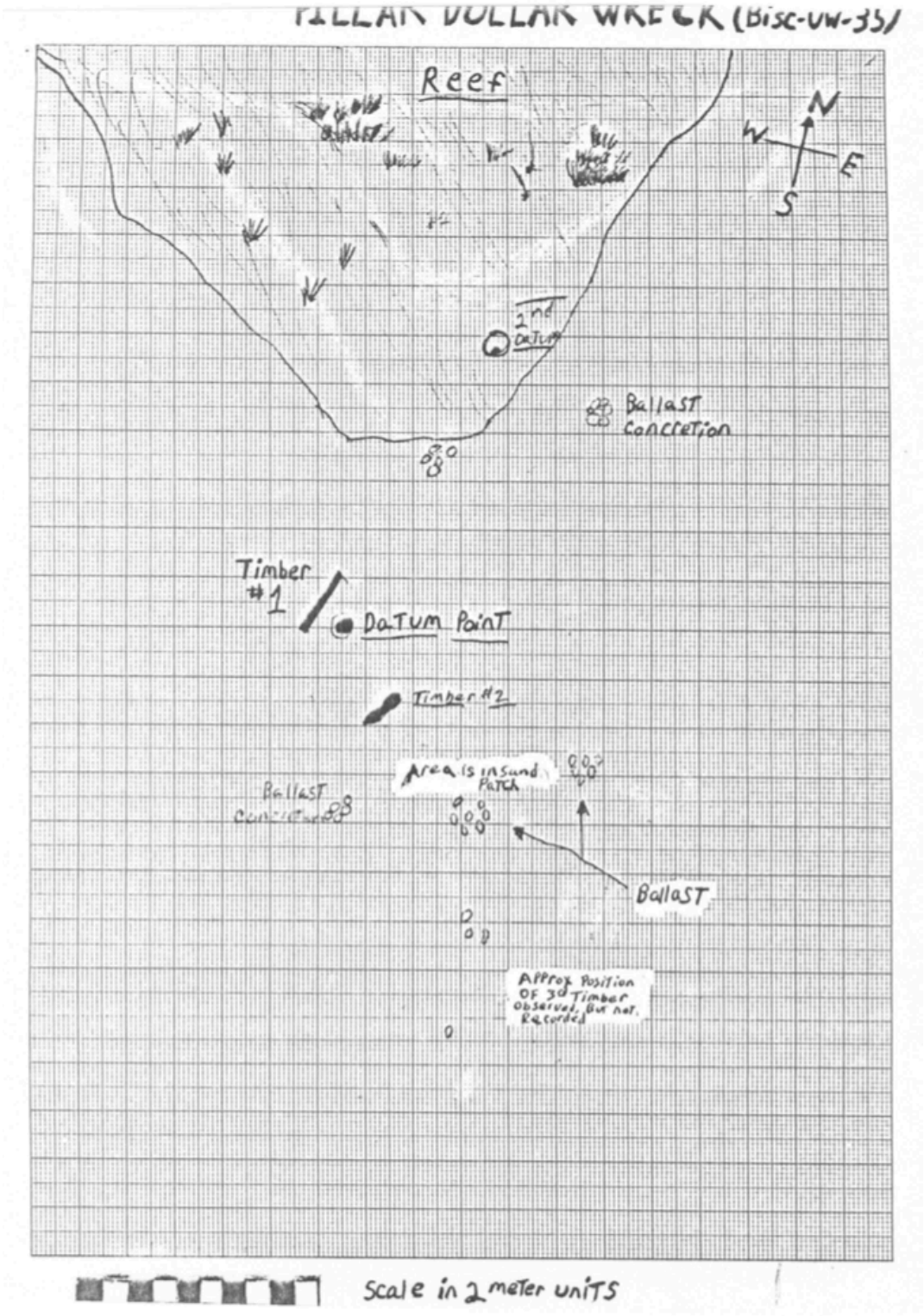


Figure 32. 1985 Pillar Dollar Wreck site map (Broward 1985:13).

Figure 33. Encrusted artifacts found in possession of U.S. vs. Hampton, S. Hood, and W. Hood defendants (M. Price 2014).

In 1987, archaeologists working in conjunction with FSU conducted a one-day survey on the Pillar Dollar Wreck to assess damages caused by the 1986 illicit activities and to confirm degradation of the site (Pomeroy 1987). Archaeologists installed a permanent PVC-pipe datum in the southwest section of the site (Pomeroy 1987:3). The datum was marked with a ring where the top of the sand touched it, in an effort to mark future substrate movement. The goal of the research was to compare the extent and condition of the site with previous surveys and to submit a site report to SEAC (Pomeroy 1987:4).

Further archaeological assessments of the Pillar Dollar Wreck were conducted by NPS personnel over the past 20 years. The first of these was a survey completed in 1992 after Hurricane Andrew, which noted that no damage was caused as a result of the weather system. NPS personnel noted at that time, however, that looters left one-meter diameter holes around the area (NPS 1992). Beginning in 2004, NPS personnel have conducted annual site condition assessments and located an anchor 509 m southeast of the site in 2015. The anchor is buried with a single palm protruding above the sand (Figure 34) and though it was initially listed as an admiralty anchor, further surveys are required to determine the type of anchor and whether it is related to the Pillar Dollar Wreck site (Roth and DeLong 2015).

A table of archaeological assessments of the Pillar Dollar Wreck is located in Appendix Q. Table 24 lists artifacts that were collected from the site based on information from various treasure salvor publications and archaeological survey reports (Meylach 1971; Weller 2001a).

Table 24. List of miscellaneous Pillar Dollar Wreck artifacts collected by treasure salvors and archaeologists since 1963 (Meylach 1971:293; Pomeroy 1987; Weller 2001a.:8, 96).

Year	Group	Artifacts
1963	Salvors	Cannon (2), pillar dollars dating between 1770 and 1778
Not given	Salvors	Iron spikes, hinges, pewter, spoons, pottery, glass, a boarding cutlass, candlestick holders, and slave bracelets
1965	Salvors	Pillar dollars dating between 1760 and 1764
unknown	Salvors	Iron anchor
1967	Salvors	Spikes of various sizes
1986	Archaeologists	Misc. artifacts laying on site after looting
1987	Archaeologists	Glass shard unearthed and left on site

Figure 34. Admiralty anchor in vicinity of the Pillar Dollar Wreck (Roth and DeLong 2015).

6.2 2014 Archaeology Field Project

ECU's 2014 field project represents the most comprehensive survey and excavation of the Pillar Dollar Wreck site. Conducted as part of an advanced archaeological field methods course, this project involved surveying, excavating, and mapping the Pillar Dollar Wreck under

permit BISC 2014-001 from SEAC. Pertaining to this thesis, the goals of the project aimed to collect data related to site formation processes, particularly as associated with treasure salvor and looting activities. The results of the fieldwork are presented in the form of a site report submitted to SEAC as a requirement of the permit (McKinnon 2015).

6.2.1 Pre-disturbance Survey

The pre-disturbance survey involved locating and establishing site perimeters via probing, hand-fanning, and use of a metal detector. A baseline with permanent datum points was established over visible structure to facilitate mapping the site. A meter-long metal T probe with a sharpened tip was used to explore areas around timbers and determine the presence of buried structure. Positive returns were mapped on a grid and helped delineate the site. A diver survey also took place on the reef adjacent to the site using 20 m search areas that were designated with pin flags. A dive team searched for points of interest on the reef while a snorkel team took GPS coordinates of points. Artifacts of interest were flagged, photographed, and mapped in relation to the site using trilateration. With the conclusion of the project, a dive team swam over the reef to retrieve all pin flags. An arbitrary marine life survey also took place on the reef, in which a diver took photographs of marine life for later identification.

6.2.2 Site Setup and Excavation

Using two datum points consisting of 1.5 m rebar driven into the sand, divers installed a 40 m baseline made of 6 mm polypropylene line along a 260/80 degree bearing with the zero end east of the site (near the reef). A measuring tape was attached to the baseline using clothespins and the total extent of the site on the baseline was 23 m. Excavation units were installed perpendicular to the baseline around features of interest by hammering rebar into the substrate and connecting the rebar with thin line to create units (Table 25). The unit locations are shown in

Figure 35. The team excavated to hull structure or a depth of 60 cm, as slumping sand hindered further activities. No original context was identified and modern artifacts were found as deep as 60 cm. As the site was excavated, numbered identification tags were hammered into each timber that was encountered and the tags were left in place upon completion of the project.

Table 25. Unit locations on the Pillar Dollar Wreck.

Unit	**Length (m)**	**Width (m)**	**Location on Baseline**
Unit 1	6	2	Perpendicular to baseline at 16 m to 18 m on the south side
Unit 2	6	2	Perpendicular to baseline at 19 m to 21 m on the south side
Unit 2A	6	1	Perpendicular to baseline at 18 m to 19 m on the south side
Unit 3	5	2	Not excavated; Perpendicular to baseline at 16 m to 18 m, south of Unit 1 (10-15 m offset)
Unit 4	6	2	Perpendicular to baseline at 14 m to 16 m on the south side

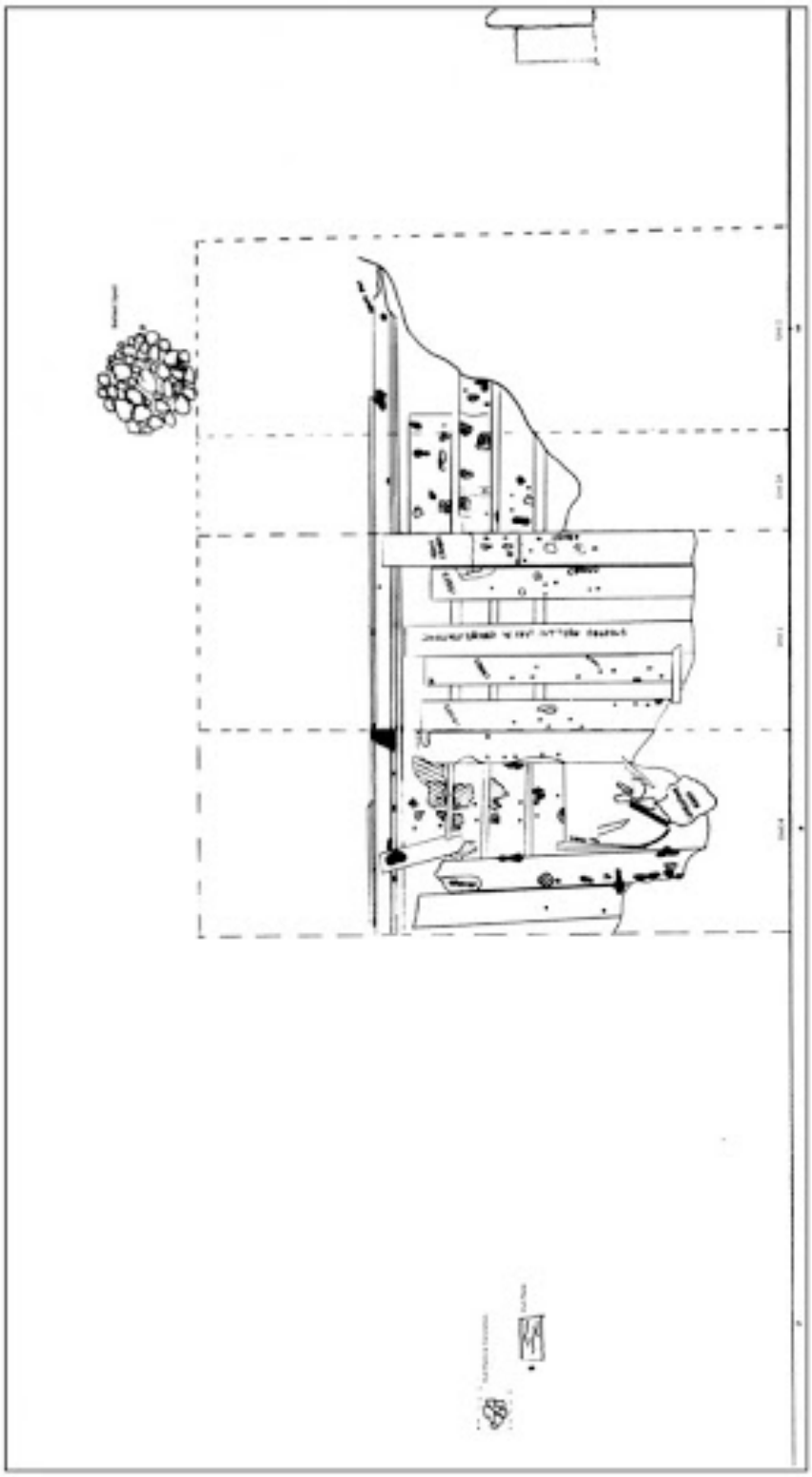


Figure 35. Draft site plan of Pillar Dollar Wreck, showing location of units (ECU Program in Maritime Studies 2014).

A scattering of ballast also is located to the west and north of the site. Due to time constraints, the ballast areas and outlier timbers were not excavated but a team probed around the timbers to determine if they were attached to the concentrated wreck area. The probe was marked in 10 cm increments and once the team established a central point, they probed the area every 50 cm in each cardinal direction until a negative hit was recorded. The team logged whether a hit was positive or negative, the depth of the hit, and suspected buried material (wood, ballast, etc.). A section of timbers was found to be articulated within the main section of the site.

Excavation of the site maintained professionally acceptable archaeological standards. Two-meter square units were installed to maintain horizontal control, but since original context was not expected as a result of years of looting on the site, vertical control was not maintained. Pre-disturbance photographs were taken before units were excavated. A water induction dredge connected to a 10 cm hose and powered by a Pacer IntekPro OHE eight-horsepower water pump was used to remove overburden. Dredge spoil passed through a 0.5 cm mesh bag attached to an outtake hose, the contents of which were later sifted for artifacts. After dredging, post-disturbance photographs were taken and level forms were completed. Each unit was mapped using baseline offsets and annotated sketches, which were later added to an overall site map created using a 1:20 scale. Scantling and goniometer measurements of the timbers were also recorded and that data was used to create profile drawings for finer detail.

6.2.3 Artifacts and Samples

Diagnostic artifacts were collected from the site during unit dredging and from the dredge spoil bags; artifacts were not mapped *in situ* because original context was not encountered. Recovered artifacts were given a field specimen number and stored in bags labeled with provenance data and filled with seawater until transferred to ECU's conservation laboratory for

typological and functional analysis and conservation. Artifacts not deemed necessary for recovery included ballast, wood fragments, and iron concretions; these were reburied on the site after undergoing typological and functional analysis in the field. The reasoning for this was that funding for conservation and storage space for recovered artifacts was limited; only a selection of diagnostic artifacts was collected.

Throughout the excavation, timber and ballast samples were collected. A handsaw, hammer, and chisel were used to extract approximately 2.5 square centimeter timber samples, ensuring tangential, radial, and transverse surfaces. The team took photographs of sample locations before and after removal and mapped locations on annotated drawings. The samples were placed in separate containers with provenance data recorded on mylar sheets and transported to ECU for further processing and typological assessment. Ballast samples were also collected from the site. Throughout excavation, ballast stones were collected and placed on a pile outside of the excavation area; samples were later collected for possible source identification.

6.2.4 Reburial

To rebury the site, the dredge was reversed to return the spoil pile sediment back onto the site with the same level of sediment coverage as pre-excavation. Prior to backfilling, artifacts and ballast not recovered were placed in Unit 4, with fasteners, ballast, and coral being placed in separate piles within the unit. Modern artifacts such as a ceramic mug, a PVC pipe, and an illegal cinder block mooring were removed from the site and discarded.

6.2.5 Conservation

With the conclusion of fieldwork, all recovered artifacts were transported to ECU's conservation lab for post-processing according to the American Institute for Conservation Code of Ethics. Prior to treatment, the artifacts were inventoried into a spreadsheet according to

regulations set forth by SFCMC; the spreadsheet is located in Appendix S. ECU supplied all curation materials for this project and the treatment included:

- Pre-treatment documentation
- Surface cleaning
- Chemical removal of ingrained environment contaminants
- Desalination
- Consolidation of the surface or entire matrix
- Packaging in archival materials for long-term curation
- After-treatment reporting and documentation

Further typological and functional examination took place at ECU's Imaging Core Facility with a scanning electron microscope (SEM). Three artifacts were examined to test composition of materials and to attempt to identify an unknown artifact. Concreted iron fasteners were x-rayed and deconcreted at ECU's conservation lab using pneumatic air scribes and an electric plaster saw. All collected artifacts will eventually be transferred to SEAC, along with all paperwork and photographs associated with the artifacts, for permanent curation.

6.3 Results

6.3.1 Site Conditions

Research on the site took place from 8 September 2014 to 3 October 2014. Air temperatures ranged between 82 and 95 degrees Fahrenheit with water temperature averaging 85 degrees Fahrenheit. Water visibility was between 10 m and 20 m depending on weather conditions. Surface chop depended on weather conditions and ranged between 0 m and 1.5 m in height.

6.3.2 Extent of the Site and Site Layout

The site consists of a partially buried section of structure that extends from 9 m to 32 m on the baseline, with outlier timbers to the north and south periphery of the main structure. It is uncertain whether some of these outlier timbers are intact and their identification and context is unknown. Ballast scatters lie to the north and west of the main wreck concentration, though it is unknown if the scatters are original deposition or were moved during salvage or looting of the site. The main excavated area consists of portions of the keel, hull planking, floors, and futtocks; no ceiling planking was located in context. The keel lies on a 260/80 degree bearing and lists 45 degrees to the north (Figure 36). A total of 6.75 m of the square-shaped keel was exposed during excavation and probing revealed 4 m more meters buried to the east of Unit 4. The keel had a molded dimension of 44 cm and a sided dimension of 27 cm and included notable features such as an iron drift pin, a small Dutchman repair, and a z-scarf between two frames (F3 and F6).

Figure 36. Listing keel at Pillar Dollar Wreck site (ECU Program in Maritime Studies 2014).

Fourteen frames were exposed, six of which were made up of floor/futtock pairs with a chock or spacer frame. The context of the last frame is unknown, as it remained unexcavated.

For the floor/futtock pairs, the first futtock consisted of a butt end; floors and futtocks were fastened together laterally with 4-6 cm square iron bolts. Limber holes run through the floors and measured 7 cm by 4 cm. One frame (F5) exhibited signs of burning in the form of black char. In total, five hull planks (averaging 36 cm sided and 11 cm molded) were exposed beneath the frames; the garboard was located next to the keel and measured 44 cm sided and 12 cm molded. The garboard is not *in situ* but has a rabbet edge at a 45-degree angle and a butt joint on the western edge.

6.3.3 Reef Survey

Artifacts located on the eastern edge of the reef included a spike and possible barshot (Figure 37). These were photographed, measured, and mapped into the main concentration of the wreck using baseline offsets and angles. Modern objects also located on the reef included fishing poles and lobster traps.

Figure 37. Spike encrusted to reef on Pillar Dollar Wreck site (ECU Program in Maritime Studies 2014).

6.3.4 Timber and Ballast Sampling

Ten wood samples were collected from structural timbers and sent to Dr. Kimberly Kasper at Rhodes College in Memphis, Tennessee for analysis. Based on this analysis it was determined the vessel was of New England construction; wood types are listed in Table 26.

Sixteen ballast samples were also collected from the site and examined in the field. The stones were broken to reveal a clean face, the results of which are listed in Appendix R. The ballast samples are at ECU's conservation lab awaiting further analysis.

Table 26. Results of timber samples taken from the Pillar Dollar Wreck.

Sample	Functional Member	Genus	Species	Common Name
1	Keel	Carya	ovata	Shagbark hickory
2	P2	Acer	sp.	Maple
3	T5 (floor)	Carya	sp.	Hickory
4	T1 (futtock)	Carya	ovata	Shagbark hickory
5	T6 (futtock)	Carya	ovata	Shagbark hickory
6	T9 (floor)	Carya	sp.	Hickory
7	Sacrificial plank on keel (north)	Pinus	sp.	Pine
8	Garboard	Acer	sp.	Maple
9	P3	Acer	sp.	Maple
10	Sacrificial plank on keel (north)	Pinus	resinosa	Red pine

6.3.5 Artifacts

A total of 117 artifacts were collected from the Pillar Dollar Wreck site including ceramics, brick, fired clay, bone, glass slag, charcoal, lead, unidentified (UID) iron, and concreted iron fasteners. Table 27 presents the artifact categories and the count associated with each, while Table 28 lists the intrusive objects found throughout the site.

Table 27. List of artifacts collected from the Pillar Dollar Wreck during 2014 field season.

Category	Count
Glass/ glass slag	12
Brick	38
Ceramic	33
Fired clay	2
Bone	5
Stone	1
Charcoal	3
Lead	1
UID iron	2
Iron fasteners	15
Ballast samples retained	5

Table 28. List of intrusive objects on the Pillar Dollar Wreck located during 2014 field season.

Object	Description
PVC pipe	3 m long, 10 cm diameter, black writing: "Carlon Sewer Pipe #43015ASTMD2729 Performance 1500# Crush 5NJ3T7B"
Illegal cinderblock mooring	2 cinderblocks fastened together with rope
Fishing lubricant	
Coffee Mug	1970s, "Made in Japan"
2 tin lids	One 1950s lid with "Folger's Coffee" and "Can Opener;" one UID tin lid
Brown glass fragments	Possible beer bottle fragments

6.4 Notable Artifacts

Though it has been stated by treasure salvors that there was "nothing of interest" on the site, the 2014 field season revealed a number of significant artifacts (Weller 2001a:96). Ceramics, including olive jar fragments and Guadalajara Polychrome, helped provide a date range for the site. Fasteners were collected for later comparison to those recovered during the 1986 illegal looting incident (NPS 1986). A selection of notable artifacts is highlighted below.

6.4.1 Ceramics

Ceramics fragments located during the 2014 archaeological investigations included olive jar, Guadalajara Polychrome, tin-enameled coarse earthenware, and other unidentified coarse earthenwares. Two of the Guadalajara Polychrome fragments (one of which is in three pieces), contained decorations (Figures 38 and 39). Also known as *tonalá* ware, these ceramics were manufactured in central Mexico between 1650 and 1830 (Charlton and Katz 1979; Barnes 1980).

Figure 38. Guadalajara Polychrome ceramic fragment, note flower design (ECU Program in Maritime Studies 2014).

Figure 39. Guadalajara Polychrome ceramic fragment, note linear design (ECU Program in Maritime Studies 2014).

6.4.2 Possible Figurine

The project revealed what was initially thought to be a bone fragment, but after SEM analysis was determined to be ceramic. Possibly part of a figurine, the artifact contains a small hole and a raised patterned surface (Figure 40). There are cases of ceramic figurines recovered

from Spanish shipwrecks of the colonial period, such as those associated with *San José* (Florida Department of State, Division of Archives, History and Records Management 1976).

Figure 40. Possible ceramic figurine from the Pillar Dollar Wreck (ECU Program in Maritime Studies 2014).

6.4.3 Quartz

The 2014 project revealed one quartz fragment with possible gold flecks (Figure 41). Quartz can also be an indicator of gold deposits, and quartz with possible silver ore has been located on the wreck of *El Infante*, another ship from the 1733 fleet (BAR, DHR 2014).

Figure 41. Quartz fragment from the Pillar Dollar Wreck (ECU Program in Maritime Studies 2014).

6.4.4 Fasteners

A sample of fasteners was collected during the 2014 field season to be used for comparison to artifacts stored at SEAC. The purpose of this comparison was to determine whether the Pillar Dollar Wreck is without doubt the looted shipwreck that catalyzed the U.S. vs. Hampton, S. Hood, and W. Hood court case. The samples were x-rayed and de-concreted and await casting at ECU. After being cast, they will be compared to the SEAC collection.

6.5 Pillar Dollar Wrecking Event

Due to the site's proximity to the patch reef, it has been suggested that the Pillar Dollar Wreck was lost on the reef and was unable to be refloated (Meylach 1971:293). It was subsequently salvaged, burned, and possibly scuttled. Evidence of burning was found on timbers, ceramic artifacts, and bricks (McKinnon 2015:20). Weller (2001a:96) noted that the wreck "piled in over a moon-shaped reef and settled on the sandy bottom." Meylach hypothesized that the wreck most likely grounded on the reef, floated a few meters, and sank nearby, spilling its contents along the way. He proposed that the sand most likely buried the shipwreck trail (Meylach 1971:293).

While the detailed wrecking event of the Pillar Dollar Wreck is unknown, the archaeological record provides some insight into the site's orientation. The broken and splintered keel is characteristic of a traumatic grounding or wrecking event (Figure 42). This, coupled with the scatter of artifacts on the reef, supports the hypothesis that the ship grounded on the shallow reef.

Figure 42. Splintered keel of the Pillar Dollar Wreck (ECU Program in Maritime Studies 2014).

Furthermore, large gaps were noted between the garboard and hull planking, and the floors were detached from the keel. While this may be attributed to treasure salvage or other illicit activities, this may have been caused during wrecking. Accounts are known of treasure salvors removing timbers to access holds or artifacts underneath planks (Meylach 1971:115).

Consistent with a wrecking and salvage scenario is the overall lack of large artifacts. Based on the relatively low number of artifacts recovered by modern salvors and collected during the 2014 field season, data further suggests that the site was salvaged in antiquity. Aside from the two cannon and one anchor reportedly recovered by salvors, archaeologists did not note any other cannon on the site, though extensive searches for cannon have not been conducted. A trail of cannon may be nearby from the sailors' attempts to lighten the ship prior to its loss.

6.6 Site Formation Processes on the Pillar Dollar Wreck

6.6.1 Natural Site Formation Processes

General change to the Pillar Dollar Wreck site can be understood based on past archaeological and condition assessments, the 2014 field season, and treasure salvor publications. Natural site formation processes acting upon the site were recorded both in condition reports and during the 2014 archaeological investigations (Lawson and Tillman 2001; Conlin and Seymour 2005; Choate 2006; Lawson 2012). One report noted the presence of strong currents and rough conditions (Choate 2006). Archaeologists noted that currents alternately expose and bury the site and create scouring around ballast stones and timbers (Lawson and Tillman 2011). A condition assessment noted the site was more covered than usual in 2012 (Wilson 2012). Similarly, hurricanes can be powerful scrambling devices; in 2005 Hurricane Wilma exposed timbers, though they were later covered by currents (Choate 2006). Exposed areas of timbers contained algae and other marine growth, suggesting certain sections of timbers were exposed regularly (Figure 43) (Conlin and Seymore 2005; Lawson and Bayliss 2010). The timbers also contained toredo worm damage, though part of the hull survived because it was covered with ballast and sand. Iron artifacts were completely concreted, as noted during the 2014 project. The reef also contained a concreted iron spike and bar shot, which were completely cemented to the reef bottom. Photographs of the site between 2006 and 2012 are included in Appendix W to demonstrate change over time.

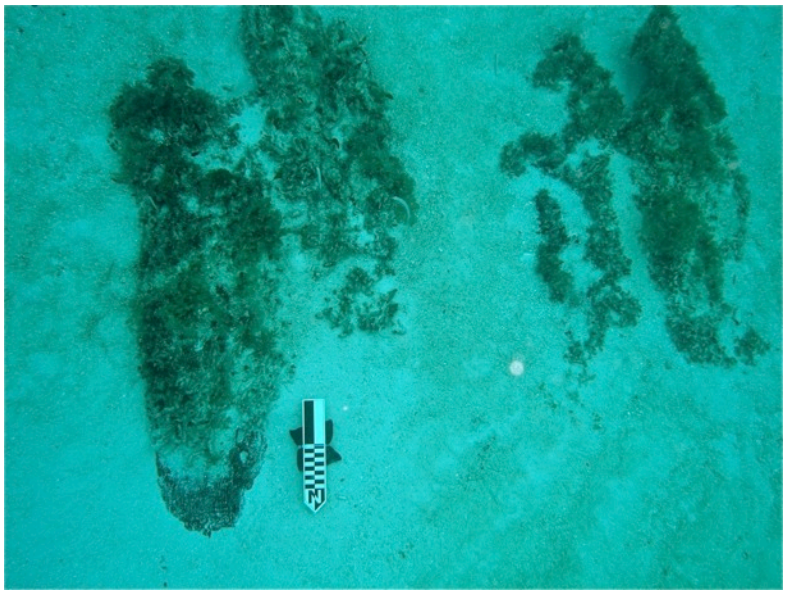


Figure 43. Timbers covered with marine growth on the Pillar Dollar Wreck (Lawson and Bayliss 2010).

6.6.2 Cultural Site Formation Processes

Since its relocation in the 1960s, cultural site formation processes have consistently affected the Pillar Dollar Wreck. Evidence of modern cultural disturbance was noted in past archaeological condition reports, treasure salvor publications, and during the 2014 field project. Cultural site formation processes included scrambling devices and extracting filters. Treasure salvor and looter scrambling devices included digging holes on the site, which left modern artifacts behind. Salvor Tom Gurr dug holes in the site in the 1960s but found "nothing on the site at all" (Weller 2001a:96). The 1992 NPS condition assessment reported looting activities in the form of holes at the site (NPS 1992). Scattered ballast and outlier timbers may also be a result of past treasure salvor activities. The three looters that sparked the U.S. vs. Hampton, S. Hood, and W. Hood court case possessed geologic hammers, spring-handled hammers, and trowels on board their vessel, which sheds light on some of the tools looters have used to damage the Pillar Dollar Wreck (NPS 1986).

Treasure salvors and looters also acted as extracting filters on the site. Salvors Sapp and Savage used 10 cm airlifts to remove sand overburden from the site (Weller 2001a:96–97). Reportedly, an iron anchor was removed from the area and supposedly resided in front of the Caloosa Cove Lodge on Lower Matecumbe Key when Weller (2001a:8) published his book. Ward (2014:11) noted that he dived the wreck but found "nothing of interest." When he brought friends to the wreck in 1967, he reported recovering spikes after hand fanning on the site. Ward's friends intended to continue to "work the wreck" but no other details were provided in the rest of the publication (Ward 2014:47). In 1963, two cannon were reportedly recovered from the area, as well as some Spanish pillar dollars. Artifacts were reportedly collected from the reef, though there was no mention as to the objects' whereabouts after collection (Meylach 1971:293).

Another example of a scrambling device is the inclusion of modern objects in the site. In 2004, archaeologists noted a long section of black line in the southeastern area, which was possibly used to attach a buoy to mark the site (NPS 2004). One archaeologist, Lawson, noted an illegal mooring on the site in July 2012, which consisted of two cinderblocks connected with chain and rope. Though there was no evidence of looting on the actual site, the archaeologist noted that the strong current could easily cover any holes (Lawson 2012). During the 2014 archaeological project, divers noted modern material as deep as 60 cm, suggesting it was deposited during illegal digging (McKinnon 2015). Intrusive objects included a cinderblock mooring, a coffee mug, a PVC pipe, and an encrusted Folger's coffee can lid (Figures 44 through 47).

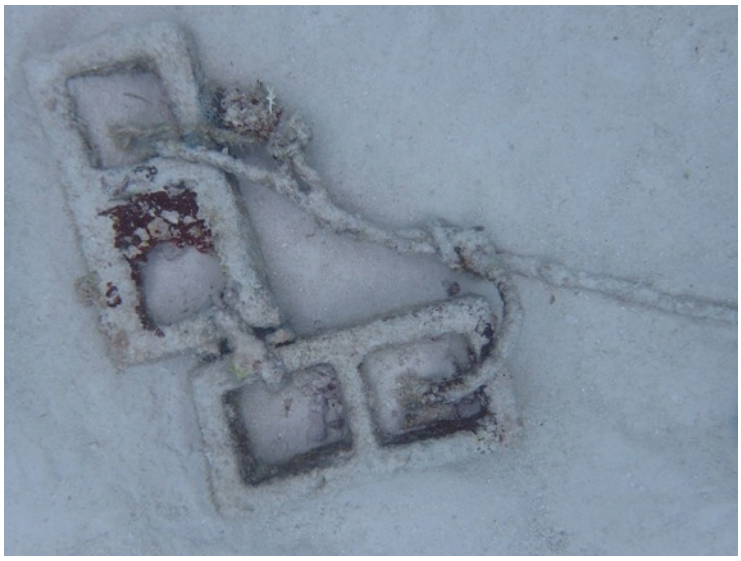


Figure 44. Illegal cinderblock mooring to the south of the Pillar Dollar Wreck (ECU Program in Maritime Studies 2014).

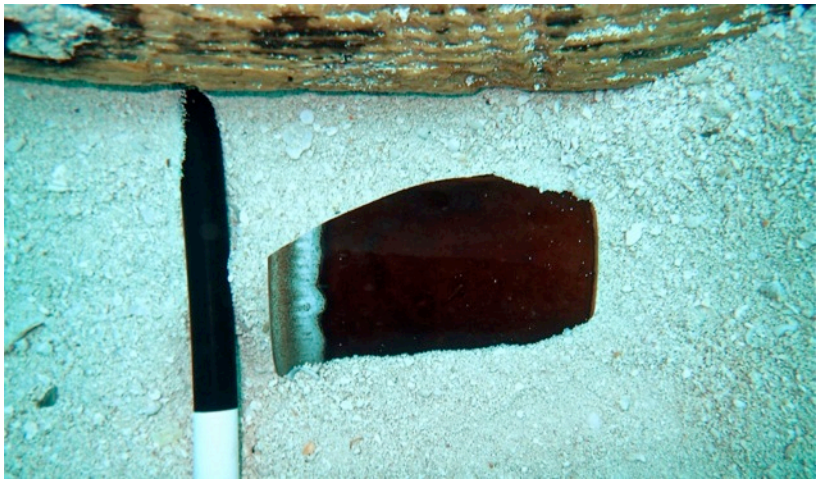


Figure 45. Coffee mug on Pillar Dollar Wreck (ECU Program in Maritime Studies 2014).

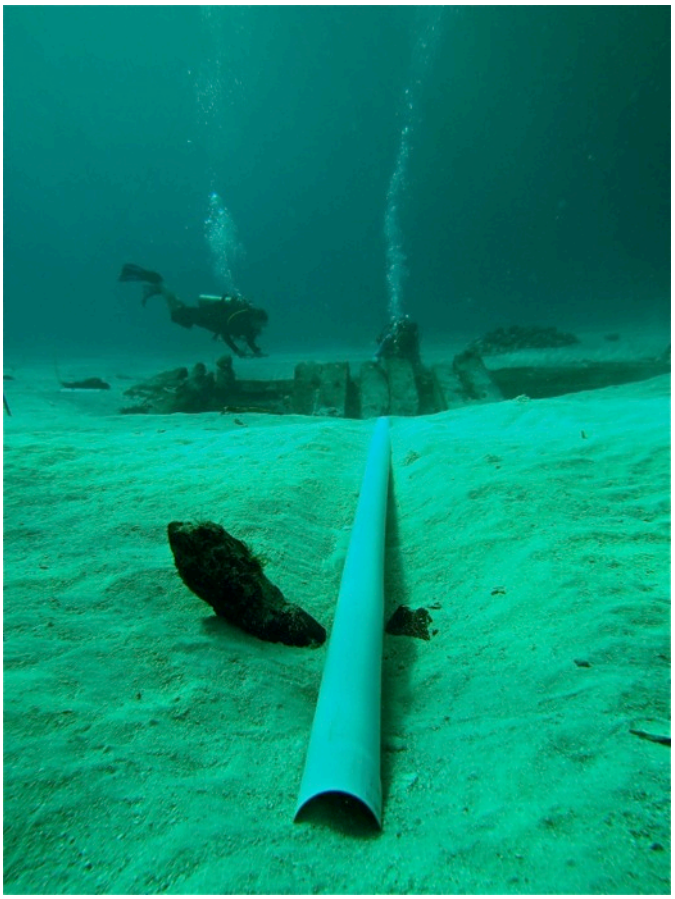


Figure 46. PVC north of concentrated timbers on Pillar Dollar Wreck (ECU Program in Maritime Studies 2014).

Figure 47. De-concreted Folgers' lid collected from Pillar Dollar Wreck (ECU Program in Maritime Studies 2014).

During the 2014 excavations, the illegal mooring line shifted locations. The mooring was photographed on the first reconnaissance dive and consisted of two cinderblocks attached with black rope. On the first dive, the mooring line was leading to the southeast, following the flow of the current, however, on the seventeenth day of diving, the line was found curled in a pile close to the cinder blocks and a section of it was frayed and torn. This could be a sign of recent visitation or impacts to the site. Archaeologists also noted evidence of the use of propwash deflectors at the site. When Unit 4 was excavated, timber debris and small fragments of artifacts were broken and scattered throughout the unit; the unit and artifacts were in a worse state compared to surrounding units. Unit 4 was also missing timbers, which may have been removed by treasure salvors. A 60 cm by 50 cm coral head in Unit 4 may have been dragged from the reef about 35 m to the southeast. Treasure salvors on other sites reported dragging coral heads out of the way of excavation or to moor to them (Ward 2014:137).

Formal archaeological investigations have served as extracting filters and scrambling devices. Archaeologists removed sand overburden and collected artifacts, ballast, and timber samples, and collected modern artifacts and removed an illicit mooring, all examples of extracting filters (Broward 1985; Pomeroy 1987; McKinnon 2015). Scrambling devices included adding modern artifacts in the form of PVC pipe and rebar datums (Broward 1985; Pomeroy 1987). The 2014 team also "scrambled" Unit 4 when they filled it with ballast, iron encrustations, and coral collected from other units during the project; the team left vinyl timber tags and steel nails in each timber throughout the site.

Table 29. Summary of site formation processes on the Pillar Dollar Wreck.

Natural	**Cultural**
Marine organisms (toredo worms, coral growth)	Use of propwash deflectors, airlifts, dredges
Currents, surge, wave action	Movement of coral head
Hurricanes	Holes dug in site
Concretion of iron	Artifact recovery (salvor and archaeological)

Wrecking event (loss of cargo)	Modern objects deposited on site
Seabed Movement (burial, sand scouring)	Movement of coral head
	Movement of ballast
	Excavation, probing
	Wood and ballast samples collected
	Salvage in antiquity

6.7 Comparative Study: Nuestra Señora del Populo

Nuestra Señora del Populo, also known as *El Pinque* or *El Populo*, served as the scout warship of the 1733 fleet and was owned by the King of Spain. It was commanded by Captain Gaspar Lopez Gonzalez and did not have any registered cargo, but nonetheless carried indigo, hides, brazilwood, boxes of gifts, citrus, tobacco, and 8 to 12 cannon. *El Populo* was the lightest of the vessels, between 150 to 250 tons, and was 35 miles north of the fleet when it wrecked in the Biscayne Bay area (BAR, DHR 2005).

According to historical records, the captain of the ship deployed the bow anchors as hurricane winds pushed *El Populo* closer to the shallows. This held the ship in place until winds shifted, causing the vessel to swing around on the anchor line and strike a coral head. The hull ruptured, ballast spilled out, and the vessel drifted until it hit a reef again and sank to its main deck. The cargo was lost but the crew and passengers survived because the captain and crew of the nearby advice boat, *El Aviso*, sent a longboat to retrieve survivors. Those from *El Aviso* and *El Populo* then travelled to shore and waited for *El Africa* to provide aid (BAR, DHR 2004). *El Africa* made repairs and sailed back to Spain, carrying those from both *El Populo* and *El Aviso*, and arrived 25 September 1733, unaware of the fate of the rest of the fleet (Weller 2001a:55). The rest of the survivors in the salvage camps were also unaware of the location of *El Africa*. *El Populo* and *El Aviso* were found shipwrecked and empty and it was assumed those onboard took longboats to shore. Some officials assumed a passing English vessel picked up the shipwrecked

passengers, taking them to Spain. Officials also considered the possibility that *El Africa* returned safely to Spain because at its last sighting, the vessel still had all of its masts (*Archivo General de Indias* [AGI] 1733; BAR, DHR 2004).

6.7.1 Treasure Salvage

Carl Ward, Lee Harding, Bob McKay, and Carl Frederick relocated *El Populo* in September 1966 (BAR, DHR 2004). The ballast pile at that time was 21.3 m long by 9.1 m wide. The group dived the site in secret for two years, both to hide the site from other treasure salvors and to avoid trouble with the law. In 2014, Ward published an account of the group's actions on the site. This book was a daily log of activities on the site and provides insight into site formation processes, especially those related to treasure salvage.

The group was unsure of the ship's identity until they located a 1732 pillar dollar coin and compared the wreck location to Spanish salvors' maps (Ward 2014:40). No anchors were found on the site, fostering the idea that the ship broke away from its anchors during the wreck (Ward 2014:63–64). The group worked with a dredge to remove approximately 1.2 m of sand, below which lay ballast, wood, and iron (Ward 2014:17). More than a meter below the sand was a layer of wood with another layer 0.5 m below that, with spikes and ceramics between the layers (Ward 2014:203). The divers found a wealth of artifacts, but no valuable "treasure" since the ship did not carry any. Most of the recovered artifacts were placed in a swimming pool to keep them wet (Ward 2014:80). Ward (2014:204) glued together many of the ceramic fragments, though some of the low-fired pottery "crumbled away." Ward (2014:195) placed a number of cannon balls in a bucket of fresh water behind his house, which was later stolen. The 1732 pillar dollar coin was eventually sold for $1,000 (US) (Ward 2014:101). Ward's book provided some insight as to where some of the artifacts recovered by treasure salvors ultimately ended up.

Unbeknownst to Ward, at least five other treasure salvor groups worked the site simultaneously (Ward 2014:160). In one instance in February 1969, Ward's group returned to the site and found that four cannon were missing and a 55-gallon drum was deposited on the site (Ward 2014:158). The site was dredged extensively and a pile of cannon balls was missing (Ward 2014:162). A ditch was trenched along the south side of the site and isolated holes pocked the area. Ward later discovered Meylach, another treasure salvor, removed two cannon. A Park officer removed at least one, and other treasure salvors took the rest (Ward 2014:159, 178, 207). Meylach chiseled the coral off the cannon and eventually displayed one in his yard (Meylach 1971:62). Ultimately, 14 cannon were removed from the site (Meylach 1971:213).

In April 1969, state of Florida personnel warned Ward's group to stop removing artifacts from the site. In December 1969, Ward's group visited the site, despite warnings and noticed the southern area had been dredged 1.5 m under the grass (Ward 2014:178). This occurred again in April and June of 1970, with holes pocking the north side of the site (Ward 2014:183,188). By 1971, Ward's group claimed to be working outside of Florida's three-mile territorial limit, but a State Archives Bureau representative for the Secretary of State for Florida informed the group that the federal and state governments made a decision in October 1970 to extend the state's three-mile territorial zone boundary, making it illegal to salvage *El Populo*. After this, the group ceased salvage operations on the site (Ward 2014:208–209).

A list of artifacts recovered from the site as relayed by Ward (2014) can be found in Appendix H. Though most likely incomplete, the list illustrates the types of artifacts the salvors recovered. The book did not discuss the artifacts other salvage groups collected from the site and some of the listed quantities of artifacts were obscure. For example, Ward (2014:176) wrote multiple times that "bucketfuls" of conglomerates were removed from the site. Ward also did not

always disclose where the artifacts went after they were collected, but it can be assumed that all went into private ownership.

6.7.2 Archaeological Work

El Populo (site number MO00147 and BISC-UW-23) was included in Biscayne National Monument in 1968 (later Biscayne National Park in 1980) and is managed by NPS. In 1983, an NPS official apprehended two amateur divers conducting dredging operations on the site (Indiana University et al. 1988:17). Upon snorkeling over the site, the official noticed a cloud of sand and a yellow bucket attached by rope to the divers' boat. Inside the bucket was a small piece of metal with two small stones (Bidwell 1983). One diver admitted he dredged the site for artifacts but the NPS official determined the divers were not in willful violation of NPS regulations. From 3 to 11 March 1984, a student from FSU, accompanied by an archaeologist, surveyed *El Populo* as part of a project for an underwater archaeology class. The results, published in a paper in April 1984, detailed that the student recorded site bearings, examined cultural impacts on the site, measured cobble ballast and three timbers, took photographs, and created a site map (Figure 48). Broward's general assessment concluded that there was a lack of historic cultural material, though the site was littered with modern bottles, cans, and orange peels. Broward himself installed a datum 2 m east of the ballast pile, which consisted of a PVC pipe fit over a metal bar pounded 0.5 m into the sand, with a cinder block for added support. After conducting an arbitrary visual search pattern, Broward collected one *tonalá* ceramic fragment for diagnostic purposes. The artifact was curated and now resides at SEAC (Broward 1984).

From June through July 1984, SEAC officials conducted an archaeological survey in Biscayne National Park and examined *El Populo* (Wild and Brewer 1985:i). The archaeologists created a photomosaic of the site, conducted test excavations, and mapped the site using a grid

framework (Wild and Brewer 1985:56). Wild and Brewer claimed the site was relatively intact, with hull material preserved below the sand and ballast, which measured 22 m long and 8 m wide. The site plan generated during these efforts is illustrated in Figure 49.

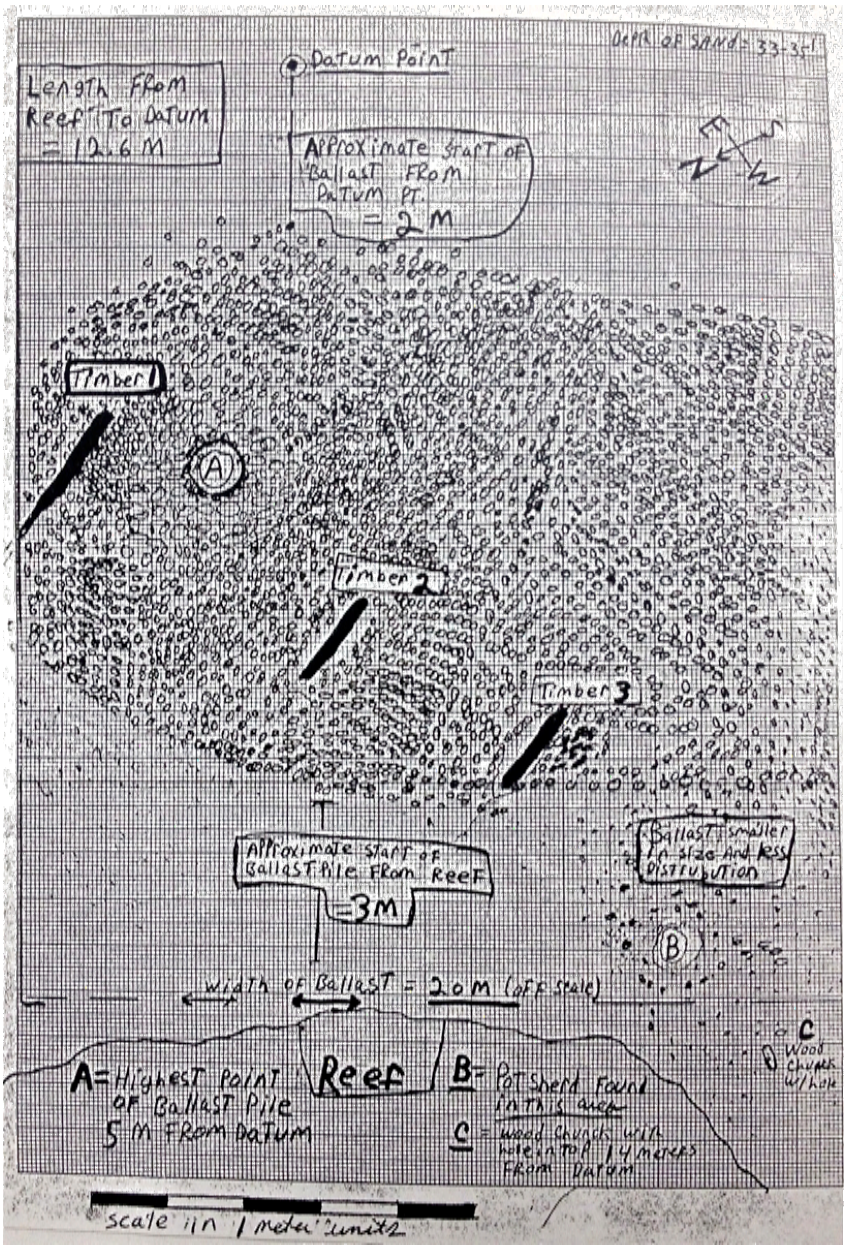


Figure 48. Broward's 1984 *El Populo* site plan (Broward 1984).

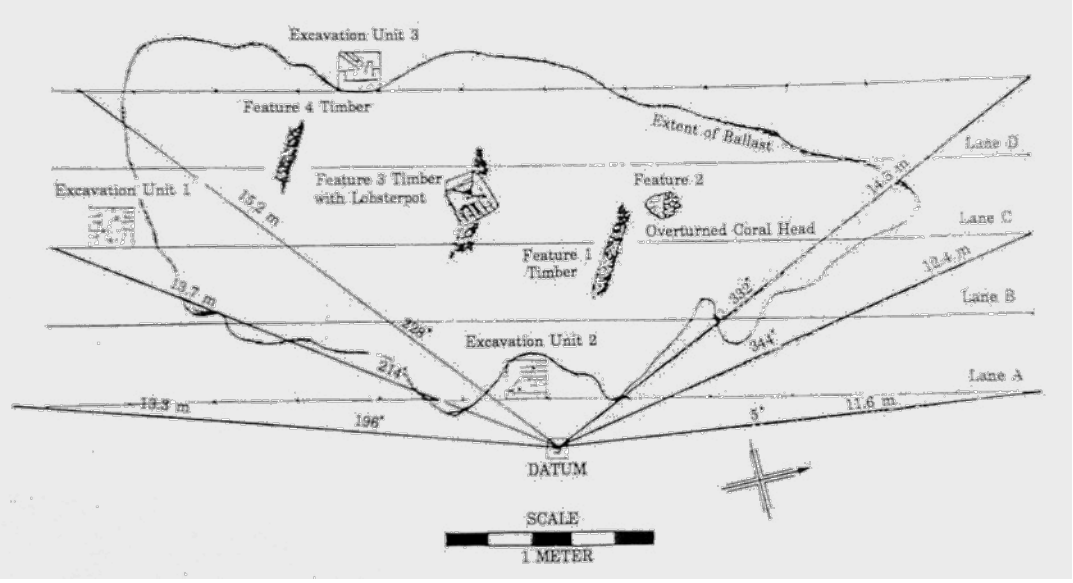


Figure 49. 1985 plan of *El Populo* (Wild and Brewer 1985:57).

In 1988, state of Florida underwater archaeologists, assisted by field schools from Indiana University and FSU, surveyed the 1733 fleet (Indiana University et al. 1988:1). The purpose of the survey was to nominate one of the wrecks for Florida's second Underwater Archaeological Preserve. Eleven sites were located and surveyed, including *El Populo*. The site, however, was not chosen as a possible candidate for the heritage trail because of its location in Biscayne National Park (Indiana University et al. 1988:25–27).

In 2004, archaeologists funded through the Florida Coastal Management Program partnered with BAR and FKNMS, John Pennekamp Coral Reef State Park, and Biscayne National Park to document the 1733 fleet and create a shipwreck heritage trail (McKinnon 2007:85). Archaeologists surveyed the sites over two and a half months in summer 2004 (McKinnon 2007:88). The wrecks were mapped with an azimuth placed in the center of each site, creating a general site plan (Figure 50) for use as recreational dive slates (McKinnon 2007:90).

Archaeologists recorded natural and cultural features and noted disturbances or excavated areas. The compiled information was used to rank the sites according to those recommended for

recreational diving. The outcome of the survey culminated in a guidebook, which detailed the history of the 1733 fleet and the sites as they look today, and a shipwreck heritage trail called the 1733 Spanish Galleon Trail (McKinnon 2007:91).

Figure 50. 2005 site plan of *El Populo* (BAR, DHR 2004).

As a result of the 2004 survey, archaeologists determined that threats to *El Populo* included looting and illegal salvage and that nomination to the NRHP may help prevent illegal salvage (Florida Master Site File, Bureau of Historic Preservation, Division of Historical Resources [FMSF, BHP, DHR] 2014a). The 2004 archaeological team noted no artifacts on site except modern remains such as the iron datum salvors installed years previously and general litter including a 55-galleon drum, beer cans, lobster pot lines, and a Pepsi bottle (BAR, DHR 2004).

In 2005 and 2006, archaeologists completed NRHP registration forms for *El Populo*, providing the most recent information about the site (FMSF, BHP, DHR 2014a). The ballast mound at the time was 30 m long and 16 m wide, with hull timbers covered by sand and eelgrass. The wreck, oriented northeast to southeast, rested on a coarse quartz sand pocket surrounded by coral reef that was within 4.5 m of the surface. Most of the hull was buried under ballast and sand and it is likely that the buried timbers are still intact. *El Populo* was placed on the NRHP in June 2006 and is monitored regularly to control illegal looting (BAR, DHR 2004).

6.7.3 Site Formation Processes

Presently, *El Populo*'s ballast serves as an artificial reef, creating a patch reef community with hard and soft corals, sponges, sea fans, and various marine life (Figure 53) (FMSF, BHP, DHR 2014a). The coral encrustation and sea life testify to this shipwreck's time in its watery environment. From the moment the ship wrecked, various natural and cultural processes acted upon *El Populo* that influenced how the site is oriented. The ship wrecked in a high-energy environment in the shallows near shore. Noncultural scrambling devices, such as wave and current action, have long since dispersed ship material away from the primary area of ballast (FMSF, BHP, DHR 2014a). Artifacts worked their way under the hull and between wooden beams or were scattered around the site in the sand (Ward 2014:186–188). The anchors, mast and rigging, and personal possessions of the passengers were lost. *El Populo* hit a section of reef and dropped ballast before continuing on and sinking 250 m away (Meylach 1971:212; Weller 2001a:60). Upon sinking, lighter objects floated away and organic objects broke down as the ship settled onto the hardpan bottom. Exposed timbers were eaten by toredo worms, though part of the hull survived because it was covered with ballast and sand.

Evidence of cultural disturbance was exhibited throughout the site in the form of a scatter of ballast stones that lay beyond the concentrated main area, as well as a general scrambled appearance of portions of ballast (FMSF, BHP, DHR 2014a). Ship timbers were also exposed in the center of the mound, as well as three holes present in the ballast pile (Ward 2014). Other scrambling devices include: the tossing of bottles into the water, dragging anchors over the site to moor onto the wreck, knocking concreted ballast apart with hammers, and leaving soda cans and a spear fishing CO2 cylinder on the site (Ward 2014:114–117). Ward (2014:137) also described how the group moved a large coral head 9.1 m by dragging it with the boat to provide a better mooring position on the site. The coral head initially rested on top of the ballast pile but was moved to the grass on the eastern edge of the pile and it was not stated if the coral head was left in that position or is still there today. The group also installed marker buoys around the site (Ward 2014:45). Other treasure salvors left dive weights attached to rope on the reef, perhaps as markers (Ward 2014:151–152). Treasure salvors scattered artifacts and timber fragments with dredges and propwash deflectors and scattered ballast and sea grass (Weller 2001a:67). Later, archaeologists installed datum points on the site (Figure 51). Treasure salvors acted as an extracting filter when they removed cannon and artifacts from the site (Figure 52) (Ward 2014). Archaeologists also removed artifacts for diagnostic purposes, therefore acting as extracting filters (Broward 1984).

Table 30. Summary of site formation processes on *El Populo*.

Natural	**Cultural**
Marine organisms (toredo worms, coral growth)	Use of propwash deflectors
Currents, surge, wave action	Use of airlifts/dredges
Hurricanes	Trenches, holes dug into site
Concretion of iron	Artifact recovery (salvor and archaeological)
Wrecking event (loss of cargo)	Modern objects deposited on site
Burial by sand	Movement of coral head
	Datum point installation
	Test pit excavations

	Anchor dragging over site
	Salvage in antiquity
	Chiseling apart ballast

Figure 51. Datum installed by archaeologists on *El Populo* (BAR, DHR 2004).

Figure 52. Martin Meylach with *El Populo* cannon (Meylach 1971:62).

Figure 53. Archaeologists measure *El Populo*, an artificial reef (BAR, DHR 2004).

6.8 Comparative Study: San Pedro

The second site used for comparative study is that of *San Pedro*, a 287-ton Dutch-built merchant galleon owned by Gaspar de Larrea Berdugo (BAR, DHR 2005). It carried 16,000 *pesos* in Mexican silver specie, cochineal, indigo, tanned hides, rare spices, precious jewels, Chinese porcelain, and Mexican wares. It was near the head of the fleet when it struck and crossed a reef at Lower Matecumbe Key. Upon grounding during the hurricane, the vessel remained primarily in tact (FMSF, BHP, DHR 2014c). Though it was full of water and the decks were awash, most of it was salvaged after the Spanish first burned the hull to the waterline to allow access to the cargo holds. Salvaged cargo was taken to a camp on Indian Key, and more specie was salvaged than was actually registered in the manifest (BAR, DHR 2005).

6.8.1 Treasure Salvage

Modern salvage took place in the 1960s and 1970s (FMSF, BHP, DHR 2014c). The shipwreck was located in an area that McKee leased for exploration from the state in 1952. He was initially unaware of the ship's existence within his lease area, instead choosing to focus on

other shipwrecks (Weller 2001a:175). The wreck of *San Pedro* was one of the first to be located when two other treasure salvors noticed the ballast pile in 1961 during an aerial search (BAR, DHR 2004). Though it was in McKee's leased area, the two men salvaged the site. Airlifts revealed the sand was merely a meter to the hardpan bottom (Weller 2001a:177). The two treasure salvors recovered artifacts from the site for over a year before passing it on to Bob Weller, another treasure salvor. When Weller salvaged the site, he described the ballast pile as 23 m long by 11 m wide (Weller 2001a:178). The stern section was excavated 4.5 m into the sand but little ballast was disturbed; airlifted overburden was moved 11 m away into the surrounding grass. Much of the ballast was still intact until 1963 because most treasure salvors were unwilling to move large amounts of stone, uninterested in timbers beneath (Weller 2001a:180).

Mel Fisher's Armada Research Company, Inc. gained control of McKee's lease (State lease 2044 A6) in 1965. A treasure salvor working with the group used a propwash deflector on the ballast pile, exposing three cannon (Weller 2001a:181). They were left behind but Weller and two friends later illegally collected them and displayed them in their yards. A state lease was also granted to Armada Research Company, Inc. in 1967 and the material collected under this lease was divided between the Armada Research Company, Inc. and the state of Florida in 1968 (FMSF, BHP, DHR 2014c). Florida retained 25% of the artifacts in return for allowing treasure salvors to recover materials from the site. Treasure salvors removed sand, ballast stones, and 2.5 m timbers in search of coins (Meylach 1971:70–71). Many coins were found in a sand pocket on the offshore side of the site that stretched to the eelgrass (Meylach 1971:75–76). After wrecking, coins had settled into cracks in the hardpan sea bottom and were subsequently covered over with sand and compacted shell. Those artifacts from *San Pedro* that were divided in 1969 and 1972 between Armada Research Company, Inc. and the state of Florida are in a permanent facility in

state collections (Florida Bureau of Historic Sites and Properties, Research and Preservation Laboratory 1969). The rest of the divided artifacts went to the treasure salvage company under contract with the state, thus going into private ownership. The artifact lists, though most likely incomplete, are included as Appendix I, the information for which came from division reports on file with the state. The artifacts from *San Pedro* owned by the state are listed in Appendix J.

6.8.2 Archaeological Work

Archaeologists visited *San Pedro* over a number of years. The first archaeological survey took place in August and September 1977, in which state field agents Roger Smith and James Dunbar attempted to locate and survey the 1733 fleet. They were referred to *San Pedro* by a treasure salvor and noted that 90% of the site was affected by treasure salvors, but some ballast was undisturbed. Though recently looted, the site consisted of ballast, *ladrillo* bricks, timbers, and ceramic fragments. Coral heads were overturned and loose from the seabed, a wooden pry lever was stuck under one coral, potholes pocked the site, and bottles, cans, an airlift pipe, a prybar, and cinderblocks littered the site. The archaeologists installed a temporary datum near the center of the site and used a protractor to take detailed measurements to create a site plan (Figure 54). Minor hand fanning was employed to expose timber details and the archaeologists excavated a test pit to collect ceramic fragments for diagnostic purposes (13 fragments of Aztec IV blackware and one salt-glazed stoneware fragment). The archaeologists also collected ballast samples for diagnostic information, which currently reside in state collections (Smith and Dunbar 1977).

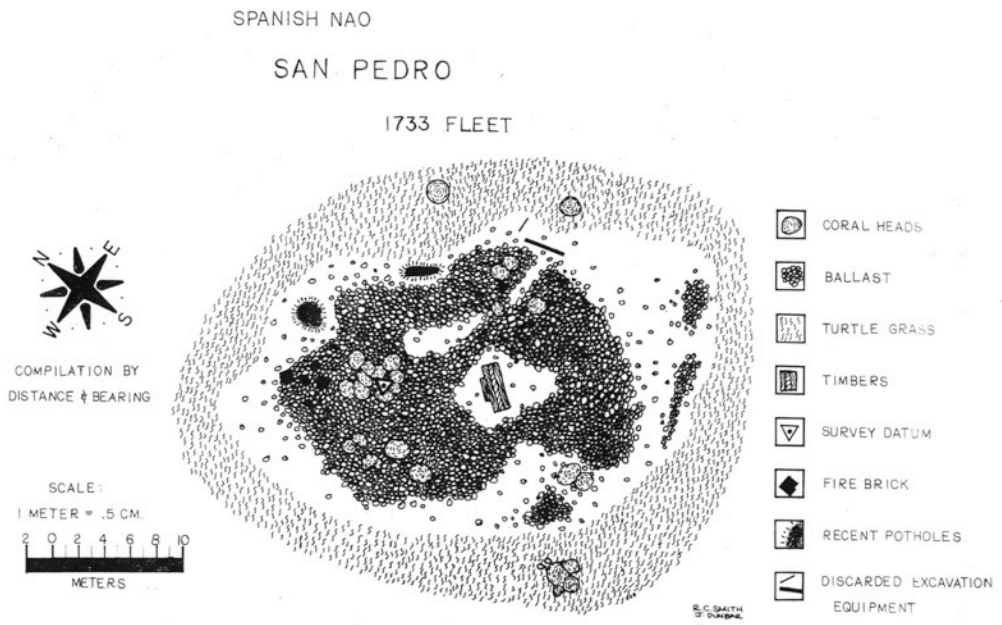


Figure 54. A 1977 site plan of *San Pedro* (Smith and Dunbar 1977).

From 24 June to 15 July 1988, state of Florida underwater archaeologists surveyed *San Pedro* with the help of Indiana University and FSU (Indiana University et al. 1988:1). Students, professors, and state archaeologists surveyed 13 sites and measured, photographed, videotaped, sketched, and plotted LORAN positions of the shipwrecks (Indiana University et al. 1988:22–25). Fieldwork resulted in a series of criteria to rank potential candidates for nomination as an underwater park (Indiana University et al. 1988:26). *San Pedro* was chosen as the best candidate for the state shipwreck preserve because of its picturesque location, abundant marine life, and relative site integrity compared to others. The team created an "enhanced site plan" for *San Pedro* (Figure 5), in which cannon and an anchor were installed on the site to emulate an undisturbed shipwreck (Indiana University et al. 1988:48). Using offsets and triangulations, the site was mapped after establishing a baseline along the longitudinal axis of the ballast mound. The team excavated a 50 cm by 50 cm unit to examine timbers and noted most were intact and well preserved. Some artifacts located during the survey included concreted fasteners, bricks,

and ceramic fragments, all left *in situ* (Indiana University et al. 1988:26). In April 1989, the Florida Department of State established an underwater park on the site (Smith 1991). A brochure and underwater guide were prepared as part of the underwater trail. In May 2001, it was listed in the NRHP (FMSF, BHP, DHR 2014c).

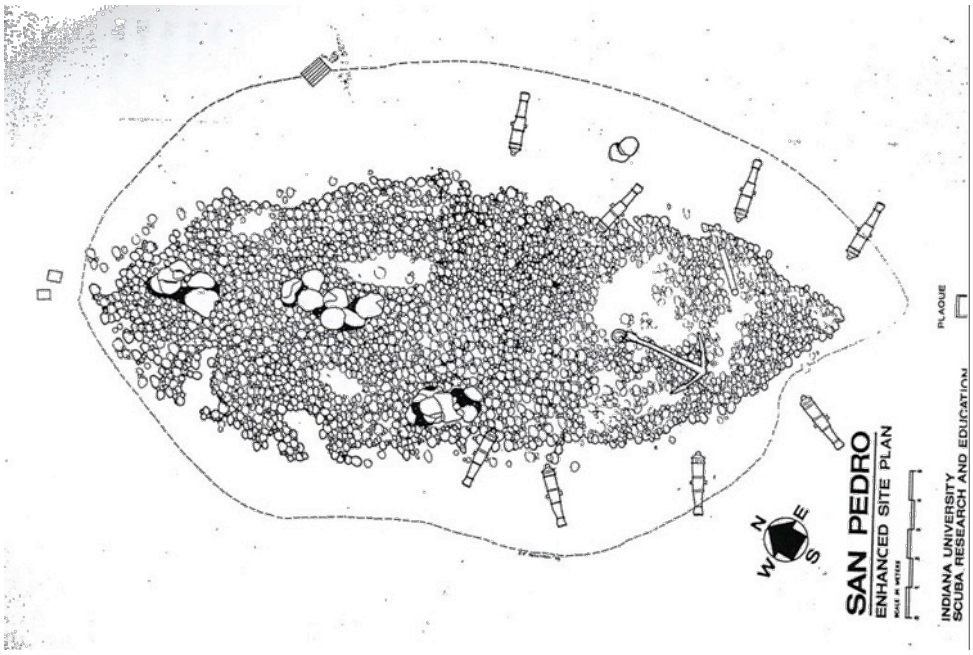


Figure 55. Enhanced *San Pedro* 1988 site plan (Indiana University et al. 1988).

In 2004, archaeologists surveyed *San Pedro* and mapped it with an azimuth placed in the center of the site area (McKinnon 2007:85, 90). Archaeologists created a general site plan (Figure 56) for use as a dive guide and recorded natural and cultural features, while noting disturbed or excavated areas. According to a 2013 survey by Florida archaeologist Franklin Price, six of the seven artificial cannon are still visible, though covered in coral growth. Firebricks were still present on the site, as well as the cannon and anchor (FMSF, BHP, DHR 2014c).

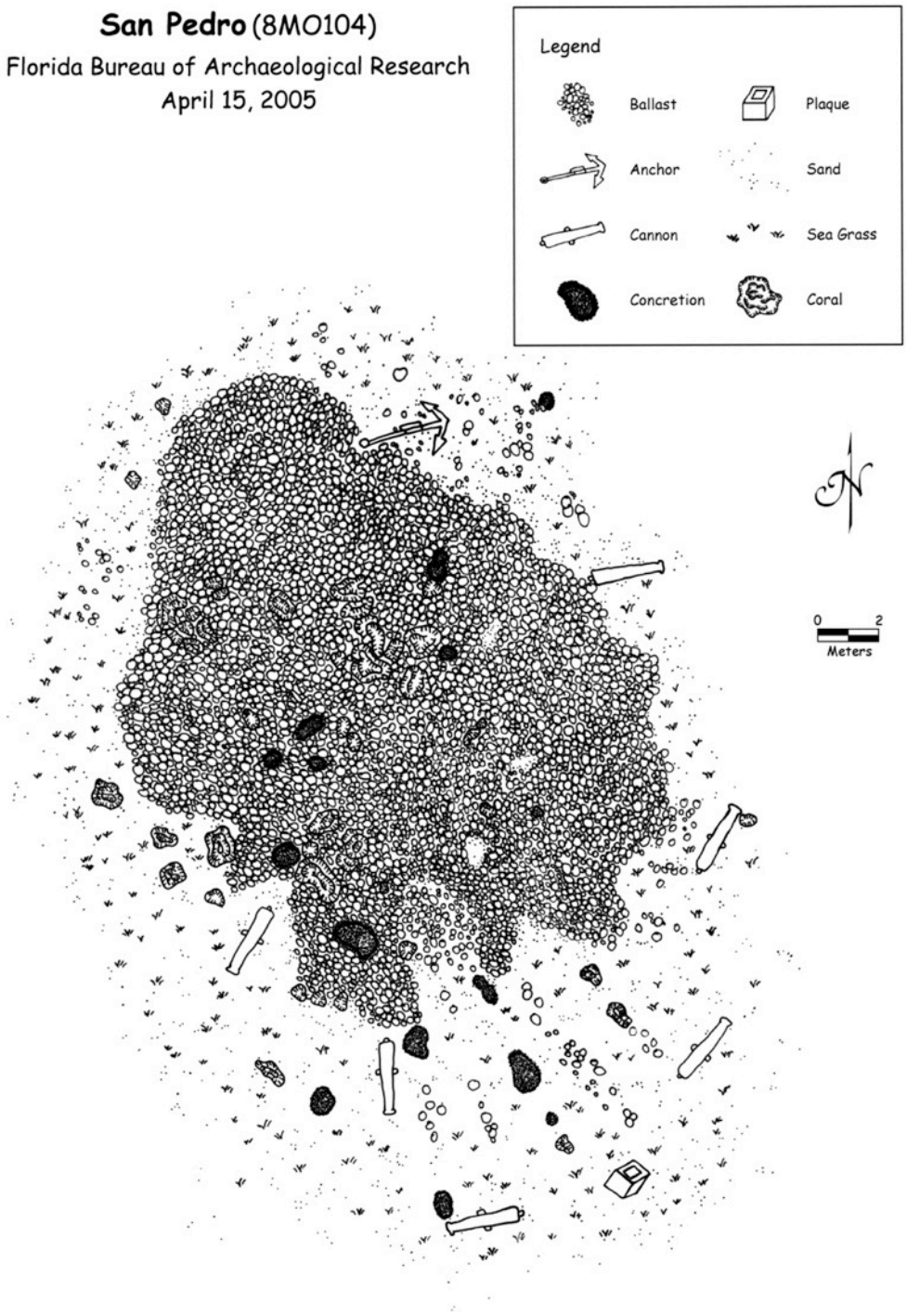


Figure 56. 2005 *San Pedro* site plan (BAR, DHR 2004).

6.8.3 Site Formation Processes

Today, *San Pedro* rests in a white sand patch that is 5.5 m to 6 m deep near Islamorada, within FKNMS (FMSF, BHP, DHR 2014c). Surrounded by turtle grass, the ballast mound is 27 m long by 9 m wide and is oriented from northeast to southeast. The hull timbers are covered with sand and marine vegetation and buried under ballast, creating an artificial patch reef with hard and soft corals, sponges, and general marine life.

The wrecking event, an extracting filter, removed material such as masts, rigging, and personal possessions from the site (FMSF, BHP, DHR 2014c). Spanish salvors in antiquity served as another extracting filter because they salvaged much of the cargo soon after the 1733 hurricane passed. After they burned the ship to the waterline, the lower hull filled with water, sand, and ballast, providing the timbers underneath with protection from toredo worms, waves, and currents. Current and wave action shifted sand and buried the site. Currents and surge also shifted objects from their original locations and caused coins and other small artifacts to settle between timbers and ballast or collect in small cracks in the hardpan bottom, as some treasure salvors noted (Meylach 1971). Iron artifacts became concreted and coral and other marine organisms grew on the exposed portions of the site. Exposed organic artifacts deteriorated or were eaten by toredo worms and other marine organisms.

San Pedro was the subject of the most extensive archaeological investigation and presents a wealth of information about how site formation processes are exhibited on a site in the Florida Keys over time. Modern treasure salvors removed artifacts and cannon from the site, acting as an extracting filter (Weller 2001a). Treasure salvors acted as a scrambling device by scattering ballast around the periphery of the site (FMSF, BHP, DHR 2014c). Their airlifts cut through seagrass and their propwash deflectors blew large holes into the sand (Figure 57)

(Meylach 1971:339–341). Modern objects, such as fishing weights and tackle, were left on the site, further acting as a scrambling device (Smith and Dunbar 1977). Lobster pots and fishing line were present as recent as 2004, a more recent scrambling device (BAR, DHR 2004).

Archaeologists acted as an extracting filter by removing objects from the site for diagnostic purposes (Smith and Dunbar 1977; Indiana University et al. 1988). Thus, archaeological activities have acted as scrambling devices, especially since state managers added replica cannon, an anchor, mooring lines, and a bronze plaque to the site after it became a state Underwater Archaeological Preserve. The replica cannon have since accumulated growth, as depicted in Figure 58.

Table 31. Summary of site formation processes on *San Pedro*.

Natural	**Cultural**
Marine organisms (toredo worms, coral growth)	Use of propwash deflectors
Currents, surge, wave action	Use of airlifts
Hurricanes	Sand movement
Concretion of iron	Artifact recovery (salvor and archaeological)
Wrecking event (loss of cargo)	Modern objects deposited on site
	Movement of coral head
	Datum point installation
	Test pit excavations
	Ballast samples collected
	Salvage in antiquity
	Installation of cannon, anchor, placard

Figure 57. Treasure salvors use airlifts on *San Pedro* in the 1960s (Weller 2001a:187).

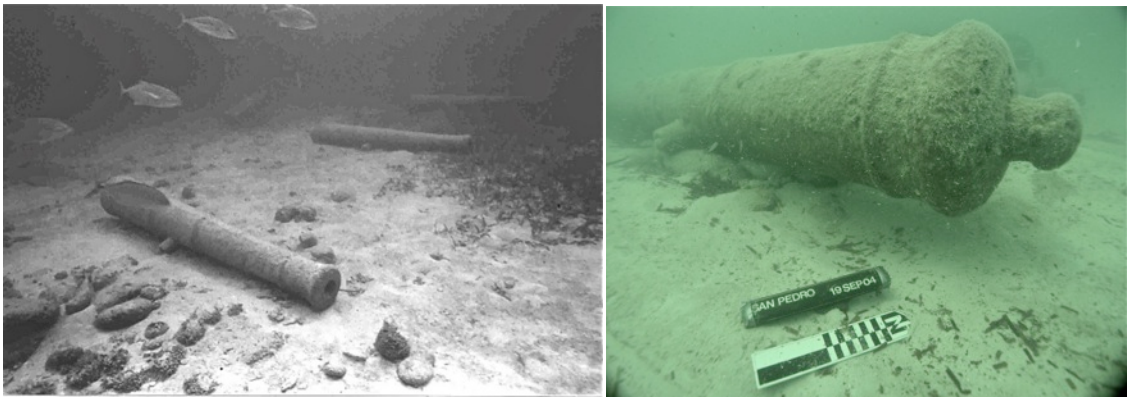


Figure 58. Artificial cannon in 1988 and 2004 (FMSF, BHP, DHR 2014c, BAR, DHR 2004).

6.9 Comparative Study: San José de las Animas

The third and final site used for comparative purposes is *San José de las Animas*, also known as *San Joseph y los Animas*, *El Duque*, or simply *San José*. Constructed in New England in 1728 and originally named *Saint Joseph*, it was 326 tons and carried 36 cannon. Owned by Don Joseph del Duque, it sailed in the vanguard of the fleet (BAR, DHR 2005). According to historic manifests, it carried 30,435 *pesos* in silver specie and bullion, sugar, chocolate, indigo, cochineal, dyewoods, cocoa, hides, ceramics, tobacco, and vanilla (FMSF, BHP, DHR 2014b).

During the hurricane, it ran aground off Tavernier Key in Upper Matecumbe Key, losing its rudder along the way. It was carried inward and left a trail of ballast and artifacts while carving a groove into the sand, coral, and limestone. It quickly flooded to the poop deck, but the passengers and crew made it to shore on rafts. It was not burned to the waterline and most of the general cargo was left behind so that efforts could be concentrated on the silver (BAR, DHR 2005). Ultimately, *San José* contained 236,247 *pesos* in unregistered contraband silver (BAR, DHR 2004).

6.9.1 Treasure Salvage

The site was initially relocated between 1950 and 1951 by fishermen and was shown to the salvor McKee, but it was not salvaged until 10 years later (FMSF, BHP, DHR 2014b). Two treasure salvors of Marine Tech Salvage Company, Inc., Gurr and Rudolf Paladino, used a magnetometer to relocate *San José* in June 1968. Buried under one to two meters of sand and seagrass, they used a propwash deflector to expose the intact ballast mound and found many artifacts. By July 1968, Gurr invited Mendel Peterson from the Smithsonian Institution to join him in the salvage of the shipwreck. George Fischer of NPS also accompanied Gurr to the site during initial salvage operations in 1968 (Indiana University et al. 1988:14). Many of the artifacts were recorded and sketched *in situ* and around 2,000 were cleaned and catalogued for display in the Smithsonian Institution (BAR, DHR 2004). As artifacts were located they were tagged and placed on a master chart and stored in fresh water before preservation (Weller 2001a:100). Ship timbers were measured and a plan of the site was drawn (Indiana University et al. 1988:15). As quoted in John S. Potter, Jr.'s *The Treasure Diver's Guide* (1988:226), Gurr stated:

> We removed over 3' of sand overburden on the west end of the wreck and over 6' on the east after cutting through the growth of eelgrass. On top of the

> intact ballast pile were located four swords, two flintlock pistols, a number of complete urns, bowls, and animal figurines of clay pottery. The wreck area is approximately 150' in length and 80' in width. There are 23 cannons scattered over the wreck ranging from 6' – 9' in length. Two anchors were found under the ballast at the east end, one 12' long and the other 18' through the shank. Twenty-five gold wedding rings were found in the ballast near the top. Silver coins were scattered all through. About 200 yards to the south we located the rudder, which still had the 25' shaft, pintles, and the lead-lined timbers intact. Also, we found four cannon, all 7' long, under the rudder. They were all covered with coral. The trunnions were all low and near the rear.
>
> We found 950 silver coins in all sizes, most in bad condition of sulfide. Coins in one cluster were in mint condition and we found several rare pillar dollars and *recortados* dated 1733 with the "F" assayer. One gold coin was found: a one escudo Seville mint, no date…Other salvage materials included 18 silver plates all hallmarked before 1700, small black glass figurines believed to be of Chinese origin, a barber's kit with ivory comb, two compasses, a pewter plate dated 1728, toys, carvings, and a human skull.

Gurr had a federal salvage license to recover artifacts from the site, believing it to be located outside of Florida's three-mile territorial limit (Weller 2001a:99). Because of this, he thought he did not need a state salvage contract. According to treasure salvor Meylach, the state believed the wreck was located within its territorial waters, and the Monroe County Circuit Court requested Gurr to halt operations on the site until state boundaries could be determined (Meylach 1971:234). Regardless of his 1967 salvage license, he lost the case against the state (FMSF, BHP, DHR 2014b). Gurr attempted to dispute the case but the judge ruled in favor of the state, requiring Gurr to cease excavations. Artifacts from *San José* were taken to Tallahassee until the issues could be resolved. Gurr was still intent on recovering artifacts from the site and entered into a contract with the state in which he relinquished half of all future artifacts to the state (Meylach 1971:236). At some point during these disputes with the state, the two-ton lead-sheathed rudder was removed and taken to Ohio where it was supposedly erected in front of a restaurant. In 1972, Gurr applied for another lease with a new salvage group called Undersea Mining Company and began excavating the site again (FMSF, BHP, DHR 2014b). In 1973,

Gurr's relationship with the state deteriorated because he did not receive his half of artifacts from the state after they had been processed in Tallahassee. As a result of Gurr's frustration, he dumped a number of artifacts onto the *San José* site in front of a TV crew. He was later arrested and charged with grand larceny after artifacts were found in a canal behind his house. He returned the artifacts to the state and pled guilty to conspiracy to commit grand larceny. The events with Gurr illustrate the relationship between one treasure salvor and the state of Florida and the difficulty with jurisdiction of historic shipwreck sites. According to treasure salvor Weller, soon after the case with Gurr, the U.S. Supreme Court in 1975 deemed *San José* was actually located outside the three mile limit and, therefore, not within the jurisdiction of the state of Florida (Weller 2001a:112).

San José was placed on the NRHP in 1975 to protect it from treasure salvage but the site was still looted for a number of years (FMSF, BHP, DHR 2014b). In 1980, Molinari filed an admiralty arrest for *San José*, claiming it was in federal waters and he could therefore salvage the site. He won his case and the state issued his salvage team, Island Treasures, Inc., Salvage Contract S-28 (BAR, DHR 2004). In 1992, Molinari also received a permit from the FKNMS, since the site fell within those boundaries, to continue working the site. Archaeologists reported that Molinari kept "reasonably good archaeological records" (FMSF, BHP, DHR 2014b). Since then, he has continued to salvage the site and submit reports to the BAR. A number of objects were collected over the years and Molinari presented site maps of excavations and distributions of ballast (Figures 59 and 60) (Appendix M) (Molinari 1999:17, 2004:12). The site was salvaged as recently as 2004, and recovered artifacts included Spanish and Chinese ceramics, silver and gold coins, gold rings, iron nails, and a cannon carriage cheek (BAR, DHR 2004). Of all artifacts collected under the contract, 25% went to the state and the rest remained with Molinari (Molinari

2004:12).

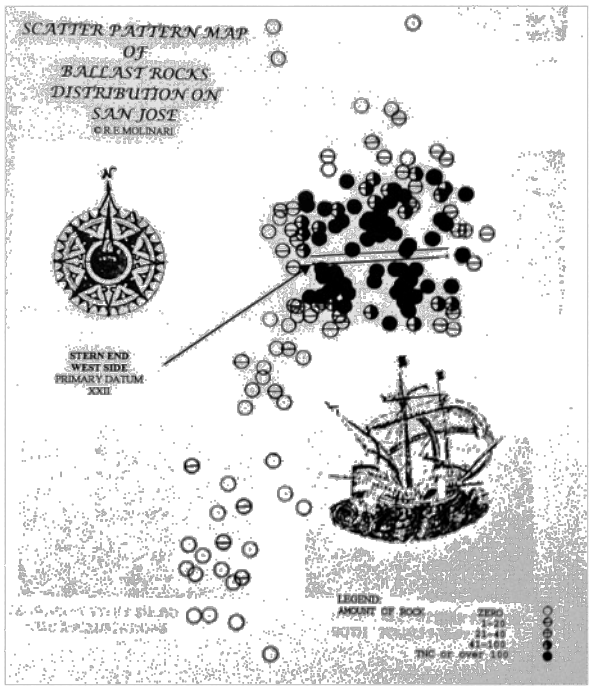


Figure 59. 1998 salvor site map of ballast dispersion on *San José* (Molinari 1999:17).

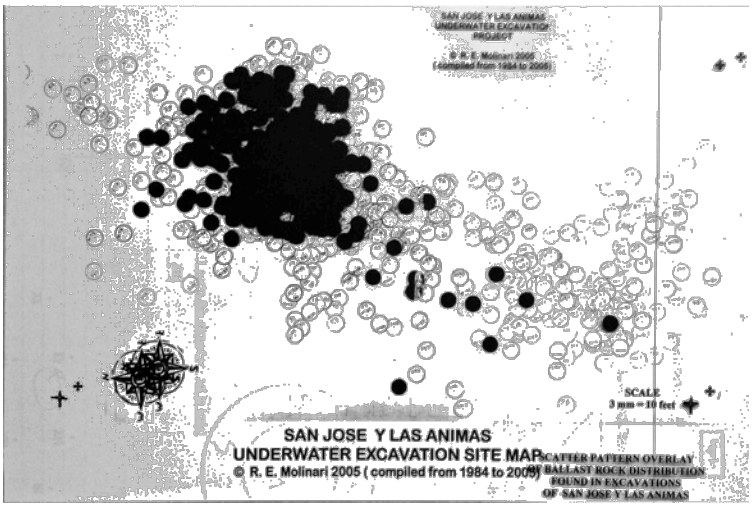


Figure 60. 2003 salvor site map of excavations on *San José* in 2005 (Molinari 2004:12).

The fact that *San José* was the subject of many salvage and looting operations illustrates the difficulty of recording all of the activities that have affected the shipwreck. It is unknown where artifacts recovered from salvage operations went; however, many were confiscated and are permanently stored in state collections, the list of which is included in Appendix K. Some

went into private ownership and some were thrown away, deteriorated, or lost completely (Florida Bureau of Historic Sites and Properties, Research and Preservation Laboratory 1972; Ward 2014). A number of wood, iron, ceramic fragments, and miscellaneous metal artifacts, including 8 corroded silver 4-*reale* coins, were donated to the Smithsonian Institution (Peterson 1971). Other artifacts, mostly consisting of coins, were auctioned in California (Weller 2001a:109–110). Division records on file at the state provide some insight into the types of artifacts that were collected and divided between Gurr and the state of Florida; these lists are included in Appendix L.

6.9.2 Archaeological Work

Due to the salvage operations that took place on *San José*, archaeologists visited the site beginning in the 1980s onwards to determine the extent of damage. In 1985, Dunbar and Moore, archaeologists working for the state, conducted a survey after the site was exposed by treasure salvors. The archaeologists took wood samples for later diagnostic lab identification; University of Florida wood analyst Dan Cring noted the ship was most likely English built (FMSF, BHP, DHR 2014b).

Though the site was discussed in a 1988 archaeological report, it was not surveyed or mapped with the rest of the wrecks of the 1733 fleet. The report mentioned that at the time of Gurr's salvage of the site in 1968, the wreckage measured 45.5 m long by 12.2 m wide and 23 iron cannon were present. As the site was uncovered and the lower hull section was exposed, the structure was partially mapped with a camera mounted on a Pegasus diver-propulsion vehicle. Despite the fact that two archaeologists worked alongside treasure salvors on the site in the late 1960s, the report stated that little archaeological data was actually generated from excavations on *San José* (Indiana University et al. 1988:14–15).

The site was officially surveyed and mapped by archaeologists in 2004 for inclusion on the 1733 Spanish Galleon Trail (McKinnon 2007:85). Archaeologists created a site plan (Figure 61) and recorded marine life and site conditions. At the time, the site was reportedly mostly buried and very little remained. Lying in nine meters of water, the site was littered with disarticulated pieces of ship timbers. The site was subject to propwash deflectors, which blew excavation holes 1.2 m to 1.5 m deep and 3 m to 4.5 m wide. There was little ballast visible but some pipe datums and mooring lines from salvage activities were still present on the site, with a single hardwood pulley sheave lying near a datum. Modern artifacts included a beer bottle, cement blocks, and an iron frame (BAR, DHR 2004).

Figure 61. *San José* 2005 site plan (BAR, DHR 2004).

6.9.3 Site Formation Processes

Today, *San José* is completely covered by sand and is still subjected to treasure salvor activity. As recently as 2004, the site was subject to propwash deflectors; visible evidence of propwash deflector holes are depicted in Figure 63 as the white "clean" areas of sand (BAR, DHR 2004).

An important extracting filter was the initial wrecking event itself, in which objects floated away or were lost as *San José* hit and dragged along the sea bottom. Currents and wave action could have carried some of the shipwreck and passengers' possessions away. The Spanish salvaged (or extracted) much of the silver cargo, along with other material objects (BAR, DHR 2004). Once the wreck settled onto the sea bottom, marine organisms grew on exposed portions of the site and toredo worms ate exposed wood.

The most influential formation processes were cultural activities. A number of existing photographs illustrate the condition of the *San José* site in the 1970s as treasure salvors and archaeologists conducted excavations (Figure 62). Modern treasure salvors and archaeologists "extracted" small artifacts, an anchor, and cannon from the site (Figure 64). Treasure salvors moved ballast in search of artifacts and used propwash deflectors and airlifts to move overburden off the site (Figure 65). Figure 66 depicts separated mounds of ballast and timbers as included in the FMSF documents; no caption or explanation for piling the timbers was provided (FMSF, BHP, DHR 2014b).

Full comprehension of the changes that have occurred at the site is difficult because it is almost completely covered with sand. In 2004, for example, very little was left on the surface because of the natural process of burial by sand (Figure 63). At the same time, modern objects on the site included an archaeological datum, which had considerable marine growth on its surface,

and mooring lines, which were not covered in marine growth, suggesting they were installed or used recently (Figure 67) (BAR, DHR 2004).

Table 32. Summary of site formation processes on *San José*.

Natural	**Cultural**
Marine organisms (toredo worms, coral growth)	Use of propwash deflectors
Currents, surge, wave action	Use of airlifts
Hurricanes	Removal of sea grass
Concretion of iron	Artifact recovery (salvor and archaeological)
Wrecking event (loss of cargo)	Modern objects deposited on site
Burial by sand	Movement of coral head
	Datum point installation
	Test pit excavations
	Wood samples collected
	Salvage in antiquity

Figure 62. *San José* in the 1970s (FMSF, BHP, DHR 2014b).

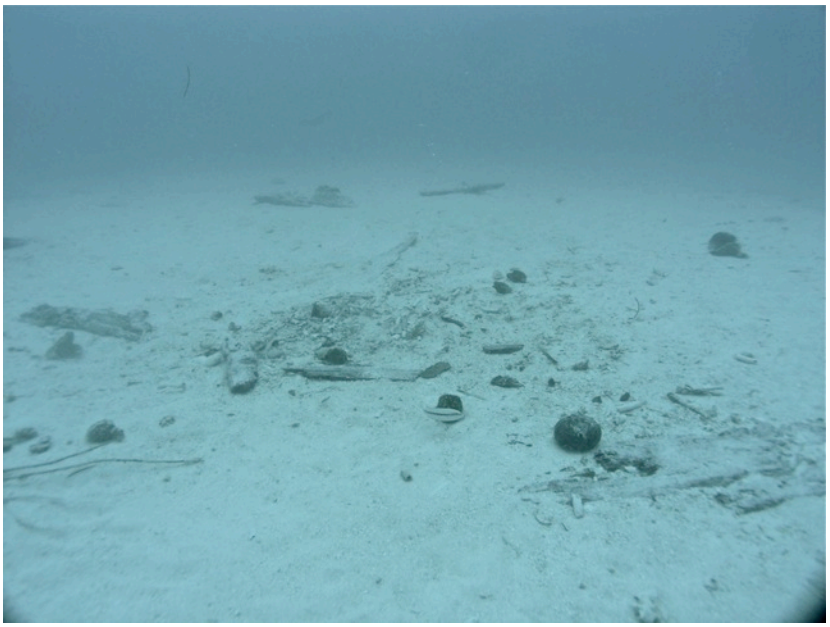


Figure 63. *San José* in 2004 (BAR, DHR 2004).

Figure 64. *San José's* anchor on the site in the 1970s after it had been moved from its original location (FMSF, BHP, DHR 2014b).

Figure 65. Treasure salvors use airlifts on *San José*, 1960s–1970s (Weller 2001a:121).

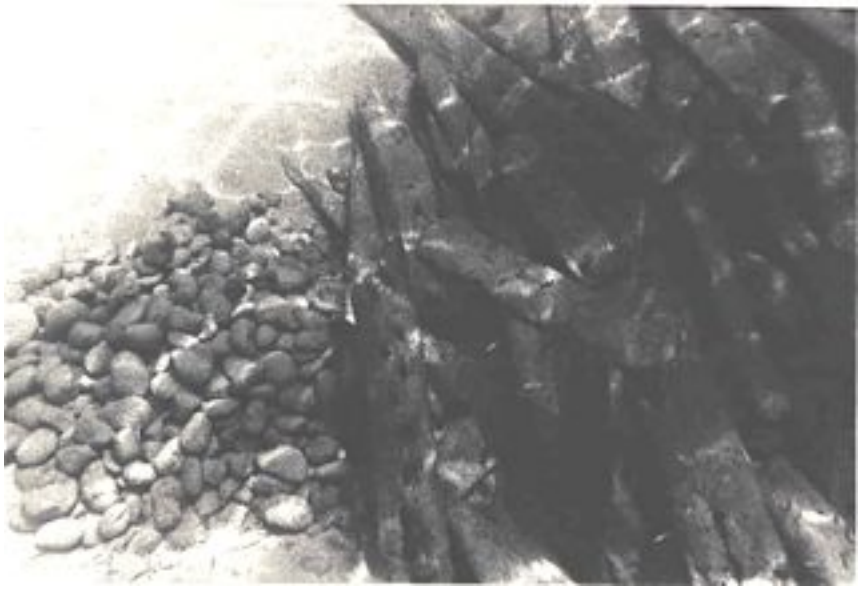


Figure 66. Separate mounds of ballast and timbers on *San José*, 1960s–1970s (FMSF, BHP, DHR 2014b).

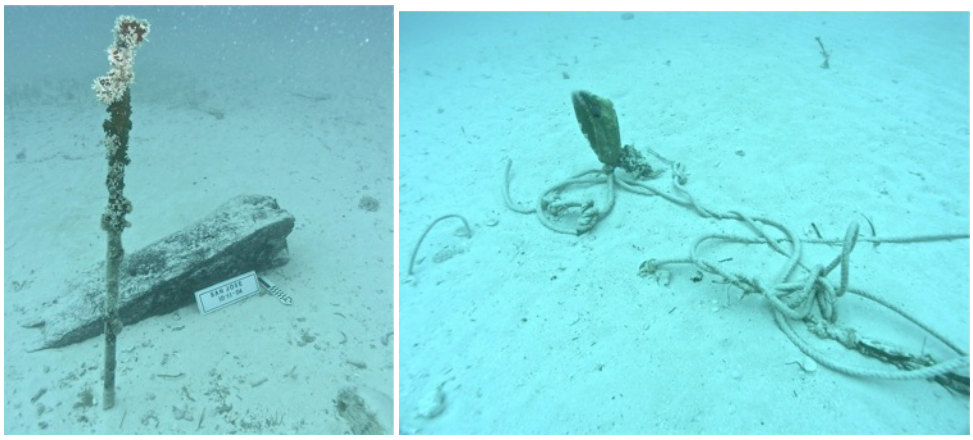


Figure 67. Datum and mooring lines on *San José*, photographed in 2004 (BAR, DHR 2004).

Overall, archaeologists recovered few artifacts from the 1733 fleet and the methods they employed were not as invasive as those used by treasure salvors. Artifacts may exist deep beneath the sand on some of the wrecks, but what matters is the protection of the sites for future enjoyment. Many of the recovered cannon and anchors were placed along highways or outside restaurants or dive shops (McKinnon 2007). Some of these objects were not conserved at all and today are in a state of severe deterioration; others however, were placed in museums by the state or conserved and organized into collections available for study and appreciation by the public. The Museum of Florida History in Tallahassee displays artifacts from the 1733 fleet, as does the Mel Fisher Maritime Museum in Key West and the History of Diving Museum in Islamorada.

The 1733 fleet is now part of a shipwreck heritage trail, called the 1733 Spanish Galleon Trail, created by the state of Florida. The trail was the culmination of the efforts of BAR, FKNMS, John Pennecamp Coral Reef State Park, and Biscayne National Park, in which the 13 shipwrecks were inspected and documented over the course of a year. The project was funded in part by a research grant from NOAA through the Florida Coastal Management Program (McKinnon 2007:85). The trail provides divers with a chance to visit the shipwrecks, learn about their histories, and understand the importance of managing underwater cultural heritage.

Shipwrecks in Florida waters are protected by the Florida Historical Resources Act, which is administered by the Florida Division of Historical Resources (BAR, DHR 2005). This department works for the protection and study of culturally significant sites in Florida for the benefit of the public and protects those shipwrecks from the shore seaward in the Atlantic for three miles and from shore seaward in the Gulf of Mexico for 10 miles. State protection came late, well after objects were removed and the integrity of the sites was compromised. The sites act as artificial reefs along the Florida coast and provide revenue for the state as divers and snorkelers pay for tours or visit the sites. Removal of artifacts or excavation is prohibited in Florida's protected areas, unless a permit has first been obtained. It is now a third-degree felony to intentionally disturb sites without a permit (Florida Department of State 1995).

6.10 A New Site Formation Diagram

With the study of site formation processes on four shipwrecks in Florida, it is possible to generate a detailed flow diagram, much like those created by Muckelroy (1978) and Keith and Simmons (1985), which is specific to Spanish colonial shipwreck sites in the Florida Keys (Figure 68). The diagram begins with a ship, in this case carrying cargo similar to that found on the 1733 fleet, such as gold, silver, indigo, hides, and ceramics (BAR, DHR 2005).

According to this diagram, the ship undergoes a wrecking event, and Gibbs' Disaster-Response Model provides the most useful outline for the actions that would have taken place during this moment (Gibbs 2006). As the ship was under the threat of wrecking, those on board would have identified disaster, such as a hurricane or running aground, and attempted to avoid shipwreck (pre-impact stage) by throwing things overboard to lighten the ship, deploying anchors to keep the ship from grounding, or cutting masts to keep the ship from rolling on its side. As the ship wrecked or grounded (impact stage), efforts would have been made to free the

ship from reef or bottom. If efforts were unsuccessful, the vessel would have been abandoned until it was safe to begin salvage operations (recoil stage, rescue stage, post-trauma stage) (Gibbs 2006:7–8). Much of the silver cargo on the 1733 fleet, for example, was salvaged after the hurricane, resulting in the discovery of contraband cargo (BAR, DHR 2004).

Immediately following the wrecking event, natural processes act on the site: cargo floats away and perishables deteriorate. Over time the site stabilizes in its environment and natural processes such as storms, seabed movement, and deterioration from marine organisms continue to take place. Cultural impacts in the form of excavation, salvage, and deposition of modern objects also continue to act upon the site. The diagram serves as a visual representation of the culmination of processes acting on these types of specific sites. It is significant in that it is the first diagram specific to shipwreck sites that were extensively salvaged in modernity and may be a useful aid for the interpretation of other Spanish colonial shipwrecks.

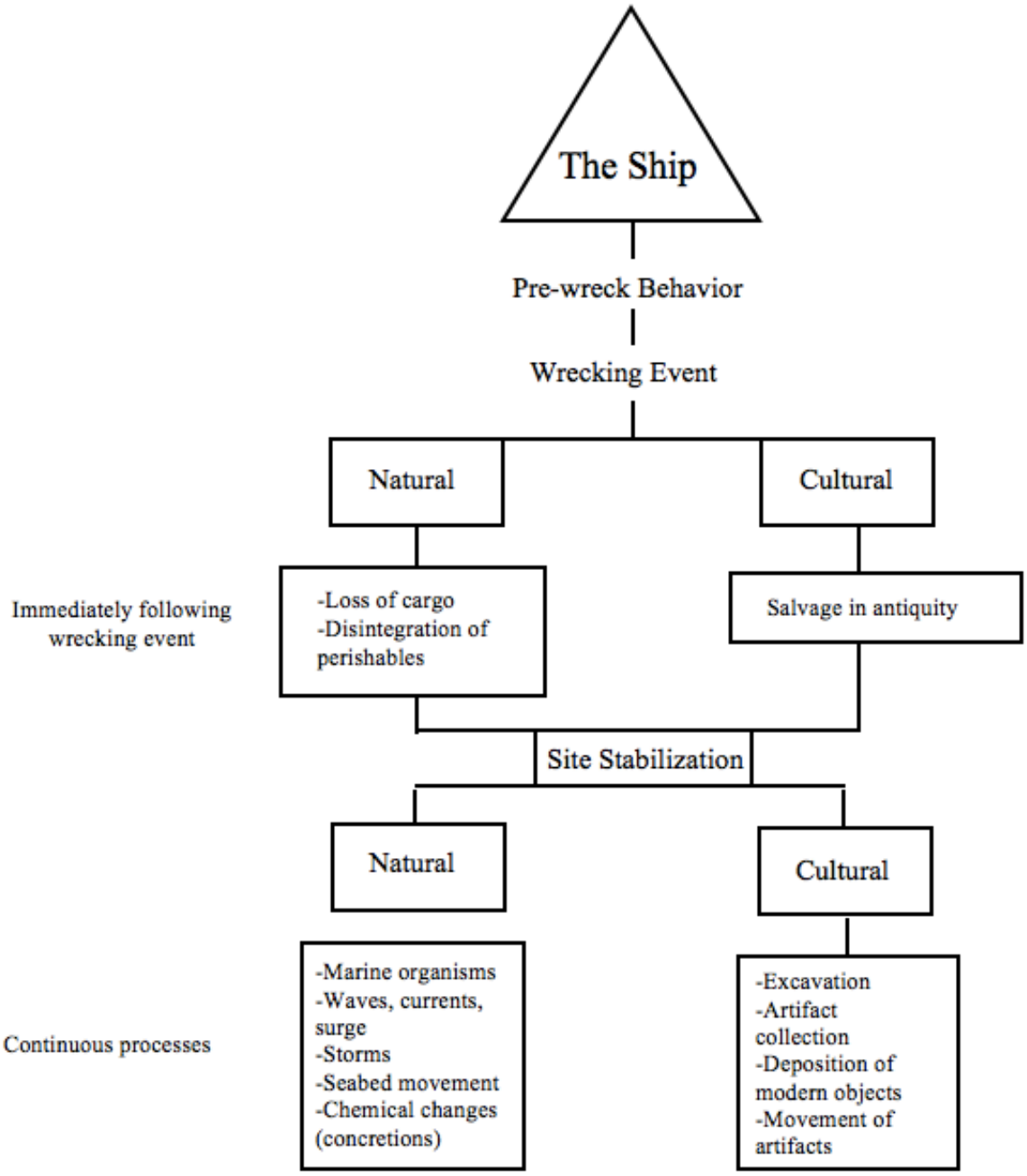


Figure 68. A site formation process diagram for Spanish colonial shipwreck sites in the Florida Keys.

6.11 Conclusion

Cataloguing natural and cultural impacts on one shipwreck is a large feat; cataloguing impacts on four shipwrecks is even more so. While this chapter discussed natural and cultural

site formation processes on the Pillar Dollar Wreck and comparative sites from the 1733 fleet, it is not all encompassing. It is impossible to be aware of every process influencing the sites, especially given their history of unchecked salvage and looting. Impacts as a result of salvage and looting were discovered on the Pillar Dollar Wreck, as the 2014 archaeological project revealed. Treasure salvor and archaeological publications also provided data for the processes acting on the sites. This chapter attempted to organize impacts on the sites by dividing them into scrambling devices and extracting filters and using that information to create a site formation flow diagram that was specific to Spanish colonial shipwrecks in the Florida Keys. The diagram drew from Muckelroy's (1978) model and provided a predictive and specific diagram for depositional and post-depositional processes.

7 Results of Analyses and Conclusions

This chapter provides results of the analysis of treasure salvor and archaeological publications, using the methods described in Chapter Four and dataset presented in Chapter Five. It also presents the results of the artifact quantification analysis, which examined artifact lists from the Pillar Dollar Wreck and the comparative shipwrecks from the 1733 fleet. It concludes with a section that readdresses the research questions posed by this thesis, discusses the significance of this study, and suggests future research recommendations.

7.1 Treasure Salvor Publications and Archaeological Publications

In comparing the archaeological publication category percentages to the treasure salvor publication categories, archaeological publications consistently had higher percentages in including standard categories (Tables 33 and 34). The only instance in which treasure salvor publications had a higher percentage for a category than archaeological publications was for including an appendix, which may be explained by the fact that most treasure salvor reports included dive logs attached to the end as part of early salvage permit report requirements. Both archaeological and treasure salvor publications, however, had similar percentages for including artifact counts or artifact measurements, a category required for state salvage permit reports.

Over 90% of archaeological publications contained a methodology section and 100% included site maps. Compared to these percentages, only 50% of treasure salvor publications contained methodology and 43.8% included a site map. These results included popular publications from both treasure salvors and archaeologists, and it is important to note that popular publications do not always include the technical information of standard reports.

Table 33. Percentage of treasure salvor publications with standard categories (N=16).

Category	Percentage
Title Page	62.5
Table of Contents, Figure Lists, Table Lists	56.3
Introduction	81.3
Site Orientation and Location	50
Physical Environment	18.8
Site Formation Processes	6.3
Methodology	50
Results	43.8
Interpretations	25
Recommendations	0
Summary/Conclusion	43.8
Site Map	43.8
Scaled Photos, North Arrows	56.3
Sources for Maps/Historical Photos	6.3
Artifact Counts or Artifact Measurements	50
Bibliography/References Cited	56.3
Appendix	62.5

Table 34. Percentage of archaeological publications with standard categories (N=15).

Category	Percentage
Title Page	86.7
Table of Contents, Figure Lists, Table Lists	80.0
Introduction	93.3
Site Orientation and Location	86.7
Physical Environment	66.7
Site Formation Processes	33.3
Methodology	93.3
Results	53.3
Interpretations	73.3
Recommendations	46.7
Summary/Conclusion	53.3
Site Map	100
Scaled Photos, North Arrows	93.3
Sources for Maps/Historical Photos	46.7
Artifact Counts or Artifact Measurements	46.7
Bibliography/References Cited	86.7
Appendix	53.3

Crosstabulations were useful for examining the differences between treasure salvor reports and treasure salvor books. While all three books directly concerned the 1733 fleet, they did not contain standard archaeological information such as methodology, site formation

processes, scaled photos, north arrows, sources for photos, detailed artifact counts and measurements, or a bibliography. Although this data would be necessary for the academic study of sites and to understand the distribution and context of artifacts, it is not generally appealing for the target audiences for the books. Artifact provenance and detailed scaled site plans were also not included in these publications. Treasure salvor books and reports instead focused more on artifacts recovered from the sites and less on site orientation (only 43.8% contained a site map). The exception to this was Meylach's *Diving to a Flash of Gold* (1971), which included general maps of sites for treasure salvage enthusiasts and information on locating the sites mentioned in the book.

For popular archaeological publications, one of the two analyzed contained information about site formation processes, and both contained site maps, methodology, scaled photos and north arrows, sources for photos, and a bibliography. There were no detailed artifact counts and measurements, as the purpose of the books was to provide an overview of archaeological projects.

Based solely on the percentages presented in the tables, it is obvious that older treasure salvor reports often lack standard information required in archaeological reports. An examination of recent reports, however, revealed they were closer in nature to archaeological reports (see Odyssey Marine Exploration reports). They contained important categories such as site orientation and location, methodology, site formation processes, site maps, and scaled artifact photographs. Based on the overall datasets presented in this chapter, there is merit in archaeologists' claims that treasure salvor reports do not produce in-depth or scientific information about sites, however, that appears to be changing with time and as a result of new requirements set forth by managing agencies (see Chapter Two).

7.2 Shipwreck Artifact Analysis

The analysis concerning artifacts collected from the four sites revealed some interesting trends. Salvage permits were issued to Armada Research Company, Inc. for work on the *San Pedro* site in 1969 and artifacts collected at the site were subsequently divided in 1969 and 1972 (Florida Bureau of Historic Sites and Properties, Research and Preservation Laboratory 1972). In 1972, Armada Research Company, Inc. kept a selection of artifacts but chose to relinquish a significant amount of objects to the state. The salvage company chose to keep most of the cannon balls (labeled "shot" on the chart) because they could be sold. The company did, however, provide the state with a selection of coins. The following pie charts depict the types of artifacts retained by the salvage company and those given to the state.

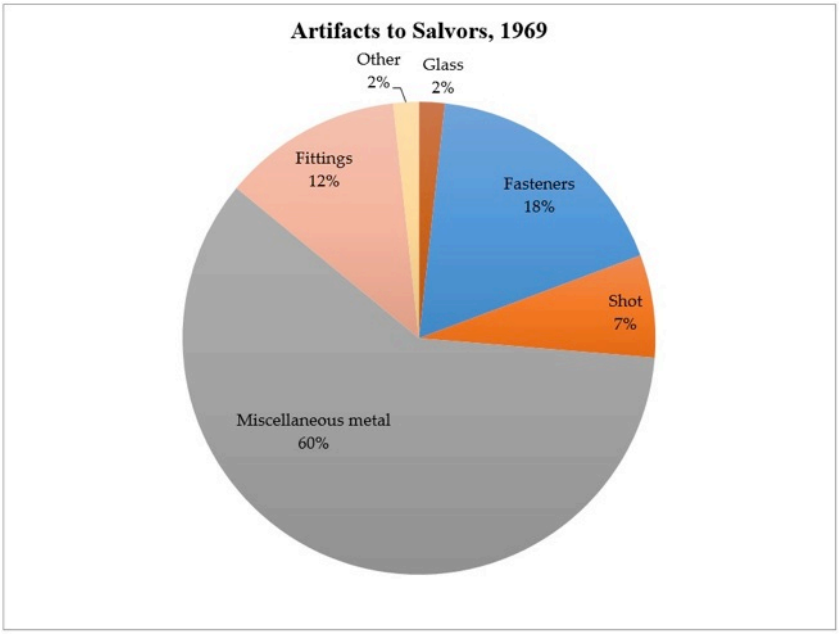


Figure 69. 1969 *San Pedro* Artifacts to Armada Research Company, Inc. (Florida Bureau of Historic Sites and Properties, Research and Preservation Laboratory 1972).

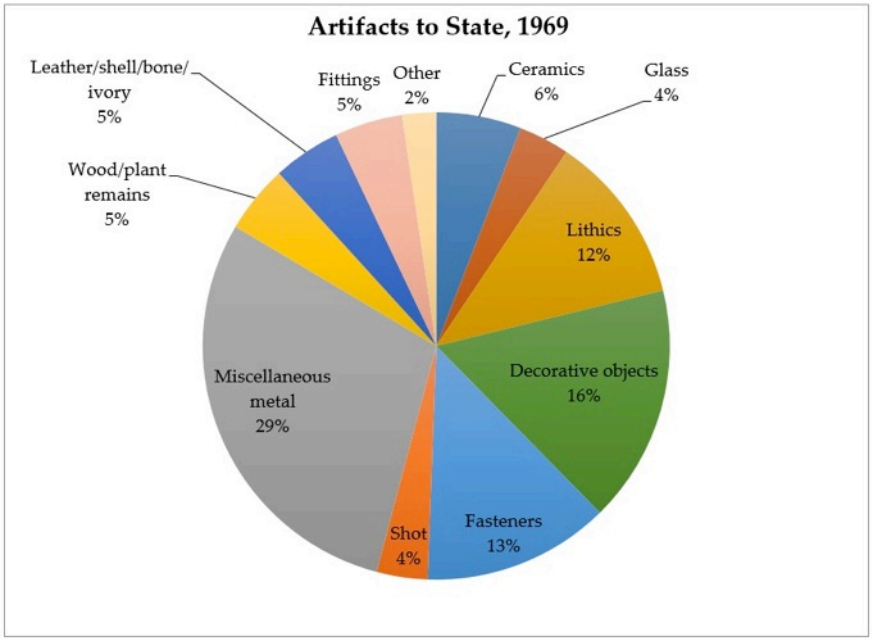


Figure 70. 1969 *San Pedro* Artifacts to State (Florida Bureau of Historic Sites and Properties, Research and Preservation Laboratory 1972).

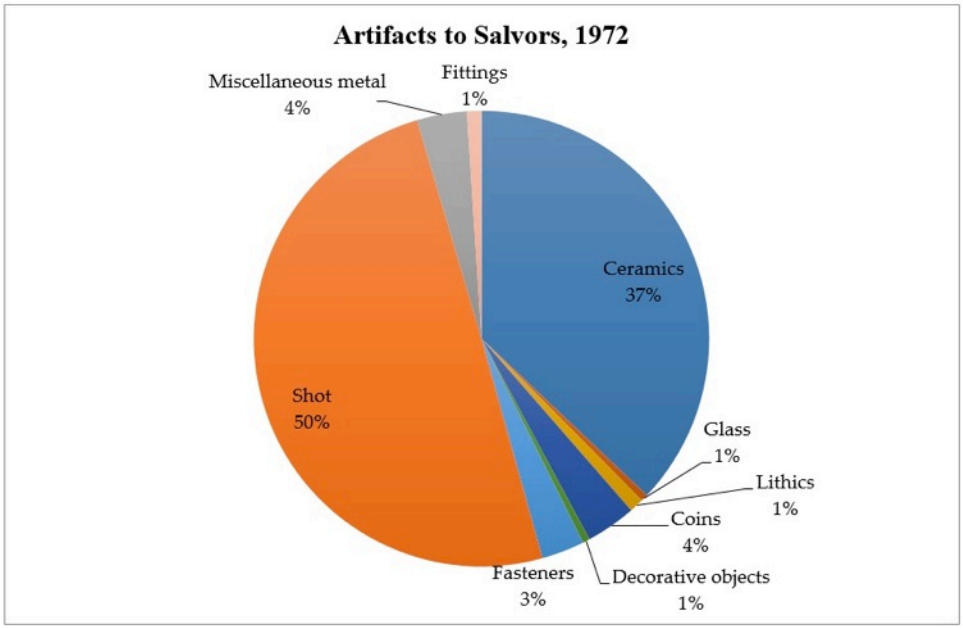


Figure 71. 1972 *San Pedro* Artifacts to Armada Research Company, Inc. (Florida Bureau of Historic Sites and Properties, Research and Preservation Laboratory 1972).

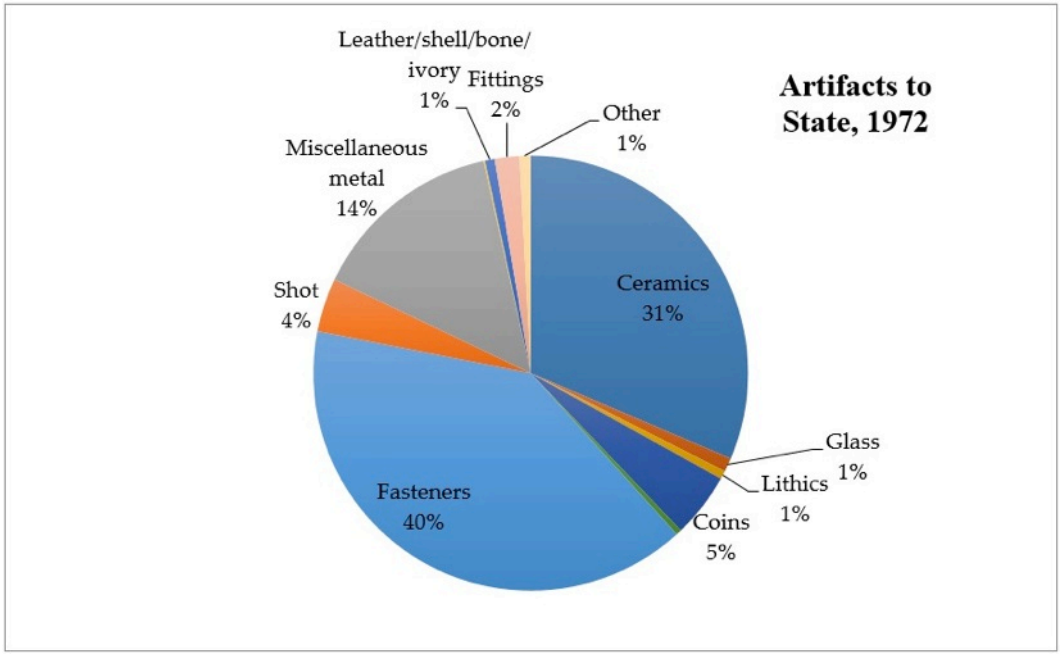


Figure 72. 1972 *San Pedro* Artifacts to State (Florida Bureau of Historic Sites and Properties, Research and Preservation Laboratory 1972).

Artifact divisions between treasure salvors and the state also took place for *San José* in 1976. Marine Tech Salvage Company, Inc., mainly kept coins and decorative objects (in this case a religious item) and relinquished all other artifacts to the state. There are two separate instances of divisions for 1976, one in which artifacts were split 25/75 with the state, and another in which artifacts were split 50/50 with the state as a result of a court case (Florida Department of State, Division of Archives, History and Records Management 1976). In both instances, the company retained a less representative sample of objects; for example, after the 50% split, 55% of the artifacts the company kept were coins. The state received ceramics (47%) and ships fittings (14%) in greater percentages than other categories. The following pie charts depict the types of artifacts retained by the salvage company and those divided to the state.

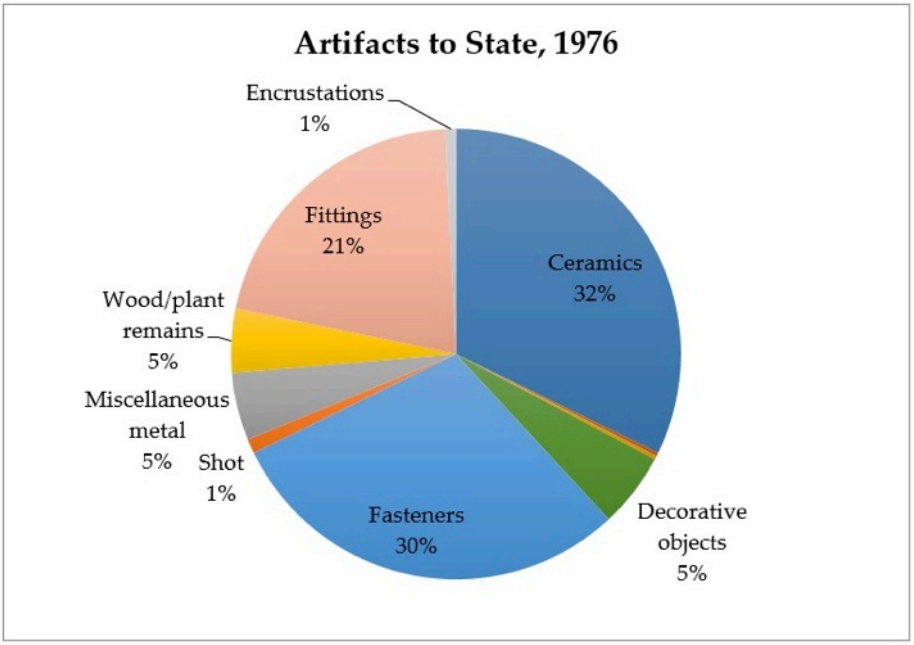


Figure 73. 1976 *San José* Artifacts to State of Florida (Florida Department of State, Division of Archives, History and Records Management 1976).

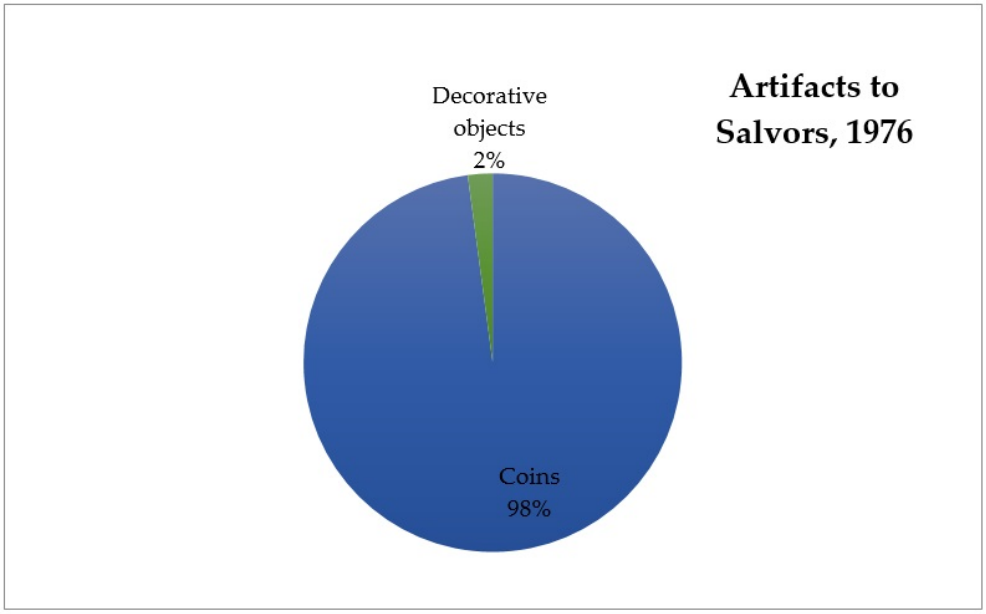


Figure 74. 1976 *San José* Artifacts to Marine-Tech Salvage Company, Inc. (Florida Department of State, Division of Archives, History and Records Management 1976).

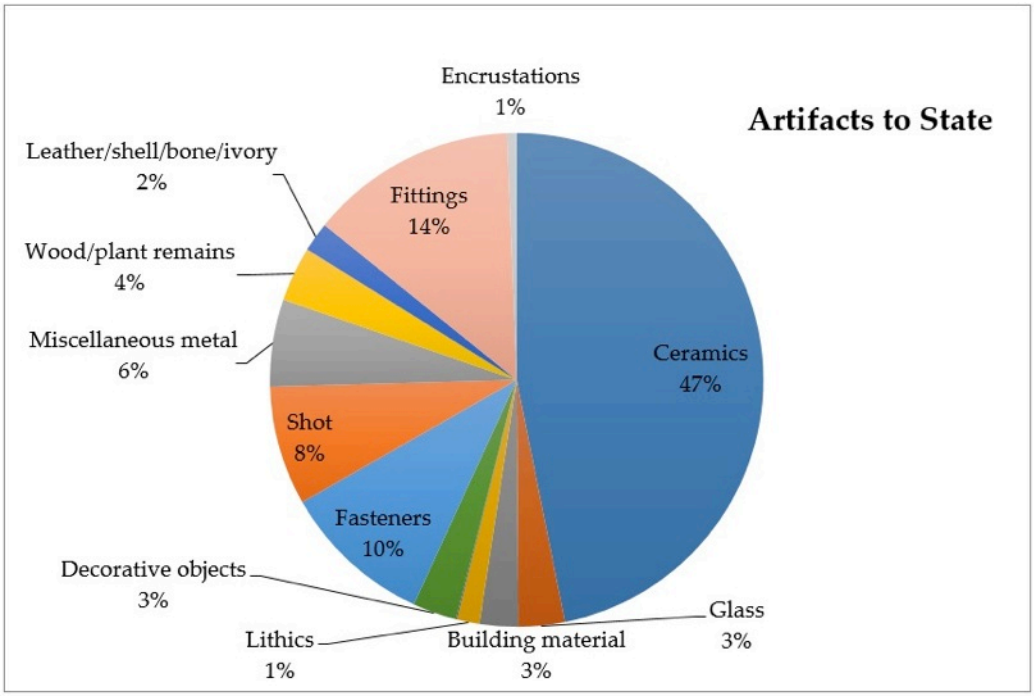


Figure 75. 1976 *San José* Artifacts to State of Florida, split 50% (Florida Department of State, Division of Archives, History and Records Management 1976).

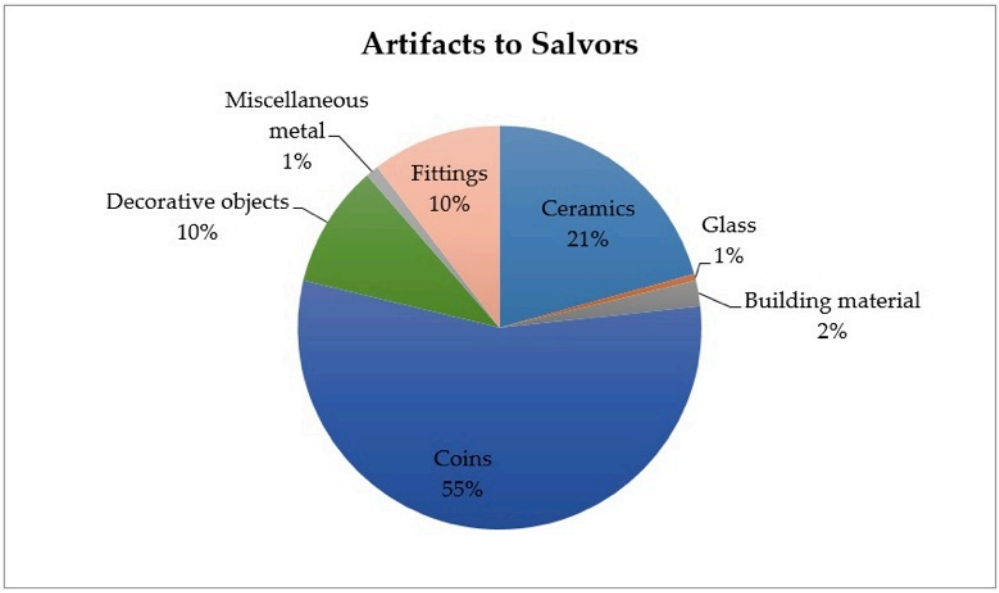


Figure 76. 1976 *San José* Artifacts to Marine-Tech Salvage Company, Inc., split 50% (Florida Department of State, Division of Archives, History and Records Management 1976).

Molinari collected a wide array of objects between 1998 and 2004 from *San José*; the following four graphs depict the percentages of artifacts recovered from the site in successive

years. Although few coins were collected, the salvor collected large amounts of ceramics, fasteners, ballast, bricks, and, in some cases, bedrock samples (Molinari 2003b).

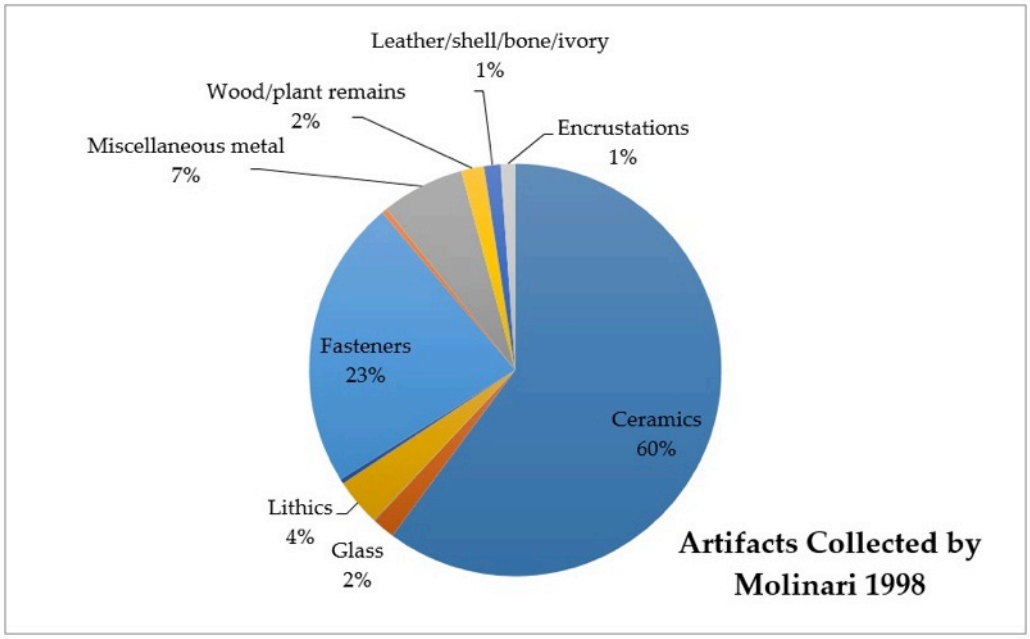


Figure 77. Molinari's 1998 *San José* Artifact List (Molinari 1998).

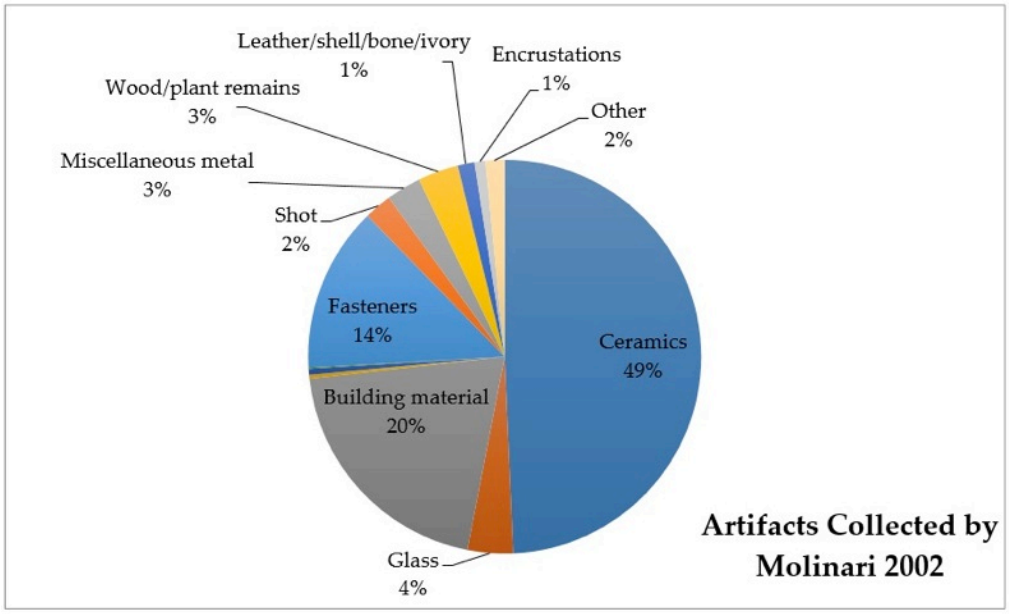


Figure 78. Molinari's 2002 *San José* Artifact List (Molinari 2002).

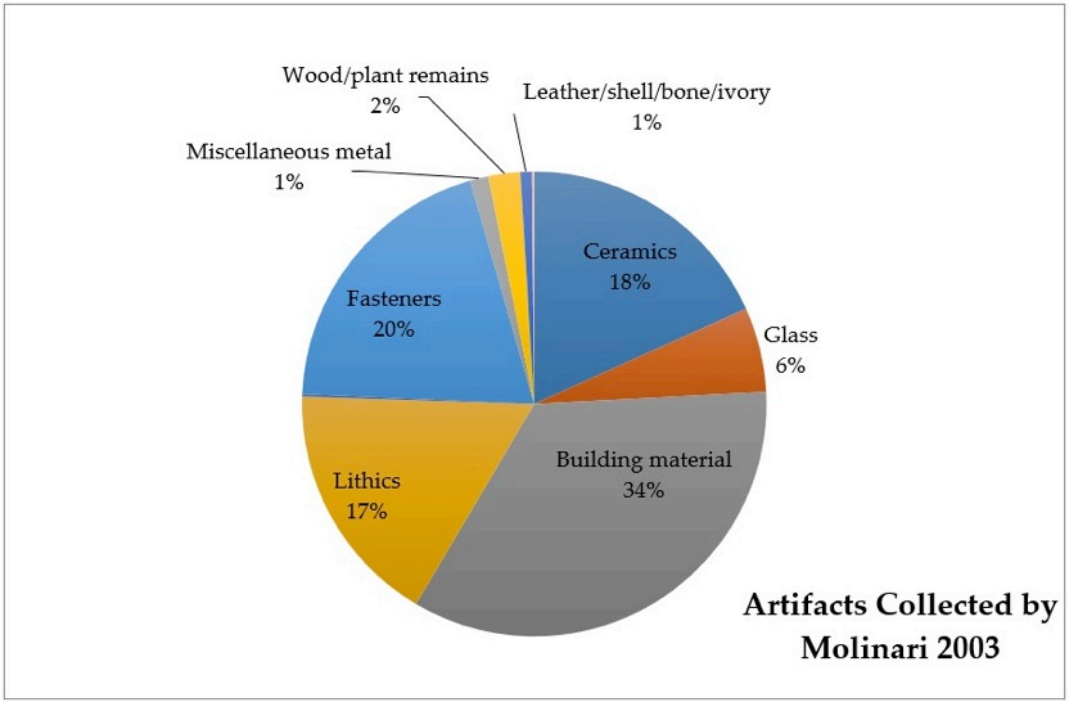


Figure 79. Molinari's 2003 *San José* Artifact List (Molinari 2003b.).

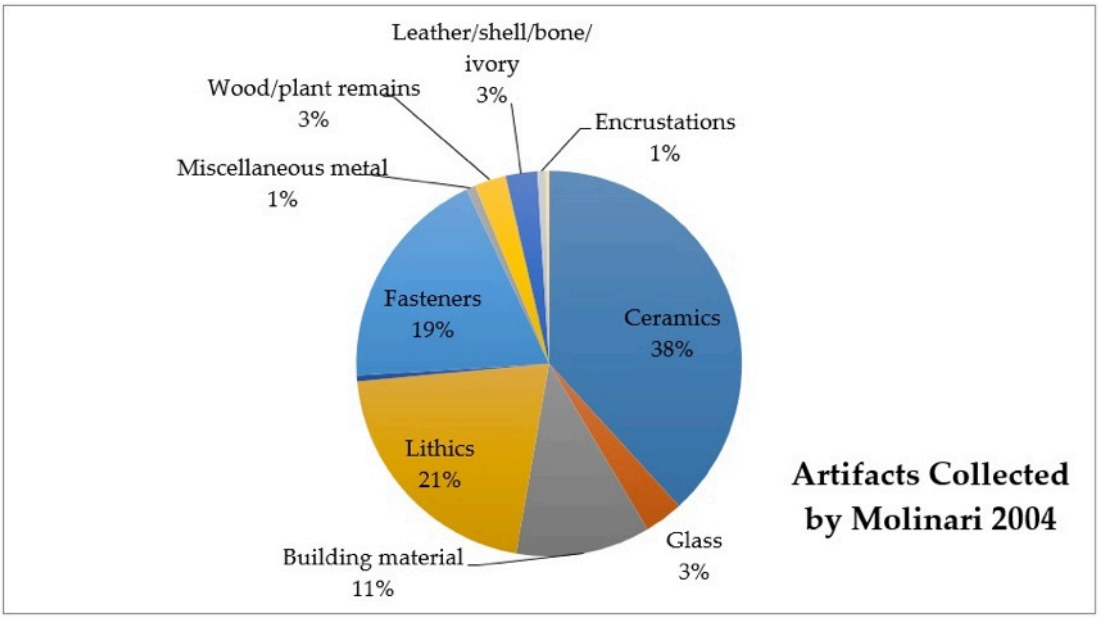


Figure 80. Molinari's 2004 *San José* Artifact List (Molinari 2004).

El Populo had the least information available concerning artifacts; permits were not issued for the site because it became part of Biscayne National Monument in 1968 (later Biscayne National Park in 1980) (Indiana University et al. 1988:17). Ward's (2014) book is the

only detailed publication pertaining to excavations conducted on the site, even though salvage was conducted without a permit. The artifacts in Figure 81 were tallied from information provided in the book (Ward 2014). The only other artifact pertaining to *El Populo* is located in the collections at SEAC. This is a single ceramic sherd collected in 1984 by FSU student John Broward for diagnostic purposes (Broward 1984). Although some reports have mentioned looters and salvors visiting the site, including individuals who removed a piece of metal set with stones, comprehensive data concerning artifacts is lacking (Indiana University et al. 1988:17).

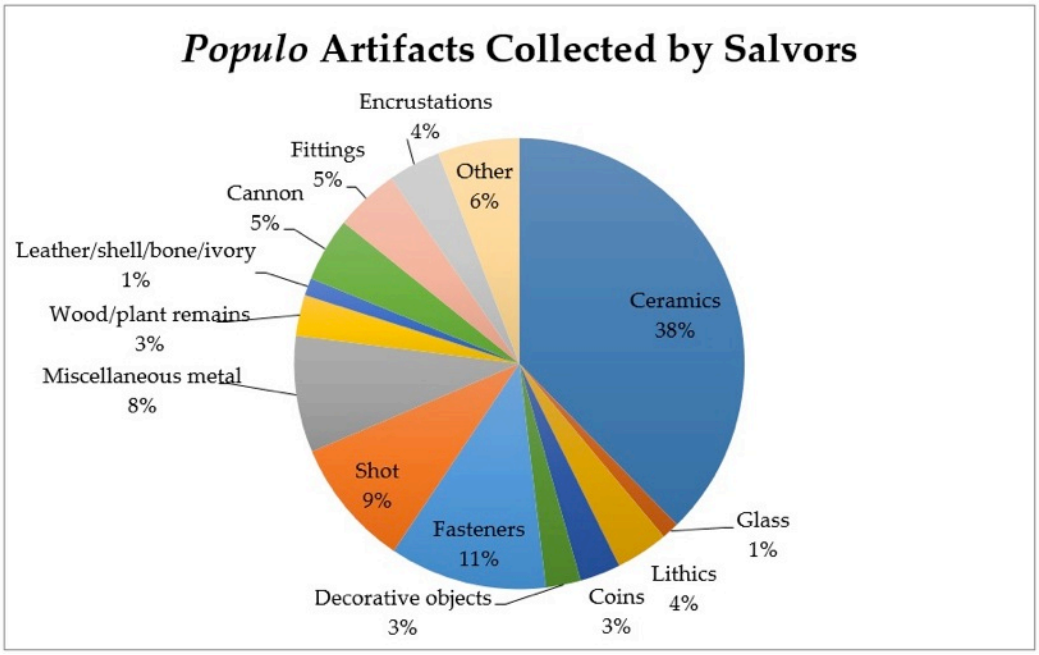


Figure 81. *El Populo* artifacts collected by Ward and associates in 1960s (Ward 2014).

The pie charts for the Pillar Dollar Wreck display the types of artifacts that archaeologists are more likely to collect. Archaeologists, depending on their sample strategies, typically collect diagnostic artifacts or significant artifacts that may be in danger of loss from looting activities. As shown in Figure 82, ceramics and brick fragments (listed as building material) were collected in higher numbers during the 2014 fall field project, making up 29% and 35% of objects collected respectively (McKinnon 2015). This information can be contrasted with what looters

are known to have removed from the site in 1986 (Figure 83). Most likely, looters collected encrusted fasteners (83% of all artifacts collected) in the hopes that coins would be included in the conglomerates (NPS 1986).

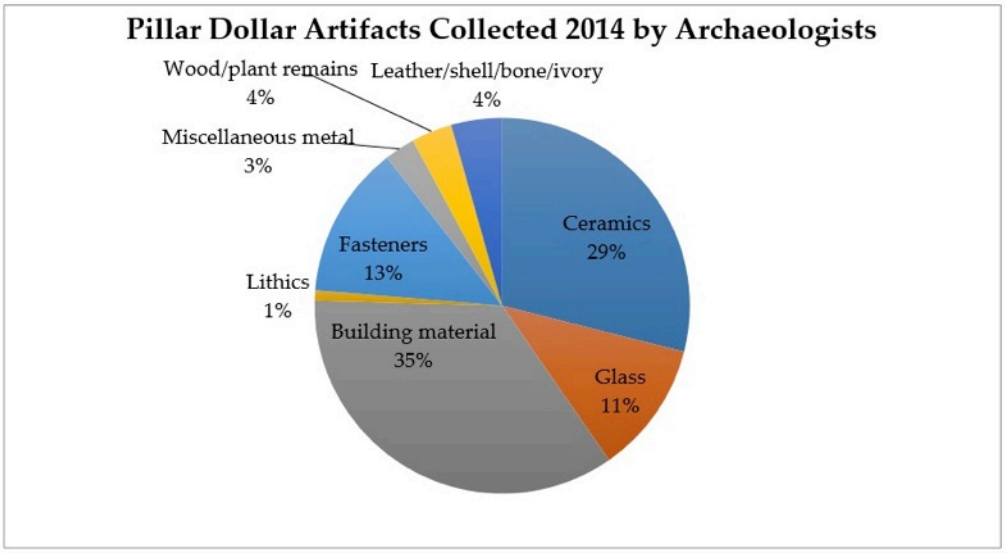


Figure 82. Pillar Dollar Wreck artifacts collected during 2014 field season (McKinnon 2015).

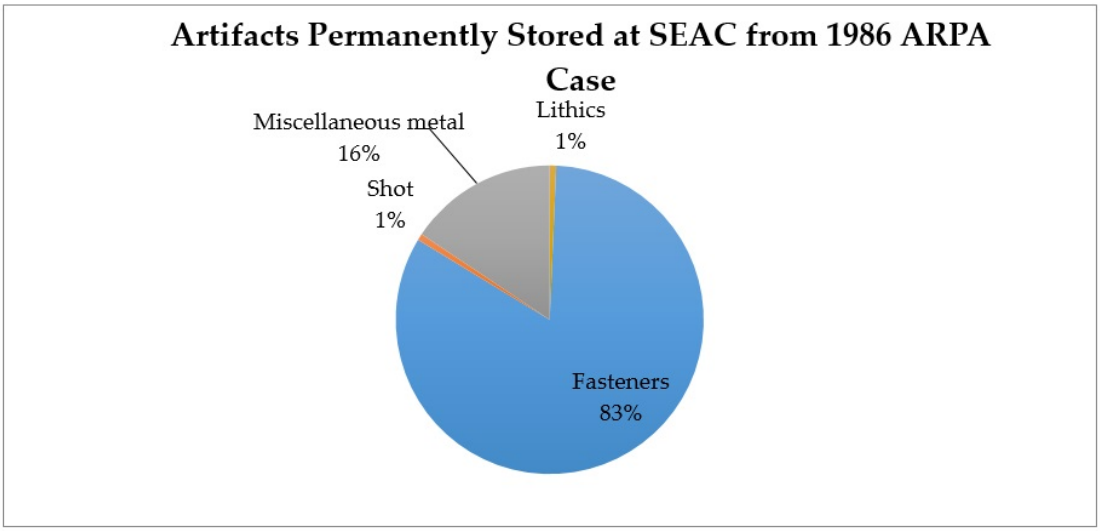


Figure 83. Pillar Dollar Wreck artifacts looted in 1986 (NPS 1986).

One result revealed by this analysis was that treasure salvors recovered all categories of artifacts from sites, though they did not necessarily retain all of the objects they recovered, at times keeping only significant or "valuable" artifacts. Armada Research Company, for example,

collected all manner of artifacts, including lead fragments, encrusted fasteners, ceramic sherds, and coins. If treasure salvors take most types of artifacts, an archaeologist excavating a Spanish shipwreck in Florida may expect to find very little on a site. This was exhibited during fieldwork on the Pillar Dollar Wreck in 2014: archaeologists discovered small sherds of ceramics, broken fasteners, and brick fragments, while ballast was the only sizeable artifact left behind with the exception of actual ship structure. Thus, the 2014 archaeological investigation of the Pillar Dollar Wreck revealed only a filtered view of artifacts and their contexts, one that had passed through years of treasure salvage and illegal looting.

7.3 Answering the Research Questions

Using the Pillar Dollar Wreck in Biscayne Bay and three shipwrecks from the 1733 fleet (*El Populo*, *San José*, and *San Pedro*) for comparative study, this study sought to answer a number of research questions concerning treasure salvage of Spanish shipwrecks in the Florida Keys. This thesis presented an examination of site formation processes on the four shipwrecks, an analysis of treasure salvor and archaeological publications, and an analysis of artifacts collected from the sites by various groups. Ultimately, the following research questions were addressed:

7.3.1 **What can the academic investigation of the treasure salvor industry reveal about what is lost or gained through commercial and illegal exploitation of Spanish colonial shipwrecks in the Florida Keys? What are the impacts of commercial treasure salvors and illegal looting on Spanish colonial shipwreck sites in the Florida Keys and how can these impacts be quantified?**

In examining files related to the Exploration and Salvage Program, it was learned that salvage in the 1960s and 1970s resulted in the loss of information regarding the four shipwrecks

studied for this thesis. Initially, there were no standards for recording and excavating sites or recovering artifacts; maintaining and documenting archaeological context was not a concern.

Eventually, the state realized the detrimental effects of unchecked salvage of historic sites; documentation requirements were introduced and a system of monitoring historical resources was instituted. Field agents accompanied salvors and permits were required to recover artifacts from sites on state-owned properties. Many of these early documents are housed in the State Archives of Florida in Tallahassee and revealed that artifact provenance and maintaining context was still not practiced to the level of professional archaeological standards. Dive logs and field data sheets reported the daily activities of salvors on the sites and what was collected each day, but the simple forms contained little information concerning site maps or artifact provenance. Further, division records tallied recovered artifacts, but did not include measurements or photographs. Information concerning artifacts was lost as a result of commercial and illegal exploitation of Spanish colonial shipwrecks in the Florida Keys. Information related to artifacts that were removed from *San José*, for example, is scattered throughout the state BAR offices in Florida, held in a multitude of popular treasure salvor adventure books, or missing completely, further illustrating the failure of commercial treasure salvage to meet professional archaeological standards.

Information concerning illegal looting of sites was more difficult to encounter; illegal looters, for the most part, stole artifacts in secret, and there was little possibility of knowing effects on sites from looters. Looters who were apprehended, such as the men caught on the Pillar Dollar Wreck in 1986, provide insight into the types of artifacts looters target and the cultural impacts inflicted on the site (NPS 1986). For the sites included in this study, however, looters were rarely apprehended, creating a gap in information about the sites. Ultimately, if

information concerning commercial treasure salvage on sites is considered to be lacking from the historical and archaeological record, information concerning illegal looting is even more so.

As this thesis has addressed, the impacts of commercial treasure salvage and illegal looting on Spanish colonial shipwrecks can be significant. Chapters Four and Five discussed site formation processes acting on the case study shipwrecks and revealed that the most detrimental and obvious impacts to the sites came from undocumented treasure salvage in the late 1950s and early 1960s. A combination of scrambling devices and extracting filters were identified, which caused a disturbance in context for artifacts and features. Artifacts, cannon, and anchors were removed from sites (an extracting filter) with no documentation and no mention of the ultimate whereabouts of the objects. As discussed in Chapter Five, treasure salvors also introduced modern objects (a scrambling device) to the sites, with the installation of mooring lines and the fact that a coffee mug was found 60 cm below the sand on the Pillar Dollar Wreck (McKinnon 2015:34). While a complete inventory of all cultural impacts to a site was impossible to generate, an overview of cultural processes was possible to ascertain from treasure salvor publications and archaeological surveys. Because of this fact, quantification of impacts was difficult to achieve, but it was possible to generate lists of known activities on the sites (see Chapter Six), which ultimately led to the creation of a specific site formation process diagram for Spanish colonial shipwrecks in Florida.

Treasure salvor endeavors were further quantified via a statistical study of treasure salvor publications as compared to archaeological publications. The study revealed that treasure salvors consistently included less data and fewer standard report categories in their publications than archaeologists, suggesting that information concerning archaeological sites is continuously lost as a result of commercial salvage. Another significant method of quantification of treasure salvor

activities concerned artifacts that were recovered from the four sites. Artifacts recovered by treasure salvors were compared to those recovered by archaeologists or divided to the state, revealing that salvors collected most types of artifacts but often kept those they considered commercially valuable. Archaeologists, on the other hand, were more likely to collect a diagnostic and representative sample of artifacts from a site.

7.3.2 What have we learned about the past from commercial treasure salvor endeavors on Spanish colonial shipwreck sites in the Florida Keys?

What has been learned about the past from treasure salvor endeavors is a fraction of the total possible information to be gained. Treasure salvors, for example, often included historical backgrounds in their publications, but data related to ship construction, site formation processes, and distribution of artifacts on sites was ultimately lacking. Concepts that were missing included those that were archaeological in nature; treasure salvors generally provided limited information concerning sites, leaving out detailed site maps and artifact provenance. There are exceptions, such as Molinari who provided the state with some of the most detailed reports submitted by a treasure salvor (Molinari 1999, 2004). Odyssey Marine Exploration is another example of a commercial salvage company that published archaeological papers similar to those found in archaeological peer-reviewed journals; one must look closely to realize the papers were a result of commercial salvage (Stemm et al. 2013a, 2013b). The structure of treasure salvor reports has changed over time, evolving from notes and dive logs to more detailed reports; this is a testament to the success of the state to require official regulation of sites. As the state permitting process was enhanced and subjected treasure salvors to the same standard requirements applied to archaeologists, reports became more detailed.

Most of the information learned about the past from commercial treasure salvors was related to the types of artifacts recovered. Treasure salvors focused on artifacts (especially those that could be considered commercially valuable), overlooking other important archaeological information concerning overall layout and context of the site and studies concerning ship construction. As discussed in Chapter Six, for example, the archaeological study of the Pillar Dollar Wreck revealed much about the construction of the ship.

7.3.3 How can this knowledge assist in future management of Spanish colonial shipwrecks in the Florida Keys?

Management of these sites has been difficult because of complications with admiralty arrests and a lengthy and often impassioned dialogue concerning title ownership of historic shipwrecks. Though the state of Florida learned from its past experiences with treasure salvors and currently grants 1A-32 research permits to accredited archaeologists and 1A-31 permits to commercial salvors, admiralty claims are still submitted for title to shipwrecks and some contracts are renewed every year as treasure salvors refuse to relinquish their titles.

For states that still manage treasure salvage contracts and admiralty claims for historic shipwreck sites, it is important that they strive to closely monitor activities on shipwrecks in order to protect underwater cultural heritage or else consider removing salvage programs altogether. This can, however, be difficult and would rely on slow legislation to end such programs (Mary Glowacki 2014, pers. comm.). The 1950s and 1960s salvage of shipwrecks was dangerous and proved that unchecked access to historic shipwrecks caused confusion, damage, and, ultimately, a loss of heritage in the tangible form of artifacts.

Understanding what is likely to be removed from a shipwreck and what types of shipwrecks are targeted by looters and treasure salvors can help management entities determine

if artifacts should be recovered due to risk of looting. It can also help managers of underwater cultural heritage determine which shipwrecks to monitor more closely. The results of this study revealed the negative and lasting impacts of commercial treasure salvage and illegal looting on four shipwrecks in Florida and could be used to educate the general public about the negative impacts of failing to protect maritime cultural heritage.

7.4 Significance of Study and Future Research

The significance of this research is that it is the first attempt at developing a methodology for quantifying the effects of treasure salvors and illegal looting on Spanish colonial shipwreck sites in the Florida Keys. It also offers the first detailed examination of the Florida Exploration and Salvage Program, which provided context and understanding for why historical shipwreck sites in the Keys were salvaged. Ultimately, the attempt of this research was to contribute to knowledge about past exploitation of sites by treasure salvors and illegal looters and to examine claims made by archaeologists that treasure salvors do not produce scientifically feasible information about sites. The results of this research revealed that information concerning salvaged sites was missing from the historical and archaeological record, effectively providing an argument for why careful management of maritime cultural heritage is crucial.

More opportunities for future research were brought to light as a result of this thesis. First, the artifact lists for the remaining shipwrecks of the 1733 fleet could be analyzed, categorized, and compared to the charts presented in this study. This could possibly reveal wider trends in the types of artifacts treasure salvors remove from Spanish colonial shipwrecks. Artifact lists from the 1715 fleet could also be examined and compared to those from the 1733 fleet, effectively expanding the dataset of information regarding salvage of artifacts. The sample presented in this study was a fraction of the larger dataset that could be accessed.

A second useful area of future research would be a continued examination of treasure salvor reports and associated report requirements in other states. Comparing Florida's Exploration and Recovery Program to similar programs in other states could shed light on management practices concerning salvage of historic shipwrecks. Treasure salvor reports from programs in other states could be studied using the categories generated in Chapter Four. Examining and understanding how treasure salvors choose to report their finds could add to the database of information about what is lost or gained through the treasure salvage industry. Similarly, all of the reports on file with BAR could be examined more closely to reveal wider trends in reporting standards within Florida's program itself. More specific categories could be generated or an examination of the quality of information included in reports could also be undertaken.

7.5 Conclusion

This thesis has demonstrated the impacts of commercial treasure salvage and illegal looting on four Spanish colonial shipwrecks in the Florida Keys: *El Populo*, *San José*, *San Pedro*, and the Pillar Dollar Wreck. This was achieved through the inspection of artifact lists, treasure salvor and archaeological publications, and site formation processes that have affected each site. These shipwrecks were targeted as a result of their historical context and the cargos they once carried, though they were salvaged at the time of the wrecking event. The academic investigation of the treasure salvor industry revealed much about what was lost through the commercial exploitation of Spanish colonial shipwrecks in Florida. In this way, the importance of protecting historic shipwrecks from illegal looters and unchecked treasure salvage was demonstrated.

Two methodologies were presented for quantifying treasure salvor and illegal looter impacts on Spanish colonial sites in the Florida Keys. The first was quantification of the

categories that treasure salvors included in their publications concerning historic shipwrecks. Comparing the publications to those published by archaeologists allowed for assessment of the differences between archaeologists and salvors, substantiating archaeologists' claims that treasure salvor publications lack scientific information. The second quantification method was a categorization of artifacts collected by treasure salvors and illegal looters. Comparing artifacts collected by salvors to those collected by archaeologists further provided a platform for assessment of differences between the groups.

Inherent in this research was site formation process studies, which provided the framework for comprehension of natural and cultural influences on the four sites. Using Muckelroy's (1978) model, a formation process diagram specific to Spanish colonial shipwrecks in Florida was created (see Chapter Six).

Finally, this study was a first step towards understanding one state's approach to treasure salvage and management of historic shipwrecks, while providing a first focus of the history of the Florida Exploration and Recovery Program (formerly Exploration and Salvage Program). The results from this research better inform the public about the negative effects of salvaging historic shipwrecks and can ultimately convince states and managers to strengthen methods of protecting underwater cultural heritage.

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Appendix A: Minutes of the Trustees of the Internal Improvement Fund, State of Florida

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MINUTES OF THE TRUSTEES OF THE
Internal Improvement Fund
State of Florida
VOLUME XXXV
From July 1, 1964 to July 1, 1966
Published Under Authority of Trustees of Internal Improvement Fund
TALLAHASSEE, FLORIDA
1966

MINUTES OF THE TRUSTEES OF THE
Internal Improvement Fund
State of Florida
VOLUME XXXV
From July 1, 1964 to July 1, 1966
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1966

11-30-65

MARINE SEARCH AND SALVAGE PROGRAM - The enactment into law of Chapter 65-300, Acts of 1965, by the 1965 Legislature was construed by the Attorney General as an expression of legislative intent that all matters relating to search and salvage operations heretofore administered under the jurisdiction of the Trustees of the Internal

Improvement Fund should properly come under the exclusive jurisdiction and administration of the State Board of Antiquities created by the provisions of the Act.

Pursuant to action taken on this date by the State Board of Antiquities, Staff recommended approval of a resolution drafted by the Attorney General transferring all interest now vested in the Trustees as to all items recovered under leases issued by the Trustees for salvage, to the Board of Antiquities, and any instruments of assignment from the Trustees to the Board which are deemed necessary by the Attorney General to fully implement the transfer of all operations for search and salvage to the jurisdiction of the Board. Also included would be a complete inventory of all recovered items in the possession of, or under the control of, the Trustees and title to which would be conveyed from the Trustees to the Board by appropriate instruments as approved by the Attorney General.

The Director recommended approval for Trustees' Staff members to assist the Director as needed in administration of provisions of Chapter 65-300 Acts of 1965 (to be shown as Chapter 267 Florida Statutes) under the jurisdiction of the State Board of Antiquities.

Upon motion by Attorney General Fair cloth, duly adopted, the Trustees approved the above recommendations and formally adopted the following resolution:

RESOLUTION BY THE TRUSTEES OF THE INTERNAL IMPROVEMENT FUND
WHEREAS, several individuals and corporations and associations have entered into lease agreements with the Trustees of the Internal Improvement Fund for exploration of state-owned sovereignty lands and the off-shore areas of Florida for sunken or wrecked vessels and the remains thereof, and for salvaging certain valuable artifacts and =objects of antiquity therefrom, and WHEREAS, the legislature of Florida in 1965 enacted Chapter 65-300, which created a new state agency to be known as the State Board of Antiquities and granted to this board broad authority to administer all matters relating to the search and recovery of treasure trove and related materials on state-owned lands, including submerged sovereignty land, and WHEREAS, it is the understanding of the Trustees of the Internal Improvement Fund that the legislature by Chapter 65-300 expressed its will that all such matters should be administered henceforth by the State Board of Antiquities, and WHEREAS, there are now outstanding three leases, numbered 1329,1687 and 2081, granting to certain lessees salvage privileges in the areas described in these leases, and for the purpose of better administration of such matters, the Trustees believe that these leases should be assigned to the new State Board of Antiquities for administration and enforcement, NOW, THEREFORE,

BE IT RESOLVED by the Trustees of the Internal Improvement Fund that the staff of the Trustees is directed and authorized to prepare proper assignments of the above numbered leases to the State Board of Antiquities of the State of Florida.

BE IT FURTHER RESOLVED that the staff is directed and authorized to make a complete inventory of all physical property obtained by the Trustees of the Internal Improvement Fund by virtue of the leasing of state lands for exploration or salvage of treasure trove and articles of antiquity, and that such personal property, together with records, files, supplies, and equipment pertaining to exploration and salvage and such matters be assigned and transferred to the State Board of Antiquities, whose director is also director of the Trustees of the Internal Improvement Fund, and such director is hereby authorized to take possession of such articles and equipment and supplies in the name of the State Board of Antiquities and to account therefor to the members of said board.

Appendix B: Log Book Instructions for Exploration or Salvage Contract (Bureau of Historic Sites and Properties 1974).

INSTRUCTION FOR MAINTAINING
DAILY ACTIVITY LOG

1. A daily activity log must be maintained pursuant to provisions of Chapter 41B-1.10 (7) Rules of the Division of Archives History and Records Management.
2. Log entries must be legible and made daily for the year contract is in force.
3. This log is the property of the Division of Archives, History and Records Management and constitutes a record of activities carried forth under the contract issued by the State to the salvager. It must be maintained in good condition in a secure location and submitted immediately by registered mail: 1) when completly filled, 2) upon termination of the contract or 3) upon written request of the Division Director, to:

DIRECTOR
DIVISION OF ARCHIVES, HISTORY
AND RECORDS MANAGEMENT
DEPARTMENT OF STATE
TALLAHASSEE, FLORIDA 32304

4. Explanation of Entries

a. **Contract Number** — enter contract designation
b. **Date** — self-explanatory
c. **Work Initiated — Terminated** — the time (hour) work on a given day was started and completed. (If over water travel to and from the salvage site or area to be explored is included in the overall time, travel time should be recorded separately. If no work on site or in the area set forth in the contract is carried out or planned, an entry reflecting the reason, whether for example weather conditions or possibly mechanical failures prohibit activities, should be made in the activity log.
d. **Area or site explored for salvagable abandoned property or (if salvage contract) site salvaged.**

1. EXPLORATION CONTRACTS — The Bureau of Historic Sites and Properties is charged by law with conducting a statewide survey of archaeological and historical sites. Marine sites are of considerable importance. If wreckage of any type is encountered during the course of work, its location, as exactly as possible, **must** be entered in the log. Magnetic bearings to permanent and easily identifiable points such as light houses or other navigational aids, water tanks, radio and radar towers and antennas or buildings are helpful. After the wreckage is examined it is desirable to describe it and offer any opinions, based on experience, that the salvager may wish to offer. *No salvage contract for a site within an exploration contract will be issued to the contractor unless the site is properly and accurately recorded in the log book at the time of discovery!*

2. SALVAGE CONTRACTS — Name of wreck or site or site designation used in the state site records (as supplied by the State Marine Archaeologist or the Archaeological Supervisor).

e. **Weather and Sea State** — Weather is self-explanatory; for sea state describe water, whether *calm*, *choppy* or *ground swells*, etc.
f. **Vessel** — Name of craft used; if unnamed, Florida registration or federal documentation.
g. **Crew** — Full names of *all* persons aboard. If other than crew or personnel approved by the Division on application, a st ement of from whom and what date permission was received.

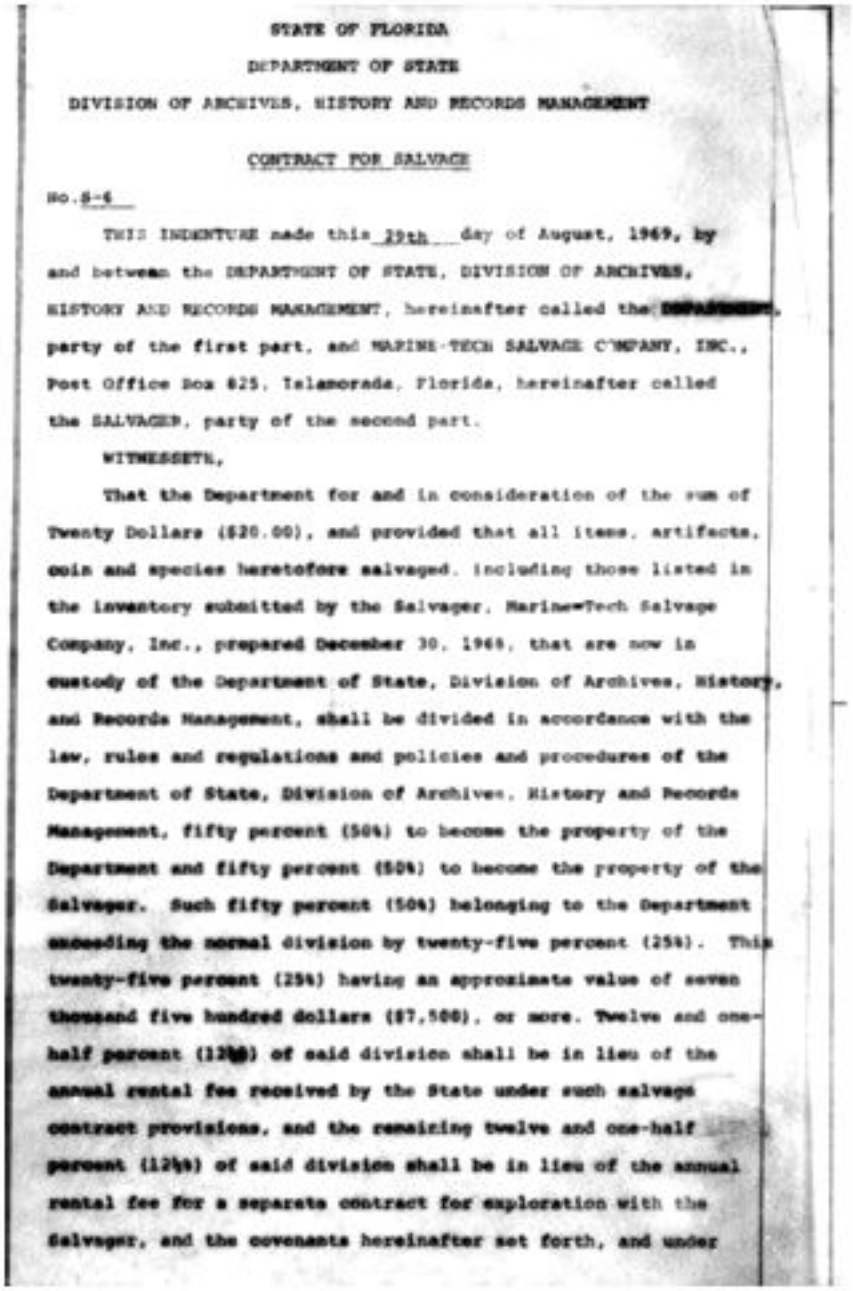
h. **Summary of Daily Activities** — This is a year long record of what your company does under the contract. Record all daily activities, including those carried out at the dock, even maintenance. **An adequate summary of each day's activities should be presented.**

i. **Signature of Person in Charge** — The person designated pursuant to Chapter 41B-1.10 (6), Rules of the Division of Archives History and Records Management.

j. **Reviewed** — Leave blank (For Division or Bureau use only).

5. At the close of each **week's** activities remove the second contractors copies (Blue second sheets) and transmit them by **registered** mail to the Director of the Division of Archives, History and Records Management (Address above). After the termination of the contract the contractors copies for each day the contract was in effect will be returned to the contractor as a record.

Appendix C: Example of Salvage Contract S-6 (Undersea Mining Company 1969).



STATE OF FLORIDA

DEPARTMENT OF STATE

DIVISION OF ARCHIVES, HISTORY AND RECORDS MANAGEMENT

CONTRACT FOR SALVAGE

No. S-6

THIS INDENTURE made this 29th day of August, 1969, by and between the DEPARTMENT OF STATE, DIVISION OF ARCHIVES, HISTORY AND RECORDS MANAGEMENT, hereinafter called the DEPARTMENT, party of the first part, and MARINE-TECH SALVAGE COMPANY, INC., Post Office Box 825, Islamorada, Florida, hereinafter called the SALVAGER, party of the second part.

WITNESSETH,

That the Department for and in consideration of the sum of Twenty Dollars ($20.00), and provided that all items, artifacts, coin and species heretofore salvaged, including those listed in the inventory submitted by the Salvager, Marine-Tech Salvage Company, Inc., prepared December 30, 1968, that are now in custody of the Department of State, Division of Archives, History, and Records Management, shall be divided in accordance with the law, rules and regulations and policies and procedures of the Department of State, Division of Archives, History and Records Management, fifty percent (50%) to become the property of the Department and fifty percent (50%) to become the property of the Salvager. Such fifty percent (50%) belonging to the Department exceeding the normal division by twenty-five percent (25%). This twenty-five percent (25%) having an approximate value of seven thousand five hundred dollars ($7,500), or more. Twelve and one-half percent (12½) of said division shall be in lieu of the annual rental fee received by the State under such salvage contract provisions, and the remaining twelve and one-half percent (12½) of said division shall be in lieu of the annual rental fee for a separate contract for exploration with the Salvager, and the covenants hereinafter set forth, and under

4. The Salvager covenants and agrees as follows:

(a) To make reports to the Department under oath at the end of each three months, or more often if either party desires, of operations and findings of all items salvaged and removed, including a list of such materials taken. The Department shall pay the Salvager up to seventy-five percent (75%) of the fair market value of all items salvaged or removed by the Salvager, or give to the Salvager items whose value is up to seventy-five percent (75%) of the fair market value on all the items in each division under this contract, or give the Salvager a combination of materials and fair market value at the option of the Department. The selection of a method of payment or division of articles shall be made by the Department through its Director of the Division of Archives, History and Records Management. In the event the parties hereto are unable to reach agreement with respect to the division of salvaged items as set forth above, then a committee of three professional appraisers shall be jointly appointed by the Board and Salvager for purpose of determining the proper division of the salvaged or recovered items to be made to the Department and Salvager, respectively. Payment for the services of the professional appraisers is to be made jointly and equally by the Salvager and the State or any of its agencies having available funds for this purpose as authorized in Chapter 67-50, Acts of 1967.

It is declared to be the public policy of the State that all treasure trove, artifacts and such objects having intrinsic or historical and archaeological value which have been abandoned on State-owned lands or State-owned sovereignty submerged lands, shall belong to the State of Florida, with the title thereto vested in the Department of State, Division of Archives, History and Records Management, for the purpose of administration and protection. No sale or disposition shall be made of any materials recovered under this contract until the Department through its Director of the Division of Archives, History and Records Management, has advised the Salvager whether the royalty set forth above shall be paid in recovered material or in cash or in a combination of the two and a division of the material has been scheduled and consummated as set forth above. It is the intent of the Department that such division shall be made as expeditiously as possible within a reasonable time after the report of the findings by the Salvager, provided, however, that the Department shall have a reasonable time in which to perform such evaluation and do such cleaning of the materials as the Department shall deem necessary prior to division. During the period of time after recovery of the materials and prior to a division of the materials between the Salvager and the State, the Salvager shall be responsible for the safekeeping of all materials and shall retain them in a place of safety designated in writing by the Director of the Division of Archives History and Records Management and shall take no action that will alter the place of safekeeping, the form of the material, or in any way use or

display said materials without the written consent of the Department acting through its Director of the Division of Archives, History and Records Management, or other designated agent.

(b) To comply with all laws and regulations of the State of Florida relating to conservation of fish, oysters, and marine life; all rules and regulations concerning navigation and riparian rights; and all rules, regulations and methods of procedure set forth by the Department to insure the preservation and protection of historic and archaeological sites as contemplated by the terms of Chapter 67-50, Acts of 1967;

(c) To obtain advance permission from the Department and from the United States Engineers, Department of the Army, before constructing pilings or locks or installing equipment in navigable waters;

(d) To disturb no beds of economically exploitable metals or minerals lying and being in their natural state.

(e) To use no explosives in any of the operations permitted under this contract.

(f) To conduct the operations authorized hereunder in such a manner as to afford protection to the rights of riparian owners;

(g) The fifty percent (50%) of the artifacts, coin, species and other material becoming the property of the Salvager, Marine-Tech Salvage Company, Inc., as provided in the consideration clause of this contract, shall, in lieu of the bond required by the Department of State, be retained by the Department of State in its custody as security for the faithful performance of this contract, and a separate exploration contract #E-21 between the Department and the Salvager, and said artifacts, coin and species, to become the property of the State as liquidated damages should the Salvager, Marine-Tech Salvage Company, Inc., fail in any respect to carry out the terms and conditions of this contract, or of that separate exploration contract #E-21 between the Department and the Salvager. Such artifacts shall be kept by the Department of State as security until the salvor furnishes an adequate and acceptable bond for Salvage Contract #S-6, and Exploration Contract #E-21, as now required of salvors to the State of Florida, or the artifacts, coin and species, in custody of the Department of State are duly inventoried and apportioned, whichever occurs last, or until in a breach of either Salvage Contract #S-6, or Exploration Contract #E-21, or both, by the Salvager, at which time ownership shall pass to the State.

(h) This contract is not subject to assignment in whole or in any part by Salvager; however, employment agreements may be entered into by Salvager subject to the prior written approval of the duly authorized representative of the Department.

(i) To permit the Department or its designated agents, at any reasonable time, to audit the books, accounts and logs of the Salvager and in connection with operations permitted under this contract. The Department, at its option, may provide an agent or agents at the home port or ports of salvage vessels operated under this contract, for the purpose of auditing the salvaged material recovered as a result of any or each day's salvage work and for the purpose of observing the operations being conducted by the Salvager under this contract, including the right and privilege of boarding any vessel engaged in salvage operations authorized herein and working underwater in actual salvage operations conducted by the Salvager as authorized herein;

(j) To maintain an accurate daily log of the operations of all vessels used in the salvage procedures authorized herein, which log shall include an accurate detailed list of all items recovered and the location of the site from which such items are recovered as prescribed by a duly authorized representative of the Department;

(k) To store all material recovered under this contract whether of a base or precious nature, in a manner prescribed by the State Marine Archaeologist or other designated agent of the Department. The Department, at its own expense, may require that all or any part of the recovered material be transported to a State facility for cleaning or preservation for the purpose of archaeological evaluation prior to scheduling a division with the Salvager. It is understood that on occasion severely deteriorated articles may not survive the cleaning process. The Department takes no responsibility in such cases other than accounting for the loss on the inventory furnished the Salvager prior to a division;

(l) Shall extend all reasonable cooperation to any archaeologist provided by the Department to prepare maps, make site studies, and salvage artifacts in the best interest of the State.

5. The log furnished by the Department and kept by the Salvager pursuant to Rules of the Department, is the property of the Department and may be removed, used, or otherwise disposed of at the discretion of the Department, subject to the right of the Salvager to microfilm a copy thereof at his discretion.

6. This contract is made subject to any and all prior grants made by the Trustees of the Internal Improvement Fund of the State of Florida.

7. Should the Salvager fail to comply fully with any of the provisions contained herein or any of the Rules and Regulations of the Department, this contract may be immediately

cancelled at the option of the Department and all of the artifacts listed in 4(g) above as being held in lieu of the bond required by the Department of State, shall be forfeited to and become the property of the Department of State, Division of Archives, History and Records Management.

IN WITNESS WHEREOF, I, Tom Adams, Secretary of State of the State of Florida, have hereunto subscribed my name and have caused the Great Seal of the State of Florida to be hereunto affixed in the City of Tallahassee, Florida, on this the_____ day of August, A. D., 1969.

Secretary of State

MARINE-TECH SALVAGE COMPANY, INC.

By: _____ President

Salvager

ATTEST:

Appendix D: Chapter 1A-46 Archaeological and Historical Report Standards and Guidelines (Florida Department of State 2015b).

CHAPTER 1A-46 ARCHAEOLOGICAL AND HISTORICAL REPORT STANDARDS AND GUIDELINES 1A-46.001 Standards and Guidelines for Reports. 1A-46.002 Definitions. (Repealed) 1A-46.003 Criteria for Reports of Identification, Evaluation, and Documentation Activities. (Repealed) 1A-46.004 Criteria for Qualifications of Archaeologists. (Repealed) 1A-46.005 Report Review Procedures. (Repealed) 1A-46.006 Technical Assistance. (Repealed) 1A-46.007 Dispute Resolution. (Repealed) 1A-46.001 Standards and Guidelines for Reports. (1) Purpose. This rule specifies criteria by which the Division of Historical Resources (Division) will review reports of cultural resource activities on federally assisted, licensed or permitted projects; on projects on state owned or controlled property or state assisted, licensed, or permitted projects; and on local projects for which the Division has review authority. (2) Definitions. The following words and terms shall have the meanings indicated: (a) "Agency" or "Applicant" means any unit of federal, state, county, municipal or other local government; any corporation, partnership or other organization, public or private, whether or not for profit; or any individual or representative of any of the foregoing proposing undertakings. (b) "Archaeological fieldwork" means actions undertaken for the purpose of recovering data about or from an archaeological site in order to evaluate and determine National Register eligibility; or to document through archaeological excavation the archaeological site prior to proposed alteration, damage or destruction. (c) "Archaeological site" means the complex of associated physical remains and features contained in the ground that evidence past use or modification by people. (d) "Area of potential effect" means the geographic area or areas within which an undertaking may directly or indirectly cause changes in character or use of historic resources, if any such properties exist. (e) "Certified Local Government" means a local government that has been certified to meet Federal and State standards, as set forth in the "Florida Certified Local Government Guidelines" (Form HR3E03204-02) herein incorporated by reference, and can participate in the nationwide program of financial and technical assistance to preserve properties. (f) "Completeness" means the inclusion in the report of archaeological and historical activities of all applicable sections of the prescribed content, but does not mean that said sections are sufficient in comprehensiveness of data or in quality of information provided. (g) "Days" means calendar days. (h) "Determination of eligibility" means the process of determining whether identified historical resources are deemed significant using the criteria for significance established by the National Park Service, U.S. Department of the Interior for the National Register of Historic Places. (i) "Federal undertaking" means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out with federal assistance; those requiring a federal permit, license or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a federal agency. (j) "Florida Master Site File" or "FMSF" means the record of identified historical resources maintained by the Division. (k) "Historical fieldwork" means actions undertaken for the purpose of recovering data about or from a building(s) or structure(s) to evaluate and determine eligibility; or to document using the Historic American Buildings Survey (HABS) or Historic Engineering Record (HAER) standards and guidelines prior to proposed alteration or destruction. (l) "Historical resource" means a building, structure, site, object or collection thereof (a prehistoric or historic district) which is generally at least fifty years old of historical, architectural, or archaeological value. (m) "Historic context" means the organizational format that groups information about related historical resources based

on theme, geographical limits and chronological period. A single historic context describes one or more aspects of the historic development of an area, considering history, architecture, archaeology, engineering and culture, and identifies significant patterns that individual historical resources represent. A set of historic contexts is a comprehensive summary of all aspects of the history of an area. (n) "Local undertaking" means a project, activity or program subject to the provisions of a local ordinance or regulation for which the Division has review authority. (o) "National Register" means the National Register of Historic Places, the list of historical resources significant in American history, architecture, archaeology, engineering and culture and authorized by the National Historic Preservation Act of 1966 as amended and administered by the U.S. Department of the Interior, National Park Service. (p) "Principal Investigator" means the person or persons responsible for supervising archaeological fieldwork and historical fieldwork. (q) "State undertaking" means a project, activity or program in which a state agency of the executive branch has direct or indirect jurisdiction; those in which a state agency provides financial assistance to a project or entity; and those in which a state agency is involved through the issuance of state permits or licenses. 2 (r) "Sufficiency" means determining whether the report meets the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (published in the Federal Register, Vol. 48, No. 190, pp. 44716-44740, September 29, 1983), herein incorporated by reference, with respect to identification, evaluation and documentation. (3) Reports. Reports of the results of archaeological fieldwork and historical fieldwork activities shall include the topics in (a)-(h) below in sufficient detail for the Division to review for completeness and sufficiency. For projects of limited scope, topics that are not applicable may be omitted when a justification for this decision is provided. In addition, all reports shall be consistent with and meet the terms of the standards and guidelines for identification, evaluation and documentation contained in the "Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation." This section shall apply to federal, state and local undertakings. Principal investigators shall meet the minimum qualifications for archaeology, history, architecture, architectural history, or historic architecture contained in 36 C.F.R. 61 ("Procedures for Approved State and Local Historic Preservation Programs, Appendix A, Professional Qualifications Standards"), herein incorporated by reference, effective 10-97. (a) General Description. The description of the project shall address the project location (including boundary map) and description; the purpose of project; the area of potential effect; and the pertinent federal, state or local laws and regulations. (b) Archival Research. Archival research shall address past field surveys in the project area and the relevance of the major findings to the area currently under study; pertinent data in the Florida Master Site File; pertinent environmental and paleoenvironmental data; pertinent data in other studies appropriate for the research problem; pertinent historical data from records such as plat maps, tract books, subdivision maps, Sanborn maps, city directories, building permits and architectural plans; and pertinent information from informants, which shall include the Certified Local Government within whose boundaries the project lies. Research results shall be presented in a chronologically arranged narrative of the prehistory and history of the project area and of the significant historical events or developments (including important individuals and institutions) which are necessary to place sites and properties in historic contexts within the project area. (c) Research Design. The description of the research design shall address the objectives; methods; expected results; and procedures to deal with unexpected discoveries including the discovery of human remains in accordance with Chapter 872.05, Florida Statutes. (d) Archaeological Fieldwork. The description of archaeological fieldwork activities shall address the types of sites encountered and evaluated; the boundaries of the area investigated; fieldwork methodology and the rationale for its selection; the location of all tests and excavations, including maps depicting testing locations and results, site components, integrity of sites and subareas within the sites; information on the location and appearance of features and artifacts, as well as the integrity and boundaries of sites and site components; information on any portions of the project area and any portions of identified sites which were not investigated and a statement explaining the reason why investigation did not occur; photographs of each site; photographs and illustrations representative of site subareas or features, or formal excavation units; identification of portions of the project area that were examined but that did not contain archaeological remains; special survey techniques; and information on changes in research design or methodology.

Special survey techniques may be necessary to search for certain subsurface or underwater archaeological sites. The description of special survey techniques shall address the following topics: equipment, field methodologies, areas surveyed and not surveyed, a record of the nature and location of all potential historical resources identified and a description of any potential historical resources investigated by examination to determine their nature. Underwater archaeological surveys shall be conducted in accordance with the "Florida Division of Historical Resources Performance Standards for Submerged Remote Sensing Surveys" (Form HR6E06304-02), herein incorporated by reference. (e) Historical Fieldwork. The description of historical fieldwork activities shall address the boundaries of the area investigated; fieldwork methodology and the rationale for its selection; the types of resources identified and evaluated; a list of all historical resources within the survey area, including the Florida Master Site File number, with all identified resources plotted on a U.S. Geological Survey (1:24,000) 7.5 minute series topographic quadrangle map; descriptions for all identified resources; photographs or illustrations representative of resources located in the project area; information on any portions of the project area which were not investigated and a statement explaining the reason why investigation did not occur; and an explanation about those portions of the project area that were examined but that did not contain historical, architectural, engineering or cultural resources. (f) Archaeological Results and Conclusions. The description of the results and conclusions of the archaeological resource investigations shall address laboratory methods used to analyze artifacts and other site materials recovered during the archaeological investigations in the project area; the curation location of artifacts and project records; findings in relation to the stated objectives of the investigations; an assessment of site integrity; methods used to apply National Register criteria for a determination of eligibility and historic context as contained in 36 C.F.R. 60 ("National Register of Historic Places"), herein incorporated by reference; a discussion of completeness of project efforts and the need for any additional identification, evaluation or documentation efforts; conclusions and analysis of the findings, including a discussion on how the findings contribute to an understanding of the historic work or treatment of the site; and a bibliography of those sources utilized. (g) Historical Results and Conclusions. The description of the results and conclusions of the historical, architectural, engineering or cultural resource investigations shall address findings in relation to the stated objectives; an assessment of the integrity of evaluated sites; methods used to apply National Register criteria for a determination of eligibility and historic context; a description of the constituent elements that constitute the complete property (e.g. outbuildings, landscape features, etc.), which is determined eligible for listing in the National Register; the National Register property boundaries depicted on a scaled site plan 3 sketch; conclusions and analysis of the findings; a discussion of the manner in which the resources contribute to an understanding of local, regional, state, or national history and/or architectural history; recommendations regarding the treatment of the resource(s) including but not limited to preservation or avoidance, minimization or mitigation of potential impacts, or no action; a discussion of the scope and completeness of the project efforts and the need for any additional identification, evaluation or documentation efforts; the location of all curated project records and location of all project records (e.g. photographs, oral interviews, etc.); and a bibliography of those sources used. (h) Florida Master Site File (FMSF) Requirements. Reports of archaeological fieldwork and historical fieldwork activities will be deemed incomplete if they do not contain FMSF survey log sheets for each report and site forms for each site identified, evaluated or documented. All archaeological fieldwork and historical fieldwork reports shall include the following, either as part of the report or as accompanying documents: 1. FMSF Survey Log Sheets (Form HR6E06610-97, effective 9-1-97), completed in accordance with the "Guide to the Survey Log Sheet" (Form HR6E05904-02), with project boundaries depicted on an attached original or photocopy portion of a U.S. Geological Survey (1:24, 000) 7.5 minute series topographic quadrangle map. 2. FMSF archaeological site forms (Form HR6E06401-97, effective 3-1-97), completed in accordance with the "Guide to the Archaeological Site Form, Version 2.2 (Form HR 6E05804-02), as appropriate. 3. FMSF historical structure forms (Form HR6E06308-96, effective 11-1-96), completed in accordance with the "Guide to the Historical Structure Form, Version 3.0" (Form HR6E06004-02), as appropriate. 4. FMSF historical bridge forms (Form HR6E06510-97, effective 10-1-97), completed in accordance with the "Guide to the Historical Bridge Form (Form HR6E06104-02), as appropriate. 5.

FMSF historical cemetery forms (Form HR6E04806-92, effective 8-1-98), completed in accordance with the "Guide to the Historical Cemetery Form" (D HR6E0620402), as appropriate. 6. Completed FMSF shipwreck forms (Form HR6E05006-92, effective 7-1-92), as appropriate. 7. Completed FMSF archaeological short form (Form HR6E04906-92, effective 12-1-95), as appropriate. 8. Completed FMSF resource group forms (Form HR6E05711-01, effective 7-1-00), as appropriate. 9. An original or photocopy portion of U.S. Geological Survey (1:24,000) 7.5 minute series topographic quadrangle maps for all identified sites showing site locations. These forms are herein incorporated by reference and are available by writing the Division at R. A. Gray Building, 500 South Bronough Street, Tallahassee, Florida 32399-0250. These forms may also be obtained from the Division's website at www.flheritage.com. (4) Review Procedures. The following procedures shall be followed in the review of archaeological fieldwork and historical fieldwork reports: (a) Reports and accompanying documentation shall be submitted to the Bureau of Historic Preservation at the Division. (b) The Division shall notify the agency or applicant in writing within fifteen days of receipt of a review request, of any additional information required. (c) Upon its determination that the report is complete, the Division shall complete its review of the report for sufficiency based on the criteria specified in subsection 1A-46.001(3), F.A.C., within thirty (30) days. (d) The Division shall notify the agency or applicant of its decision as to whether the report meets the requirements of this rule with respect to completeness and sufficiency, and shall include a statement of the reason for determining a report to be incomplete or insufficient. Specific Authority 267.031(1) FS. Law Implemented 267.031 FS. History–New 6-10-92, Amended 7-21-96, 8-21-02

Appendix E: Florida Administrative Code (Florida Department of State 2015b).

CHAPTER 1A-32

ARCHAEOLOGICAL RESEARCH

1A-32.001 Definitions.

(1) Accredited Institutions shall mean those state institutions that:

(a) Permanently possess professional archaeological staff who meet or, in the judgment of the State Archaeologist, are capable of meeting the following Secretary of the Interior's Professional Qualifications Standards for archaeology, which may be represented by separate individuals:

1. A graduate degree in archaeology, anthropology, or closely related field plus:

a. At least one year of full-time professional experience or equivalent specialized training in archaeological research, administration or management;

b. At least four months supervised field and analytic experience in general North American archaeology; and

c. Demonstrated ability to carry research to completion.

2. In addition to these minimum qualifications, a professional in prehistoric archaeology shall have at least one year of full-time professional experience at a supervisory level in the study of archaeological resources of the prehistoric period. A professional in historic archaeology shall have at least one year of full-time professional experience at a supervisory level in the study of archaeological resources of the historic period; and

(b) Subscribe to the "Principles of Archaeological Ethics" of the Society of for American Archaeology, particularly with respect to facilities and support services for the successful, professional conduct of archaeological field research. The "Principles of Archaeological Ethics," effective 2/2014, are incorporated herein by reference and may be obtained by writing the Bureau of Archaeological Research, 1001 de Soto Park Drive, Tallahassee, Florida 32301, or by calling (850) 245-6444, http://www.flrules.org/Gateway/reference.asp?No=Ref-03710.

(2) Non-Accredited Institution shall mean all other institutions as provided in Section 267.12(2), F.S.

(3) Professional archaeological expertise shall mean persons who meet, or in the judgment of the State Archaeologist are capable of meeting, the Secretary of the Interior's Professional Qualifications Standards for archaeology.

(4) Professional quality research shall mean research conducted by persons with professional archaeological expertise and in a manner consistent with the "Principles of Archaeological Ethics" of the Society for American Archaeology.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.12(2), (3) FS. History–New 1-1-75, Amended 9-7-78, Formerly 1A-32.01, Amended 2-16-14.

1A-32.002 Scope.

Rulemaking Authority 267.12(1) FS. Law Implemented 267.12 FS. History-New 1-1-75, Formerly 1A-32.02, Repealed 12-18-95.

1A-32.003 Criteria for Evaluating Research Requests.

The following criteria are established to insure that research upon archaeological sites pursuant to Section 267.12, F.S., shall be conducted in a professional manner, and that the data recovered as a result thereof shall benefit the people of Florida in understanding their rich and varied heritage. All research requests shall contain the following:

(1) Only museums, universities, colleges or other historical, scientific or educational institutions or societies that subscribe to the "Principles of Archaeological Ethics" of the Society for American Archaeology will be considered as valid research applicants; and,

(2) Applicants shall possess or will secure the professional archaeological expertise necessary for the performance of professional quality archaeological field research, comprehensive analysis and interpretation in the form of publishable reports and monographs; and,

(3) Applicants shall possess or will secure sufficient artifactual conservation and storage capabilities to insure artifact preservation during the research period; and,

(4) No research request shall be considered, exclusive of reconnaissance survey requests, unless (a) a degree of endangerment to the archaeological resources is present in the proposed research area (i.e. severe erosion); (b) the proposed research area form an integral part in a well-defined research design or (c) the research is part of a planned interpretive reconstruction or restoration project; and,

(5) Adequate funding capability must be available to fully implement the proposed research plan, including field work, laboratory analysis and processing and manuscript preparation.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.12(2), (3) FS. History–New 1-1-75, Amended 9-7-78, Formerly 1A-32.03, Amended 2-16-14.

1A-32.004 Notification Requirements for Accredited Institutions.

(1) A written notification to the Division by accredited institutions requesting approval for archaeological research according to Section 267.12(2), F.S., must be submitted prior to scheduled project initiation.

The notification shall contain all of the following items:

(a) Name and address of the requesting institution;

(b) Date of notification;

(c) Specific location(s) of the proposed research area, including site means and numbers where applicable;

(d) Aims, character, and purpose of the proposed research (include a clear and concise research design);

(e) Specific threats or endangerment of archaeological sites within the proposed project area (if applicable);

(f) Name of the individual in direct charge of the field research;

(g) Total number of project personnel;

(h) Initiation and termination dates of the research;

(i) Proposed publication source and date the completed manuscript;

(j) Total research funds to be expended on the project; and,

(k) Signature of the requesting official.

(2) The Division will respond to the requesting accredited institution within 15 days after receipt of the written notification. The Division's response will consist of (a) approval, or (b) disapproval, or (c) a request for information clarification. In the event the Division requests clarification of one or more items in the written notification, the 15 day response obligation will take effect upon receipt of the additional information by the Division.

Rulemaking Authority 267.031(4) FS. Law Implemented 267.12(2) FS. History–New 1-1-75, Amended 9-7-78, Formerly 1A-32.04.

1A-32.005 Application Requirements for Non-accredited Institutions.

(1) Non-accredited institutions desiring to conduct research under Section 267.12(2), F.S., must apply to the Division for a research permit for each and every proposed project. Archaeological Research Permit – 1A-32 Application (Form HRE4404-13), effective 2/2014, is herein incorporated by reference, effective 01/2014, http://www.flrules.org/Gateway/reference.asp?No=Ref-03343. A copy of the form may be obtained by writing the Bureau of Archeaological Research, 1001 de Soto Park Drive, Tallahassee, Florida 32301, or by calling (850) 245-6444.

(2) In addition to the requirements imposed upon accredited institutions by paragraphs (a)-(k) of subsection 1A-32.004(1), F.A.C. herein, non-accredited institutions must supply the following information:

(a) Name, address and official status of person to be in general charge of project, including a resume of previous experience pertinent to archaeological research; and,

(b) Nature, status and scientific affiliations of applicant organization; and,

(c) Names and qualification of additional research participants who will exercise any supervisory authority during the proposed research project; and,

(d) Total fiscal resources available for publication requirements.

(3) Completed permit applications must be submitted to the Division prior to the project research initiation date.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.12(2) FS. History–New 1-1-75, Amended 9-7-78, Formerly 1A-32.05, Amended 2-16-14.

1A-32.006 Prohibited Practices; Penalties.

(1) When the division determines that a person or business organization is violating, or has violated, one or more of the provisions of Sections 267.13(2)(a) and (d), F.S., the division will contact the alleged violator and direct that the offending activity cease immediately and/or direct that the property of the State be returned to the division. If the violation does not cease or is not cured within the time specified by the division, the division will send the alleged violator notice of an administrative proceeding provided in Section 267.13(2)(b), F.S., and/or the division will apply to a court of competent jurisdiction for injunctive relief as specified in Section 267.13(2)(d), F.S.

(2) The division will commence an administrative proceeding if it is determined that the alleged violation resulted in permanent damage to historic property of the State.

(3) The division will apply to a court of competent jurisdiction for injunctive relief if the alleged violation is ongoing and the division determines that continued activity poses a threat to the historic preservation goals of the State.

(4) The division will commence an administrative proceeding and apply to a court of competent jurisdiction for injunctive relief when the division determines that the alleged violation has caused permanent damage to the historic property of the State and that continued activity poses a threat to the historic preservation goals of the State.

(5) If the alleged violator timely requests a hearing, the administrative proceeding may be an informal or formal hearing as the facts and law dictate. The requested administrative proceeding shall not be mediation.

Rulemaking Authority 20.10(3), 267.13 FS. Law Implemented 267.13(2)(a)-(d) FS. History–New 5-15-06.

CHAPTER 1A-31

PROCEDURES FOR CONDUCTING EXPLORATION AND SALVAGE OF HISTORIC SHIPWRECK SITES

1A-31.001 Definition.

Rulemaking Authority 267.031(5) FS. Law Implemented 267.061 FS. History-New 5-7-68, Repealed 1-1-75, Formerly 1A-31.01.

1A-31.0012 Purpose.

It is the public policy of the state to preserve and protect archaeological sites and objects of antiquity for the public benefit and to limit exploration, excavation, and collection of such materials to qualified persons, businesses, and educational institutions possessing the requisite skills and purpose to add to the general store of knowledge concerning history, archaeology, and anthropology. The purpose of this rule is to provide guidance and information to the public regarding issuance of permits by the division for exploration and recovery of historic shipwreck sites by commercial salvors on state-owned sovereignty submerged lands and for transferring objects recovered by commercial salvors under permit in exchange for recovery services provided to the state.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), (5)(i), (k), (o), 267.061(1), 267.115, 267.14 FS. History–New 7-20-09.

1A-31.0015 Definitions.

(1) "Applicant" means any corporation, individual, partnership or other legal entity making application to the division for an Exploration Permit or a Recovery Permit.

(2) "Application" means a formal written request on the Application for Exploration Permit or the Application for Recovery Permit and all other documentation required by this chapter to be submitted as part of such application.

(3) "Archaeological materials" means artifacts and remains of historic shipwreck sites including but not limited to ships' structure and rigging, hardware, tools, utensils, cargo, and personal items of crew and passengers.

(4) "Permittee" means an applicant that has been issued an Exploration Permit or a Recovery Permit in accordance with this chapter.

(5) "Division" means the Division of Historical Resources of the Department of State.

(6) "Historic Shipwreck Site" means the remains of a sunken or abandoned ship or other watercraft on or below the seabed including but not limited to ships' structure and rigging, hardware, tools, utensils, cargo, personal items of crew and passengers, and treasure trove, which is at least fifty years old.

(7) "Historical resource" means a building, structure, site, object or collection thereof (a prehistoric or historic district) which is at least fifty years old and of historical, architectural, or archaeological value.

(8) "Exploration Permit" means the form of permission issued in accordance with this chapter to search for historic shipwreck sites on state-owned sovereignty submerged lands.

(9) "Recovery Permit" means the form of permission issued in accordance with this chapter to recover archaeological materials from a historic shipwreck site on state-owned sovereignty submerged lands.

(10) "Project Archaeologist" means the professional underwater archaeologist who meets both the Secretary of Interior's minimum Standards for Professional Qualifications of January 1, 2009, found in 36 C.F.R. Part 61, which are incorporated herein by reference, and the specific standards set forth in Rule 1A-31.030, F.A.C.

(11) "Sovereignty submerged lands" means those lands including but not limited to tidal flats, sand bars, shallow banks, and lands waterward of the ordinary or mean high water line, under navigable fresh and salt waters to which the State of Florida acquired title on March 3, 1845 by virtue of statehood, and which have not been heretofore conveyed or alienated.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), (5)(i), (k), (o), 267.061(1) FS. History–New 4-13-87, Amended 7-20-09.

1A-31.002 Scope of Law.

Rulemaking Authority 267.031(4) FS. Law Implemented 267.061 FS. History-New 5-7-68, Repromulgated 1-1-75, Formerly 1A-31.02.

1A-31.0022 Prior Agreements.

Any existing agreements or contracts concerning shipwreck exploration or salvage in effect as of the date of enactment of this rule are unaffected by this rule for their stated term and for as long as they shall be renewed by the division. Once such existing agreements or contracts expire, are not renewed or are terminated, this rule shall apply for any future permits.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2) FS. History–New 7-20-09.

1A-31.0025 Scope.

Rulemaking Authority 267.031(3) FS. Law Implemented 267.031(4), 267.061(3), 267.13 FS. History-New 4-13-87, Repealed 12-18-95.

1A-31.003 Division Authorized to Enter into Contracts.

Rulemaking Authority 267.031(4) FS. Law Implemented 267.031(5) FS. History-New 5-7-68, Amended 1-1-75, Formerly 1A-31.03, Repealed 4-13-87.

1A-31.0032 Notice Address and Form of Communication.

All communication to the division regarding applications, forms, information, permits and all reports required under the terms of a permit shall be submitted in written form to the division at:

Florida Division of Historical Resources

Bureau of Archaeological Research

1001 de Soto Park Drive

Tallahassee, FL 32301

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), 267.061(1) FS. History–New 7-20-09.

1A-31.0035 Form of Consent, Other Laws.

Within 30 days of the receipt of an application, the division shall, in writing, notify the Department of Environmental Protection and the applicant that a form of consent may be required from the Board of Trustees of the Internal Improvement Trust Fund to conduct the exploration or recovery activities. No exploration or recovery activities for archaeological materials may commence until the applicant has received necessary consent from the Board of Trustees of the Internal Improvement Trust Fund and any other permits that may be required by local, state or federal laws.

Rulemaking Authority 267.031(1) FS. Law Implemented 253.77, 267.031(2), (5)(i), 267.061(1) FS. History–New 4-13-87, Amended 7-20-09.

1A-31.004 Declaration of Ownership by State.

Rulemaking Authority 267.031(5) FS. Law Implemented 267.061 FS. History-New 5-7-68, Repealed 1-1-75, Formerly 1A-31.04.

1A-31.0042 Diving on Historic Shipwreck Sites.

Diving on historic shipwreck sites in Florida waters does not require a permit.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), 267.061(1), 267.11 FS. History–New 7-20-09.

1A-31.0045 Non-permittable Areas and Sites.

The division will not issue permits for the following areas and sites:

(1) Any abandoned shipwreck in or on the public lands of the United States or in or on Indian lands as set forth in the Abandoned Shipwreck Act of 1987, 43 U.S.C. sec. 2105(d), herein incorporated by reference;

(2) Any vessel for which a federal admiralty court has awarded title as against the State of Florida prior to April 28, 1988, the effective date of the Abandoned Shipwreck Act of 1987 (herein incorporated by reference), while such title remains valid;

(3) Vessels owned or operated by a government on military non-commercial service when they sank, which are entitled to sovereign immunity under federal law or international law, treaty, or agreement, including without limitation, United States or foreign military vessels, and as defined in the Sunken Military Craft Act (Public Law Number 108-375, Div. A, Title XIV, Sections 1401-1408, Oct. 28, 2004, 118 Stat. 2094);

(4) Areas of federal jurisdiction including but not limited to areas of the National Park System, National Marine Sanctuaries, National Wildlife Refuges, National Estuarine Research Reserves and US Military Reservations;

(5) Areas of the Florida Keys National Marine Sanctuary;

(6) Areas of state jurisdiction such as State Parks, State Aquatic Preserves, Coastal and Aquatic Managed Areas, State Archaeological Landmarks, State Archaeological Landmark Zones, Underwater Archaeological Preserves, Underwater Archaeological Research Reserves;

(7) Areas of submerged lands conveyed to public or private entities;

(8) Vessels that are or have been under the jurisdiction of a federal admiralty court, when such jurisdiction was established prior to April 28, 1988, the effective date of the Abandoned Shipwreck Act of 1987, except where the applicant provides proof that the federal court's jurisdiction and any rights it may have awarded are permanently terminated; and

(9) Historic shipwreck sites that are of such singular historical or archaeological significance that permitted activities would be incompatible with the division's responsibility to administer state-owned and state-controlled historic resources in a spirit of stewardship and trusteeship and to preserve archaeological sites and objects of antiquity for the public benefit. Significance shall be measured against the criteria established for National Historic Landmark designation, per 36 C.F.R. sec. 65.4 "National Historic Landmark criteria," effective as of February 2, 1983, which is herein incorporated by reference.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), 267.061(1), 267.11 FS. History–New 7-20-09.

1A-31.005 Contracts for Exploration.

Rulemaking Authority 267.031(5) FS. Law Implemented 267.061 FS. History-New 5-7-68, Repealed 1-1-75, Formerly 1A-31.05.

1A-31.0052 Security.

(1) The division and the permittee will cooperate to protect the permit area if state-owned historic resources are at risk.

(2) The permittee is responsible for protecting all archaeological materials they have recovered from the permit area.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), 267.061(1)(b), 267.14 FS. History–New 7-20-09.

1A-31.0055 Exploration Agreements.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), 267.13 FS. History–New 4-13-87, Repealed 7-20-09.

1A-31.006 Contract for Salvage.

Rulemaking Authority 267.031(5) FS. Law Implemented 267.061 FS. History-New 5-7-68, Repealed 1-1-75, Formerly 1A-31.06.

1A-31.0062 Types of Permit.

(1) The division may issue two types of permits:

(a) An exploration permit allows the permittee to collect remote sensing and visual information on potential historic shipwreck sites without excavation or bottom disturbance. The exploration permit may be modified in writing at a later stage to allow such disturbance and excavation for purposes of attempting to determine the presence or absence and the nature of potential historic shipwreck sites. The number, location, extent and type of such test excavations shall be specified in the permit modification.

(b) A recovery permit may be issued only after the existence and nature of a historic shipwreck site has been documented by exploration permit activities and mutually agreed upon by the division and the permittee. A recovery permit allows the permittee to conduct more extensive excavations and recover archaeological materials, and allows for the transfer of title to the permittee of objects recovered, per Rule 1A-31.090, F.A.C. The number, location, extent and type of such excavation and recovery operations shall be specified in the permit.

(2) The division shall not issue multiple permits for any active permit area or historic shipwreck site that is within an active permit area.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), 267.061(1) FS. History–New 7-20-09.

1A-31.0065 Salvage Agreements.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), 267.13 FS. History–New 4-13-87, Repealed 7-20-09.

1A-31.007 Scope.

Rulemaking Authority 267.031(4) FS. Law Implemented 267.061 FS. History-New 5-7-68, Repromulgated 1-1-75, Formerly 1A-31.07, Repealed 4-13-87.

1A-31.0072 Number of Permits Limited to Agency Ability.

The division shall not issue more permits than it can properly supervise, monitor and administer. The maximum allowable number of concurrent permits shall be determined by the division based on:

(1) Number and types of permits already in effect;

(2) The anticipated termination date of permits already in effect;

(3) The number of applications under review or anticipated to result in permits;

(4) The number of staff assigned to supervise, monitor and administer permits; and

(5) The availability of funds necessary for the division to conduct all office and field activities under this chapter.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2) FS. History–New 7-20-09.

1A-31.008 Employment Contracts.

Rulemaking Authority 267.031(4) FS. Law Implemented 267.031(5), 267.013 FS. History-New 5-7-68, Amended 1-1-75, Formerly 1A-31.08, Repealed 4-13-87.

1A-31.0082 Duration of Permit.

A permit shall have a term of three years.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2) FS. History–New 7-20-09.

1A-31.0085 Subcontracts.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), 267.013 FS. History-New 4-13-87, Repealed 2-27-97.

1A-31.009 Ownership and Payment for Recovery.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.061 FS. History-New 5-7-68, Amended 1-1-75, 9-6-78, Formerly 1A-31.09, Amended 4-13-87, Repealed 2-27-97.

1A-31.0092 Permit Area.

(1) The maximum size of an exploration permit area is three square statute miles.

(2) The size of a recovery permit area is limited to the size required to encompass the archaeological remains from which recovery is permitted.

(3) Permit areas shall be separated by a buffer zone of 100 yards width from recognized admiralty arrest areas.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2) FS. History–New 7-20-09.

1A-31.010 Supervision.

Rulemaking Authority 267.031(1), (2) FS. Law Implemented 263.061(3)(i), (k), 267.031 FS. History–New 5-7-68, Amended 1-1-75, 9-6-78, Formerly 1A-31.10, Amended 4-13-87, Repealed 7-20-09.

1A-31.011 Boats to Carry Identification.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.061(3)(i), (k) FS. History–New 5-7-68, Amended 1-1-75, 9-6-78, Formerly 1A-31.11, Amended 4-13-87, Repealed 7-20-09.

1A-31.012 Penalty; Unauthorized Exploration and Salvage.

Rulemaking Authority 267.031(4) FS. Law Implemented 267.031(4), 267.061 FS. History-New 12-19-70, Amended 9-6-78, Formerly 1A-31.12, Repealed 4-13-87.

1A-31.0125 Violations.

Rulemaking Authority 267.031(3) FS. Law Implemented 267.13 FS. History-New 4-13-87, Repealed 12-18-95.

1A-31.013 Prohibited Practices; Penalties.

(1) When the division determines that a person or business organization is violating, or has violated, one or more of the provisions of Sections 267.13(2)(a) and (d), F.S., the division will contact the alleged violator and direct that the offending activity cease immediately and/or direct that the property of the State be returned to the division. If the violation does not cease or is not cured within the time specified by the division, the division will send the alleged violator notice of an administrative proceeding provided in Section 267.13(2)(b), F.S., and/or the division will apply to a court of competent jurisdiction for injunctive relief as specified in Section 267.13(2)(d), F.S.

(2) The division will commence an administrative proceeding if it is determined that the alleged violation resulted in permanent damage to historic property of the State.

(3) The division will apply to a court of competent jurisdiction for injunctive relief if the alleged violation is ongoing and the division determines that continued activity poses a threat to the historic preservation goals of the State.

(4) The division will commence an administrative proceeding and apply to a court of competent jurisdiction for injunctive relief when the division determines that the alleged violation has caused permanent damage to the historic property of the State and that continued activity poses a threat to the historic preservation goals of the State.

(5) If the alleged violator timely requests a hearing, the administrative proceeding may be an informal or formal hearing as the facts and law dictate. The requested administrative proceeding shall not be mediation.

Rulemaking Authority 20.10(3), 267.13 FS. Law Implemented 267.13(2)(a)-(d) FS. History–New 5-15-06.

1A-31.020 Inspection by Permitting Agency.

Prior to or after issuance of any permit, the division may, without notice, inspect the permit area to perform any or all of the following:

(1) Evaluate statements made in the application;

(2) Determine the nature of any historical resources present;

(3) Determine whether any areas or sites within the proposed permit area are exempted from permitting;

(4) Examine all work already done or being done under the terms of the permit;

(5) Make a determination of compliance with Chapter 267, F.S., the terms of the permit, and the conditions specified in this rule.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2) FS. History–New 7-20-09.

1A-31.025 Assignment and Subcontracting.

No permit may be assigned or transferred. Subcontract agreements are allowed and require the prior written approval of the division. Compliance with all terms and conditions of the permit is the sole responsibility of the permittee whether or not permitted activities are subcontracted.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2) FS. History–New 7-20-09.

1A-31.030 Project Archaeologist Qualifications.

Any permit issued under this rule shall require the participation of a professional underwater archaeologist who shall serve as the project archaeologist. The project archaeologist must meet, at a minimum, the Secretary of Interior's Standards for Professional Qualifications, as set forth in Federal Register Vol. 48, No. 190, p. 44739, and the

following minimum qualifications of training, knowledge, experience and skills with an emphasis on underwater sites, water-saturated archaeological materials, and preservation methods, as evidenced by the project archaeologist's resume submitted with the permit application:

(1) At least 12 weeks of supervised underwater archaeological fieldwork and 10 weeks of supervisory underwater archaeological fieldwork;

(2) At least two weeks field experience and training in underwater survey technique and familiarity with the general theory and application of varied remote sensing technology;

(3) Experience or training in the recovery and interpretation of both archaeological and archival data and familiarity with the history and technology of navigation and ship building;

(4) Design and execution of an underwater archaeological study as evidenced by an M.A. thesis or a published report of equivalent scope and quality;

(5) For exploration permits, at least one month of experience in the operation of remote sensing devices in a marine environment for the purpose of discovery and evaluation of archaeological resources supervised by a specialist in the use of such devices;

(6) For exploration permits, at least three months of experience in a supervisory or independent role; and

(7) For recovery permits and exploration permits involving recovery of archaeological materials, at least eight weeks of supervised training in the general theory and application of stabilization and conservation methods as they pertain to waterlogged materials.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), (5)(i), (k), 267.061(1) FS. History–New 7-20-09.

1A-31.036 Project Archaeologist Responsibilities.

The project archaeologist shall:

(1) Ensure that professional archaeological standards, consistent with the standards and guidelines for archaeological reports in Rule 1A-46.001, F.A.C., are maintained throughout the course of the project;

(2) Develop a research design and appropriate procedures for its implementation;

(3) Review remote sensing data and provide a written interpretation of the results to the division;

(4) Based on their professional judgment, personally be present and visually inspect excavations when significant archaeological material clusters and/or areas of articulated ship's structure are being excavated, at such times as may be necessary to properly interpret the historic shipwreck site, and as needed in order to prepare an interim or final report consistent with the standards and guidelines for archaeological reports in Rule 1A-46.001, F.A.C.;

(5) Ensure that adequate records are maintained during all remote sensing, testing, excavation, recovery and conservation and stabilization of recovered artifacts as needed in order to prepare an interim or final report consistent with the standards and guidelines for archaeological reports in Rule 1A-46.001, F.A.C.; and

(6) Maintain regular contact with the division, providing electronic, facsimile or paper copy reports of all significant developments, including discoveries of historic shipwreck sites and historical resources.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), 267.031(5)(i), (k), (o), 267.061(1) FS. History–New 7-20-09.

1A-31.040 Application Procedures.

(1) Applications for permits issued under this chapter shall be made on forms prescribed by the division. Application forms may be requested in writing at the division's address in Rule 1A-31.0032, F.A.C. Application for Exploration Permit (Form HR6E9001-08), (4/09) is herein incorporated by reference, effective 7-20-09. Application for Recovery Permit (Form HR6E9002-08), (4/09) is herein incorporated by reference, effective 7-20-09.

(2) One copy of the completed application bearing an original signature of the applicant shall be submitted to the division at the address specified in Rule 1A-31.0032, F.A.C.

(3) The permittee may apply for a permit renewal in accordance with procedures in this rule. The application form shall specifically explain any differences from the previous application. Any sections that are unchanged may be answered "No Change."

(4) The division may request additional information or clarification on any application that is submitted. Such request shall be made to the applicant in writing and shall indicate the date by which the information or clarification is needed.

(5) Requests for renewal must be received prior to the termination date of the permit. Requests for renewal will be considered sufficient when all requirements of the permit have been satisfied, any errors or omissions have been corrected, and any additional information requested by the division has been received.

(6) Renewals shall have a term of three years.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2) FS. History–New 7-20-09.

1A-31.046 Application Review.

The division shall consider the following criteria in its decision to approve or deny a permit application, and may consider other relevant information:

(1) The public policy of the state to preserve and protect archaeological sites and objects of antiquity for the public benefit and to limit exploration, excavation, and collection of such matters to qualified persons and educational institutions possessing the requisite skills and purpose to add to the general store of knowledge concerning history, archaeology, and anthropology;

(2) Conflicts with other permit areas and non-permittable areas and sites, per Rule 1A-31.0045, F.A.C.

(3) Date of receiving the application in relation to other applications for the same location. A duplicate application for the same area shall not be entertained until the initial application for that area has been fully processed and made subject to a final order by the division;

(4) Experience, ability and plans to comply with safety and security requirements as demonstrated in the application;

(5) Experience, ability and plans to collect and supply data and records as demonstrated in the application;

(6) Ability of the division to supervise and administer the permit in addition to permits already issued;

(7) Results of the inspection of the requested permit area, if any;

(8) Financial ability to conduct the permitted activities as described in the application;

(9) Qualifications, experience and ability of the project archaeologist;

(10) Suitability of proposed research design and methodology;

(11) Experience, ability and plans for data collection, security, inventory, and curation of recovered archaeological materials and records as demonstrated in the application;

(12) Qualifications, experience and ability of the applicant to complete the proposed activities;

(13) Access to necessary equipment and qualified operators;

(14) Size of permit area;

(15) Compliance with requirements of any previous permits or agreements issued under Chapter 1A-31, F.A.C., from the date of its adoption.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), (5)(i), (k), (o), 267.061(1) FS. History–New 7-20-09.

1A-31.050 Permit Issuance.

The division shall only issue a permit when:

(1) The applicant has supplied evidence of sufficient financial ability to conduct the permitted activities;

(2) The applicant has demonstrated that project participants including subcontractors possess sufficient qualifications, resources, and abilities to successfully complete the permitted activities;

(3) The applicant has supplied a letter of intent from a professional underwater archaeologist who has agreed to serve as project archaeologist;

(4) The applicant has demonstrated that proposed project activities will utilize professionally accepted techniques for exploration, identification, recovery, recording, conservation and/or stabilization, and analysis of archaeological materials recovered;

(5) The applicant has supplied an adequate plan for the conservation and/or stabilization, analysis, and curation of all archaeological materials recovered, records, and other materials resulting from the permitted activities, including facilities if appropriate; and

(6) The division has determined that activities allowed under the permit are consistent with the requirements of this rule.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), (5)(i), (k), (o), 267.061(1) FS. History–New 7-20-09.

1A-31.055 Notice of Approval or Denial.

(1) The division shall notify the applicant of approval or intended denial of the application at the address provided in the application or as specified in any notice of change, per Rule 1A-31.080, F.A.C.,within 90 days after receipt by the division of a completed application for a permit or a permit renewal. If the application is approved, the division shall furnish a permit document for signature by the applicant certifying agreement with its terms and conditions. The applicant shall return the signed permit to the division for signature by the division's authorized representative. The permit shall be executed by the division and returned to the permittee within 15 days of receipt. The permit is effective when it is signed by the applicant and the division.

(2) If the division intends to deny the application, the division shall list those criteria from Rule 1A-31.046, F.A.C., on which the intended denial is based and inform the applicant of the options available within the 90 days as cited above.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2) FS. History–New 7-20-09.

1A-31.060 Requirements for All Permits.

Each permit must include:

(1) Name and contact information for division staff administering the permit;

(2) Name and contact information for the permittee or agent;

(3) Name and contact information for the project archaeologist;

(4) Name and contact information for key project personnel;

(5) Registration numbers of all boats participating in the permitted activities, including a notice that registration numbers may be updated by the permittee as needed;

(6) Duration of the permit;

(7) Boundaries of the area covered by the permit;

(8) Description of the scope of work to be undertaken, which may include archaeological guidelines;

(9) Minimum standards of diligence, expressed as a projected schedule of specific work activities to be initiated or conducted;

(10) Notice that the permit requires submittal of a final or interim report meeting the guidelines established in subsection 1A-46.001(3), F.A.C. National Oceanic and Atmospheric Administration 1:80,000 nautical charts should be substituted for U.S. Geological Survey (1:24,000) 7.5 minute series topographic quadrangle maps as required in subsection 1A-46.001(3), F.A.C., as appropriate;

(11) Notice that Daily Field Note and Activity Logs (Form HR6E067, Revised 06/08), herein incorporated by reference, must be completed and submitted monthly.

(12) Notice that the permittee must notify the division in writing within 72 hours of any change affecting the ability or plans to conduct the permitted activities as set forth in the application and the permit, including changes in boats and boat registration numbers used in the permitted activities;

(13) Notice that the use of clamshell dredges, cutterhead dredges, explosives and suction dredges greater than 10 inches in diameter is prohibited; and

(14) Notice of the conditions under which the use of propwash deflectors is allowed.

(15) Notice that all vessels used in exploration or recovery activities or operations shall carry copies of the executed permit issued by the division.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), (5)(i), (k), (o), 267.061(1) FS. History–New 7-20-09.

1A-31.065 Additional Requirements for Exploration Permits.

(1) The division will approve the excavation and recovery of those artifacts which will assist in the identification of age and type of historic shipwreck site being investigated. No excavation or displacement of archaeological materials shall be conducted unless approved in writing by the division in the form of an amendment to the Exploration Permit. No archaeological materials shall be recovered unless approved in writing by the division in the form of an amendment to the Exploration Permit. All archaeological materials recovered under an Exploration Permit shall be included in the pool of artifacts considered for transfer to the permittee if a recovery permit is issued, per Rule 1A-31.090, F.A.C.

(2) With a minimum of disturbance to the permit area the permittee shall:

(a) Conduct such remote sensing of the entire permit area as may be required to locate the specific historic shipwreck site or sites as referenced in the permittee's exploration application and permit;

(b) Identify the source of anomalies as may be required, with an emphasis on locating the historic shipwreck site or sites as referenced in the permittee's exploration application and permit;

(c) Delineate the extent of historic shipwreck sites, with an emphasis on locating the historic shipwreck site or sites as referenced in the permittee's exploration application and permit; and

(d) Evaluate the potential characteristics and significance of any historic shipwreck site in consultation with the division, with an emphasis on locating the historic shipwreck site or sites as referenced in the permittee's exploration application and permit.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), (5)(i), (k), (o), 267.061(1) FS. History–New 7-20-09.

1A-31.070 Additional Requirements for Recovery Permits.

A research design and description of proposed excavation activities prepared by the applicant's project archaeologist, and approved by the division, shall be included in the recovery permit. The division shall require the permittee to secure the use of a conservation and curation facility, as well as relevant conservation expertise, to be approved by the division, if the permittee is responsible for conserving archaeological materials under the terms of the permit. The permittee is solely responsible for transporting, storing, insuring, and conserving all archaeological materials recovered under the permit and for the costs associated with these activities. The division may assist in these activities.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), (5)(i), (k), (o), 267.061(1) FS. History–New 7-20-09.

1A-31.075 Permit Modification.

Permit modifications may be requested in writing by the permittee. Requests for permit modifications will be evaluated against the conditions of the permit, the requirements of this chapter, and the project research design developed by the project archaeologist, per subsection 1A-31.036(2), F.A.C. The division will respond in writing to requests for modification within 30 days.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2) FS. History–New 7-20-09.

1A-31.080 Permittee Required to Give Notice of Change.

The permittee shall notify the division in writing, in such form and detail as required by the division, of changes or proposed changes in financial support, contact information, key personnel or equipment from that noted in the permit application.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), (5)(i), (k), (o), 267.061(1) FS. History–New 7-20-09.

1A-31.085 Permit Suspension and Revocation.

(1) When the division has reason to believe that a permittee may have violated one or more of the criteria for suspension or revocation of a permit, the division shall contact the permittee in writing and take other appropriate actions to make a determination of facts. If the division determines a violation has occurred, the division may suspend the permit by notifying the permittee of the violation and specifying corrective actions and dates by which such actions must be completed for the permit to be reinstated. If the stated corrective actions are not completed by the specified dates, the division may revoke the permit by notifying the permittee of the intent to revoke and informing the permittee of the available options.

(2) Criteria for suspension or revocation of a permit are:

(a) Violation of Chapter 267, F.S., or this rule chapter;

(b) Violation of terms or conditions of the permit;

(c) Obtaining the permit by misrepresentation or failure to disclose all relevant facts;

(d) Knowingly making false statements in an application, report or other document submitted to the division under this rule chapter;

(e) Failure to meet minimum standards of diligence as specified in the permit;

(f) Issuance based upon incorrect information, mistaken belief, or clerical error, or any other just cause as provided by this rule chapter; or

(g) Non-permitted activities that jeopardize archaeological materials.

(h) Changes in financial support, key personnel or equipment as reported to the division, per Rule 1A-31.080, F.A.C.

(3) Suspension or revocation of a permit does not relieve the permittee of any obligations concerning protecting archaeological materials exposed and/or recovered by the permittee or providing reports and information to the division as required by the permit.

(4) The division shall not unreasonably suspend or revoke a permit and shall take into consideration the unknown variables that are inherent in the exploration and recovery of historic shipwreck sites prior to the revocation or suspension of any permit.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), (5)(i), (k), (o), 267.061(1) FS. History–New 7-20-09.

1A-31.090 Transfer of Archaeological Materials, Title to Archaeological Materials Conveyed.

The division may transfer archaeological materials to which it holds title to the permittee in consideration of recovery services provided to the state under the terms of a recovery permit. Specific provisions for transfer of archaeological materials will be specified in each recovery permit.

(1) The division will ensure that materials are transferred so that the permittee receives approximately 80% of recovered archaeological materials, with the division retaining approximately 20% of recovered archaeological materials;

(2) Distribution of the recovered archaeological materials will be negotiated by the division and the permittee based on the historical value of recovered materials;

(3) Current holdings in the division collection shall be considered in the distribution of recovered archaeological materials;

(4) Artifacts recovered under an Exploration Permit for the same area or historic shipwreck site will be included in the pool of artifacts considered for transfer to the permittee, per subsection 1A-31.065(1), F.A.C.; and

(5) Each transfer of archaeological materials will include a written statement from the division to the permittee conveying title to the transferred materials.

Rulemaking Authority 267.031(1) FS. Law Implemented 267.031(2), (5)(i), (k), (o), 267.061(1) FS. History–New 7-20-09.

Appendix F: 1A-32 Permit Application (Florida Department of State 2015b).

Florida Bureau of Archaeological Research, Department of State
Archaeological Research Permit – 1A-32 Application

Project Name: Application Date:

Applicant Name: Email Address:

Applicant Affiliation:

Full Mailing Address:

Principal Investigator **(attach brief resume):** RPA

Project Contact Person: Telephone:

Email Address:

Site or Project Location **(attach detailed map of project location)**:

Florida Site File number(s):

Property Manager Name/Position:

Property Manager Email: Phone:

Threats to Resource:

Proposed Work **(attach research design)**:

Crew Size: Estimated Project Cost:

Source of Funding:

Proposed Field Start Date: Proposed Field End Date:

Proposed Laboratory End Date:

Proposed Report Date (including site forms and artifacts):

Publication Outlet(s):

Curatorial Facility:

HRE4404-92
(Note: If underwater or wetlands excavations are involved, provide evidence that dredge and fill permits [DEP and COE] and consent to use state lands [DEP] have been obtained, or determined not necessary.)

Appendix G: Manifests for Three 1733 Spanish Ships (BAR, DHR 2004).

Nuestra Senora del Populo

Manifest list	**Spanish 1733-34 salvage**
No registered cargo	None
Indigo, hides, brazilwood, citrus, tobacco	
Boxes of gifts	

San Pedro

Manifest list	**Spanish 1733-34 salvage**
16,000 pesos in Mexican silver	Most salvaged
Cochineal, indigo	
Chinese porcelain	

San Jose de las Animas

Manifest list	**Spanish 1733-34 salvage**
30,435 pesos in silver coin and bullion	227, 084 pesos in minted silver
Porcelain	3,753 pesos in 150 arrobas
	3 tomines of wet cochineal
	560 pesos in 28 botijas of balm
	Contraband cargo
	236,247 pesos unregistered

Appendix H: List of Artifacts Salvaged from *El Populo* (Ward 2014).

Count	Artifact	Count	Artifact
4	Pulley block	1	Quartz
1	Metal cup/small bowl	undetermined	Ore-bearing rocks
1	Remains of a rosary	15	Cannon balls
1	Small triangular piece of glass with cross shape etched on surface	1	Unidentified silver object 5 inch long and 2.5 inch wide
1	Wire object similar to rosary remains	1	Pewter candleholder
1	Wooden pulley with single wheel	3	Bar shot
50	Pottery (glazed and unglazed)	undetermined	Iron shot
33	China	3	Encrustations
1	Small metal dish	6	Conglomerate
3	Pulley wheel	1	4 ¼ inch dividers
1	Dead eye	2	Gold ring
1	Pottery jug, almost whole	2	Buckle
1	Crumpled metal	2	Spoon
1	Metal shaft (probably axel to gun carriage) 2.5inch circumference, 4-4.5 feet long	8-9	Cannon (some removed by other treasure salvors)
6	Barrel hoops/staves	2	Silver *reale*
1	Pillar dollar	1	Pillar dollar 1732
1	Cob Coin	1	1731 2-*reale* coin
1	Brass snuff box	2	Possible measuring dish
1	A keg end with “L” and Star of David engraved on surface	2	Scissors (one pair with box on blade maybe for cutting oil wicks)
1	Glass bottle with square bottom	1	Wood comb
1	Ornamental wood	1	Small glass bottle
undetermined	Ballast	3	Fire brick
27	Spike/nails/iron fittings	1	3 inch glazed pottery lid
1	Timber beam (dropped it in Ceasar’s Creek)	1	Silver or pewter mini pitcher and saucer
1	Slate piece	1	Brass thumb tack
1	Sacrament jug with IHN engraved on surface	1	Metal plate with “NO” and clover etched on surface
1	14-16 inches square, 4 inch thick wooden block with 2 holes that are 2.5 inches across	2	Bronze cannon (swivel guns, breech loaders) 1 given to Mendel Peterson
2	Bones	1	Large china
1	Ivory tuning key	1	Dagger blade
1	Coconut with the top cut off	2	Brass straight pin
1	Carved wood	2	Clay pipe stem pieces

1	Flint	1	Pillar dollar
1	Lead shot	1	Decorated handle wood
2	Grape shot	1	Bronze or brass washer
1	Brass sleeve 2in l .5 in across	1	Lead dipper for gun powder
2	Wood fids	1	Grommet
1	Medallion	1	Hoe
1	Granite grinding stone	1	Hook with eye
1	Pipe bowl		

Appendix I: *San Pedro* Divisions Records (Florida Bureau of Historic Sites and Properties, Research and Preservation Laboratory 1972).

Artifacts Divided to Florida, 1969

Count	Artifact	Count	Artifact	Count	Artifact
2	Iron strap fragments	1	Yard band	1	Deadeye frame, chain
14	Button	1	Grab hook	1	Iron scale weight
6	Iron spike	1	Slip hook	1	Silver/lead seal
2	Thimble fragments	1	Canvas fragments	1	Ring belt
2	Iron fragments	1	Slate fragment	1	Iron fid
3	Drift bolt	1	Spoon handle	1	Guadalajara ware fragment
2	Copper sheathing	1	UID ceramic fragment	1	Rope fragments
3	Black glass fragment	1	Bone/shell fragment	1	Bone pin fragment
2	Pearlware fragment	1	Brass latch plate	1	Sheet copper fragment
3	Tacks	1	Iron grape shot	1	UID wooden object
5 of 128	Bronze sheathing tacks	2	Bone fragment	1	Wooden stock and block of anchor
2 of 8	Lead musket pistol balls	2	Bronze boat spikes	1	Iron strap joint with rivet
9 of 61	Ballast stones	3	Bronze fragment	1	Salt-glazed earthenware fragment

Artifacts Divided to Armada Research Company, Inc., 1969

Count	Artifact	Count	Artifact	Count	Artifact
2	Iron barrel hoop	1	Fragment of drift bolt	1	Three sections pistol or musket barrel
2	Spar or yard band	1	Rigging hook fragment	1	Clinker hook
6	Iron spike	1	Deadeye frame and chain	1	Fastener
3	Cannon ball	1	Square iron pin	1	Forged block and hook
3	Iron strap fragment	1	Hatch hinge	1	Iron pintle and strap assembly
22	Headless tacks	1	Thimble	1	Broad axe
2	Copper sheathing	1	Deadeye strap	1	Copper strap fragment
1	Bronze spike head	1	Iron grapeshot	1	Vial with 6 tack fragments

Number of artifacts discarded due to severe deterioration: 419

Artifacts Divided 1972

Artifact type	Artifact count	
	State	Armada Research Company, Inc.
Guadalajara fragments	188	70
Porcelain fragments	18	0
Olive jar fragments	12	2
Earthenware	89	1
Glass	10	1
Slate/Flint	3	0
Groundstone	3	2
Lead Projectiles	28	83
Lead shot	5	13
Lead sheeting	135	5
Lead sinker	2	1
Lead tack	1	0
UID brass/copper	2	0
Utensil handle	3	0
Silver coins	47	7
Animal bones	7	0
Gold bead	4	1
Wood fragments	1	0
Iron nails	375	6
Iron projectiles	6	2
Tools	5	0
Ships fittings	9	1
Strapping and hinges	9	1
Misc iron	1	1
Fasteners through hull	14	0

Appendix J: *San Pedro* artifacts stored in State Collection (BAR, DHR 2014).

Artifact Category		Count
Ceramic (fragments)	Porcelain	2
	Earthenware	191
	Mexican ware	6
	Crockery	1
	Olive jar	7
Glass		6
Metal	Nail	12
	Spike	18
	Shot	6
	Lead	12
	Other (washer, knife fragments, axe)	20
	Slag	1
	Bar	2
	Pin	18
	Coins (silver)	27
	Jewelry/Decorative	6
Encrustations		3
Lithic	Ballast	2
	Modified stone	1
	Unmodified stone	5
Building material	Brick	2
	Tile	1
Rope		1
Wood		2
Bone	Unmodified faunal	1
Other	AMCO	1

Appendix K: *San José* artifacts stored in State Collection (BAR, DHR 2014).

Artifact Category		Count
Ceramic (fragments)	Porcelain	30
	Earthenware	212
	Mexican ware	274
	Crockery	12
	Olive jar	87
	Pipe stem	11
	Figurine	27
Glass		50
Metal	Nail	111
	Spike	118
	Shot	67
	Lead	83
	Other (rigging, carpentry, kitchenware)	589
	Slag	1
	Bar	25
	Pin	143
	Shot (Cannonballs)	138
	Coins	111
	Jewelry/Decorative	92
	Cannon	5
	Weapon	45
	Sailmakers palm	1302
Encrustations		5
Lithic	Ballast	12
	Modified stone	10
	Unmodified stone	6
	Ground stone	45
	Slate	4
	Coal	6
Building material	Brick	26
	Tile	8
Plant remains	Rope	3
	Charcoal	1
	Nut/seed	2

	Cannon wadding	4
Wood		241
BOWK (turtle shell, ivory)		23
Shell/SHWK		3
Leather		6
Bone	Unmodified faunal	32
	Human remains	3
Other	AMCO	3
	Carriage axel	1

Appendix L: *San José* Divisions Records (Florida Department of State, Division of Archives, History and Records Management 1976).

Artifacts to State of Florida, 1976 25%

Artifact Category		**Count**
Ceramic (fragments)	Porcelain	1
	Earthenware	118
	Mexican ware	4
	Crockery	3
Glass		1
Metal	Nail	17
	Spike	1
	Shot	2
	Lead	10
	Other (rigging, carpentry, kitchenware)	82
	Bar shot	2
	Jewelry/Decorative	21
	Weapon	9
	Fasteners	98
Encrustations		3
	Modified stone	1
Plant remains	Rope	3
Wood		15

Artifacts to Marine-Tech Salvage Company, Inc., 1976 75%

Artifact	**Count**
Gold ring	3
Marine ware intact	1
Black glazed pottery bowl	1
Sherd	1
Silver coins	139
Pewter Plate	1

Artifacts to State of Florida, 1976, 50%

Artifact Category		**Count**
Ceramic (fragments)	Porcelain	156
	Earthenware	654
	Mexican ware	220
	Crockery	55
	Olive jar	245
	Pipe stem	3
	Figurine	23
Glass		88
Metal	Nail	37
	Spike	5
	Shot	69
	Lead	120
	Other (rigging, carpentry, kitchenware)	393
	Bar shot	33
	Pin	5
	Shot (Cannonballs)	124
	Coins	2
	Jewelry/Decorative	83
	Fasteners	245
	Weapon	20
	Sailmakers palm	20
Encrustations		18
Lithic	Ballast	7
	Modified stone	7
	Unmodified stone	1
	Ground stone	15
	Slate	10
	Coal	3
Building material	Brick/Fragments	25
	Tile	48
Plant remains	Rope	12
	Charcoal	1
	Nut/seed	1
Wood		90
Turtle, shell, ivory		8

Leather		8
Bone	Unmodified faunal	40

Artifacts to Marine-Tech Salvage Company, Inc., 1976 50%

Artifact Category		**Count**
Ceramic (fragments)	Porcelain	1
	Earthenware	2
	Mexican ware	8
	Crockery	5
	Olive jar	5
	Figurine	19
Glass		1
Metal	Other (rigging, carpentry, kitchenware)	20
	Coins	107
	Jewelry/Decorative	19
	Weapon	2
Building material	Brick/fragments	4

Appendix M: Artifacts Collected from San José by Molinari.

Artifacts collected 1998.

Artifact	Count	Artifact	Count
Musket Balls	2	Iron Straps and Pieces	4
Cannon Balls	5	Iron Flakes	70
Iron Key	1	Ballast	50
Fan Rib	1	Fire Brick	1
Bottle Base	1	Bones	9
Pipe Stems	2	Charcoal Pieces	23
Leather Pieces	8	Iron Encrusted Objects	16
Nails	315	Glass Pieces	24
Drift Pins	3	Horn Piece	1
Rope Pieces	2	Lead Piece	9
Sheaves	1	Paint Tubes	2
Iron Washer	1	Slate Pieces	2
Coin, Eight *Reales*	3	Pottery Sherds	825
Coin, Four *Reales*	1	Porcelain Sherds	10
Coin, Two *Reales*	1	Miniature Dish	1
Tobacco Sticks	2	Figurines, Ceramic	3

Artifacts collected 2002.

Artifact	Count	Artifact	Count
Bones	10	Leather Piece	1
Barrel Hoop	1	Majolica Sherds	2
Course Earthenware Sherds	40	Medal-Silver, Religious	1
Charcoal Piece	2	Modern Objects, Tom Gurr Boat Parts	16
Coins-Silver Piece of Eight	2	Musket Balls	23
Coins-Silver Piece of Four	3	Nails, Brass, Small	1
Drift Pins	2	Nails, Part of Spike	1
Encrusted Objects	8	Nails, Iron	133
Encrusted Objects (UID)	1	Olive Jar Pottery Sherds	153
Figurine (Ceramic)	3	Peat/Wood Above Bedrock	1
Fire Brick	52	Pewter/Silver Scrap	1
Fire Bricks Clumps	148	Pipe Stems	1
Flint Striker	1.5	Pottery Sherds, UID	22
Glass Shards	38	Porcelain Sherds	6
Guadalajara Sherds	221	Redware Sherds	13
Hand Grenade	1	Rope Pieces	27
Ladrillo Sherds	5	Shark Tooth	1
Latch-Brass	1	Slate Sherd	1
Lead Fragments	23	Tack, Brass	1
Lead Sheathing	1	Toredo Worm casing	2
Lead Strip with Holes	1	Wooden Blocks	2

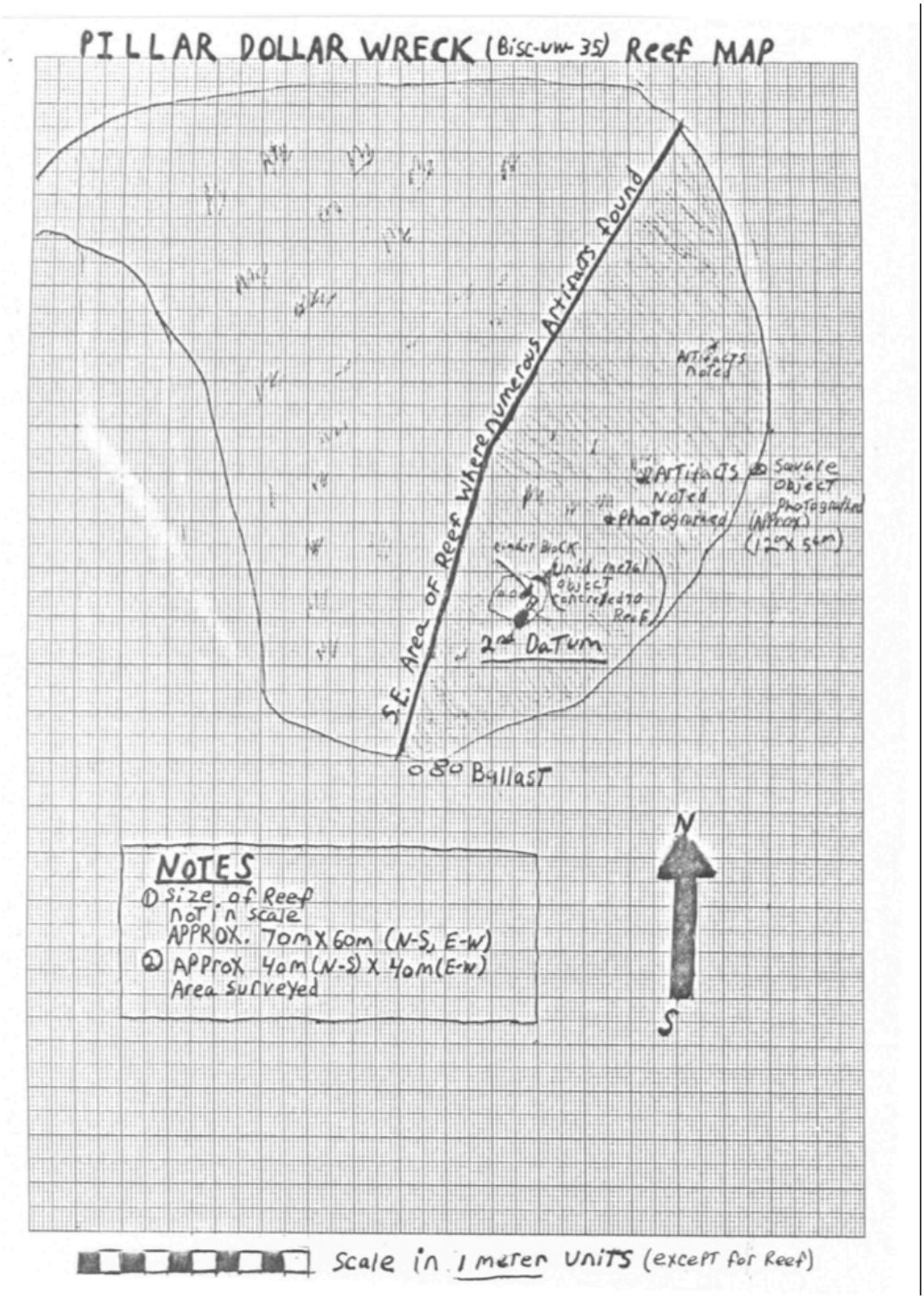
Artifacts collected 2003.

Artifact	Count	Artifact	Count
Course Earthenware Sherds	84	Charcoal Piece	3
Guadalajara Sherds	61	Rope Fragments	2
Glass Fragments	37	Lead Pieces	1
Majolica Sherds	8	Iron Staple	1
Porcelain Pottery Sherds	4	Bone Pieces	5
Olive Jar Pottery Sherds	1	Large Iron Andiron	1
Olive Jar Rim Pieces	2	Pieces of Sacrificial Sheathing Samples	2
Pipe Stem Pieces	2	Parts Wooden Cannon Carriage Axel	3
Ladrillo Sherds	9	Ballast Rocks	102
Part of Pipe Bowl	1	Fire Brick Clumps	116
Ceramic Handle Part	1	Fire Bricks	91
Small Metal Fragments	2	Bed Rock Samples	4
Small Iron Nails	123	Samples of Peat/Wood Above Bedrock	5
Iron Spikes	1	Fire Striker	1
Iron Thimble	1	Piece of Two	1
Spike with Iron Ring	1	Sailor's Palm	1
Small Wood Piece with Iron	1		

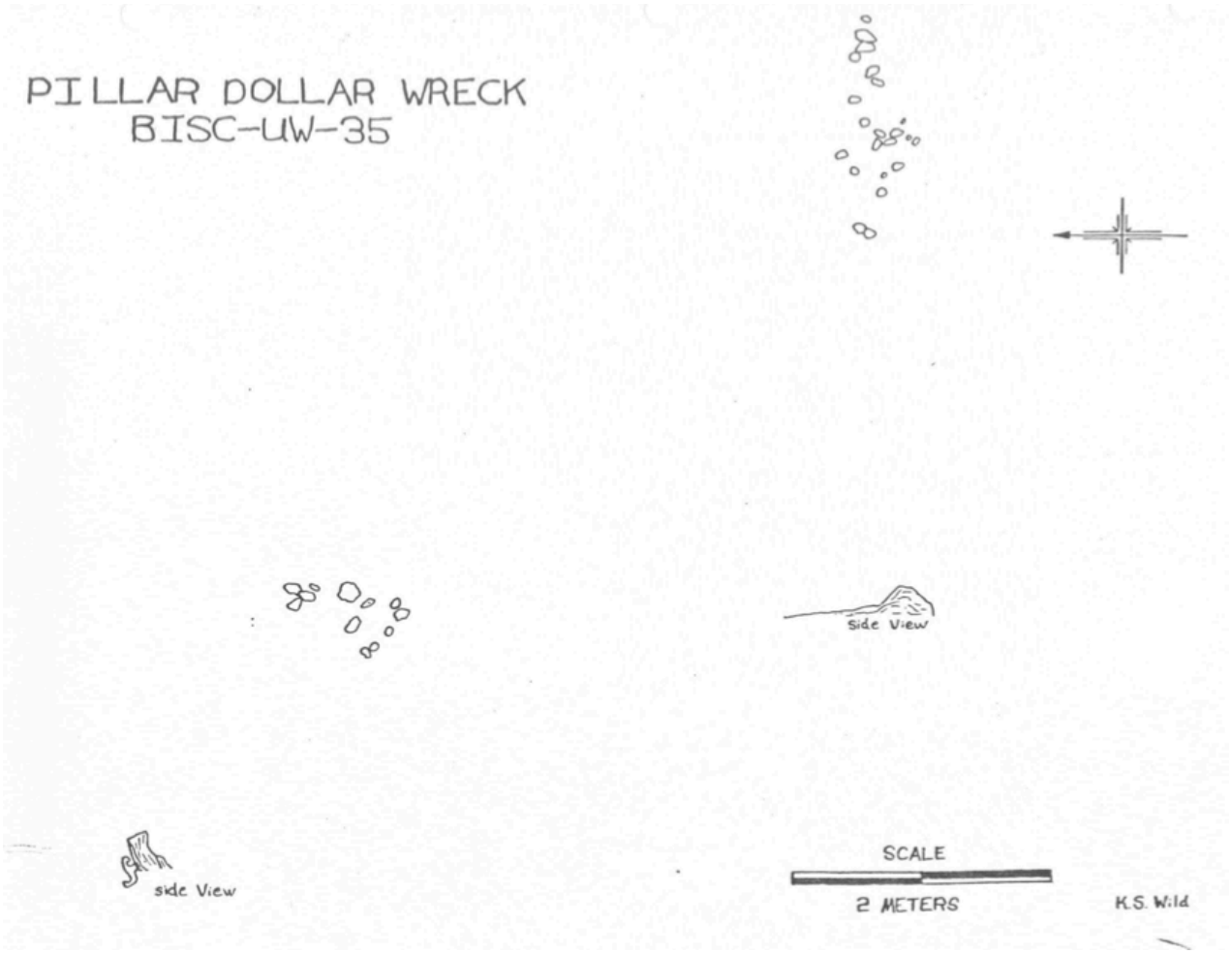
Artifacts collected 2004.

Artifact	Count	Artifact	Count
Course Earthenware Sherds	188	Charcoal Pieces	9
Guadalajara Sherds	179	Slate Pieces	2
Glass Fragments	33	Lead Pieces	3
Majolica Sherds	8	Brass Shoe Buckle	1
Porcelain Pottery Sherds	10	Bone Pieces	25
Olive Jar Rim Pieces	4	Wood Samples	17
Ladrillo Sherds	9	Pieces Sacrificial Sheathing Samples	4
Unidentified Modern Objects	1	Broken Figurines	1
Modern Spoon	1	Ballast Rocks	207
Broken Shaped Stone Object	2	Fire Brick Clumps	106
Small Iron Nails	193	Modern Ballast Casing	1
Flint Flake	1	Broken EO with Rope	1
Small Iron EOS	6	Piece of Four	1
Leather Piece	1	Piece of Two	4
Wood Conglomerate with Fur/Bones	1	Broken Ivory Item with Threads	1

Appendix N: Broward's 1984 Reef Map.



Appendix O: Broward's 1984 Pillar Dollar Site Plan.



Appendix P: Pillar Dollar Artifacts at SEAC.

Class	Type	Count	Comp	Décor/Modified/Manufacture/Burnt	Dimension (cm) LxW	Form
Metal	Spike	1	Iron	wrought	15.5 x 1	whole but missing head
Metal	Spike	1	Iron	wrought	9x1	frag; head and body
Metal	Spike	1	Iron	wrought	17x.8	head diam 3; head rounded
Metal	Spike/ nail	1	Iron	wrought	6.5	clenched end
Metal	Fastener	1	Iron	wrought	12.5	portion of body
Metal	Spike	1	Iron	wrought	10	clenched hole nail; head diam 1.1; irregular shaped head
Metal	Fastener	1	Iron	wrought	3	small portion of head and body; irregular head, possibly square
Metal	Spike	1	Iron	wrought	16	whole fastener but head corroded and missing
Metal	Nail	1	Iron	wrought	9.5	square 1.7 head
Metal	Nail	1	Iron	wrought	14.5	broken in half; 22 head; roundish
Metal	Fastener	1	Iron	wrought	9	
Metal	Nail	1	Iron	wrought	10.5	square head; 1.7
Metal	spike	1	Iron	wrought	12	body frag
Metal	Spike or nail	1	Iron	wrought	7.5	1.2 head
Metal	Hinge	1	Iron	wrought	4.5x3	3 pieces; fasteners .8 in diam; two pieces of flat with pin; pin .3 in diam
Metal	uid (auger?)	1	Iron	wrought	8.2	
Metal	padlock	5	Iron	wrought		padlock is in several pieces. The triangular bottom is in good condition as is the half circle top

Metal	lock?	15	Iron	wrought		several pieces
Rock	Ballast	1	Granite?		11.4	round river rock
Metal	IUD	1	Iron	unk	3.5	uid piece of metal; interesting divot pattern on outside?
Metal	nail	3	Iron	wrought		three frags of metal nail; head 1.5
Metal	nail	1	Iron	wrought	4	frag
Metal	spike	1	Iron	wrought	13.5	
Metal	spike	1	Iron	wrought	13.5	bent but not clenched; head is 1.8
Metal	spike	1	Iron	wrought	11.5	frag, no head
Metal	spike	1	Iron	wrought	10	frag, no head
Metal	spike	1	Iron	wrought	7	broken; eroded head
Metal	Fastener	1	Iron	wrought	4	uid size and shape
Metal	Fastener	1	Iron	wrought	4.2	uid size and shape
Metal	musket worm	1	iron	wrought		
Metal	Fastener	1	iron	wrought	4.5	broken; eroded head; head 2
Metal	plate	1	iron	?	6x3	uid; thick .1
Metal	nail	2	iron	wrought	4&3.5	two frags of bodies
Metal	nail	1	iron	wrought	3.5	frag of body
Metal	spike	1	iron	wrought	9.5	head and body frag; 1.9 head
Metal	uid	1	iron	wrought	3	uid metal
Metal	nail or spike	1	iron	wrought	1.5d head	just head
Metal	Fastener	1	iron	wrought	9.5	frag of body
Metal	spike	1	iron	wrought	12.5	body, no head
Metal	hinge	2	iron	wrought	4x3	two flat pieces with fastener holes plus pin; pin .3 diam
Metal	spike	1	iron	wrought	10.5	frag of body with head; head 1.9
Metal	sheathing or patch	1	lead	?	4x2.4	folded with small nail hole
Metal	uid	1	lead	?	9.5x6	spare lead?
Metal	sheathing or patch	1	lead	?	15x7	nail holes along edges
Metal	sheathing or patch	1	lead	?	5.5x2.5	folded lead; has fabric impression on one side

Metal	sheathing or patch	1	lead	?	15x7	nail holes along edges
Metal	sheathing or patch	1	lead	?	5.5x2.5	folded lead; has fabric impression on one side
Metal	sheathing or patch	1	lead	?	7.3x3.2	folded lead; has fabric impression on one side; nail holes along edge
Metal	sheathing or patch	1	lead	?	7.3x3.2	folded lead; has fabric impression on one side; nail holes along edge
Metal	lead fishing	10	lead	mold		egg shape; mold
Metal	lead fishing weight	1	lead	mold		tear drop
Metal	lead fishing	1	lead	mold		oblong
Metal	spike	1	iron	wrought	11	bent at end byt not clenched; 1.2 head; rounded
Metal	spike	1	iron	wrought	11	bent at end byt not clenched; 1.2 head; rounded square
Metal	spike	1	iron	wrought	17.5	whole; head 2.8; rounded square
Metal	spike	1	iron	wrought	17.5	frag; heavily corroded; would have been much larger
Metal	spike	1	iron	wrought	24.5	nearly whole; 3.4 head; rounded
Metal	spike	2	iron	wrought	21x23	one is whole and the other is nearly whole; head 4
Metal	spike	2	iron	wrought	21x23	one is whole and the other is nearly whole; head 4
Metal	spike	1	iron	wrought	25	whole; head 3.3; rounded
Metal	spike	1	iron	wrought	11	rounded square; 1.9
Metal	spike	1	iron	wrought	11	rounded square; 1.9
Metal	spike	1	iron	wrought	7	frag; heavily twisted
Metal	spike	1	iron	wrought	7	frag; heavily twisted
Metal	spike	1	iron	wrought	21	eroded
Metal	spike	1	iron	wrought	18	round; 3.9
Metal	spike	1	iron	wrought	19	2.5; round
Metal	spike	1	iron	wrought	22.5	3.5; round
Metal	spike	1	iron	wrought	13.5	eroded frag
Metal	spike	1	iron	wrought	22	offset head; 3x2;
Metal	spike	1	iron	wrought	17.5	frag 3.2; rounded
Metal	spike	1	iron	wrought	12.5	frag

Metal	latch?	1	iron	wrought	16	eye diam 2.2 outside edge; 1.1 inside edge; latch?
Metal	spike	1	iron	wrought	17.5	2.5 rounded
Metal	nail	1	iron	wrought	7	frag
Metal	spike	1	iron	wrought	12	frag
Metal	nail	1	iron	wrought	12.5	frag; no head; nearly whole
Metal	nail	1	iron	wrought	8	frag
Metal	cannon ball	1	iron	mold	10.5	whole
Metal	plate?	1	copper alloy		33.5d	plate or cap; has R and crown stamp on back; several fasteners around edges; 23 inside diameter; rolled lip

Appendix Q: Table of Archaeological Assessments.

Year	Agency	Author	Description
1984	SEAC	Brewer and Wild	Biscayne National Park resource assessment
1985	SEAC	Broward	Initial site survey
1986	NPS	Fulmer	Incident report for Hampton, S. Hood, and W. Hood
1987	FSU	Pomeroy	Research proposal for ARPA damage assessment
1992	NPS	n/a	Post Hurricane Andrew assessment
2004	NPS	Cassotis, Lanzendorf	Condition assessment
2005	NPS	Choate, Lanzendorf	Condition assessment
2005	NPS	Conlin, Seymour	Condition assessment
2006	NPS	Choate, Tritt	Condition assessment
2007	NPS	n/a	Condition assessment
2008	NPS	Garis, Helmers	Condition assessment
2009	NPS	n/a	Condition assessment
2010	NPS	Lawson, Bayliss	Condition assessment
2011	NPS	Lawson, Tillman	Condition assessment
2011	NPS	Anderson	Condition assessment
2012	NPS	Wilson	Condition assessment
2012	NPS	Lawson	Condition assessment
2014	NPS	McKinnon	Condition assessment

Appendix R: Pillar Dollar Wreck Ballast Samples.

Ballast Samples

Sample #	Description	Sampled Retained
1	Most common ballast stone; sulfurous, hard, likely basalt	No
2	Diorite or Granodiorite; biotite present; volcanic formation	No
3	Rhyolite	No
4	Likely basalt; could not break for fresh face	No
5	Likely basalt; could not break for fresh face	No
6	Metamorphic; boudins present	Yes
7	Quartzite	No
8	Chert	No
9	Sedimentary? Rhyolite, quartz, black/red sand matrix present	Yes
10	Brittle volcanic; muscovite present	No
11	Chert	No
12	Metamorphic	Yes
13	Brittle volcanic; muscovite present	Yes
14	Andalusite	No
15	Chert	No
16	Volcanic?	Yes

Appendix S: Pillar Dollar artifacts collected during 2014 fieldwork.

Catalog #	Class 3	Class 4	Object	Item Count	Description	Within Site	FS#	Object Part	Object Form	Type Name
BISC 1065	COMPOSITE	GLASS	BOTTLE	1	CONCRETED GLASS BOTTLE LIP	UNIT 1	10	LIP	BOTTLE	
BISC 1066	COMPOSITE	CLAY	BRICK	1	RED BRICK FRAGMENT	UNIT 1	19	BODY		
BISC 1067	COMPOSITE	CLAY	BRICK	1	RED BRICK FRAGMENT	UNIT 2	23	BODY		
BISC 1068	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	TAN CEW FRAGMENT	UNIT 2	23	BODY	JAR	OLIVE JAR
BISC 1068	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	BROWNISH BLACK CEW FRAGMENT	UNIT 2	23	POSS RIM		
BISC 1068	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	GREY CEW FRAGMENT	UNIT 2	23	BODY		
BISC 1068	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	GREY CEW FRAGMENT	UNIT 2	23	BODY		
BISC 1069	COMPOSITE	GLASS	SLAG	3	BLACK GLASS SLAG	UNIT 2	23			
BISC 1070	ANIMAL	BONE	BONE	1	BONE FRAGMENT	UNIT 2	23			
BISC 1070	ANIMAL	BONE	BONE	1	BONE FRAGMENT	UNIT 2	23			
BISC 1070	ANIMAL	BONE	BONE	1	BONE FRAGMENT	UNIT 2	23			
BISC 1071	MINERAL	STONE	STONE, UNMODIFIE	1	QUARTZ FRAGMENT	UNIT 2	23			

			D							
BISC 1073	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	GREY CEW FRAGMENT	UNIT 2A	24	BODY		
BISC 1073	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	GREY CEW FRAGMENT	UNIT 2A	24	RIM	STORAGE JAR	
BISC 1073	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	GREY CEW FRAGMENT	UNIT 2A	24	BODY	STORAGE JAR	OLIVE JAR?
BISC 1073	COMPOSITE	GLASS		1	GLASS OR SILICATE MATERIAL	UNIT 2A	24			
BISC 1074	VEGETAL	WOOD	WOOD	1	CHARCOAL	UNIT 2A	24			
BISC 1075	COMPOSITE	GLASS	SLAG	3	BLACK GLASS SLAG	UNIT 2A	24			
BISC 1076	COMPOSITE	CLAY	BRICK	1	RED BRICK FRAGEMENT	UNIT 2A	24	BODY		
BISC 1077	VEGETAL	WOOD	WOOD	1	CHARCOAL	UNIT 2A	27			
BISC 1078	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	BLACK CEW FRAGMENT?	UNIT 2A	27	BODY		
BISC 1079	COMPOSITE	CLAY	BRICK	1	RED BRICK FRAGMENT	UNIT 2A	27	BODY		
BISC 1080	COMPOSITE	CERAMIC	FIGURINE?	1	BONE FRAGMENT	UNIT 2A	27			
BISC 1081	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	BLACKISH GREY CEW FRAGMENT	BACKDIRT	28	BODY		
BISC 1081	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	BROWNISH GREY CEW FRAGMENT	BACKDIRT	28	BODY		
BISC 1081	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	BROWNISH GREY CEW FRAGEMENT	BACKDIRT	28	RIM		
BISC 1082	COMPOSITE	CLAY	BRICK	1	BROWNISH GREY BRICK FRAGMENT	BACKDIRT	28	BODY		

BISC 1082	COMPOSITE	CLAY	BRICK	1	BROWNISH GREY BRICK FRAGMENT	BACKDIRT	28	BODY		
BISC 1082	COMPOSITE	CLAY	BRICK	1	RED BRICK FRAGEMENT	BACKDIRT	28	BODY		
BISC 1082	COMPOSITE	CLAY	BRICK	1	RED BRICK FRAGEMENT	BACKDIRT	28	BODY		
BISC 1082	COMPOSITE	CLAY	BRICK	1	RED BRICK FRAGEMENT	BACKDIRT	28	BODY		
BISC 1083	COMPOSITE	CLAY	BRICK	1	RED BRICK FRAGEMENT	UNIT 2A	29	BODY		
BISC 1083	COMPOSITE	CLAY	BRICK	1	GREYISH BRICK FRAGMENT	UNIT 2A	29	BODY		
BISC 1083	COMPOSITE	CLAY	BRICK	1	GREYISH BRICK FRAGMENT	UNIT 2A	29	BODY		
BISC 1084	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	TANNISH GREY CEW FRAGMENT	UNIT 2A	29	BODY	STORAGE JAR	OLIVE JAR
BISC 1084	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	BROWN CEW FRAGMENT	UNIT 2A	29	BODY		
*	COMPOSITE	METAL	FASTENER	1	CONCRETED IRON FASTENER	UNIT 2A	29		NAIL	
*	COMPOSITE	METAL	FASTENER	1	CONCRETED IRON FASTENER W CEW, STONE CONCRETED	UNIT 2A	30		NAIL	SQUARE
*	COMPOSITE	METAL	CONCRETION	1	UID IRON CONCRETION	UNIT 2A	30			
*	COMPOSITE	METAL	FASTENER	1	CONCRETED IRON FASTENER	UNIT 2A	30		NAIL	

*	COMPOSITE	METAL	DISK	3	UID CONCRETED IRON DISK (BROKEN)	UNIT 2	31			
*	COMPOSITE	METAL	FASTENER	1	POSS CONCRETED IRON FASTENER	UNIT 2A/2	31		NAIL?	
*	COMPOSITE	METAL	FASTENER	1	CONCRETED IRON FASTENER	UNIT 2A/2	31		NAIL?	
*	COMPOSITE	METAL	FASTENER	1	CONCRETED IRON FASTENER	UNIT 2A/2	31		NAIL?	
*	COMPOSITE	METAL	FASTENER	1	CONCRETED IRON FASTENER	UNIT 2A/2	31		NAIL?	
BISC 1085	COMPOSITE	CLAY	CLAY, FIRED	1	GREYISH TAN CLAY FRAGMENT	BACKDIRT	50			
BISC 1085	COMPOSITE	CLAY	CLAY, FIRED	1	GREYISH TAN CLAY FRAGMENT	BACKDIRT	50			
BISC 1086	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	BLACK CEW FRAGMENT	UNIT 4	57	BODY		GUADALAJARA POLYCHROME
*	COMPOSITE	METAL	DISK	1	UID CONCRETED IRON DISK	UNIT 4	58		DISK	
*	COMPOSITE	METAL	FASTENER	1	POSS IRON FASTENER	UNIT 4	59			
*	COMPOSITE	METAL	FASTENER	1	CONCRETED IRON FASTENER	UNIT 4	59		NAIL	
*	COMPOSITE	METAL	FASTENER	1	CONCRETED	UNIT 4	59		NAIL	

					IRON FASTENER					
BISC 1087	COMPOSITE	METAL	SLAG	1	LEAD SLAG	UNIT 4	59			
BISC 1088	COMPOSITE	CERAMIC	VESSEL FRAGMENT	3	BLACK CEW FRAG	UNIT 4	59	RIM/BODY		GUADALAJARA POLYCHROME
BISC 1088	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	GREY CEW FRAGMENT	UNIT 4	59	BODY	STORAGE JAR	OLIVE JAR
BISC 1088	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	BLACK CEW FRAG	UNIT 4	59	BODY		
BISC 1088	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	GREYISH BLACK CEW FRAGMENT	UNIT 4	59	BODY		
BISC 1088	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	BLACKISH GREY CEW FRAGMENT	UNIT 4	59	RIM		
BISC 1089	COMPOSITE	CLAY	BRICK	7	BRICK FRAGMENTS	UNIT 4	59	BODY		
*	COMPOSITE	METAL	CONCRETION	1	UID IRON CONCRETION	UNIT 4	60			
*	COMPOSITE	METAL	FASTENER	1	CONCRETED IRON FASTENER	UNIT 4	60			
BISC 1090	COMPOSITE	CLAY	BRICK	6	BRICK FRAGMENTS	UNIT 4	60	BODY		
BISC 1091	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	GREYISH BLACK CEW FRAGMENT	UNIT 4	60	BODY		
BISC 1092	COMPOSITE	CLAY	BRICK	1	BRICK FRAGMENT	UNIT 1	61	BODY		
BISC 1093	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	BLACK CEW OR BRICK FRAGMENT	UNIT 1	61	BODY		

BISC 1093	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	GREY CEW FRAGMENT	UNIT 1	61	BODY	STORAGE JAR	POSS OLIVE JAR
BISC 1094	VEGETAL	OTHER PLANT MATERIALS		1	AMBER-COLORED RESIN AND WOOD	UNIT 1	61			
BISC 1095	COMPOSITE	GLASS	SLAG	2	BLACK GLASS SLAG FRAGMENT	UNIT 1	61			
BISC 1096	VEGETAL	WOOD	WOOD	1	CHARCOAL	UNIT 1	61			
BISC 1097	ANIMAL	BONE	BONE	1	BONE FRAGMENT	UNIT 4	62			
BISC 1097	ANIMAL	BONE	BONE	1	BONE FRAGMENT	UNIT 4	62			
BISC 1098	COMPOSITE	GLASS	SLAG	4	BLACK GLASS SLAG FRAGMENT	UNIT 4	62			
BISC 1099	COMPOSITE	CLAY	BRICK	11	BRICK FRAGMENTS	UNIT 4	62	BODY		
BISC 1100	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	GREY TIN ENAMELED CEW FRAGMENT	UNIT 4	62	BODY		MAJOLICA
BISC 1100	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	BLACK CEW FRAGMENT	UNIT 4	62	RIM/BODY		GUADALAJARA POLYCHROME
BISC 1100	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	BLACK CEW FRAGMENT	UNIT 4	62	BODY		
BISC 1100	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	GREY CEW FRAGMENT?	UNIT 4	62	BODY		
*	COMPOSITE	METAL	FASTENER	1	CONCRETED IRON FASTENER	UNIT 4	62		NAIL	SQUARE
*	COMPOSITE	METAL	FASTENER	1	CONCRETED	UNIT 4	62			

					IRON FASTENER					
BISC 1101	COMPOSITE	CLAY	BRICK	1	RED BRICK FRAGMENT	UNIT 4	63	BODY		
BISC 1102	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	GREY CEW FRAGMENT	UNIT 4	63	POSS RIM	STORAGE JAR	
BISC 1102	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	GREYISH BROWN CEW FRAGMENT	UNIT 4	63	BODY		
BISC 1102	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	GREYISH BLACK CEW FRAGMENT	UNIT 4	63	BODY		
BISC 1102	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	GREY CEW FRAGMENT	UNIT 4	63	BODY		
BISC 1102	COMPOSITE	CERAMIC	VESSEL FRAGMENT	1	GREYISH BLACK CEW FRAGMENT	UNIT 4	63	BODY		

Appendix T: Categories included in selected archaeological reports.

Categories included in "Archaeological and Biological Examination of "The Mystery Wreck" (8MO143) off Vaca Key, Monroe County, Florida" (Smith, Scott-Ireton et al. 2006).

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Research Design and Proposal
Site Orientation and Location
Physical Environment
Site Formation Processes
Methodology
Interpretations
Recommendations
Site Map
Artifact Counts or Artifact Measurements
Scaled Photos, North Arrows
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Categories included in "Archaeological and Biological Examination of The Bronze Pin Wreck (8MO1879) off Grassy Key, Monroe County, Florida: an Interim Report" (Shefi et al. 2009).

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Categories included in "The *Capitana* Project: Final Excavation Report" (Benson, ed. 2002).

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Categories included in "Archaeological Investigations of the Pillar Dollar Wreck (BISC-35) in Biscayne National Park, Florida" (McKinnon 2015).

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Categories included in "Archaeological Investigations of the Brick Wreck (8MO1881) off Vaca Key, Monroe County, Florida" (Smith, Moates et al. 2006).

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Categories included in "The Legare Anchorage shipwreck site, Grave of HMS *Fowey*, Biscayne National Park, Florida" (Skowronek et al. 1987).

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Categories included in "Underwater Archaeological Survey and Site Assessment of Biscayne National Park" (Wild and Brewer 1985).

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Categories included in "An Underwater Archaeological Survey of Eight Spanish Merchant Naos of the 1733 New Spain Fleet" (Smith and Dunbar 1977).

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Categories included in "A Proposal to Establish an Underwater Archaeological Preserve in the Florida Keys" (Indiana University et al. 1988).

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Further Reading

Categories included in "*San Pedro* Underwater Archaeological Preserve State Park: 2003 Reef Restoration and Cannon Recovery Project" (Indiana University 2003).

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Categories included in "A Preliminary Report on a Spanish Plate Fleet Shipwreck Site in the Florida Keys: *El Infante*, *Nuestra Señora de la Balvaneda*, 1724-1733" (Westrick 2002).

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Categories included in "The Texas Historical Commission's Underwater Archaeological Survey of 1995 and the Preliminary Report on the Belle, La Salle's Shipwreck of 1686" (Arnold 1996).

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Categories included in "The Emanuel Point Ship Archaeological Investigations 1992-1995" (Smith et al. 1999).

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Categories included in *Shipwreck Archaeology in Australia* (Nash 2007).

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Categories included in *Cargo for the Colony: The 1797 Wreck of the Merchant Ship Sydney Cove* (Nash 2001).

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Appendix U: Re-categorized lists of Artifacts from Case Study wreck sites.

Re-categorized list of *El Populo* artifacts permanently stored at SEAC.

Category	Count
Ceramics	1
Glass	0
Building material	0
Lithics	0
Coins	0
Decorative objects	0
Fasteners	0
Shot	0
Miscellaneous metal	0
Wood/plant remains	0
Leather/shell/bone/ivory	0
Cannon	0
Anchors	0
Fittings	0
Encrustations	0
Other	0

Re-categorized List of Artifacts Salvaged from *El Populo* (Ward 2014).

Category	Count
Ceramics	90
Glass	3
Building material	0
Lithics	9
Coins	7
Decorative objects	6
Fasteners	27
Shot	22
Miscellaneous metal	20
Wood/plant remains	7
Leather/shell/bone/ivory	3
Cannon	11
Anchors	0
Fittings	11
Encrustations	9
Other	14

Re-categorized 1969 Divisions Records List of *San Pedro* Artifacts Divided to Florida (Florida Bureau of Historic Sites and Properties, Research and Preservation Laboratory 1972).

Category	**Count**
Ceramics	5
Glass	3
Building material	0
Lithics	10
Coins	0
Decorative objects	14
Fasteners	11
Shot	3
Miscellaneous metal	25
Wood/plant remains	4
Leather/shell/bone/ivory	4
Cannon	0
Anchors	0
Fittings	4
Encrustations	0
Other	2

Re-categorized 1969 Divisions Records List of *San Pedro* Artifacts Divided to Armada Research Company, Inc. (Florida Bureau of Historic Sites and Properties, Research and Preservation Laboratory 1972).

Category	**Count**
Ceramics	0
Glass	1
Building material	0
Lithics	0
Coins	0
Decorative objects	0
Fasteners	10
Shot	4
Miscellaneous metal	34
Wood/plant remains	0
Leather/shell/bone/ivory	0
Cannon	0
Anchors	0
Fittings	7
Encrustations	0
Other	1
Artifacts discarded due to severe deterioration	419

Re-categorized 1972 *San Pedro* Divisions Records List of Artifacts Divided to State (Florida Bureau of Historic Sites and Properties, Research and Preservation Laboratory 1972).

Category	Count
Ceramics	307
Glass	10
Building material	0
Lithics	6
Coins	47
Decorative objects	4
Fasteners	389
Shot	39
Miscellaneous metal	141
Wood/plant remains	1
Leather/shell/bone/ivory	7
Cannon	0
Anchors	0
Fittings	18
Encrustations	0
Other	8

Re-categorized 1972 *San Pedro* Divisions Records List of Artifacts Divided to Armada Research Company, Inc. (Florida Bureau of Historic Sites and Properties, Research and Preservation Laboratory 1972).

Category	Count
Ceramics	73
Glass	1
Building material	0
Lithics	2
Coins	7
Decorative objects	1
Fasteners	6
Shot	98
Miscellaneous metal	7
Wood/plant remains	0
Leather/shell/bone/ivory	0
Cannon	0
Anchors	0
Fittings	2
Encrustations	0
Other	0

Re-categorized list of *San Pedro* artifacts owned by State, stored at Mission San Luis (BAR, DHR 2014).

Category	Count
Ceramics	207
Glass	6
Building material	3
Lithics	8

Coins	27
Decorative objects	6
Fasteners	30
Shot	6
Miscellaneous metal	53
Wood/plant remains	3
Leather/shell/bone/ivory	1
Cannon	0
Anchors	0
Fittings	0
Encrustations	3
Other	1

Re-categorized list of *San José* artifacts owned by State, stored at Mission San Luis (BAR, DHR 2014).

Category	**Count**
Ceramics	653
Glass	50
Building material	34
Lithics	83
Coins	111
Decorative objects	92
Fasteners	229
Shot	205
Miscellaneous metal	1,599
Wood/plant remains	251
Leather/shell/bone/ivory	67
Cannon	5
Anchors	0
Fittings	589
Encrustations	5
Other	4

Re-categorized 1976 *San José* Divisions Records list of Artifacts to State of Florida, 25% (Florida Department of State, Division of Archives, History and Records Management 1976).

Category	**Count**
Ceramics	126
Glass	1
Building material	0
Lithics	1
Coins	0
Decorative objects	21
Fasteners	116
Shot	4
Miscellaneous metal	19
Wood/plant remains	18

Leather/shell/bone/ivory	0
Cannon	0
Anchors	0
Fittings	82
Encrustations	3
Other	0

Re-categorized 1976 *San José* Divisions Records list of Artifacts to Marine-Tech Salvage Company, Inc., 75% (Florida Department of State, Division of Archives, History and Records Management 1976).

Category	**Count**
Ceramics	0
Glass	0
Building material	0
Lithics	0
Coins	139
Decorative objects	3
Fasteners	0
Shot	0
Miscellaneous metal	0
Wood/plant remains	0
Leather/shell/bone/ivory	0
Cannon	0
Anchors	0
Fittings	0
Encrustations	0
Other	0

Re-categorized 1976 *San José* Divisions Records list of Artifacts to State of Florida, 50% (Florida Department of State, Division of Archives, History and Records Management 1976).

Category	**Count**
Ceramics	1,356
Glass	88
Building material	73
Lithics	43
Coins	2
Decorative objects	83
Fasteners	287
Shot	226
Miscellaneous metal	165
Wood/plant remains	104
Leather/shell/bone/ivory	56
Cannon	0
Anchors	0
Fittings	393
Encrustations	18

Other	0

Re-categorized 1976 *San José* Divisions Records list of Artifacts to Marine-Tech Salvage Company, Inc., 50% (Florida Department of State, Division of Archives, History and Records Management 1976).

Category	**Count**
Ceramics	40
Glass	1
Building material	4
Lithics	0
Coins	107
Decorative objects	19
Fasteners	0
Shot	0
Miscellaneous metal	2
Wood/plant remains	0
Leather/shell/bone/ivory	0
Cannon	0
Anchors	0
Fittings	20
Encrustations	0
Other	0

Re-categorized list of *San José* Artifacts Included in Final Permit Report FKNMS-99-045 (Molinari 2004).

Category	**Count**
Ceramics	390
Glass	33
Building material	115
Lithics	212
Coins	5
Decorative objects	0
Fasteners	193
Shot	0
Miscellaneous metal	8
Wood/plant remains	27
Leather/shell/bone/ivory	27
Cannon	0
Anchors	0
Fittings	0
Encrustations	7
Other	3

Re-categorized list of *San José* Artifacts Included in Final Permit Report FKNMS-99-045 (Molinari 2003b.).

Category	Count
Ceramics	115
Glass	37
Building material	216
Lithics	107
Coins	1
Decorative objects	0
Fasteners	125
Shot	0
Miscellaneous metal	8
Wood/plant remains	14
Leather/shell/bone/ivory	5
Cannon	0
Anchors	0
Fittings	1
Encrustations	0
Other	0

Re-categorized list of *San José* Artifacts Included in 2002 Final Permit Report FKNMS99-045 (Molinari 2002).

Category	Count
Ceramics	501
Glass	38
Building material	205
Lithics	3
Coins	5
Decorative objects	1
Fasteners	138
Shot	23
Miscellaneous metal	29
Wood/plant remains	34
Leather/shell/bone/ivory	14
Cannon	0
Anchors	0
Fittings	0
Encrustations	9
Other	16

Re-categorized list of *San José* Artifacts Included in 1998 Final Permit Report FKNMS(UR)-37-94 (Molinari 1998).

Category	Count
Ceramics	841
Glass	25
Building material	1
Lithics	52
Coins	5

Decorative objects	0
Fasteners	318
Shot	6
Miscellaneous metal	91
Wood/plant remains	25
Leather/shell/bone/ivory	18
Cannon	0
Anchors	0
Fittings	0
Encrustations	16
Other	0

Re-categorized list of Pillar Dollar artifacts stored at SEAC.

Category	**Count**
Ceramics	0
Glass	0
Building material	0
Lithics	1
Coins	0
Decorative objects	0
Fasteners	55
Shot	1
Miscellaneous metal	20
Wood/plant remains	0
Leather/shell/bone/ivory	0
Cannon	0
Anchors	0
Fittings	0
Encrustations	0
Other	0

Re-categorized list of Pillar Dollar artifacts from U.S. vs Hampton, S. Hood, and W. Hood court case stored at SEAC.

Category	**Count**
Ceramics	0
Glass	0
Building material	0
Lithics	0
Coins	0
Decorative objects	0
Fasteners	67
Shot	0
Miscellaneous metal	3
Wood/plant remains	0
Leather/shell/bone/ivory	0
Cannon	0

Anchors	0
Fittings	0
Encrustations	0
Other	0

Re-categorized list of Pillar Dollar artifacts collected during 2014 field season (McKinnon 2015).

Category	**Count**
Ceramics	33
Glass	13
Building material	40
Lithics	1
Coins	0
Decorative objects	0
Fasteners	15
Shot	0
Miscellaneous metal	3
Wood/plant remains	4
Leather/shell/bone/ivory	5
Cannon	0
Anchors	0
Fittings	0
Encrustations	0
Other	0

Appendix V: Example of Points Assigned to Artifacts in 1976.

(Florida Department of State, Division of Archives, History and Records Management 1976).

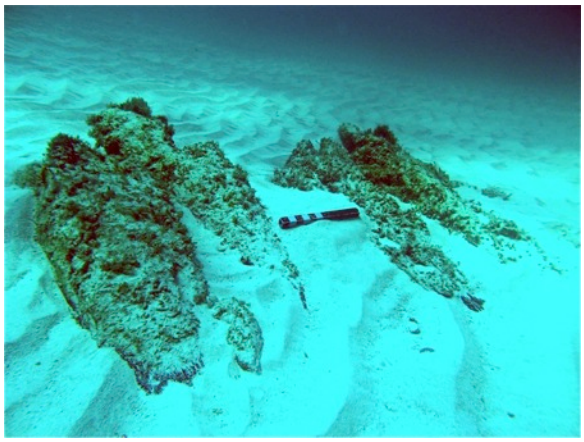
Artifact	Points
Gold Ring with Green Stone	1000.0
Marineware Intact	100.0
Pewter Plate	50.0
Black Glazed Pottery Bowl	80.0
Gold Ring	350.0
Lead Pipe	.1
Fastener	.1
Buckle	2.0
Cocoa Stirrer	2.0
Wood Handle	1.0
Axe Head	14.0
Brass Fastener	2.0
Metal Bars and Ring	.1
Brass Rings	2.0
Shot	.1
Nested Cups	.1
Wing Bolt	4.0
Silver Plated Brass Buckle	5.0
Majolica Plate	100.0
Encrusted Key	8.0
Wood Block	.1
Wooden Cleat	.1
Sword Handle	80.0
Lead Weight	4.0
Barrel Loop	.1
Painted Ceramic Stopper	4.0
Silver Fork with Wood Handle	28.0
Small Medallion	7.0
Whetstone	30.0
Rope	.1
Encrusted Lock	10.0
Wood Container with Metal	80.0
Sherd	.1
Mexican Small Vessel	22.0

Appendix W: Pillar Dollar Site Photographs 2006 to 2012.

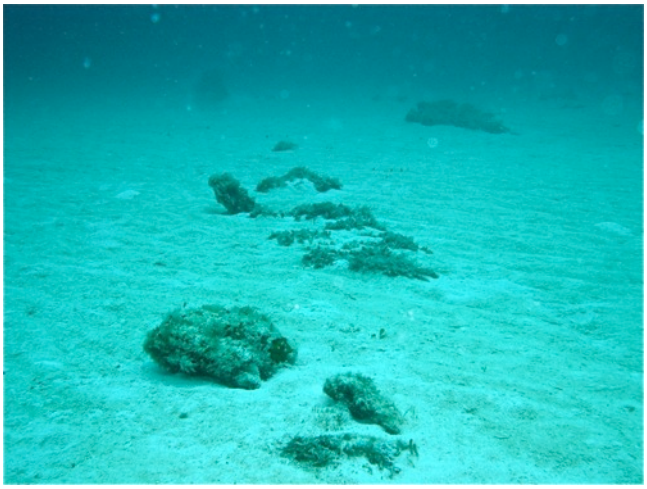
(Choate 2006)

(Lawson and Tillman 2011)

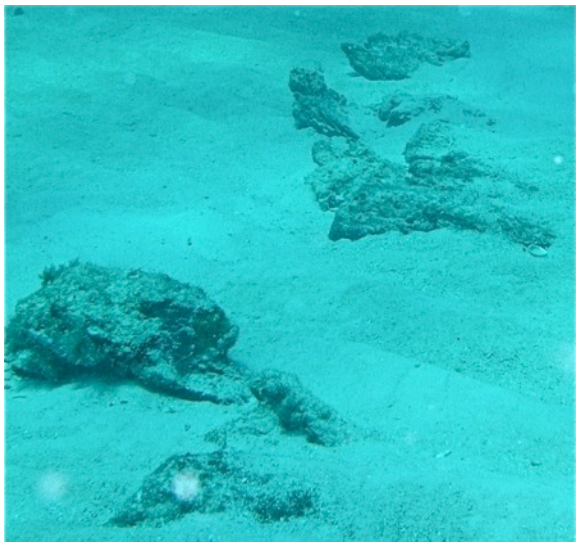
(NPS 2007)



(Lawson 2012)

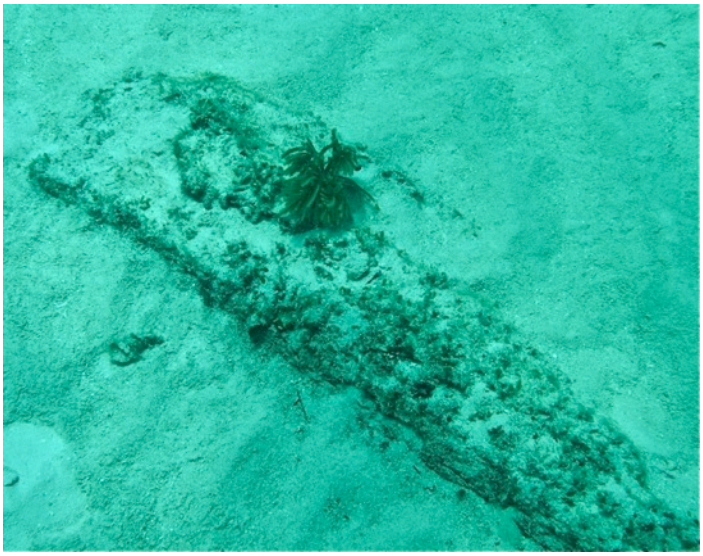


(Lawson and Bayliss 2010)



(Lawson and Tillman 2011)

(Choate 2006)



(Garis and Helmers 2008)

Appendix X: Glossary of Terms.

Adventure diver: An individual in Florida who dived historic shipwrecks and recovered artifacts before state laws required permits.

Archaeology: The scientific study of the past through the systematic examination of material remains of past human life and activities. Surveys, excavations, and other research methods are conducted to a high standard of scientific examination with the ultimate goal of building the story of humanity's cultural past (Hall 2007:5).

Exploration permits (esp. Florida): Permits given by the state of Florida that allow for remote sensing survey of Florida waters (Florida Legislature 2013b). The principle is based on the concept of minimum disturbance to sites and survey must be undertaken within certain standards. Applicants must meet predetermined requirements to be considered.

Law of finds: Claiming goods that no longer have an owner or that the owner has abandoned; this law is rooted in the U.S. law of "finders keepers" (Wilder 2000:93–94). The finder must prove that the property has been abandoned or that the owner has publicly announced that he or she abandoned ownership of the property in question.

Looter/looting: Those actions conducted by individuals who remove artifacts from shipwreck sites in the U.S. without a state permit.

Permitted treasure salvage: Through the Exploration and Salvage Program**,** the state of Florida provided permits to treasure salvage companies that applied to recovering artifacts from historic shipwrecks (BAR, DHR 1994). A percentage of finds were given to the state, and the state provided field agents to monitor salvage activities.

Recovery permit: The recovery permit replaced salvage contracts and is currently in use in Florida. The recovery permit allows the permit holder to collect diagnostic artifacts from the site for help with site identification (Florida Administrative Code 2013).

Salvage: The act of recovering property, ships, or cargo from loss in a maritime environment (Wilder 2000:92).

Salvage law: Originating from laws in Mediterranean Sea ports during the Byzantine Empire, salvors were rewarded for their efforts of recovering or rescuing cargo or ships from the perils of sea (Wilder 2000:92). This law was adopted by the U.S. in the 1960s when the Supreme Court decided upon the basic principles of maritime salvage.

Salvor: Originally pertaining to saving commercial goods from loss, this term became synonymous with treasure hunting in Florida during the 20th century when the state issued salvage contracts to treasure hunters, allowing them to recover artifacts from historic shipwrecks. Contrast this to the original definition of salvor, which denoted those individuals who recovered items lost at sea and returned them to the rightful owner, receiving a reward for their efforts (Wilder 2000:93–94). See *Salvage law*.

State salvage contracts: Contracts given to treasure hunters in the U.S., especially during the late 20th century, to survey and recover artifacts from historic shipwrecks (Wilder 2000:92–94). A percentage of recovered finds went to the state while treasure hunters retained the rest of the artifacts.

Treasure hunter: Fueled by the market of antiquities, this type of individual seeks to collect artifacts for profit. Collection is carried out with disregard to the importance of historical context and is conducted at the expense of the archaeological record. Treasure hunters may have the technology and humanpower needed for excavation but do not follow an archaeological code of ethics (Hall 2007:1–2).

Treasure salvor: An individual who is similar to a treasure hunter, but who has government permission to recover artifacts from historic shipwrecks; a legally sanctioned treasure hunter.

Underwater cultural heritage (UCH): Those culturally significant material remains of past human societies that are now submerged and make up the collective history of humans (Elias 2000:42–45). These remains include shipwrecks, sunken or flooded cities, ports, harbors, roads, piers, etc. Synonyms include maritime heritage, submerged cultural resources, and underwater cultural resources.