Abstract

THE IMPACT OF EMPIRE:

THE EFFECTS OF BRITISH IMPERIAL CULTURE ON THE COLONIAL MARITIME LANDSCAPE OF BLUEFIELDS BAY, JAMAICA.

by

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The history of Colonial Bluefields Bay diverges from the widely accepted model of eighteenth century histories of the British Caribbean and Imperial Jamaica. Bluefields' colonial society was not sugar based because local planters were not wealthy enough to grow or refine it. Nor did the bay thrive as a bustling commercial port, like Port Royal, but instead simply served as a rendezvous for naval and commercial convoys. Because of its size, remoteness, and irrelevance, to the Imperial economy we might expect to find in Bluefields Bay a landscape free of Imperial influence. This, however, is not the case.

In 2009 the author conducted a Phase I non-invasive archaeological surveyed of the bay's seafloor and coastline. This survey revealed the location of an eighteenth century or early nineteenth century shallow water anchorage likely used by British ships-of-the-line, and relocated and examined remnants of the bay's coastal fortifications and economic centers. Surprisingly, this examination of the bay's landscape revealed that the patterns of use, types of structures erected, and commercial products produced in the region all allude to the prevalence of an Imperial culture in Colonial Bluefields Bay.

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By Benjamin D. Siegel

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DEDICATION

To my loving and supportive parents, Franklin J. Siegel and Debra Bannon-Siegel.

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Chapter 1: Introduction

In 1656, English colonists began to settle an area of Jamaica known as Bluefields Bay. Situated on the island's southwestern coast, the bay area soon proved to have both commercial and strategic advantages. Bluefield's location offered English merchantmen a vantage point from which they could interfere or participate in Spain's Caribbean economy (Edwards 1818). Furthermore, the bay's natural features encouraged the English to establish two anchorages in the area. Soon after Bluefields' settlement, area plantation owners began to grow fruit, coffee, and pimento. The production of these goods combined with the bay's convenient location invited English merchants into the bay and allowed the small anchorage to grow. By the late eighteenth-century, Jamaican pilotage notes included Bluefields Bay as a significant landmark on the Jamaican coast (Leard 1792). Additionally, notes from the admiralty records and other historical sources show that the Royal Navy made used the bay as a rendezvous for convoys leaving the Caribbean in the latter half of the 1700s (New York Historical Society 1932[2]:839; Wright and White 1969:173; Hall 1999:138).

In June 2008, an archaeological team led by Dr. William Wedenoja of Missouri State University and his associate Dina Bazzil conducted a brief underwater survey of Bluefields Bay. Wedenoja and Bazzil investigated a single towboarding transect. This surveying group only took four days to investigate the transect, but with the help of knowledgeable local fishermen, the lone transect encompassed a cannon, two anchors, two other unidentifiable ferrous objects, and what was at the time believed to be a ballast pile.

Encouraged by the success of Wedenoja and Bazzil's survey, the present author devised a two part study that was designed to discover, document, and interpret the surviving maritime artifacts from Bluefields' colonial period. First, the author constructed a predictive model to locate the bay's colonial period artifacts. The model was based on the data from Wedenoja and Bazzil's 2008 survey, the written historical record of the Bluefields region, and the knowledge of additional artifacts offered by local fishermen. Then, in October 2009, the author tested the predictive model during a twenty-eight day archaeological investigation of Bluefields Bay.

The purpose of this thesis is to describe the findings of the author's 2009 study and to extrapolate from them an understanding of the British imperial culture that existed in colonial Bluefields Bay during the seventeenth, eighteenth, and early nineteenth centuries. To accomplish this task, this work will examine and consider the colonial maritime artifacts and sites found in Bluefields as parts of a larger, and imperially influenced, maritime cultural landscape. Through this process, Bluefields' archaeological remains will reveal some of the physical and cognitive characteristics of Bluefields' maritime culture, including the locations of the bay's shallow water anchorage, defensive structures, and centers of industry, as well as the reasons why such places were constructed and used, and how Bluefields' locals perceived their role within the greater imperial system (Westerdahl 1992, 2011; Jasinksi 1993; Dellino-Musgrave 2006; Ford 2011). Such an in-depth look at Bluefields' colonial past is warranted because the region hosted an incredibly nuanced and, at times, seemingly counterintuitive Jamaican society, while still functioning as a part of the British imperial system. Rather than a sugar driven

and commercial port, Bluefields Bay primarily functioned as a watering station or rendezvous point for vessels leaving the Caribbean. Instead of a population of incredibly wealthy planters with extremely large plantations, colonial Bluefields was home to an almost middle planting class that had only modest land holdings and that would often have to work in the field along with their slaves. In lieu of a sugar based society, we find in Bluefields a colonial culture dependent on subsistence farming, skilled labor, and the production of niche imperial market goods such as pimento and lime. Thus, analysis of the bay's history and artifacts will not only answer questions about Bluefields' maritime landscape, but refine our understanding of the cultures present within Jamaica throughout the colonial period as well.

Research Questions

This thesis will examine the role British imperial policy, economic policies, and societal norms played in the use and development of artifacts and places pertaining to maritime traffic, trade, and defense in colonial Bluefields Bay. To characterize what is meant by imperial culture, economy, and societal values, this research will investigate Jamaica's, and then Bluefields', role within the greater scheme of the British Empire. It will also describe the constraints placed on Bluefields' inhabitants' ability or desire to adhere to this imperial system, based on their limited resources, geographical practicality, and the bay's proximity to Savannah-la-Mar. Investigating these concepts will involve the interpretation of Bluefields' extant archaeological record as parts of an imperially influenced maritime landscape by asking a variety of questions.

Do the maritime activities suggested in Bluefields' historical record coincide with those suggested by the bay's surviving archaeological record, and what do both records suggest about maritime activity in Bluefields? Where is the bay's colonial period shallow water anchorage and what accounts for its location, size, and forms of use? What prompted British merchants and naval captains to stop in Bluefields Bay, and how did they know what to do when entering and exiting the bay? What types of goods did Bluefields' merchants and planters produce, why, and to whom were they being sold? What was the final destination of these goods, and by what methods were they moved out of the Bluefields area? By asking these and similar questions we shall gain insight into the milieu of the typical colonial Bluefields' inhabitant or visitor and come to understand the relationship between the maritime cultural landscape of Bluefields Bay and the imperial culture that created it.

The Maritime Cultural Landscape of Bluefields Bay

So how can we define the concept of a "maritime cultural landscape" and why is it valuable for our examination of Bluefields Bay, Jamaica? In 1992, Christopher Westerdahl used the term "maritime landscape" to unify the remains of a maritime culture he examined on the coast of Swedish Norrland (Westerdahl 1992:5). "The maritime cultural landscape" wrote Westerdahl, "[encompasses areas that] signify human utilization (economy) of maritime space, by boat, settlement, fishing, hunting, shipping and its attendant sub-cultures, such as pilotage, lighthouse and seamark maintenance" (Westerdahl 1992:5). But for Westerdahl a maritime landscape was not just the physical

remains of a culture, it was also the immaterial, cognitive, and indicatory value that objects held within the minds of each user of the landscape. To help find the overlap between a society's material and immaterial culture then, Westerdahl recommended the archaeological analysis of several types of places within a given maritime landscape such as "transit points," or areas where goods were loaded, unloaded, or traded, "centers of maritime culture," where two or more of a society's maritime activities took place, and "sea routes," or the paths that visiting vessels followed (Westerdahl 1992:7). He also stressed the value of "place names" and the archaeological sites they pertain to, calling them a factor in the cognitive landscape because the names are based on actual experience, and help members of a society communicate ideas with one another about the space in which they live (Westerdahl 2011).

Just as Westerdahl's concept of a maritime cultural landscape attempted to strike at the immaterial characteristics of a society, Marek E. Jasinski further illustrated how the study of several different types of archaeological evidence can help uncover the cognitive aspects of a society's relationship with the sea. Proposing that maritime archaeology is intended to investigate "man's connection to the sea," Jasinksi urged the use of evidence found beyond the natural boarders of the ocean to develop an understanding of how the sea can affect man and the ideas men hold (Jasinksi 1993:14). Through the experiences one has in a landscape Jasinksi writes, "the landscape can acquire a qualitative new place in the ontological space of the person concerned, i.e., his/her philosophical perception of life and of the world" (Jasinksi 1993:16). As a consequence of this process, a society's culture becomes related to its physical landscape both functionally and symbolically. For

Jasinski then, it becomes archaeologists' duty to turn a collection of geographically related artifacts and sites into a cultural landscape to understand why the society created these objects and places, rather than simply explaining how they were made.

To make this leap, from the analysis of a collection of artifacts to an investigation of the immaterial aspects of a society through the cultural landscape it left behind, we can use Structuration Theory to gain insight into the cultural patterns that helped shape the landscape (Westerdahl 1992; Jasinski 1993; Flatman 2003; Dellino-Musgrave 2006). Structuration Theory functions as an interpretive tool by identifying the roles of society, the individual (Agent), and human action (Agency), in the construction a landscape. At the center of this theory is the idea that agents within a society actively understand and alter the rules, or structure, of their social system through agency, or actions. The structure of a society reflects these actions, by either having its rules and protocols reinforced or changed. The agents' choices are determined by the individuals' internal thought and external experiences which they use to rationalize their actions as being in compliance with societal structures (Giddens 1984). But a society's structure limits actions through "rules" and enables other actions through the use of "resources" (Giddens 1984). As explained by Giddens (1984:33), "there are two types of resources; "allocative resources" refer to capabilities – or, more accurately, to forms of transformative capacity – generating command over objects, goods or material phenomena. Authoritative resources refer to types of transformative capacity generating command over persons or actors." As such, the rules and resources of a structure are internalized and used by agents, and allow the agents to act or produce agency and thus participate in their society. In this way, a society's structure nurtures agency by being placed in the minds of a

society's members through a variety of modalities including language, laws, moral codes, and the opportunity for individuals to refute or legitimize these quantities (Giddens 1984:29, 165). There exists then, a conversation, or dialectic between a society's structure and its agents, the result of which is actions that have physical manifestations, such as artifacts and places, built and used within a society's landscape.

Structuration Theory can be applied to colonial Bluefields Bay, where we have a society whose "structure to agency" dialect originates from the region's participation in the British Empire. The language, laws, economic policies, and means of societal reform and legitimization were dictated to the inhabitants of Bluefields by the imperial system. Thus Bluefields' inhabitants began their choice in actions upon a negotiation between their local "allocative resources" such as manpower, monetary holdings, and physical resources, and their limited access to "authoritative resources" within the larger empire, including the political and economic power needed to create structural change. Motivated by the potential for improvement of their social and commercial circumstances, but constrained by their physical and structural realities, the planters and merchants of Bluefields internalized and assessed the resources available to them and took practical courses of action within their maritime landscape (Dellino-Musgrave 2006:4). Maritime artifacts and sites used during Bluefields' colonial period then, are physical manifestations of locals' and visitors' practical courses of action, and consequently, provide us with insight into the "structure to agency" dialectic that took place within the minds of Bluefields' inhabitants.

Chapter 2: The Colonial History of Jamaica and Bluefields Bay

This chapter is intended to serve as an introduction into the colonial history of Jamaica and Bluefields Bay so that the reader will better understand the historical context of the archaeological findings presented elsewhere in this thesis. While there are a number of ways to tell the history of Jamaica, I have found it most prudent to tell the story through the trials and tribulations of the island's planter class. These planters merit such attention because many among them chose to grow and refine sugar, a decision that essentially determined the nature of the economy and culture that developed in Jamaica throughout the eighteenth-century. Moreover, for the duration of the eighteenth-century, Jamaican planters were politically organized and exercised a level of influence over the imperial policies that Parliament enacted. These planters additionally dealt with the ramifications of imperial decisions, such as food shortages brought on by wars, and the restrictions placed on trade in times of peace, making themselves the clear links between British imperial legislation and the realities of life in Jamaica. By following their seventeenth-, and eighteenth-century histories, then, this chapter will demonstrate how life in Jamaica, and subsequently life in Bluefields Bay, was closely tied to the island's participation in the British imperial system. But before we can discuss these planters, we must first set the stage for their arrival to the island. Initially under Spanish rule, Jamaica underwent a number of changes before it was able to host this influential planter class.

Jamaica before the Coming of the English: 1500- 1655

In the 1500s, Spanish Jamaica had no significant exports and was a relatively unimportant possession when compared with Spain's other Caribbean colonies. Politically, the island belonged to the audiencia of Santo Domingo, the theoretically powerful but historically weak seat of government in the Spanish Caribbean. Local governors within this audiencia squabbled over territorial rights frequently, and in the late sixteenth century the commercial center of Havana became all but autonomous in communications with merchants and government officials in Spain (Andrews 1978:47). Similarly, throughout the 1500s, the audiencia exercised little control over Jamaica because its government fell into mismanagement as soon as Charles I assigned Christopher Columbus's descendants as its rulers. Jamaican corruption reached such heights that in 1582 local government officials were stopping residents' attempts to contact administrators in Santo Domingo by "intercept[ing] correspondence, confiscating legal documents and forbidding depositions" (Andrews 1978:42).

Jamaica's economic potential lay dormant during Spain's occupation because the island did not lie along the routes used by the Spanish treasure fleets. On rare occasions, ships arrived in Jamaica to take on smoked meats, hides, and tallow, but by and large, the colony was devoid of a merchant marine (Craton and Walvin 1970:12). Thus, even if the Spanish planters sought to grow cash crops and produce large surpluses of staple foods like cassava, they lacked access to a market where their goods could be sold at a

worthwhile profit. Neither a closely managed, nor heavily frequented portion of New Spain, Jamaica suffered because the island lay in the backwaters of the Spanish Empire.

England took Jamaica from Spain in 1655. Originally, Oliver Cromwell, the Lord Protector of England, had sent an expeditionary force of some 14,000 troops to capture Hispaniola. But the English found Santo Domingo, the island's capital, too well fortified. Searching for easier prey, the expedition sailed to St. Jago (Spainsh Town), the Spanish capital of Jamaica (Nicholson 1708:268). The poorly fortified city quickly capitulated, and its inhabitants and garrison fled to the nearby hills with all the town's wealth. From their position of exile, the Spanish launched a series of small raids in an attempt to dislodge the English, but seeing that these attacks were unsuccessful, they soon retreated to the northern part of the island and fortified themselves in St. Chetras. Having established a settlement near Port Morant, the English commander left approximately 2,500 soldiers and twenty men of war to defend Jamaica and returned to England to inform Lord Protector Cromwell of the situation. In the commander's absence, the remaining English troops found and destroyed the surviving Spanish resistance and forced the remaining civilians to abandon the island.

Buccaneering and Planting in Jamaica: 1655-1700

While it is not within the bounds of this chapter to discuss exactly why or how the decision was made to hold Jamaica, Crommwell undoubtedly saw the island's great potential. Situated directly in the middle of the Caribbean, Jamaica provided an excellent location from which Englishmen could profit by the Spaniards in central America. Essentially an outpost of resistance to Spanish law, Jamaica quickly became a haven for smugglers, privateers, and pirates. So perpetual was their presence that Jamaican governors fell into the habit of employing them in the island's defense. Governors did this by distributing letters of marque to these would be criminals, giving them liberty to seek, loot, and destroy Spanish vessels, but requiring them to follow the instructions of the Jamaican governor in times of crisis (Earle 2007:30). In this way, the buccaneers afforded the island a modicum of protection in the absence of England's imperial navy.

These men of the sea were also a major source of income for Jamaica's inhabitants. Privateer vessels needed outfitting, repairs, and provisions, and locals were employed in the restocking of these ships. Additionally, the goods these corsairs captured were sold on the island well beneath their market value, and when in port the crews frequented local taverns and brothels (Earle 2007:32). Indeed, even the governor of Jamaica himself took his share of the booty. After a captured ship was proven to be lawful prize in a court of law, an inventory was drawn up of the items on board. The governor was entitled to one-tenth of the prize, in addition to the fees for the privateer's commission.

Jamaican privateering remained a legal enterprise until 1671. In an episode best told by historian Peter Earle, Henry Morgan, the famous privateer, upset the king of Spain by sacking the port cities of Portebello and Panama. He returned to Port Royal in April 1671, where Governor Thomas Modyford was waiting for him with orders to officially declare peace between Jamaica and Spain and to put an end to the English plundering (Earle 2007:232). Sir Thomas Lynch's appointment as lieutenant governor of Jamaica, and the subsequent arrest of Modyford (under the pretext that he had insubordinately given Henry Morgan a letter of marque in the first place), seemed to cement this change in Jamaican policy. Lynch arrived on July 1st with two royal ships, the *Assistance*, and the *Welcome*. Iconic as well as physical manifestations of English royal authority and power, these ships helped usher in a new era of Jamaican history.

Whereas Governor Modyford had encouraged Jamaica's privateers, Lynch had a vested interest in developing the island's agricultural economy (Parry and Sherlock 1956). To this effect, he distributed 1200 land patents, many of which were in previously sparsely inhabited parishes, such as St. Elizabeth, St. George, St. Mary, St. Ann, and St. James. He also cracked down on privateering by making it explicitly illegal, and punishable by death (Harper 1684). From Lynch's arrival in 1671, throughout the remainder of the seventeenth century, ex-soldiers and wealthy investors from England purchased and reorganized most of Jamaica's arable land (Craton and Walvin 1970:36). Many of these land purchases were speculative, but by the 1680s and 1690s, many planters bought out weaker neighbors with the intent of cultivating sugar cane. This crop not only needed large tracts of land to be farmed efficiently, but its cultivation and

processing required planters to have large amounts of start up capital and a perpetual source of labor (Edwards 1818[2]:57).

While the island offered planters sizable portions of land, it provided little of the other two factors of production. For these, the planters relied upon English merchants, who were not always able or willing to deliver. Capital was short, because most farmers had invested their wealth in the land grab. Labor was also in short supply in Jamaica because white immigration had dropped off by the 1670s and the importation of black slaves was constrained by the high prices charged by the Royal African Company (RAC) (Dunn 1973:164). When the RAC's monopoly ended in 1698, private slave traders were allowed into Jamaica, and the island's sugar production soared. This resulted because the private tradesmen sold slaves on generous credit and allowed planters to pay their debts in sugar, making it possible for landowners to obtain many more slaves and produce far more sugar. The increase in slave purchasing soared, so that by 1720 the ratio of the black to white population on the island reached ten to one (Craton and Walvin 1970:121).

As the 1600s ended, the planters who had taken control of the island's land went on to take control of the island's politics. They accomplished this feat by first establishing a unified and undeniable voice within the Jamaican Assembly (the island's representative legislature), and then by strengthening their ties with the English Parliament. These two processes were interwoven, and can be traced back to events in the 1680s. In 1687, King James II appointed Christopher Monk, the second duke of Albemarle, as governor of Jamaica. Disinterested with large planters, the duke used physical force to secure the election of buccaneers and small plantation owners who

supported him (Dunn 1973:161). Infuriated by this, a number of big planters fled to England to plead their case to friends and associates in Parliament. By the time of the Glorious Revolution in 1689, these absentee planters had established a powerful lobby in London, and persuaded William III (the new king as a result of the revolution) to remove the fraudulent representatives installed by the duke, and allow for the return of big planter politics to Jamaica. The king's next gubernatorial appointment in 1692 seemed to cement this change to pro-planter politics, as the appointee, Sir William Beeston, was a former plantation owner and parliamentary lobbyist himself.

The Development of Jamaica's Sugar Based Civilization: 1700 – 1763

With their political control of the island intact, and their influence in Parliament expanding, the planters exercised their available political power to extract favorable economic policies from the British government. West Indian lobbyists and vested representatives pushed the the Molasses Act of 1733 through Parliament, for example, effectively imposing a tax on North Americans when they bought non-British molasses. Similarly in 1739, the West Indian planters secured a reprieve from the Navigation Acts and were allowed to export their sugar directly to southern Europe, without having to first travel through England for taxation (Craton and Walvin 1970:74). With the help of imperial policies like these, Jamaica's sugar planters made fantastic fortunes and continued to expand their means of harvesting and refining sugar. This emphasis on sugar

production, however, proved to have major implications for Jamaica's population, economy, and culture.

By the middle of the eighteenth century, the sugar industry's expansion had all but forced the small planter class out of Jamaica. The financial gains of the island's larger planters allowed them to expand and consolidate their holdings to such an extent that by 1754 the average size of an estate was over 1,000 acres (Colonial Office Papers 1754[142]:31; Pitman 1967:124). To acquire these plots, though, smaller and less profitable plantations had to be bought out. While this practice might have seemed wise to a planter purchasing more land, it in effect ruined the smaller planters who had grown crops and raised cattle at a modest profit for local consumption. Without these small planters, food prices in Jamaica increased, and the island's population became dependent on the importation of foodstuffs. Soon cattle, fish, rice, and grain had to be imported from the American mainland (O'Shaughnessy 2000:71; Pitman 1967:109).

The spread of the sugar industry also perpetuated the practice of absenteeism among the wealthier planters. To move away to an English estate and escape the harsh climate of Jamaica was the goal of nearly every planter, and the wealth acquired by sugar production allowed many to do so. When the planters left, they inadvertently sapped the island of its much-needed management. Recognizing this custom as a degradation of Jamaica's leadership and development, Parliament passed the 1718 Deficiency Act (and in subsequent years passed similar acts) that required absentee proprietors to keep a certain number of white people on their plantation in proportion to the number of slaves and livestock they held, at the threat of additional taxation (Colonial Office Papers

1719[137]:13; Pitman 1967:35). Nonetheless, planters continued to leave the colony, and by the 1740s many absentee landholders had no personal experience in Jamaica, having received their estates from the previous generations (Pitman 1967:40). From England, these absentee planters entrusted the daily management of their properties to overseers or attorneys, many of whom proved to be corrupt or incompetent.

Those few whites who were required to stay in Jamaica to maintain plantations were forced to alter their societal values to meet the realities of Jamaican life. As a general rule, they opted against public works, particularly in the context of raising funds for the construction of churches and schools (Pitman 1967:24). These were largely considered wastes of resources, as planters who could afford to, sent their children to England to be educated, and few men attended church services regularly. Furthermore, planters were less inclined to provide money for these causes when they were already required to serve in the island's militia at their own expense, and to pay for the construction and repair of roads throughout the island.

The preponderance of sugar in Jamaica's markets also dictated the style of trade that was conducted on the island. Up until the 1750s, Kingston served as Jamaica's only official port of entry, which is to say, it was the only port where customs officials kept track of shipping lists. With this neglect, Jamaican merchants made a habit of re-exporting cheaper sugar and sugar products from the French islands into the British market (Pitman 1967:333). To crack down on the island's rampant smuggling, Savannah-la-Mar, Montego Bay, and Port Antiono were opened as ports of entry on June 29, 1758 (Pitman 1967:306). These openings, however, had little impact on the island's illicit

trade, as the corruptible customs-house officials only managed to slightly raise the cost of smuggling as they readily took bribes in exchange for falsified documents, or turning a blind eye.

By far, however, Jamaican planters' adoption of a sugar-based society had the most direct impact on the island's inhabitants when Great Britain went to war with other empires. This happened frequently in the eighteenth century with Britain fighting in the War of Spanish Succession (1702-1715), the War of Jenkins' Ear (1739-1743), the War of Austrian Succession (1744 – 1748), and the Seven Years' War (1756-1763). During these times of conflict, the planters proved unwilling or unable to defend Jamaica's vast coastline. Though they bemoaned the increase in coastal raids that accompanied these wars, they refused to build defensive fortifications, on the grounds that they were too costly, and that the time their slaves spent constructing them would be better spent in the sugar fields (Pares 1963:243). Even when fortifications were built, the society created by the sugar planters was hardly capable of fielding a militia large enough to properly man them. As has already been mentioned, the sugar planters had ousted Jamaica's smaller farmers in their efforts to consolidate the island's farmable land, and in times of war this meant that the island had fewer men eligible for militia service. This lack of provision farmers in Jamaica additionally had the compounded effect of making the cost of feeding a standing force extremely high, as planters were forced to import army provisions at inflated freight and insurance rates brought on by wars. (Pares 1963:258). Without the ability to defend or feed themselves, Jamaicans became completely dependent on

Britain's navy and merchant marine during the imperial wars of the first half of the eighteenth century.

Jamaica's Dependencies Exposed and Abused: 1763 – 1790s

With the close of the Seven Years' War, the demand in England for sugar was high, and freight and insurance rates soon dropped to all time lows. Furthermore, parliamentary protection for British sugar was forthcoming with renewals on pre-war protective tariffs on foreign sugar sold in Britain. Such legislation helped sugar stabilize around thirty six shillings per hundred weight of muscovado for the remainder of the 1760s (Ragatz 1928). Parliament even took further steps to appease Jamaican planters by passing legislation that allowed greater liberties in trade between Jamaicans and merchants of the foreign colonies. (Ragatz 1928:138). This new legitimate form of trade not only lowered the cost of provisions in Jamaica, it also supplied the island with much needed silver and gold coin to be reinvested into sugar.

While these postwar pieces of legislation did much to reassure Jamaican planters of their political influence in Parliament, the truth was that they were, in fact, at the total mercy of imperial policy. Jamaicans, and indeed all British sugar planters, grew far less and charged far more for their sugar than their French counterparts. While this had been true for most of the eighteenth century, it became particularly pronounced in the years after the Seven Years' War. By 1765, the French planters' lower prices allowed them to become the leading purveyors of sugar in Hamburg, Holland, Scandinavia, and Russia, all of which had previously been outlets for British sugar (Ragatz 1928:126).

Furthermore, in the 1770s, British sugar prices reached levels one-quarter to one-third above those of the French, and the French colony of St. Domingue alone produced more sugar than all of the British sugar colonies combined (O'Shaugnessy 2000:61). In such a market, Jamaican planters knew they were only able to turn a profit because of Parliament's protective tariffs, which kept Jamaican sugar relatively cheap in British markets, and the low cost of American agricultural goods, timber, and livestock, which kept the planters' overhead costs low.

The events surrounding the American Revolution, however, soon took the cheap supplies from America out of the equation. Even before the war's outbreak, the American colonies closed their ports to British Caribbean produce in December 1774, and stopped exporting goods to Jamaica in September 1775. This disruption of trade alone nearly brought the Jamaican economy to its knees with the value of the islands' exports to the mainland at approximately £36,510 annually (Edwards 1818[2]:257). Once the war commenced, the Americans further ruined Jamaica's economy by harassing British West Indian shipping, reducing the number of vessels traveling from Britain's sugar colonies to London from 354 craft in 1775 to 243 by 1778. Food prices in Jamaica soared with rice per hundredweight, flour per hundredweight, and corn per bundle rising from 17s. to 60s., 17s. to 35s., and 4s. to 11s., respectively. Similarly, the costs of building and shipping supplies such as shingles and white oak staves more than doubled during the war (Colonial Office Papers 1785[137]:85; Ragatz 1928). These cost increases put many planters in debt and in some instances even caused starvation among Jamaica's slave population.

At the tail end of this war, Jamaican planters also faced the threat of outright foreign invasion. Even though the war had ended in America early in 1782, France, America's ally, refused to begin peace negotiations until it had made one last bid for power in the Caribbean. On April 8, 1782, French Admiral the comte de Grasse set out from Martinique with an allied Franco-Spanish fleet consisting of forty-five ships intent on capturing Jamaica. British Admiral Sir George Rodney, however, saw de Grasse leave Martinique and set out from St. Lucia to meet him. At the Battle of the Saintes, Rodney defeated and captured de Grasse, and ensured that Jamaica would stay in British hands.

It cannot be said, however, that Jamaicans profited from the war's conclusion. While they were now free from the threats of invasion and starvation, Parliament soon stripped Jamaican planters of their cheap American supplies for the remainder of the eighteenth-century. As a result of the war, an independent America now stood outside of the British Empire. By law, the new nation no longer fell under the jurisdiction of the Navigation Acts, and thus, Americans should not have been allowed to trade directly with the British West Indies. Realizing this possibility even before the war's end, affluent Jamaicans joined with other West Indian planters, in pleading with king and Parliament to permit them to continue their free trade with America. They reasoned that American imports were not luxuries but necessities, that they made life in Jamaica possible because they were shipments of beef, pork, fish, grain, and timber (Edwards 1784). They also argued that there was no existing British merchant fleet capable of replacing the Americans, and that without free trade the islands would again face severe shortages and high prices (Allen 1784:5). But these sentiments fell on deaf ears. In 1783, Parliament

made it explicitly illegal for Jamaicans (or any British West Indians for that matter) to purchase goods that had been carried to their island in American bottoms (O'Shaugnessy 2000:239).

A great number of American and Jamaican merchants were willing to break the law and smuggle goods into Jamaica, but this did not prevent planters all over the island from falling into extreme levels of debt. Collaterals as large as a 1,181-acre plantation with 218 slaves, were required for loans of merely £1,500 (Craton and Walvin 1970). Consequently, fifty-five Jamaican plantations were abandoned and ninety-two were turned over to creditors by 1791. Furthermore, some 177 Jamaican plantations had been sold for the payment of debts between 1772 and 1792 (Edwards 1818[2]:264). To compound matters, numerous hurricanes in 1784, 1785, and 1786 ravaged Jamaica, destroying buildings, crops, and livestock that, without American trade, could not easily be replaced. The hurricanes also caused food shortages in Jamaica worse than those of the late war, with a famine after the 1785 hurricane resulting in the deaths of no fewer than 15,000 slaves (Ragatz 1928:192).

Slight relief did come, however, in the form of the renewed Free Port Act of 1787. This act allowed wood, horses, cattle, and produce to be imported into Kingston, Savannah-la-Mar, Montego Bay, and St. Lucea, on the grounds that these goods, as well as the vessels that carried them, were owned by European nations (Ragatz 1928:203). Subsequent acts extended this practice, and in 1792 it became permanent. Within the first year, Jamaican plantation owners and merchants imported heavily from other European colonies, bringing in 194,000 pounds of cotton, 64,750 pounds of cacao, and 1,202 work

animals among a number of other miscellaneous goods (Edwards 1818[2]:245). Interestingly, these goods were overwhelmingly paid for in cash, with just 2,200 gallons of rum and 224 pounds of coffee leaving Jamaica for foreign West Indian colonies in 1787 (Edwards 1818[2]:243). In light of the economic strains placed on Jamaican planters, these cash payments indicate that the goods imported were either desperately needed, or that they could be readily re-exported to Britain for profit. In either case the numbers suggest that Jamaican planters were trying to find new avenues of commerce to fill the void left by American trade.

The damage was already done, however. By the 1790s, the ravages of the American war and the subsequent hurricanes converted Jamaica's dependencies into weaknesses, and the island's planter class lost its sway over Parliament. In 1790 Parliament refused to lower the wartime customs duties on West Indian sugar despite pleas from the Society of West India Merchants and the Jamaican legislature. Then, in 1791 Parliament actually raised the duty on sugar from its wartime rate of 12s. and 2/5d. per hundredweight to 15s. (Colonial Office Papers 1783[137]:83; Ragatz 1928:189). Parliament did this, wrote historian Lowell Ragatz, because "the sugar tax was one of [Britain's] most productive sources of national income" (Ragatz 1928:190). Far from creating imperial policy, Jamaican planters were now being abused by it. The age of the great Jamaican plantocracy had come to an end.

The History of Bluefields Bay: a Microcosm of Imperial Jamaica?

In 1656, shortly after Cromwell's expeditionary force captured Jamaica, English colonists began to settle the area of Bluefields Bay. Situated on the island's southwestern coast, the bay proved to have both commercial and strategic advantages. Bluefields' location offered English merchantmen a vantage point from which they could interfere or participate in Spain's Caribbean economy (Edwards 1818[2]). Furthermore, the area's soil proved fertile enough to allow planters to grow coffee, cocoa, and pimento. From the beginning these crops were incorporated into England's mercantilist economy, and transported, either by wagon or canoe, to nearby Savannah-la-Mar, where they were sold and loaded aboard ships for travel to America or England. Farmers also grew crops and raised livestock for local consumption and sometimes sold their surpluses to ships that anchored in the bay.

The day-to-day life of the inhabitants of Bluefields Bay can be extrapolated from Thomas Thistlewood's memoirs. An enterprising gentleman who lived in the Bluefields area from 1750-1786, Thistlewood worked first as an overseer on Egypt Plantation, and eventually earned enough to purchase Paradise Plantation, a modest plot at the bay's northernmost point. While it is difficult to consider any case study as perfectly "typical," Thistlewood often worked for neighboring planters, labored in the field along with slaves, and made frequent visits to other plantations and local centers of business. In other words, Thistlewood's immersion in the society he lived in was total. He knew many of the local owners intimately, dealt with his slaves directly, and was in tune with the region's politics and economics.

Through Thistlewood's eyes, it would seem that many characteristics of Jamaica's culture and economy were absent in Bluefields. The loathsome practice of absenteeism, for example, was a non-issue in Bluefields Bay. Unlike their wealthier counterparts, Bluefields' planters lacked the capital necessary to move away, and so remained much more involved with the daily management of their properties (Hall 1999:138). These smaller planters also had to safeguard their plantations against foreign invasion and slave rebellion. Law dictated that they had to drill with, and serve in, Savannah-la-Mar's militia in times of crisis, and they were forced to purchase equipment and erect coastal defenses at their own expense.

Additionally, Thistlewood's account indicates that sugar did not dominate Bluefields' economy in the eighteenth century. Most Bluefields planters simply did not have the financial resources to buy or maintain the equipment and slaves necessary for sugar processing (Hall 1999:138). Furthermore, the plots taken out in Bluefields were not large enough to sustain economically the cultivation of sugar, and the area's soil proved unsuitable for cane farming. Instead, local plantation owners made a great portion of their living by growing less burdensome cash crops (like coffee, cocoa and pimento), producing logwood and quicklime, and by raising cattle. Notably, most of Thistlewood's income resulted from renting out his slaves to nearby estate owners (Hall 1999:148).

Despite these differences, there are important reasons why Bluefields Bay can, and should be identified as a microcosm of Jamaican society. First, Bluefields' economy was still entirely dependent on slave labor. Though the slaves on Bluefields' plantations were spared the horrors particular to the sugar industry, Thistlewood's writings reveal

that they were still subjected to a cruel existence. Their days consisted of forced labor, perpetual malnourishment, and constant, violent, reprimand from their masters. At least for Thistlewood's slaves, the type of work they did depended on the slave's specific set of skills. Many of his slaves could perform specific tasks for hire such as fishing, factory working, construction (of roads, wharves, or houses), cooking, and transporting goods. In fact, skilled labor in Bluefields was so coveted that an artisan slave community named Auldayr took root in the central part of the bay. Members of this community were especially skilled in working the boilers of local pimento factories and spoke a distinct dialect of Patwa.

Additionally, the area can be viewed as a microcosm of Jamaican society because Bluefields' inhabitants, like those in other parts of the island, depended upon Britain's imperial economic system. Planters and merchants in Bluefields produced items particularly sought after in the British isles (like pimento, logwood, and cocoa) and depended upon on the importation of grains, construction materials, and luxury items from other parts of the empire. Additionally, the local kiln in Bluefields produced quicklime to sell to ships passing through the bay or to those stopping in Savannah-la-Mar, and the region's pimento factories helped their owners meet the English and European demand for the perfume that comes from pimento leaves. Local dependency on imperial trade was even acutely felt in Bluefields during Britain's eighteenth-century imperial wars (just as it was elsewhere in Jamaica), as Thistlewood reports that famine and material shortages hit the region during the Seven Years' War and the American Revolution (Hall 1999:116,259).

Some imperial conflicts inflicted even more direct effects on local residents, because in times of war planters were required to serve in the bay's militia at their own expense. During each imperial war, Jamaica's Assembly called Savannah-la-Mar's militia to arms and instituted round the clock guard duties so that Bluefields Bay was constantly watched (Hall 1999:266). Such constant surveillance was needed not only to expedite the call to arms in the event of foreign invasion, but also to preclude the possibility of a local slave revolt. During the Seven Years' War the conscripted Bluefields men were also obliged to stockpile war materials in Savannah-la-Mar and help transport Spanish prisoners of war from Savannah-la-Mar to Bluefields by canoe, and then from Bluefields to Parker's Bay by road (Hall 1999:125). Through their services in the militia the Bluefields planters showed that they were not merely local farmers, but British subjects obliged to aid in the defense of the empire.

Bluefields Bay can also be appreciated as a microcosm of imperial Jamaica because it occasionally harbored merchantmen and Royal Navy ships. This practice became more frequent during wars, when British admirals used the bay as a rendezvous for convoys leaving the Caribbean. On June 8, 1778, for example, Thistlewood wrote that a fleet of merchant ships had rendezvoused in the bay to receive naval escort (Hall 1999:257). Another convoy arrived in 1779, when Admiral Peter Parker sent out a notice to Jamaican merchants that "a convoy [would] be appointed to sail for Europe; [and that] the trade from the respective parts of the island [Jamaica] are to assemble at Bluefields and are to go through the Gulph of Florida. The men of war which are to compose the convoy will sail from Kingston the 28th day of May, and from Bluefields the 1st day of

June" (Wright and White1969:173). Finally, in perhaps the most famous instance of Bluefields' use by the Royal Navy, Admiral Rodney's fleet took shelter in Bluefields Bay in May 1782, after its victory over the combined Franco-Spanish fleet in the Battle of the Saintes. For three days, some eighty-eight ships stayed in the bay, during which time British officers and semen came ashore to take on water, buy victuals, and enjoy shore leave before their impending voyage to Britain (Hall 1999:290). In July of that same year, Admiral Rodney again used Bluefields as a rallying point, commanding Admirals Thomas Graves and Hugh Pigott to lead ships arriving in Bluefields back to England (Wall 1932[2]:849). The arrivals of these convoys were, of course, of crucial importance because they allowed planters to conduct their usual imperial trade exchanging their produce for much needed food, timber, and livestock, but more than that, they represented moments in time when British policies directly impacted Bluefields Bay, just as they did the rest of Jamaica.

Finally, Thistlewood's writings show that Bluefields Bay should be acknowledged as a microcosm of Jamaica because he and his fellow planters, like their sugar growing counterparts from other parts of the island, participated in Britain's imperial project. Understanding Jamaicans' privileged role in the creation of imperial policy, the locals of Bluefields read and discussed political pamphlets like *The Rights of Great Britain asserted against the claims of America, being an answer to the Declaration of the General Congress* and *Observations on the Nature of Civil liberty, the Principles of Government, and the Justice & Policy of the war with America,* which circulated throughout the empire at the outbreak of the American Revolution (Hall 1999:241-242).

By the same token, Bluefields planters also wrote letters of encouragement and gratitude to Royal Navy captains and admirals in times of crisis, and even went as far as meeting with the captains of Admiral Rodney's fleet at the local tavern for celebratory drinks (Hall 1999:290). Clearly considering themselves loyal and active British subjects, the Bluefields planters were confirmed in this belief when in May 1782, Royal Navy officers invited them aboard the captured French flagship the *Ville de Paris* for a tour and some friendly conversation (Hall 1999:291).

Cleary, Bluefields Bay can indeed serve as a microcosm of Jamaican society despite the fact that sugar never became the region's primary crop. Like other regions on the island, Bluefields' economy was tied to the British imperial system of trade, as planters intentionally produced goods sought elsewhere in the empire, while they simultaneously remained dependent on other parts of the empire for sustenance and building materials. Furthermore, Bluefields' planters felt the ravages of Britain's eighteenth-century wars just as others in Jamaica did, through shortages, invasion scares, and chance encounters with convoys and Royal Navy fleets. Finally, the inhabitants of the bay saw themselves as participants in Britain's imperial project, and acted accordingly, both by reading current literature on imperial policy, and by endorsing the efforts of captains and admirals during the wars. As a place where small planters developed a society, culture, and economy that relied upon Britain's trans-atlantic empire, colonial Bluefields clearly functioned as a part of a much larger Imperial system.

Chapter 3: Methodology

As it is one of the goals of this thesis to develop an understanding of Bluefields' colonial maritime landscape, the purpose of its archaeological investigation was to locate, document, and interpret artifacts from Bluefields that could help explain how Great Britain's subjects and the Royal Navy made use of the bay with respect to the region's traffic, defense, and trade. The investigation consisted of three distinct phases: predictive modeling, archaeological fieldwork, and analysis. To construct the predictive model the author used both historical and contemporary sources, including memoirs, eighteenth-century pilotage notes, historic and modern charts, Bluefields locals' knowledge of land, and previously collected archaeological data. The project's fieldwork consisted of fourteen Phase I non-disturbance surveys that took place in October and November 2009. Each survey was designed to locate artifacts and archaeological sites in locations suggested by the predictive model. The analysis of the data collected in the field incorporates evidence from both the historical and archaeological records, and can be found in the Results and Interpretations Chapters of this thesis.

Constructing the Predictive Model

The first step in creating the predictive model involved the collection of historical sources, such as maps, charts, and local journal entries, to collect data about Bluefields

Bay so that sites with a high likelihood to contain artifacts could be identified. This proved challenging because Bluefields is not a traditionally acknowledged area of historical significance. The author collected the historical data at East Carolina University's Joyner Library, and through Joyner Library's interlibrary loan system. Among the most revealing sources found in Joyner Library was Douglas Hall's "In Miserable Slavery, Thomas Thistlewood in Jamaica 1750-86." As an edited version of the diary of a Bluefields Bay plantation owner, the work revealed Bluefields' small scale, and cash crop based economy (Hall 1999). Through this the author determined that the bay had no port, and that the area was largely devoid of sugar cane. Another invaluable source was located through Joyner Library's subscription to Eighteenth Century Collections Online. This item, written by John Leard in 1792, contained sailing directions for ships that sought to enter Bluefields Bay.

The second step in constructing the predictive model involved the compilation of data from historical and modern charts and maps of Bluefields Bay. The author obtained copies of historic charts and maps from the eighteenth, nineteenth, and twentieth centuries from Dr. William Wedenoja, professor of Anthropology at Missouri State University, when he traveled to the Jamaican National Archives in Spanish Town in 2008. The author also incorporated the most current NOAA chart of Bluefields Bay available to the public into the model, which he obtained through the Joyner Library. Several maritime landmarks found on these maps and charts yielded promising survey targets, including the bay's navigational hazards, a watering place, a fortification, a wharf, and the bay's shallow water anchorage. This process also confirmed that

Bluefields' historical road to Savannah-la-Mar has not changed route since the eighteenth century.

Next, the author asked Bluefields locals to volunteer information regarding the location of artifacts or known sites of historical interest either in or around the bay. These efforts yielded the location of a cannon, a potential location for a fortification, a pimento factory, and a submerged anchor. Additionally, Wolde Kristos, a resident of Bluefields, and this project's local liaison, contributed some practical knowledge about the bay's current condition. He explained that the Bluefields River flooded in 1979 and deposited a tremendous amount of silt into the bay. Additionally, the overall water flow of the Bluefields River dropped off after the flood and has never returned to pre-flood levels. He also mentioned that Bluefields Bay Villas, a hotel and resort on Belmont Point, also represents a significant change in the bay's landscape, and that surveys would not be permitted within their private property (Wolde Kristos 2009 pers. comm.).

Lastly, the author integrated the archaeological work previously done in Bluefields Bay into the predictive model. In June 2008, Wedenoja and his associate, Dina Bazzill, conducted an underwater survey in the bay using a towboard, snorkels, and advice from local fishermen. The survey consisted of a single transect cut across the widest point of the bay, but the bulk of the survey's data came from local fishermen. In just four days the fishermen took the surveyors to two submerged cannons, several anchors, and what was believed to be a ballast pile. The author added the locations of these artifacts to the predictive model and made relocating them a top priority during fieldwork.

Archaeological Fieldwork

The October and November 2009 archaeological investigation of Bluefields Bay included extensive tow boarding of the bay's seafloor, a series of coastline surveys, the investigation of several locally known historical sites, and a number of scuba dives. All methods employed during the survey were non-invasive and meant to cause as little disturbance to the sites as possible. Throughout the project the author used a 14.7 mega pixel Canon Powershot G10 digital camera to document the sites and artifacts found. During the towboarding survey and scuba dives, the author also utilized a Canon WP-DC28 waterproof housing for the Powershot G10 camera.

Towboarding surveys were conducted in areas suggested by the predictive model to contain the bay's primary shallow water anchorage, a smaller anchorage used in conjunction with a colonial era watering station, and any cultural remains that might lie trapped within the area's most apparent ship traps. A team of three surveyors, a skin diver, a boat captain, and a navigator/recorder performed the towboarding surveys. The surveyors used a fifteen-foot skiff (named *New Hope – Mr. Duke*) with a seventy-five horsepower engine, a plastic towboard that pivoted on a metal harness, a hand held GPS, a watch, and a compass. Upon arrival at the area of the bay to be surveyed, the diver was deployed with the towboard to search for cultural remains on the seafloor. The survey's visible range varied according to the diver's depth, weather, and lighting, but generally stayed within the range of twenty to twenty-five meters horizontally. The boat captain's main tasks were to keep the boat at a constant speed (between one and two knots) and to

watch the boat's compass to ensure that the boat maintained a course in line with the designated cardinal direction. The team's navigator/recorder used a handheld GPS to place the boat at the start of the predetermined transect. Then, after electing to use north and south or east and west transects (depending on the sea and weather conditions), the recorder traced the boat's movements by recording the boat's position with GPS coordinates every five minutes, recording the boat's position when the diver let go of the towboard, and monitoring the boat's adherence to the appointed transect via handheld compass and GPS.

The coastline surveys usually took one of two forms: surveyors either visually inspected the shoreline itself, or divers used snorkel equipment to survey the shallows just offshore. In one special instance, Survey X ("The Old Wharf"), surveyors searched the space between the main road and the waterline for cultural remains. In all cases, when objects were found, they were photographed and given GPS coordinates. The areas for the coastline surveys were chosen because of their proximity to historical maritime features, such as forts, wharves, and river mouths that appeared on historical maps or charts.

There were also terrestrial surveys simply designed to investigate known historical sites and objects. Examples include Survey VII (the Fort Charles Cannon), Survey XIII (the Lime Kiln), and Survey XIV (the Pimento Factory). In these cases locals revealed the location of specific artifacts, and with no previous knowledge on the site, surveyors conducted an impromptu survey. For each of these surveys, surveyors took photographs of the site or artifacts in question, collected GPS coordinates, performed a

visual survey of the surrounding area, and where necessary, created site maps and artifact drawings.

The fieldwork also included four days of scuba diving, for a total of ten separate scuba dives. The dives helped to examine the area covered in Survey IV (the Historic Shallow Water Anchorage), as it encompassed the findings of Dina Bazzill's 2008 underwater survey. Two full dives were dedicated to the documentation of a cannon, while an additional four dives were spent recording several anchors found on the sea floor. The remaining four dives were underwater surveys whose areas were chosen based on the locations of previously located artifacts.

Introduction to the Surveys

The primary purpose of all of the project's surveys was to find and document artifacts that might show how Bluefields Bay was used during the colonial period (1655 through 1800). Surveys one through five took place underwater and investigated the routes used and the areas occupied by visiting ships. Additionally, the underwater surveys examined the area's ship traps consisting of coral reefs and shallows. Surveys six through ten investigated the bay's defensive structures and the areas surrounding cannons thought to be used as part of the bay's coastal defense system. Finally, surveys eleven through fourteen focused on areas or structures associated with the bay's commerce, including sites where locally produced goods were made, exchanged, and negotiated for (Figure 1).

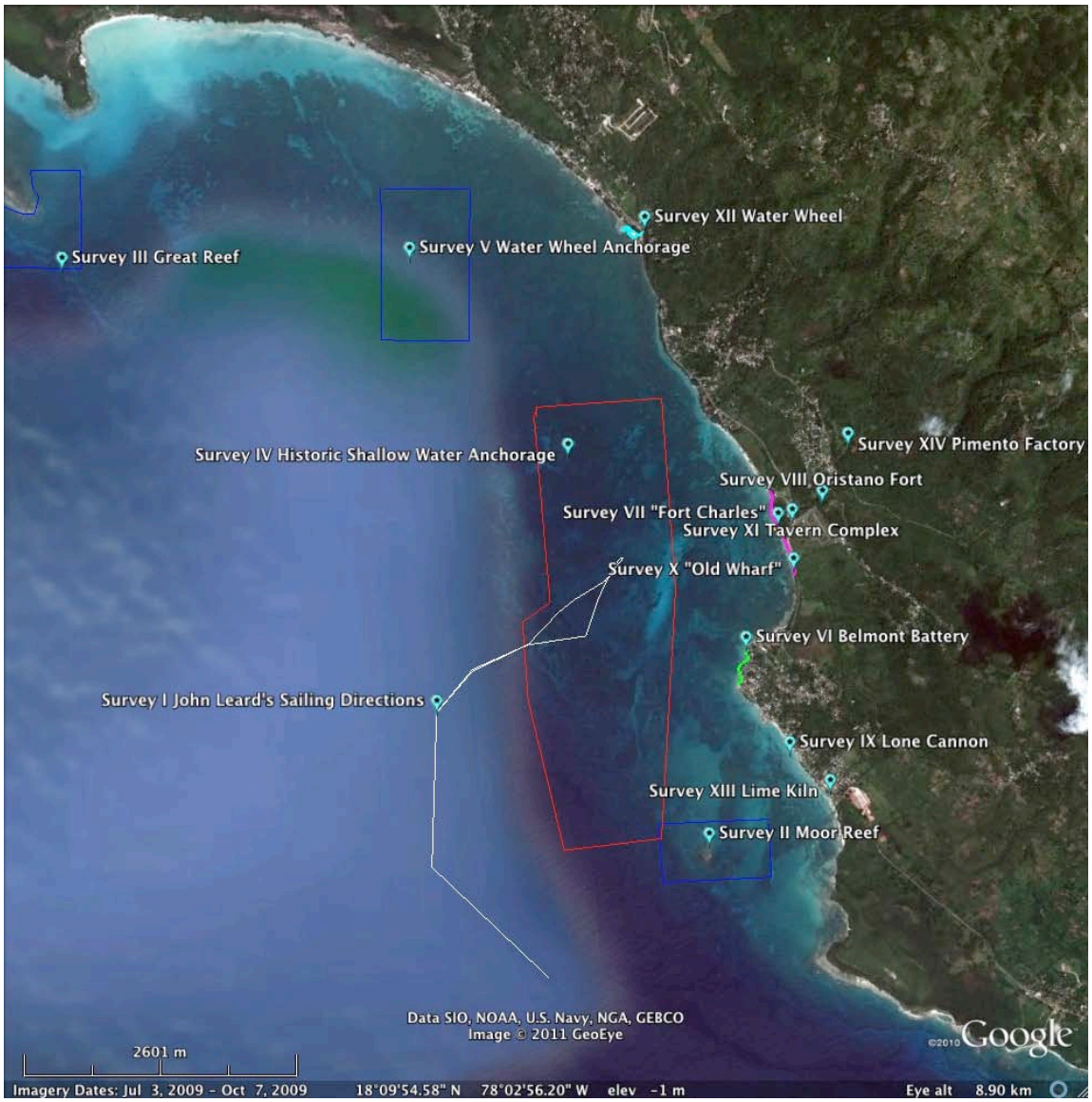


FIGURE 1. Map of the Fourteen Surveys. This map shows the outline or specific point of interest that defined each of this project's fourteen surveys. *Surveys I-V* targeted areas used by visiting ships, *Surveys VI-X* targeted areas used in local defense, and *Surveys XI-XIV* covered areas used for commerce. (Map by author, 2011.)

Surveys I through V: the Bay's Maritime Traffic

While small locally owned craft might have traveled to and from Bluefields in the direction of their choice, the historical record reveals that in the eighteenth century, the commercial and naval traffic of Bluefields Bay generally traveled from south to north. Thomas Thistlewood, a resident of Bluefields Bay from 1750 to 1786, recorded that two fleets moved into the bay from the south, anchored near the bay's center, and departed to the northwest. Admiral Lord Rodney's naval correspondence from 1783 confirms Thistlewood's accounts (Hall 1999:290; Wright and White 1969:173). A few other fleets have been documented exhibiting the same behavior, but more importantly, editions from the 1780s and 1790s of John Leard's *Sailing directions for the island of Jamaica* clearly recommend a south to north route for entering the anchorages of Bluefields Bay:

> To anchor here with large ships, give Crabpond Point a birth of a mile and a half, and bring the overseer's house at Bluefields estate open a little to the eastward of the tavern, and will then bear N.E. by E. ½ E. Steer with this mark on, and keep your lead going, and be ready to anchor as the water shoals pretty sudden; and when you come to nine or eight fathoms, anchor. You may anchor with the overseer's house and tavern in a line, or the overseer's house open to the westward; but the first mentioned is the best. Ships of sixteen or seventeen feet draught of water may sail over the rocky ledge in three fathom and three-quarters, or four fathoms; the mark is the overseer's house just open to the

> eastward of the tavern; keep them so until you are over the ledge, which you will see by having a sandy bottom, and five and a half or six fathoms, then you may bear away a little, and after running two or three cables length within the ledge, look for a clear spot to anchor in five and half or six fathom, with the overseer's house and the tavern in a line, or nearly so. A little to the westward of this anchorage the water shoalens on the rocky ledge to three fathom (Leard 1785).

Leard's directions were also accompanied by a chart of Bluefields Bay, which provided additional instructions for any ship wishing to navigate the bay (Figure 2).

Having access to such specific directions, and with the overwhelming majority of the landmarks still existent, the Maritime Traffic Surveys were designed to test the assumption that Leard's route was in use, if not heavily traversed (Ingersoll, Yellen, and Macdonald 1964). The criterion used to affirm or refute this hypothesis, was the presence of maritime archaeological remains along the sea floor of the route proposed by Leard, or the existence of artifacts within the coral reefs and shallows near the areas designated by Leard as good places to anchor.

FIGURE 2. Leard's Chart. This is the nautical chart printed in John Leard's *Sailing Directions* published during the 1780s and 1790s. This particular chart is taken from the 1791 edition. (Leard 1791.)

Survey I: John Leard's Eighteenth Century Route

Survey I was an underwater towboarding survey. It incorporated visual scans of an area that corresponded to the route of entry into the bay as proposed by Leard in his sailing directions. A comparison of Leard's directions and a modern NOAA chart of Bluefields Bay determined the survey's parameters. The towboarding was performed in the manner outlined in the Archaeological Fieldwork section of this thesis, and consisted of two transects.

The first transect's starting point was artificially set at a point 1.5 miles (2.41 km) off of Crab Pond Point as specified in Leard's sailing directions. As it became apparent that divers could not effectively use the towboard in such deep waters, the second transect simply began when the diver signaled she could see the seafloor. The ending of Leard's directions, determined the stopping point for both of the transects, suggesting that the surveyors stop at "a clear spot to anchor in five and half or six fathom, with the overseer's house and the tavern in a line, or nearly so" (Leard 1791). As a testament to the survey team's efforts and the specificity of Leard's directions, the stopping point for both transects was nearly at the exact same spot. After reaching the end point of JL 2, the transect was briefly extended back out toward the southwest to cover more ground on our way to another target.

Survey II: Moor Reef

Survey II examined one of the main obstructions that Leard's sailing directions intended to avoid, the coral heads and shallows of Moor Reef. Located in the southern portion of Bluefields Bay, Moor Reef is approximately 300 meters wide, and 500 meters long. At its center, the oldest and most prominent coral heads in the bay penetrate the water's surface. Noted in Leard's chart, as well as on modern NOAA charts, Moor Reef clearly poses a threat to vessels entering the bay, and thus, is an area likely to contain cultural remains from ships unfortunate enough to hit it. Survey II thus consisted of a towboarding survey of all navigable parts of Moor Reef, with a particular focus on the reef's southern border. The depths of the reef ranged from eight to eighteen meters.

Survey III: Great Reef

Survey III also investigated the periphery of another prominent reef near Bluefields Bay, Great Reef, which is located just to the west of Bluff point, and extends to the west right up to Savanah la Mar. Technically outside the perameters of Bluefields Bay, Great Reef represents the largest threat to ships exiting the bay to the north, and might have contained debris from ships trying to enter Savannah-la-Mar. The survey covered the southeastern shallows of Great Reef, in waters approximately eight to ten meters in depth.

Survey IV: Historic Shallow Water Anchorage

Survey IV constituted the largest and longest survey of the entire project. It located the bay's historic shallow water anchorage and catalogued cultural remains found within it.

Survey IV took place in three distinct phases. Phase I consisted of a towboarding survey of an area that the author believed to encompass the locations of the bay's shallow water anchorage as they appear in charts from the eighteenth, nineteenth, and twentieth centuries. Phase II was comprised of skin diving and scuba diving investigations of underwater artifacts that had already been located by local fishermen, skin divers, and by Dina Bazzil and Dr. William Wedenoja during their brief underwater survey of the bay in August 2008. The initial list of artifacts to examine included a possible ballast pile, an iron bar, an anchor with a "hoop" anchor nearby, an "iron cross" anchor, and a cannon (Table 1). Finally, with the project's underwater surveys having only revealed one artifact independent of those artifacts examined during phase II, phase III of the Shallow Water Anchorage Survey consisted of a series of scuba diving surveys that searched the areas around the artifacts that had been previously located.

TABLE 1
OBJECTS AND THEIR GPS COORDINATES FOUND BY DINA BAZZIL

Object	**Northing**	**Easting**
Possible Ballast Pile	18.09'21.5 N	78.02'52.3 W
Iron Bar	18.09'30.5 N	78.02'37.8 W
Anchor	18.09'11.4 N	78.02'39.5 W
"Hoop" Anchor	18.09'11.4 N	78.02'39.5 W
Iron Cross Anchor	18.09'29.2 N	78.03'48.4 W
Cannon	18.09'22.9 N	78.02'57.2 W

Survey V: Water Wheel Anchorage

Survey V consisted of a brief towboarding survey over an area where ships or boats might have anchored while taking on fresh water from the watering place mentioned in

John Leard's *Sailing Directions* and illustrated in Leard's accompanying chart. Consequently, the survey followed Leard's *Directions* and covered a patch of reefs approximately a quarter of a mile off the shore of the watering place, in approximately five fathoms (or approximately nine meters) of water.

Surveys VI through IX: The Bay's Coastal Defensive Structures

Eighteenth-century maps and charts of Bluefields Bay, including the one in John Leard's *Sailing Directions*, suggest the presence of a fortification of some kind on the Belmont peninsula. Moreover, three cannons still remain in Bluefields Bay today in three different locations on the coast. Surveys VI through IX investigated all four locations in hope of locating and identifying the structures and armaments used in the bay's historic defense. In the instance of the fort that had been demarked on the eighteenth-century maps, the survey aimed to find ruins. In the instances of the sites with cannons, the surveys began with analyses of the cannons themselves and ended with brief investigations of the surrounding areas.

Survey VI: Belmont Battery

Both John Leard's chart and a 1899 U.S. Navy Hydrographic chart depict a fort on the Belmont peninsula. Survey VI sought the remains from this fortification by surveying three twenty meter by eight meter areas located to the south, west, and north of the peninsula. These areas were under approximately four to six feet of water, and the survey used a baseline offset method. Surveyors also conducted an informal investigation in the

small system of caves that run underneath the peninsula, and along the sea wall found to the north of the Belmont Bluff. Surveyors were unable, however, to conduct a follow up land survey along the coastline of the peninsula as the land is private property, and owner denied the surveyors access.

Survey VII: The Fort Charles Site

Survey VII investigated a cannon and the area surrounding it for signs of an historic fortification (Figure 35). A local guide led surveyors to the cannon itself and suggested that the cannon was once part of a fortification known as "Fort Charles." The cannon was easily relocated at the top of a bluff not twenty feet from the coastline, at the GPS coordinates of 18.04'56.2 N north and 78.01'41.1 W. Surveyors also examined the immediate area around the cannon and conducted two coastline and underwater surveys near the bluff. For these surveys two skin divers each performed circle searches with radiuses no smaller than twenty meters together encompassing the north-south span of the bluff. The depths encountered within these surveys ranged from one to three meters.

Survey VIII: Oristano, Fort and Cannon at the Overseer's House

Survey VIII covered a cannon and what seemed to be the remains of a defensive structure on the property of the historic overseer's house of the Bluefields Plantation. With the help of the current property owner, four surveyors relocated the cannon and the fortification at 18.10'02.4 N and 78.01'27.0 W. According to the property owner, this

fortification and cannon were once Spanish possessions but the cannon was shot out of the fort by an English naval gun when the English took the island by force in 1655. Poor weather, dwindling sunlight, harsh terrain, and an impatient guide, made a thorough investigation of this structure and artifact assemblage impossible, but the surveyors did to take measurements and photographs of the cannon, photographs of the structure, and interviewed the property owner (Figures 39-44).

Survey IX: Lone Cannon to the South of Belmont Peninsula

Survey IX investigated a submerged cannon that Dina Bazzil and her research team located in 2008. The cannon was easily relocated at the GPS coordinates provided by Dina at 18.8'46.4 N and 78.1'43.2 N. The cannon lay approximately thirty meters from the shore and under two meters of water. It was heavily encrusted with both concretions and bio-clutter. Two skin divers removed as much bio-clutter as possible and recorded and photographed the cannon. Still, it is doubtful that the surveyors captured the cannon's true dimensions, as the thickness of the concretions made some measurements impossible. The two skin divers also conducted an informal search from the location of the cannon to the shore (west to east,) and from the location of the cannon to the north for approximately thirty meters.

Surveys Targeting the Bay's Commercial Centers; Surveys X through XIV

While it is probable that ships stopped in Bluefields because of its calm waters and convenient location, there can be no doubt that while at anchor, there was interaction

between those aboard the ships of Great Britain and Bluefields' locals. At the very least, the ships ordered to rendezvous at Bluefields would have needed to take on supplies, such as food and water. While there is no surviving documentation of these transactions, the historical record does reveal that officers aboard these vessels went ashore to frequent the tavern at Bluefields, where they shared news of the campaigns. Moreover, the historical record also shows that Bluefields' locals produced commercial goods, such as pimento, coffee, and logwood, and it would not be hard to imagine that these goods might have also been sold to ships visiting Bluefields as parts of a convoy. Consequently, Surveys X through XIV examined structures or areas associated with the bay's commerce, in an effort to better understand how locals and sailors used the bay's landscape.

Survey X: The "Old Wharf"

While not mentioned in John Leard's *Sailing Directions* or depicted on any eighteenth-century charts or maps of Bluefields bay, one property line map, presumably from the nineteenth-century, refers to a location where "The Old Wharf Stood." Survey XI was thus designed as a coastline survey that would encompass the "wharf" area marked on the plat map (Figure 48). This survey began at the GPS coordinates of 18.09'41.3 N and 78.01'37.9 W and progressed from south to north along the coast until surveyors passed the mouth of the Bluefields River (a landmark blatantly to the north of the location of the "wharf") at 18.10'07.7 N and 78.1'43.2 W. Five surveyors conducted this coastline survey simultaneously, each visually scanning a two meter stretch of the coast. One surveyor searched the shallows of the water, while another searched the rocks on which

the surf fell. A third surveyor searched a strip of sand, and a fourth covered a strip covered in vegetation. Finally, the fifth surveyor covered the incline between the beach and the modern road.

Survey XI: The Tavern Complex

Depicted in historic and modern charts, as well as in an eighteenth-century painting of Bluefields, the tavern has long stood as an iconic landmark for those visiting or living in Bluefields Bay (Figure 3). Known to have been built no later than the eighteenth century, Survey XI investigated the tavern's lay out and two associated structures, including a three sided structure and a small oven house, to better understand how the space might have been used during colonial times. Surveyors photographed, and in some instances measured, the structures with attention to construction details and potential utility.


FIGURE 3. Bluefields from HMS Providence. A painting of Ships at anchor at Bluefields Bay. Note the *tavern illustrated just to the left of the vessels*. (Painting by George Tobin, 1791.)

Survey XII: John Leard's "Watering Place"

Survey XII located and recorded historic remains found in or near the "watering place," or stream, as described in John Leard's *Sailing Directions*. Today, the stream still flows directly into the ocean, as a small concrete bridge allows the modern road to pass over the stream leaving it unobstructed. Because the stream water was both clear and shallow, surveyors searched most of the streambed. They also informally searched the small bay into which the stream flows in an effort to find cultural remains.

Survey XIII: the Lime Kiln

The construction date and nature of the lime Kiln are unknown, as there are no historic references to it in charts, maps, or literature on the area. Survey XIII documented the location and condition of the kiln. Surveyors found the southeastern corner of the kiln at 18.08'33.6 N and 78.01'30.4 N. The structure consists of three boilers and a chimney. The entire structure lies within twenty meters of the sea. Survey XIII was cut short, however, as the kiln's owner would only let surveyors quickly look at and photograph the kiln.

Survey XIV: the Pimento Factory

Survey XIV was an impromptu and brief survey, suggested by the project's local liaison, Wolde Kristos, while surveyors were on route to another site. Consequently, surveyors could only take the Pimento Factory's GPS coordinates and some photographs. Kristos, however, suggested that the Pimento Factory was one of the last three operating in Westmoreland Parish, and had been running since at least the nineteenth-century.

Chapter 4: Archaeological Results

This chapter forms the first part of the thesis's analysis, and will describe the results from the project's fourteen archaeological surveys conducted in October and November 2009. The author chose each of the areas surveyed based on the project's predictive model as described in the methodology chapter. While not every survey yielded archaeological findings, even negative results proved helpful to surveyors who used them to refine the project's predictive model, and ultimately draw conclusions about Bluefields' maritime landscape. Alternatively, many of the surveys did uncover artifacts and historically significant sites. In the present chapter, these findings will be depicted, mapped, and whenever possible, historically and chronologically contextualized.

Results from Survey I: John Leard's Eighteenth-Century Route

Surveyors conducted Survey I by towboarding along the route proposed by John Leard in his eighteenth-century *Sailing Directions*. Surveyors performed two transects along the suggested route, both of which started and stopped at nearly identical locations (Figure 4). While performing Survey I, divers quickly became aware of the limitations of the towboard, and that they could not survey the seafloor at depths exceeding twenty meters. The ending of Leard's directions "a clear spot to anchor in five and half or six fathom [between ten and eleven meters], with the overseer's house and the tavern in a line" consistently placed the surveying vessel in the middle of a huge sandy and grassy patch. No archaeological remains were found during Survey I.

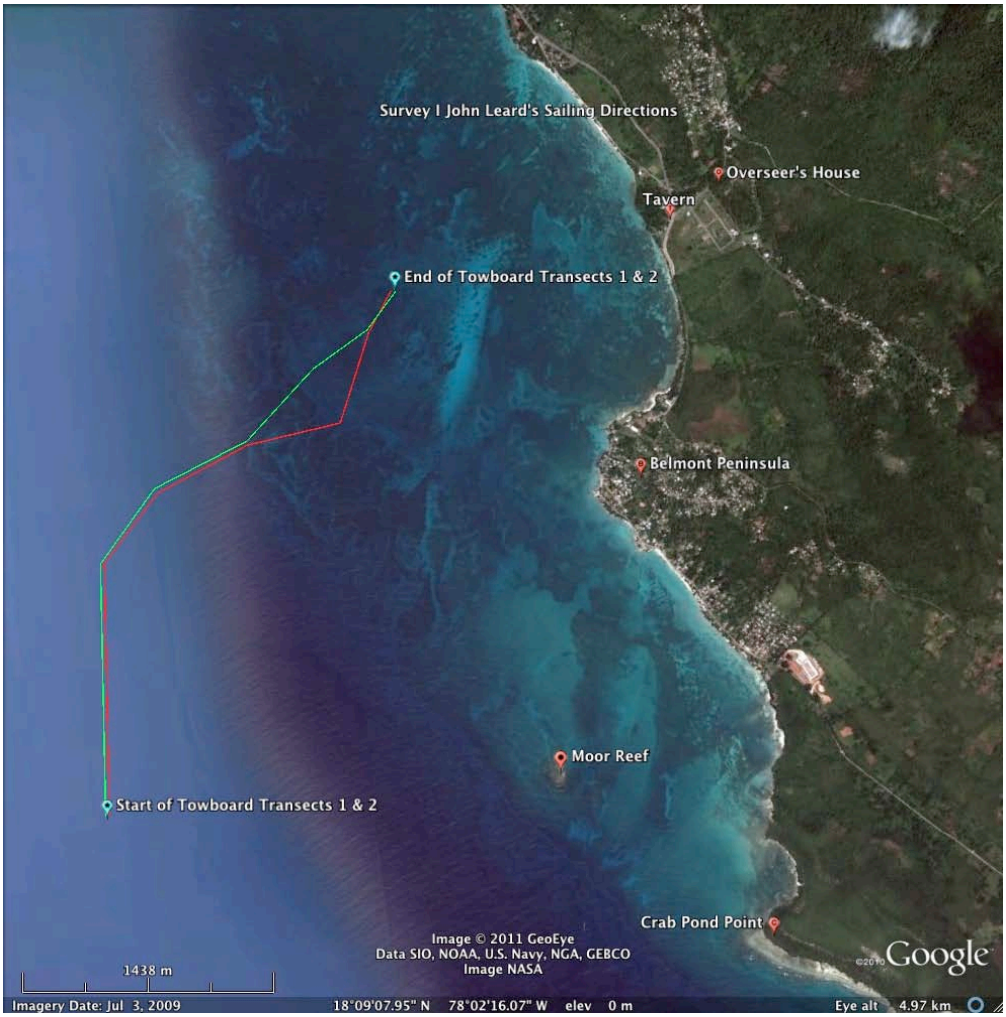


FIGURE 4. Survey I Results. Survey I consisted of two transects that followed the sailing directions offered by John Leard in his eighteenth century pilotage notes. *Transect 1 is depicted in green*, while *transect 2 is depicted in red.* Both transects had nearly the same ending point. (Map by author, 2011.)

Results from Survey II: Moor Reef

Survey II covered the area's single greatest threat to ships entering Bluefields Bay from the south, Moor Reef. It consisted of a towboarding survey with a particular emphasis on the reef's southern edge. Surveyors also conducted a brief informal survey of the reef's shallows. Survey II discovered one anchor. It was found while investigating the southernmost extent of the reef, which the author believed to be the most hazardous part

of the reef's navigation. The anchor was found at 18.7'53.2 N and 78.02'02.7 W amidst two east-to west bands of coral (Figure 5). It is approximately two meters in length, and has angled arms. The anchor's shank lies at a bearing of 37 degrees, and it lay in approximately fifteen meters of water. Further specifics on the anchor could not be recorded, however, as the surveyors were equipped with only snorkel equipment, and the project's camera was malfunctioning. It is quite possible, though, that this anchor is similar to the small longshank anchor described in the results of survey IV.

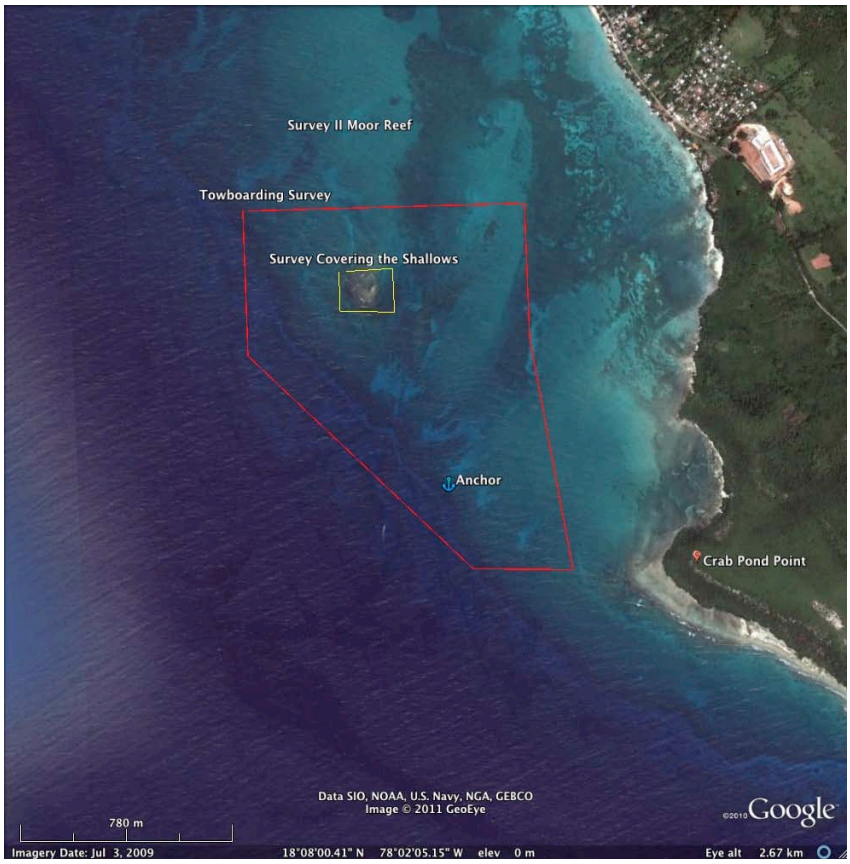


FIGURE 5. Survey II Results. Survey II Moor Reef, consisted of a large towboarding survey *(outlined in red)* and a smaller informal survey of the reef's shallows *(outlined in yellow).* The survey revealed a small anchor at 18.7'53.2 N and 78.02'02.7 W. (Map by author, 2011.)

Results from Survey III: Great Reef

Survey III covered the northeastern shallows of Great Reef, a potential navigational hazard for ships exiting the bay to the north. Survey III consisted of four towboarding transects, but rather than traveling in cardinal directions, the transects followed the general contours of the reef, expanding each consecutive transect in order to cover an area slightly farther to the south and east (Figure 6). The survey's westward boundary was conservatively set at 78.6'34.10 W, as the project's archaeological permit did not allow the investigation of Savannah-la-Mar's bay. The surveyor operating the towboard commented that the shallows were filled with broken up and dead coral, but found no cultural remains.

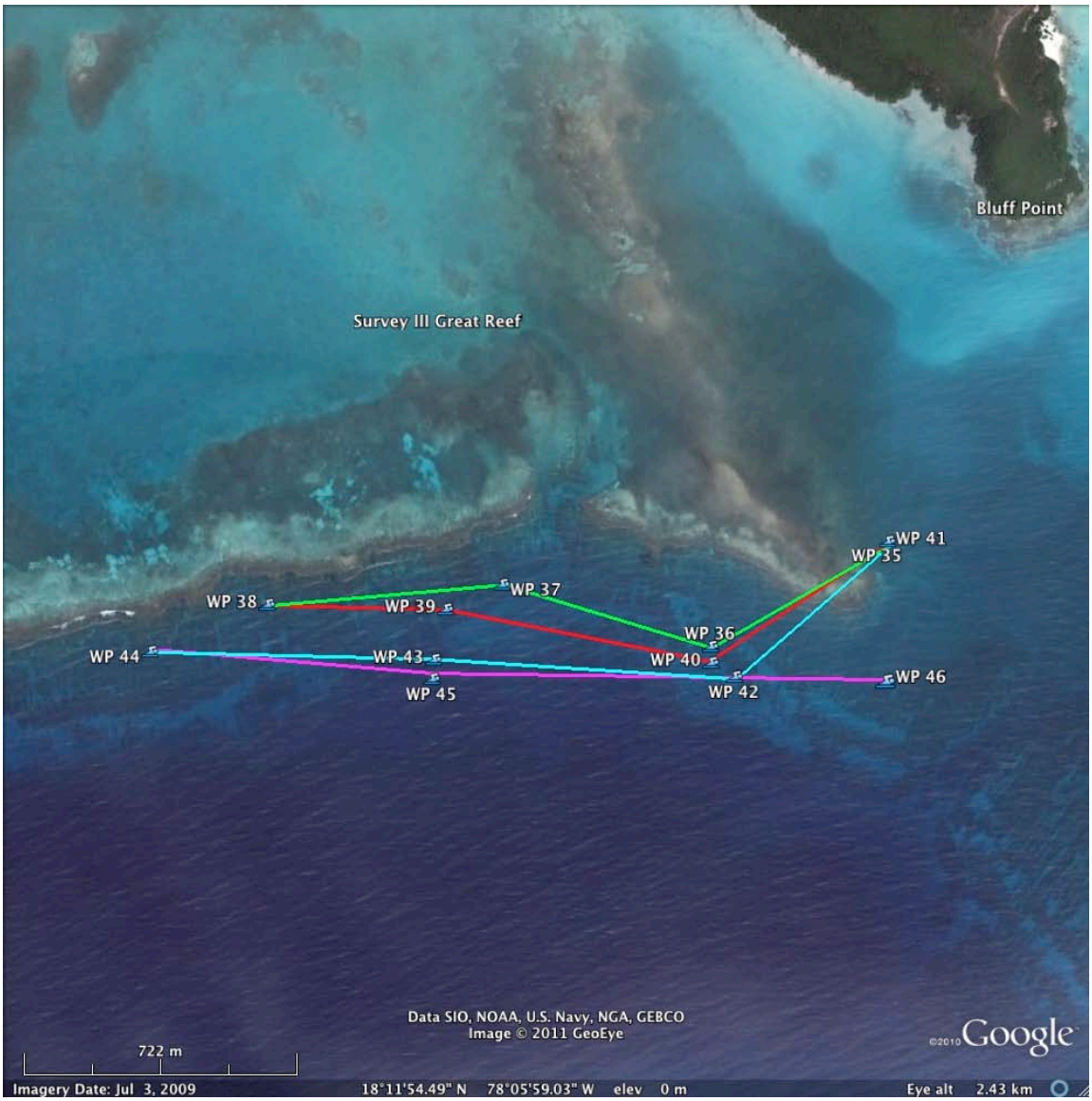


FIGURE 6. Survey III Results. This map depicts *transects one through four of Survey III, colored green, red, blue, and purple* respectively. All together, Survey III consisted of twelve waypoints (*WP 35- 46*), each collected at five-minute intervals. (Map by author, 2011.)

Results from Survey IV: Historic Shallow Water Anchorage

Survey IV took place in three distinct phases: a large towboarding survey, an extended investigation of previously located artifacts, and a search for additional artifacts in the areas adjacent to the previously found cultural remains. The following section addresses the results from each phase of Survey IV.

Phase I: The Towboarding Survey

The towboarding survey encompassed an area of the bay where historic and modern charts indicated the shallow water anchorage. With its northwestern corner at 18.10'32.00 N, 78.2'58.00 W, its northeastern corner at it 18.0'32.00 N, 78.2'18.00 W, its southeastern corner at 18. 9'33.00 N, 78, 2'18.00 W and its southwestern corner at 18.9'33.00 N, 78.2'58.00 W, Phase I covered an approximate area of two square kilometers. The sea floor investigated during this phase contained only sandy and grassy patches with the exception of one large reef in the mid-east portion of the surveying area (Figure 7). In addition to passing over the reef during scheduled towboarding transects, surveyors also investigated the large reef during an hour-long informal skin diving survey. Surveyors did not find any historical remains during Phase I, but they did find a few pieces of wooden debris, (obviously recently deposited because of their minimal state of deterioration) and five modern fish traps within the area's larger reef.

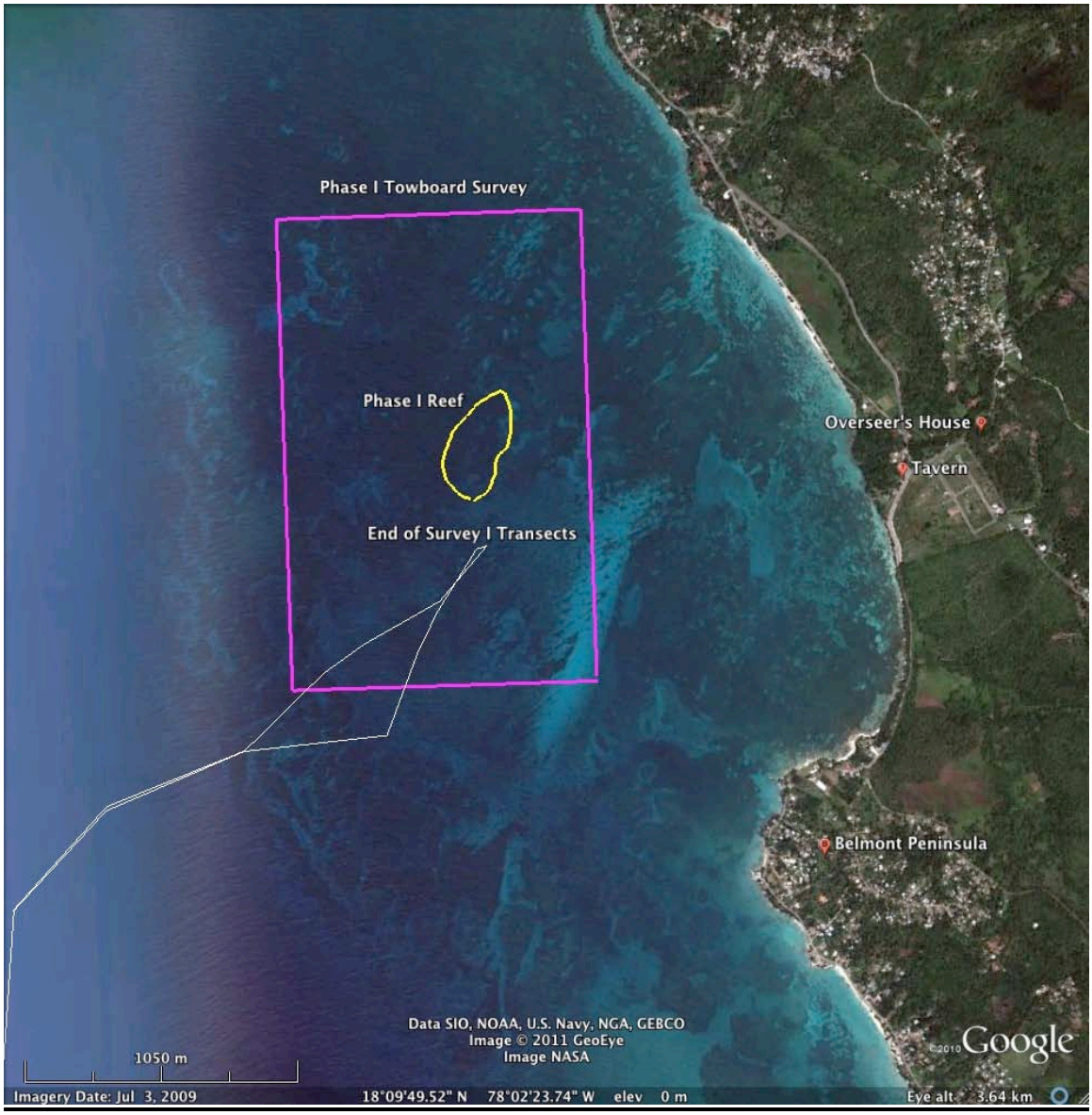


FIGURE 7. Phase I of Survey IV. This map shows the towboarding area covered during Phase I of Survey IV (*in pink*) and the large reef found during Phase I (*in yellow*). For comparative purposes the ending locations of the transects covered during Survey I have been included. If John Leard's eighteenth-century *Sailing Directions* were observed, the shallow water anchorage should be nearby. (Map by author, 2011.)

Phase II: The Investigation of Previously Located Artifacts

In the second phase of Survey IV, surveyors attempted to relocate and document artifacts that had been previously located, either by local fishermen or by Dina Bazzill during her 2008 survey. A series of skin and scuba dives recovered details from three anchors and a cannon, but failed to relocate the possible ballast pile, iron bar, and iron cross anchor as described by Bazzill's 2008 report (Figure 8). All three anchors found during Phase II are British longshank anchors produced sometime between 1600 and 1800. Additionally, the cannon is a carronade, a weapon of British origin produced between about 1780 and 1820.

Anchor 1

Surveyors relocated the first anchor at 18.09'21.5 N and 78.02'52.3 W. It is 2.02 m from the crown to the tip of the shank, and has arms that span .70 m away from the shank. The arms are joined at an approximately 60˚ angle to the shank. The crown is of particular interest, as it is somewhat eroded, leaving a square shape at the bottom of the shank (Figure 9). The flukes are also very distinctive. They are .26 m at their widest, triangular in shape, and narrow down into small pinched off bills that are approximately .06 m in length (Table 2, Figures 10-12). Surveyors did not find raised lips at the top of the anchor's shank, but this could have been due to corrosion or heavy concretion. With is angled crown, and triangularly shaped flukes, Anchor 1 is more than likely a British longshank anchor, a type of anchor used by Britain's navy and merchant marine throughout the colonial period (Curryer 1999:50-61).

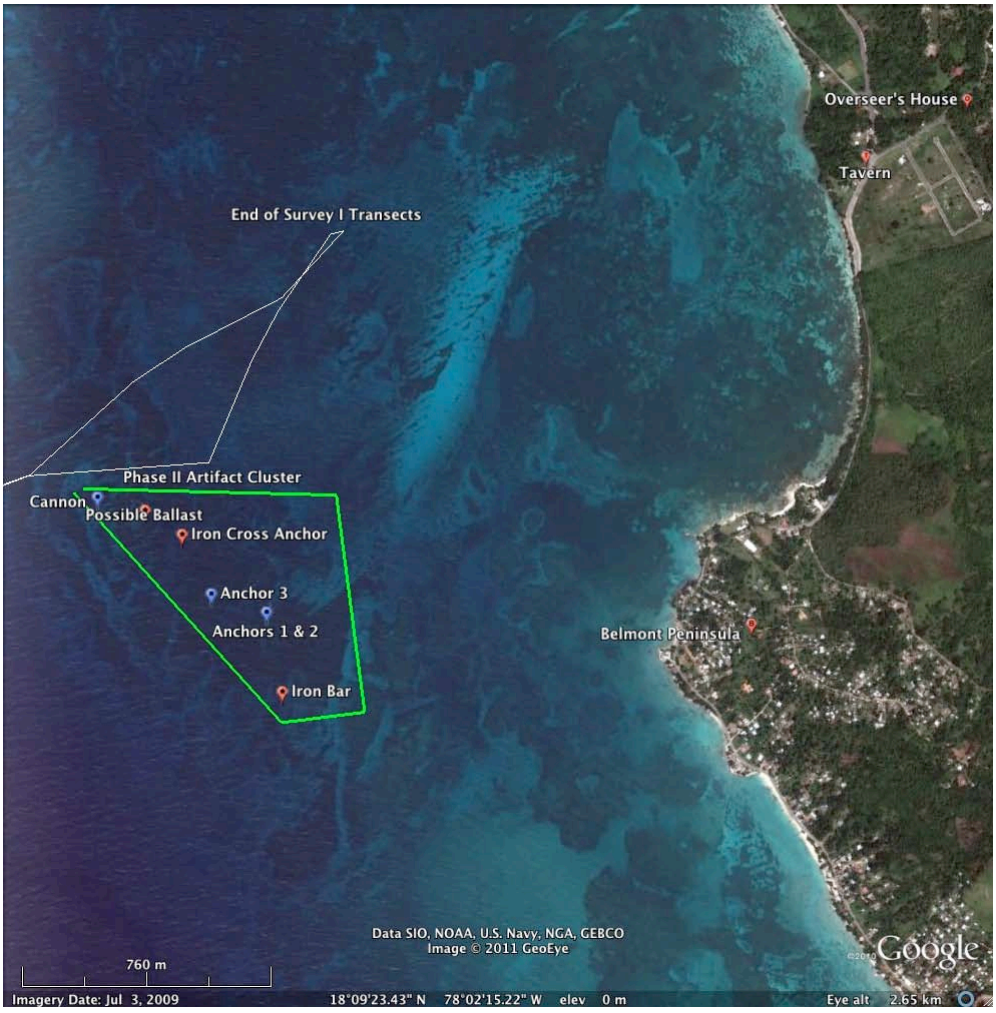


Figure 8. Findings of Phase II. This map shows the artifacts targeted by Phase II of Survey IV. *The successfully relocated artifacts are marked in blue*. (Map by author, 2011.)

From ship and anchor treatises published in 1622, 1717, 1763, and 1815, it is clear that longshank anchors' design changed very little over the two-hundred year colonial period (Mainwaring 1622; Sutherland 1717; Burney 1815; Lavery 1987:30; Curryer 1999:50,1763 table). This survey of publications also provides two useful tools for approximating the weight of Anchor 1. First, Sir Henry Mainwaring's *Seaman's*

Dictionary from 1622 suggests that an anchor's weight was approximately equal to the cube of its' shank's length (Mainwaring 1622). Second, William Burney's *Maritime Dictionary* from 1815 includes a chart of the dimensions and weights of anchors made and used in British dockyards in the eighteenth and early nineteenth centuries (Figure 9) (Burney 1815). From Mainwaring's cubic equation we surmise a weight for Anchor 1 of approximately 132 kg (291 lbs. or 2.5 cwt). Burney's chart provides a similar approximation of 101.6 kg (224 lbs. or 2 cwt) by using the given weight of an anchor whose shank is just .04 m smaller than Anchor 1's shank.

Based on these weight estimates, it is possible to speculate concerning the size of ship that might have brought Anchor 1 to Bluefields, and which role the anchor might have played aboard the craft. Traditionally, English, and later British, vessels carried three different sizes of longshank anchors, bowers, stream anchors, and kedges. Bowers were the most often used, and heaviest aboard. Stream anchors were second largest, and used in instances with little wind in order to help move maneuver the ship. Finally, kedges, the smallest anchors, were used sparingly, often only employed to help work a ship up a river or narrow inlet (Curryer 1999:51). A variety of sources, including a table from 1763 designed to standardize the sizes and weights of anchors on Royal Navy ships, Burney's 1815 *Maritime Dictionary,* and Peter Hedderwick's 1830 *Practice of Shipbuilding,* suggest that Anchor 1 is just bareley too light to have been used as a kedge aboard a 14 gun ship, could have been used as a kedge on a Brig weighing between 187 to 250 tons, or might have been used as a bower aboard a vessel of 40 to 60 tons (Public Records Office 1763; Burney 1815; Hedderwick 1830).

TABLE 2
ANCHOR 1 FROM SURVEY IV PHASE II, DIMENSIONS

Part of Anchor	**Measurement in Meters**	**Measurement in Inches**
Length of Shank	2.02m	79.44 in
Width of Shank	.08m	3.15 in
Length of Arms	.70m	27.55 in
Length of Palms	.42m	16.54 in
Breadth of Palms	.26m	10.24 in
Thickness of Palms	.03m	1.18 in
Length of Bills	.06m	2.36 in
Length of Flukes	.48m	18.90 in

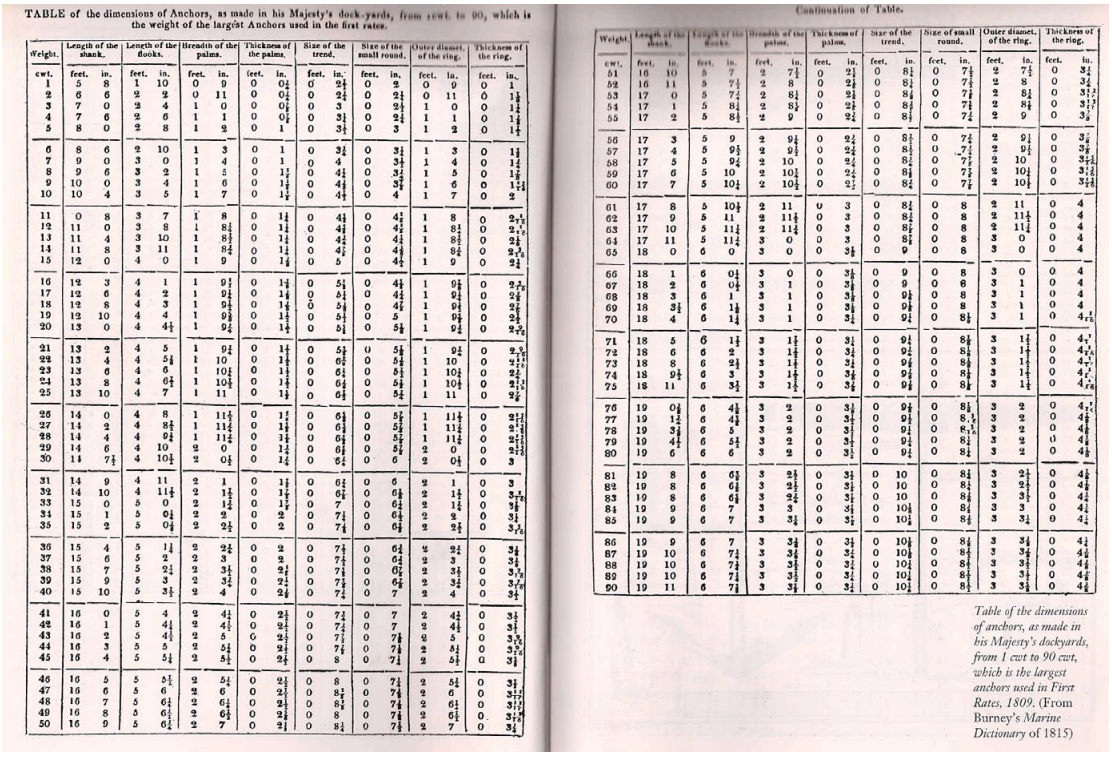


TABLE of the dimensions of Anchors, as made in his Majesty's dock-yards, from 1 cwt. to 90, which is the weight of the largest Anchors used in the first rates.

Weight.	Length of the shank.	Length of the flooks.	Breadth of the palms.	Thickness of the palms.	Size of the trend.	Size of the small round.	Outer diamet. of the ring.	Thickness of the ring.
cwt.	feet. in.	feet. in.	feet. in.	feet. in.	feet. in.	feet. in.	feet. in.	feet. in.
1	5 8	1 10	0 9	0 0½	0 2½	0 2	0 9	0 1
2	6 6	2 2	0 11	0 0½	0 2½	0 2½	0 11	0 1⅛
3	7 0	2 4	1 0	0 0½	0 3	0 2½	1 0	0 1¼
4	7 6	2 6	1 1	0 0½	0 3½	0 2½	1 1	0 1⅜
5	8 0	2 8	1 2	0 1	0 3½	0 3	1 2	0 1½
6	8 6	2 10	1 3	0 1	0 3½	0 3½	1 3	0 1⅝
7	9 0	3 0	1 4	0 1	0 4	0 3½	1 4	0 1¾
8	9 6	3 2	1 5	0 1⅛	0 4½	0 3½	1 5	0 1⅞
9	10 0	3 4	1 6	0 1⅛	0 4½	0 3½	1 6	0 1⅞
10	10 4	3 5	1 7	0 1⅛	0 4½	0 4	1 7	0 2
11	0 8	3 7	1 8	0 1¼	0 4½	0 4½	1 8	0 2 1/16
12	11 0	3 8	1 8½	0 1¼	0 4½	0 4½	1 8½	0 2 1/16
13	11 4	3 10	1 8½	0 1¼	0 4½	0 4½	1 8½	0 2⅛
14	11 8	3 11	1 8½	0 1¼	0 4½	0 4½	1 8½	0 2 1/16
15	12 0	4 0	1 9	0 1¼	0 5	0 4½	1 9	0 2¼
16	12 3	4 1	1 9½	0 1½	0 5½	0 4½	1 9½	0 2 3/16
17	12 6	4 2	1 9½	0 1½	0 5½	0 4½	1 9½	0 2⅜
18	12 8	4 3	1 9½	0 1½	0 5½	0 4½	1 9½	0 2⅜
19	12 10	4 4	1 9½	0 1½	0 5½	0 5	1 9½	0 2⅜
20	13 0	4 4½	1 9½	0 1½	0 5½	0 5⅛	1 9½	0 2 5/16
21	13 2	4 5	1 9½	0 1½	0 5½	0 5⅛	1 9½	0 2 5/16
22	13 4	4 5½	1 10	0 1½	0 6⅛	0 5⅛	1 10	0 2 7/16
23	13 6	4 6	1 10½	0 1½	0 6½	0 5½	1 10½	0 2½
24	13 8	4 6½	1 10½	0 1½	0 6½	0 5½	1 10½	0 2 1/16
25	13 10	4 7	1 11	0 1½	0 6½	0 5½	1 11	0 2 9/16
26	14 0	4 8	1 11½	0 1⅝	0 6½	0 5½	1 11½	0 2 11/16
27	14 2	4 8½	1 11½	0 1⅝	0 6½	0 5½	1 11½	0 2 11/16
28	14 4	4 9½	1 11½	0 1⅝	0 6½	0 5½	1 11½	0 2 11/16
29	14 6	4 10	2 0	0 1¼	0 6½	0 5½	2 0	0 2 13/16
30	14 7½	4 10½	2 0½	0 1¼	0 6½	0 6	2 0¼	0 3
31	14 9	4 11	2 1	0 1⅜	0 6½	0 6	2 1	0 3
32	14 10	4 11½	2 1½	0 1⅜	0 6½	0 6½	2 1½	0 3 1/16
33	15 0	5 0	2 1½	0 1⅜	0 7	0 6½	2 1½	0 3⅛
34	15 1	5 0½	2 2	0 2	0 7½	0 6½	2 2	0 3⅛
35	15 2	5 0½	2 2½	0 2	0 7½	0 6½	2 2½	0 3 1/16
36	15 4	5 1½	2 2½	0 2	0 7½	0 6½	2 2½	0 3⅜
37	15 6	5 2	2 3	0 2	0 7½	0 6½	2 3	0 3½
38	15 7	5 2½	2 3½	0 2½	0 7½	0 6½	2 3½	0 3 9/16
39	15 9	5 3	2 3½	0 2½	0 7½	0 7	2 3½	0 3 9/16
40	15 10	5 3½	2 4	0 2½	0 7½	0 7	2 4	0 3¾
41	16 0	5 4	2 4½	0 2½	0 7½	0 7	2 4½	0 3⅞
42	16 1	5 4½	2 4½	0 2½	0 7½	0 7	2 4½	0 3⅞
43	16 2	5 4½	2 5	0 2½	0 7½	0 7⅛	2 5	0 3 15/16
44	16 3	5 5	2 5½	0 2½	0 7½	0 7⅛	2 5½	0 3 15/16
45	16 4	5 5½	2 5½	0 2⅝	0 8	0 7½	2 5½	0 3⅞
46	16 5	5 5½	2 5½	0 2⅝	0 8	0 7½	2 5½	0 3⅞
47	16 6	5 6	2 6	0 2⅝	0 8½	0 7⅛	2 6	0 3 15/16
48	16 7	5 6½	2 6½	0 2⅝	0 8½	0 7⅛	2 6½	0 3 15/16
49	16 8	5 6½	2 6½	0 2⅝	0 8	0 7⅛	2 6½	0 3 15/16
50	16 9	5 6½	2 7	0 2⅝	0 8½	0 7⅛	2 7	0 3⅞

Continuation of Table.

Weight.	Length of the shank.	Length of the flooks.	Breadth of the palms.	Thickness of palms.	Size of the trend.	Size of small round.	Outer diamet. of the ring.	Thickness of the ring.
cwt.	feet. in.	feet. in.	feet. in.	feet. in.	feet. in.	feet. in.	feet. in.	feet. in.
51	16 10	5 7	2 7½	0 2½	0 8½	0 7½	2 7½	0 3 1/16
52	16 11	5 7½	2 8	0 2½	0 8½	0 7½	2 8	0 3 1/16
53	17 0	5 7½	2 8½	0 2½	0 8¼	0 7½	2 8½	0 3 1/16
54	17 1	5 8½	2 8½	0 2½	0 8½	0 7½	2 8½	0 3 1/16
55	17 2	5 8½	2 9	0 2½	0 8½	0 7½	2 9	0 3⅛
56	17 3	5 9	2 9½	0 2½	0 8½	0 7½	2 9½	0 3⅛
57	17 4	5 9½	2 9½	0 2½	0 8½	0 7½	2 9½	0 3⅛
58	17 5	5 9½	2 10	0 2½	0 8½	0 7½	2 10	0 3 3/16
59	17 6	5 10	2 10½	0 2½	0 8½	0 7½	2 10½	0 3 3/16
60	17 7	5 10½	2 10½	0 2½	0 8½	0 7½	2 10½	0 3 3/16
61	17 8	5 10½	2 11	0 3	0 8½	0 8	2 11	0 4
62	17 9	5 11	2 11½	0 3	0 8½	0 8	2 11½	0 4
63	17 10	5 11½	2 11½	0 3	0 8½	0 8	2 11½	0 4
64	17 11	5 11½	3 0	0 3	0 8½	0 8	3 0	0 4
65	18 0	6 0	3 0	0 3⅛	0 9	0 8	3 0	0 4
66	18 1	6 0½	3 0	0 3⅛	0 9	0 8	3 0	0 4
67	18 2	6 0½	3 1	0 3⅛	0 9	0 8	3 1	0 4
68	18 3	6 1	3 1	0 3⅛	0 9⅛	0 8	3 1	0 4
69	18 3½	6 1⅛	3 1	0 3⅛	0 9⅛	0 8	3 1	0 4
70	18 4	6 1⅛	3 1	0 3⅛	0 9⅛	0 8⅛	3 1	0 4 1/16
71	18 5	6 1⅛	3 1⅛	0 3⅛	0 9⅛	0 8⅛	3 1⅛	0 4 1/16
72	18 6	6 2	3 1⅛	0 3⅛	0 9⅛	0 8⅛	3 1⅛	0 4 1/16
73	18 8	6 2⅛	3 1⅛	0 3⅛	0 9⅛	0 8⅛	3 1⅛	0 4 1/16
74	18 9½	6 3	3 1⅛	0 3⅛	0 9⅛	0 8⅛	3 1⅛	0 4 1/16
75	18 11	6 3⅛	3 1⅛	0 3⅛	0 9⅛	0 8⅛	3 1⅛	0 4 1/16
76	19 0⅛	6 4⅛	3 2	0 3⅛	0 9⅛	0 8⅛	3 2	0 4 1/16
77	19 1⅛	6 4⅛	3 2	0 3⅛	0 9⅛	0 8 1/16	3 2	0 4⅛
78	19 3⅛	6 5	3 2	0 3⅛	0 9⅛	0 8 1/16	3 2	0 4⅛
79	19 4⅛	6 5⅛	3 2	0 3⅛	0 9⅛	0 8⅛	3 2	0 4⅛
80	19 6	6 6	3 2	0 3⅛	0 9⅛	0 8⅛	3 2	0 4⅛
81	19 8	6 6⅛	3 2⅛	0 3⅛	0 10	0 8⅛	3 2⅛	0 4⅛
82	19 8	6 6⅛	3 2⅛	0 3⅛	0 10	0 8⅛	3 2⅛	0 4⅛
83	19 8	6 6⅛	3 2⅛	0 3⅛	0 10	0 8⅛	3 3⅛	0 4 3/16
84	19 9	6 7	3 3	0 3⅛	0 10⅛	0 8⅛	3 3	0 4⅛
85	19 9	6 7	3 3⅛	0 3⅛	0 10⅛	0 8⅛	3 3⅛	0 4⅛
86	19 9	6 7	3 3⅛	0 3⅛	0 10⅛	0 8⅛	3 3⅛	0 4⅛
87	19 10	6 7⅛	3 3⅛	0 3⅛	0 10⅛	0 8⅛	3 3⅛	0 4⅛
88	19 10	6 7⅛	3 3⅛	0 3⅛	0 10⅛	0 8⅛	3 3⅛	0 4⅛
89	19 10	6 7⅛	3 3⅛	0 3⅛	0 10⅛	0 8⅛	3 3⅛	0 4⅛
90	19 11	6 7⅛	3 3⅛	0 3⅛	0 10⅛	0 8⅛	3 3⅛	0 4⅛

Table of the dimensions of anchors, as made in his Majesty's dockyards, from 1 cwt to 90 cwt, which is the largest anchors used in First Rates, 1809. (From Burney's *Marine Dictionary* of 1815)

FIGURE 9. Burney's Table. This table shows the dimensions and weights of anchors made in British dockyards from 1 cwt (50.80 kg) up to 90 cwt (4,572.21 kg), the largest anchors used in First Rate ships of the line. (Table by Burney, 1815.)

FIGURE 10. Photograph of the crown of Anchor 1. (Photo by author, October 19, 2009.)

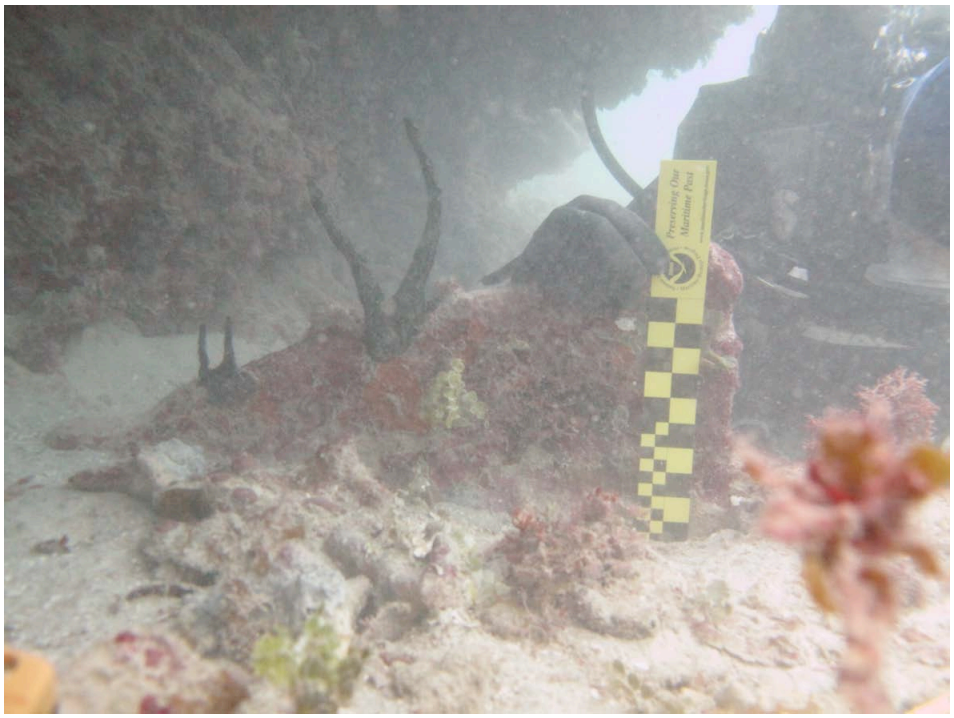


FIGURE 11. Photograph of the right fluke of Anchor 1, an interior shot. Note the fluke's curvature and the presence of a pronounced bill beyond the extent of the fluke. (Photo by author, October 19, 2009.)

FIGURE 12. Close up of the bill's protrusion on Anchor 1. Taken from the interior of the right fluke. (Photo by author, October 19, 2009.)

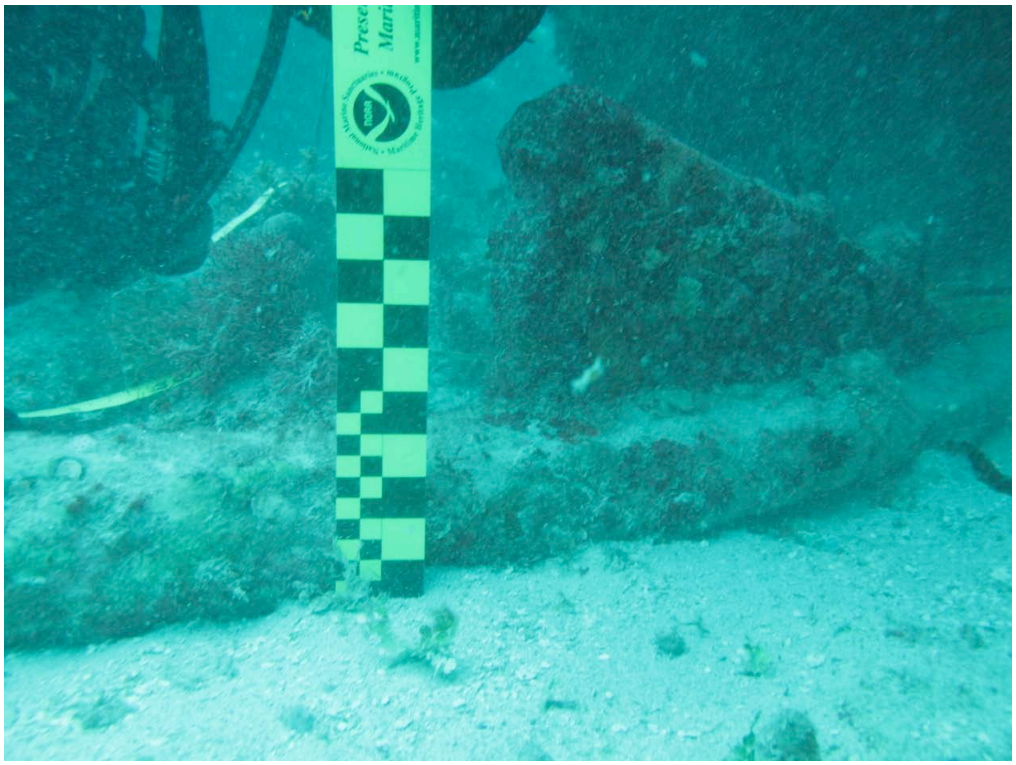


FIGURE 13. Detail of the right fluke on Anchor 1. Shot from the exterior. (Photo by author, October 19, 2009.)

Anchor 2

Surveyors relocated Anchor 2 not nine meters (30 ft) to the southwest of Anchor 1, at 18.09'11.4 N and 78.02'39.5 W. Dubbed the "hoop anchor" by Dina Bazill and her 2008 crew, Anchor 2, proved to be a British longshank anchor deeply embedded within a coral reef. Efforts to uncover the crown and parts of its arms with hand fanning proved successful, but surveyors could not reveal the anchor's palms. From the crown it can be deduced that like Anchor 1, Anchor 2 has arms that join the bottom of the shank at 60˚ angle. With a shank measuring 3.08 m (10.10 ft), Mainwaring's 1622 cubic equation indicates that Anchor 2 weighs approximately 467.34 kg (1030.30 lbs. or 9.20 cwt). Similarly, Burney's chart from 1815 suggests that based on its length of shank, Anchor 2 weighs somewhere between 457.22 and 508.02 kg (1,008 and 1,120 lbs or 9 and 10 cwt)

(Burney 1815). Through a comparison of these predicted weights with our colonial period tables, Anchor 2 is just under the size requirements for use as a kedge aboard a 100 gun ship-of-the-line, viable as a stream anchor aboard a 44 gun ship, and was suitable for use as a bower aboard a vessel as large as 200 tons (Public Records Office 1763; Burney 1815; Hedderwick 1830).

Figure 14 shows the profile of the top half of the anchor. Note the heavy coral growth, and how the ring is held in place as a result of concretion. The anchor was leaning (from crown to tip of shank) at an approximate bearing of 290 degrees. For purposes of observing the ring, however, Figure 13 shows a profile view of the anchor when approaching from the south. Technical difficulties with the camera prevented surveyors from taking pictures of Anchor 2's lower portion.

TABLE 3
ANCHOR 2 FROM SURVEY IV PHASE II, DIMENSIONS

Part of Anchor	**Measurement in Meters**	**Measurement in Inches**
Length of Shank	3.08m	121.26 in
Width of Shafnk	.14m	5.51 in
Length of Arms	.65m	25.59 in
Diameter of Ring (interior)	.20 m	7.87 in
Diameter of Lift (exterior)	.28 m	11.02 in
From Lift Ring Hole to Top of Shaft	.13 m	5.12 in
From 1st Raised Lip to Top of Shaft	.35 m	13.78 in
From 2nd Raised Lip to Top of Shaft	.69 m	27.17 in
Width of Raised Lips	.03 m	1.18 in
Height of Raised Lips	.03 m	1.18 in
Length of Raised Lips	.14 m	5.11 in

FIGURE 14. Profile view of the top of Anchor 2. This photograph shows the shank as is visible above the coral reef line. (Photo by Rob Minford, Oct 19, 2009.)

Anchor 3

Emsly, the survey team's boat captain, provided the location of Anchor 3. Relocated at 18.9'13.2 N, 78.2'45.3 W, most of this anchor's shank was embedded in a coral reef, as was much of the anchor's ring. As a result, the distance between the ring hole and the top of the shank could not be determined. However, surveyors successfully uncovered the anchor's crown, arms, and palms, through hand fanning. From the crown to the tip of the shank, the anchor lies at a bearing of approximately 340 degrees. The recorded measurements of Anchor 3 appear in Table 4. Figures 15 through 19 are photographs detailing the third anchor. Like Anchors 1 and 2, the arms of Anchor 3 join at the crown

at 60˚ angles. The flukes also end in nearly equilateral triangles. Together these two characteristics strongly suggest that Anchor 3 is also a British longshank anchor (Curryer 1999:50). Anchor 3, which has a shank 3.88 m (12.73 ft) long, probably weighs somewhere between 935.73 kg (2,062.93 lbs or 18.42 cwt), according to Mainwaring's method, and between 914.44 and 965.24 kg

(2,016 and 2,128 lbs, or 18 and 19 cwt) according to Burney's chart (Mainwaring 1622; Burney 1815). These weights would make Anchor 3 eligible for use as a kedge on a 100 gun ship-of-the-line, a stream anchor on vessels of 90 guns and smaller, and a bower on a brig, sloop, or other vessel upwards of 363 tons (Public Records Office 1763; Burney 1815; Hedderwick 1830).

TABLE 4
ANCHOR 3 FROM SURVEY IV PHASE II, DIMENSIONS

Part of Anchor	**Measurement in Meters**	**Measurement in Inches**
Length of Shaft	3.88 m	152.76 in
Width of Shaft (at Crown)	.26 m	10.24 in
With of Shaft (at Top)	.21 m	8.27 in
Length of Arms	1.00 m	39.37 in
Length of Palms	.66 m	25.98 in
Breadth of Palms	.31 m	12.20 in
Thickness of Palms	.07 m	2.76 in
Length of Bill	.11 m	4.33 in
Diameter of Lift Ring (interior)	.47 m	18.50 in
Diameter of Lift Ring (exterior)	.65 m	25.59 in
From 1st Raised Lip to Top of Shaft	.35 m	13.78 in
From 2nd Raised Lip to Top of Shaft	.84 m	33.07 in
Height of Raised Lips	.26 m	10.24 in
Length of Raised Lips	.20 m	7.87 in
Width of Raised Lips	.03 m	1.18 in

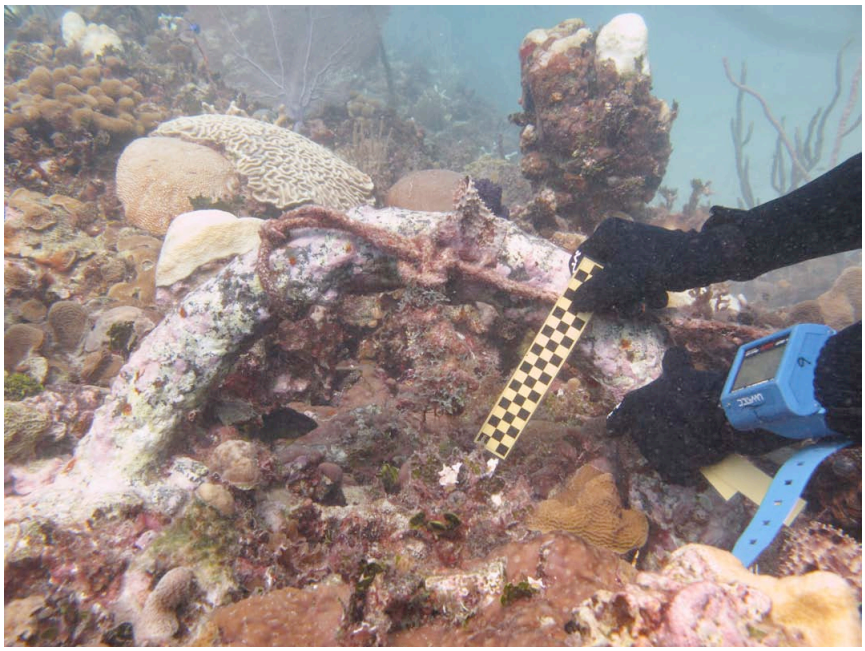


Figure 15, Detail of Anchor 3's ring. Note the heavy coral growth around the joint between the lift ring and the shaft. (Photo by author, November 3, 2009.)

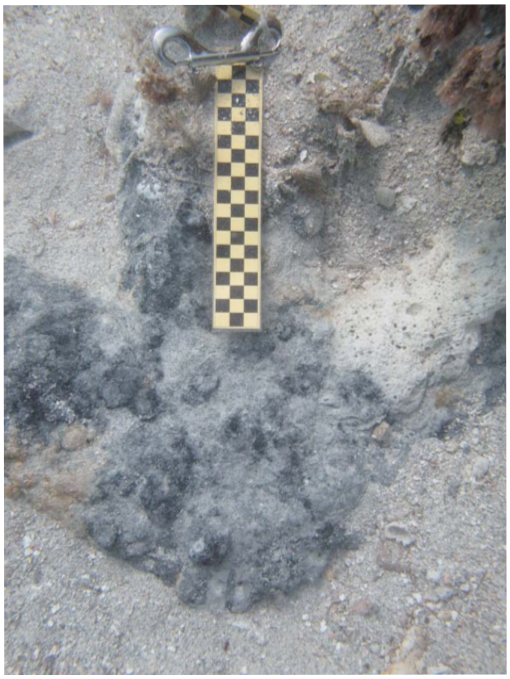


FIGURE 16. Crown detail of Anchor 3. (Photo by author, November 3, 2009.)

FIGURE 17. Interior of Anchor 3's right fluke. Photo by author, November 3, 2009.)

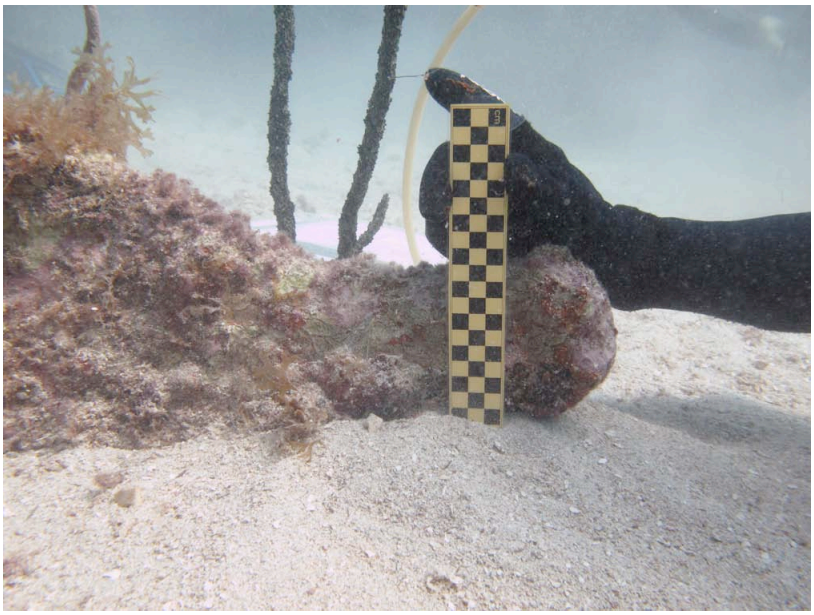


FIGURE 18. Bill on Anchor 3's right fluke. (Photo by author, November 3, 2009.)

FIGURE 19. Exterior of Anchor 3's left fluke. (Photo by author, November 3, 2009.)

The Carronade

Surveyors relocated the cannon mentioned in Dina Bazzil's 2008 report at 18.09'22.9 N, 78.02'57.2 W. The gun was found mostly covered, with only portions of the cascabel breaching the sea floor. Scuba surveyors, however, exposed almost all of the weapon with hand fanning, allowing them to take its measurements. Found with a breech ring located on the button, a very short barrel, and without trunnions, the details of this gun revealed it to be a carronade (Lavery 1987). The location of the carronade's vent field could not be determined because it was covered over with coral growth and concretions. It lay on the sea floor with an orientation of 250 degrees from button to muzzle. Table 5

shows the measurements taken from the carronade, and Figures 20 and 21 show the carronade's overall shape and the details of its button respectively.

TABLE 5
CARRONADE FROM SURVEY IV PHASE II, DIMENSIONS

Part of Carronade	Measurement in Meters	Measurement in Inches
Length from Button to Base Ring	.11 m	4.33 in
Length from Base Ring to Muzzle	1.14 m	44.88 in
Widest Diameter (at Base Ring)	.36 m	14.17 in
Narrowest Diameter (at Mouth)	.18 m	7.09 in
Diameter at First Reinforce	.25 m	9.84 in
Length of First Reinforce	.05 m	1.97 in
Distance from Button to First Reinforce	.79 m	31.10 in
Diameter of Breech Ring	.05 m	1.97 in
Thickness of Breech Ring	.06 m	2.36 in
Length of Exterior of Breech Ring	.13 m	5.12 in

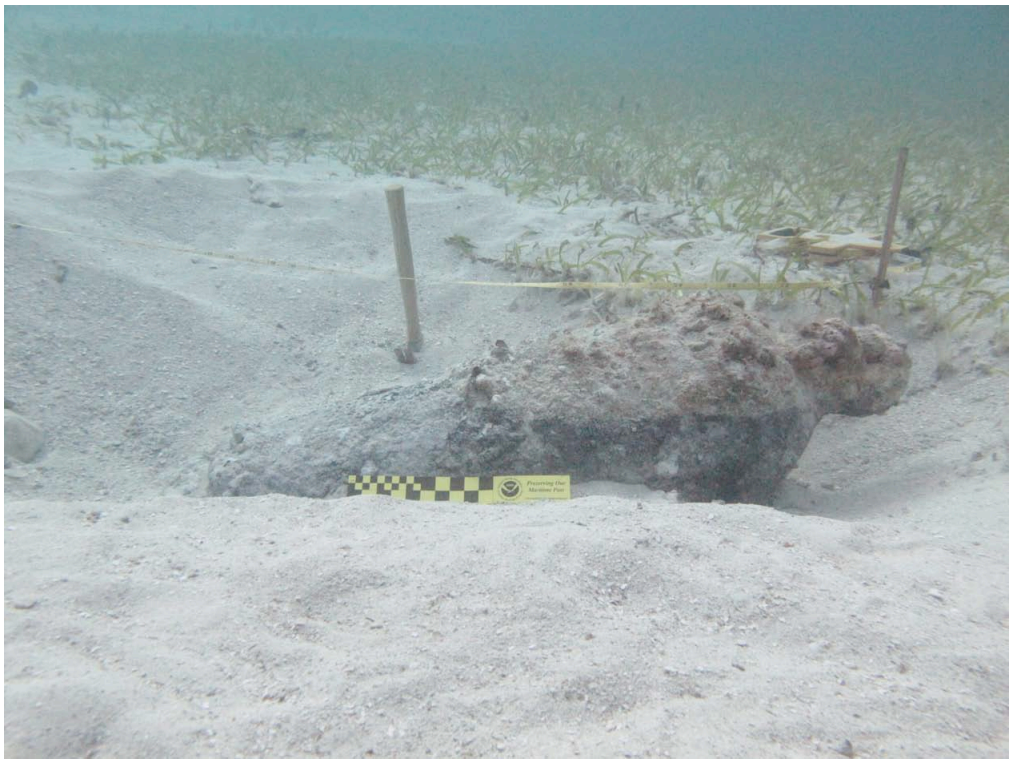


FIGURE 20. Profile view of the carronade. Note the absence of trunnions and the ball shape of the button. (Photograph by author, October 18, 2009.)

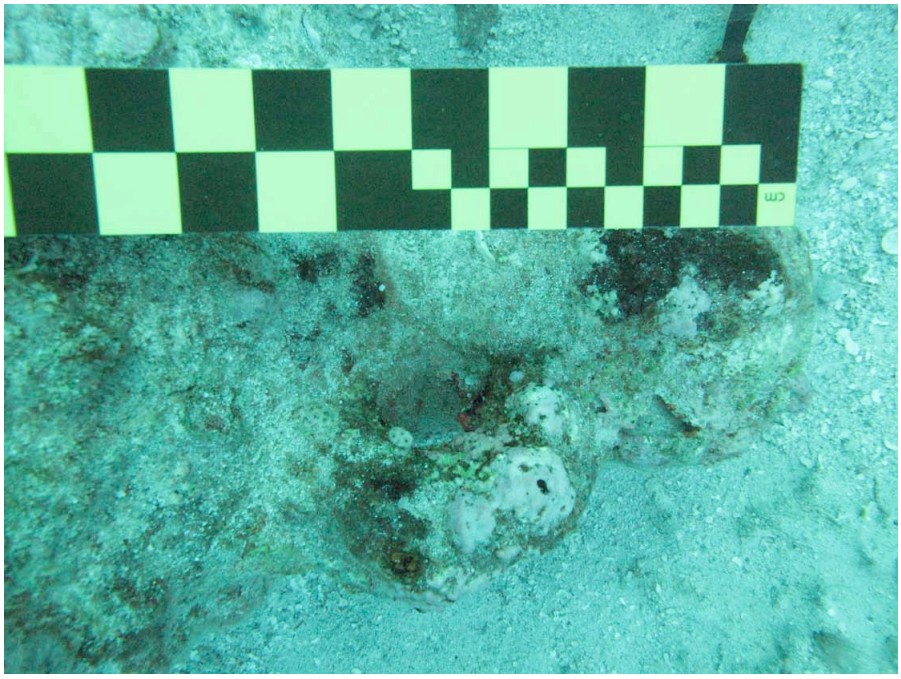


FIGURE 21. Detail of the carronade's button and breech ring. Note how the ring spans from the round end piece of the button to the cascabel. (Photo by author, October 18, 2009.)

The Carron Company of Falkirk, Scotland, was the first company to produce carronades in an effort to renew the Royal Navy's interest in the foundry after several of their models failed to pass muster during a 1773 Board of Ordnance proof test. Later that year the company experimented with lighter and heavier caliber guns. They put these new guns to trial in Woolwich in the summer of May 1779, where they caught the eye of Sir Charles Middleton, a forward thinking member of the Navy Board, who saw the advantages of the lighter, yet more powerful weapon and recommended it for use on poops and quarter decks of royal ships-of-the-line (Lavery 1987). Carronades weigh significantly less, and are significantly shorter, than cannons that can shoot the same weight of shot. This meant that small caliber armaments on ships' upper decks could be

exchanged for carronades without increasing the ship's overall tonnage. Carronades' main disadvantage is that they are less accurate over longer distances, but this was counterbalanced by the weapon's fearsome impact at close range. Its smaller size also made the carronade easier to reload, and its reduced windage (or extra space provided between the ball and the bore) actually made the gun more accurate over short distances than its long bore counterparts. The first major fleet action in which carronades played an important role was in Lord Admiral Rodney's Victory at the Battle of the Saintes in April 1782, where he encountered and overcame a larger Franco-Spanish fleet as it was sailing to capture Jamaica. The gun type remained popular throughout the American Revolution and the Napoleonic Wars, proving valuable to British captains who preferred to engage in close quarters and melee combat with French, Dutch, and American enemies (Padfield 1974). Soon after though, carronades fell out of use as tactics shifted to prefer longer range weapons. Between 1779 and 1820 British founders produced 68- 42- 32- 24- 18- and 12- pound carronades. Based on its length of 1.03 m (3.38 ft), and an 18th century gunners rule provided by in Peter Padfield's *Guns at Sea*, we can estimate that the carronade found during Phase II of Survey IV, either fired 24 – or 18 – pound shot, and weighed somewhere between 508 and 660 kg (1,120 and 1,456 lbs or 10 and 13 cwt) (Padfield 1974:106).

Phase III: Proximity Searches Near Artifacts Previously Located

While Phase II of Survey IV successfully relocated and documented four known artifacts in close proximity to one another, Phase III of Survey IV sought to discover new artifacts

within this apparent artifact cluster. The author deemed Phase III prudent as no other survey within the bay revealed any significant cultural remains, and the report from Dina Bazzil's 2008 investigation attested to the presence of more artifacts nearby. Consequently, the locations of previously discovered artifacts (whether found my Bazzil's expedition or the present study) were used as the launch points for the Phase III scuba dive surveys. In total, Phase III consisted of four scuba surveys during which four objects of interest were found, including a grapnel anchor, a metallic box, a metallic ovoid, and a metal stock anchor (Figure 22).

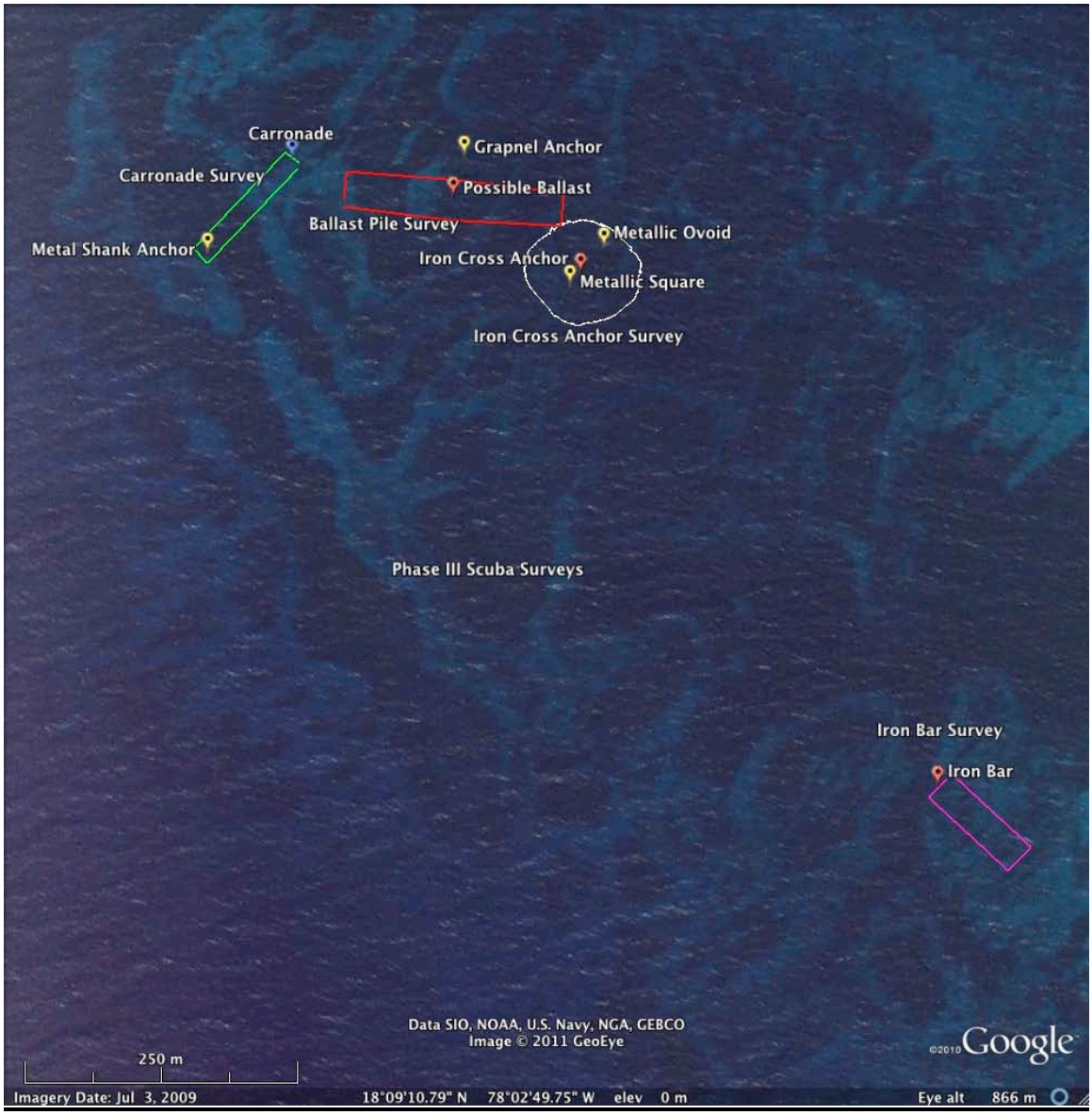


FIGURE 22. The Scuba Surveys of Phase III. Surveyors launched four scuba surveys from objects that had already been located by either Bazzill's 2008 expedition or the author's 2009 project. These surveys revealed four artifacts, a *grapnel anchor*, *two unidentified metal objects*, and a *metal shank anchor* marked on the map in yellow. (Map by author, 2011.)

The Grapnel Anchor

The first scuba survey of Phase III actually began as a search for the cluster of stones and bricks that Bazzil had labeled as a "possible ballast pile" (Table 1). A 100 by 20 m

jackstay survey conducted to the east and west of the "ballast pile's" coordinates of 18.09'21.5 N, 78.02'52.3 W failed to relocate Bazzill's target. Once the jackstay survey was completed, the divers decided to spend their remaining bottom time conducting an informal survey of the nearby reefs. A diver found and uncovered a grapnel anchor lying flush against a reef approximately 40 meters to the northeast of the "possible ballast pile's" given coordinates. Evidence of all four of the grapnel anchor's arms were visible, but most of one lay buried under sand, while most of two others had been broken off. Additionally, the end of the anchor's shank was buried under far too much sand to be uncovered by hand fanning. Surveyors took detailed photos, however, of the anchor's crown and lone exposed arm (Figures 23-26).

FIGURE 23. Overview of the Grapnel Anchor. The grapnel anchor was found while searching for Dina Bazzil's "possible ballast pile." The author took this photograph from the west of the anchor. Note that the anchor lies nearly north to south. (Photo by author, November 3, 2009.)

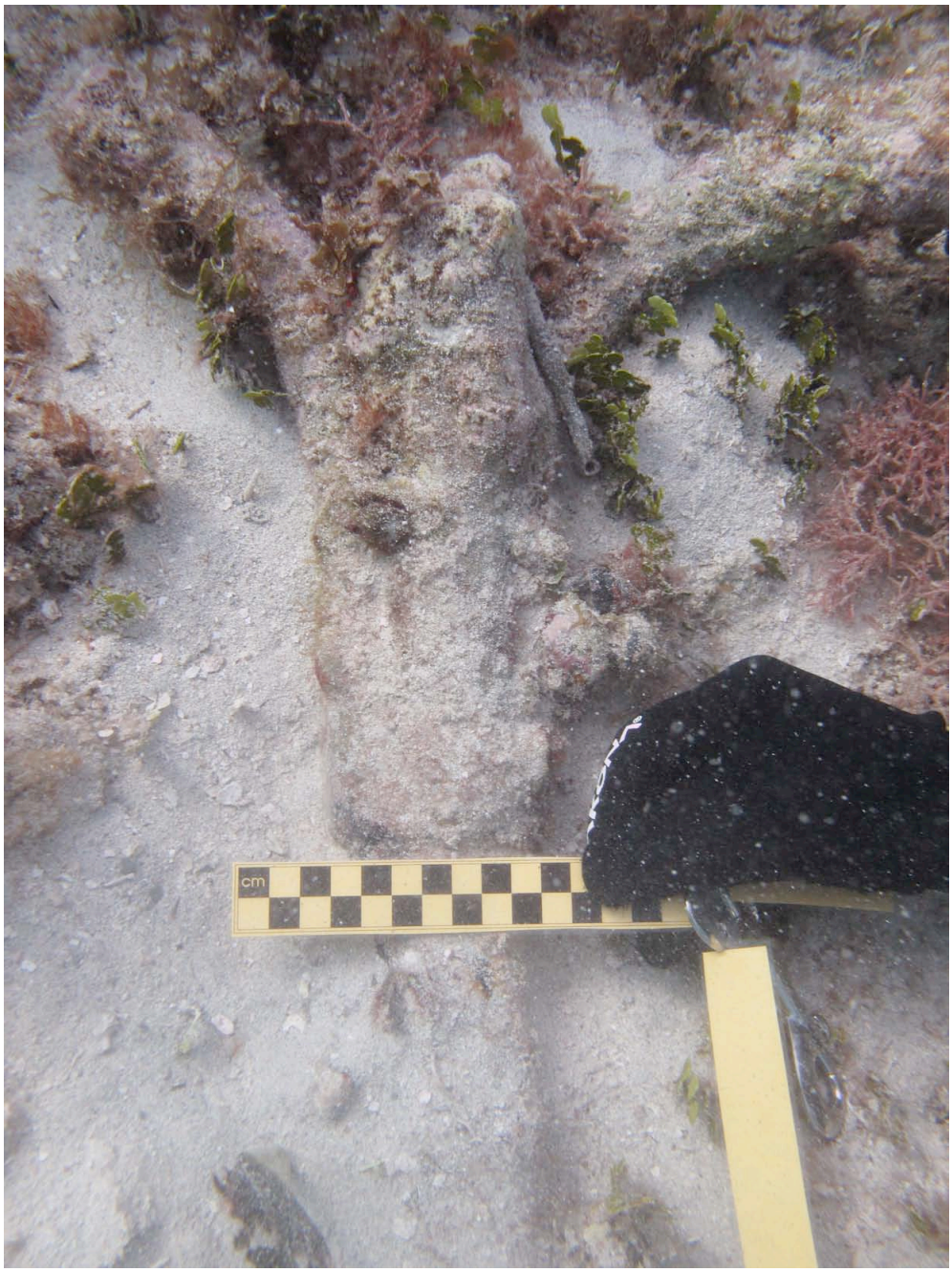


FIGURE 24. The Grapnel Anchor's crown. (Photo by author, November 3, 2009.)

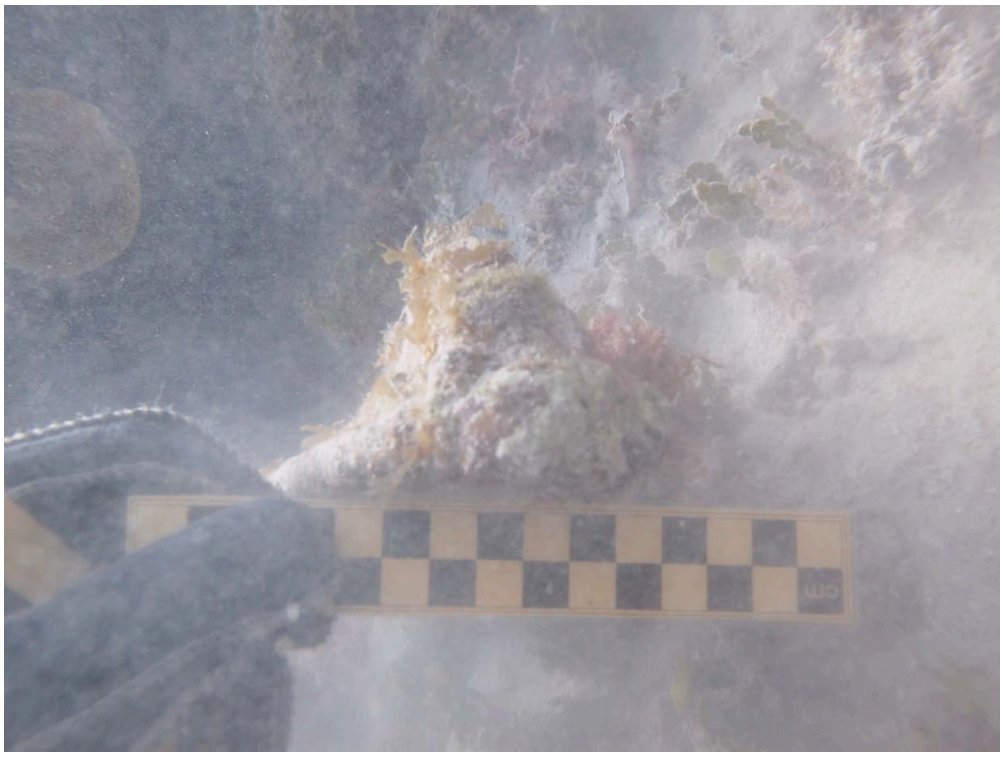


FIGURE 25. Profile view of the Grapnel Anchor's fluke. (Photo by author, November 3, 2009.)

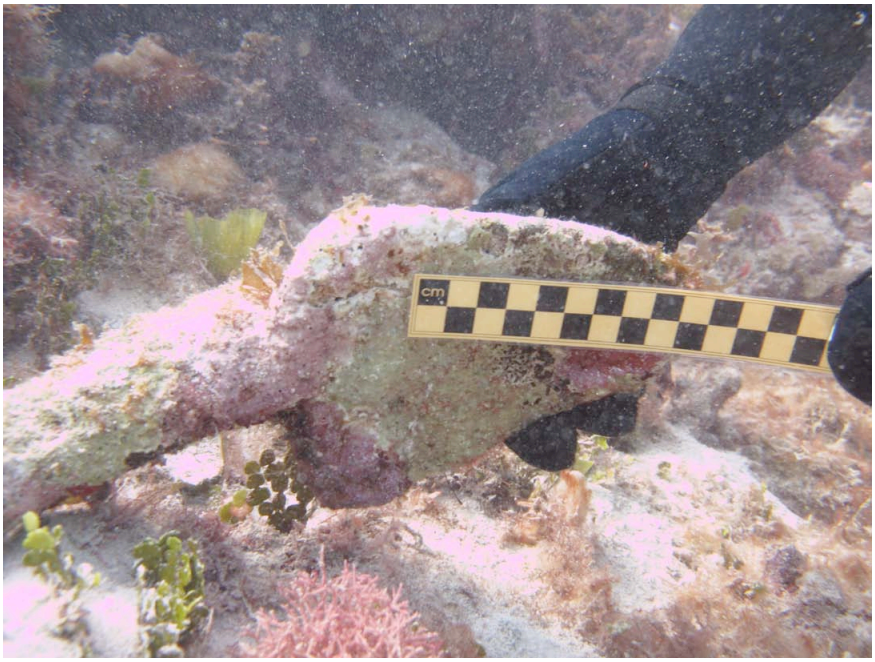


FIGURE 26. Interior of the Grapnel Anchor's fluke. Note the fluke's triangular shape. (Photo by author, November 3, 2009.)

While thorough measurements of the anchor could not be made as a result of the divers' limited air supply, what could be gleaned from the grapnel anchor can be found in Table 6. It was also impossible for surveyors to record the anchor's overall length as its shaft lay under too much sand to be uncovered by hand. Despite these shortcomings in recordable details, the flukes' obvious triangular shape and the heavy curvature in the arms match the design of grapnel anchors detailed in David Steel's *Naval Architecture*, *a Catalogue of British Ships' Arming and Fitting*, published in 1794 (Steel 1794). Grapnel anchors are much smaller than even kedge anchors, and were primarily used by smaller boats to assist or work in conjunction with ships of the line. Classes of boats that used grapnel anchors included longboats, pinnaces, yawls, cutters and launches, but based on its 7.5 cm (2.95 in) width at the crown, it is likely that the Grapnel found during this project was used on a launch (Steel 1794:363). Like the British longshank anchor, grapnel anchors were widely used throughout the colonial period, giving this anchor a relatively wide date of production, somewhere between the eighteenth and early nineteenth centuries.

TABLE 6
GRAPNEL ANCHOR FROM SURVEY IV PHASE III, DIMENSIONS

Part of Anchor	**Measurement in Centimeters**	**Measurement in Inches**
Width of Stock	5.0 cm	1.97 in
Width of Crown	7.5 cm	2.95 in
Widest breadth of Palm	9.5 cm	3.74 in
Length of Palm	13.5 cm	5.31 in
Thickness of Palm	≈ 2.0 cm	.79 in

The Metallic Square and Ovoid

The second scuba survey of Phase III was initially searched for the "Iron Cross Anchor" described by Bazzil in her 2008 report. Three divers descended at 18' 9.19.1 N, 78' 2.48.4 W, installed a datum on the sea floor, and conducted 3 coordinated circle searches at 10, 30, and 50 m. The anchor was never found, but surveyors discovered two other metallic objects and recorded them. Approximately 3.5 m to the southwest of the datum lay a metallic square 40 cm long on each side. The sides of the square were six centimeters tall, with a three-centimeter gap found in the center of the eastern side. The square's corners were curved (Figure 27). The second object found was a metallic ovoid approximately 30 m to the northeast of the datum. This object was 55 cm long, and 26 cm deep. Somewhat cone shaped, the ovoid is 32 cm at its widest. Both sides of the ovoid had convex curvature, making it very unlikely that the ovoid was a gun or projectile.

While it is clear that the two objects are metallic (they each had a shiny luster and emitted a metallic "clang" when struck), both the square and ovoid were heavily covered over with coral and sponge growths, making meaningful interpretation difficult. One possibility for the metallic square is that it was used as a band to hold together two halves of a British longshank anchor stock (Steel 1794). This theory seems reasonable as Phase II of Survey IV located three longshank anchors nearby, but it is clear that both the square and ovoid's most valuable interpretive trait is their proximity to other artifacts, suggesting that they can be considered as parts of a much larger artifact cluster.

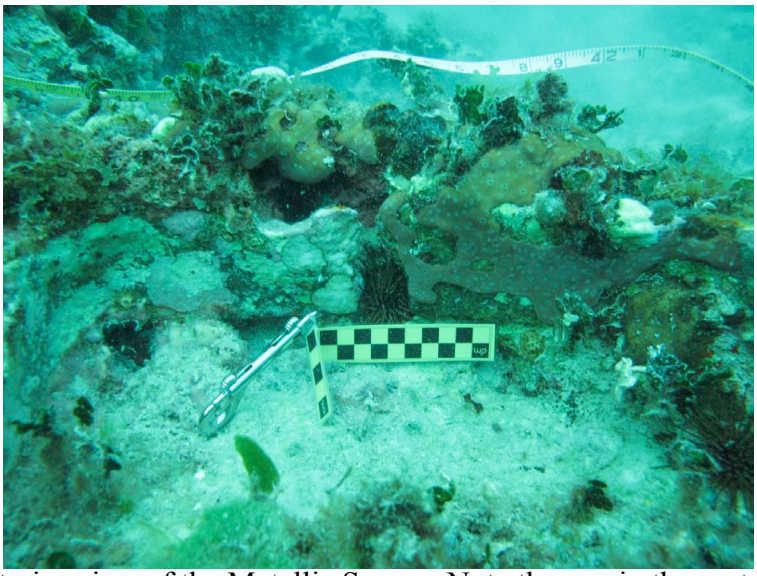


FIGURE 27. Interior view of the Metallic Square. Note the gap in the eastern side. This object could be a square band placed on a British longshank anchor used in the eighteenth and nineteenth centuries. (Photo by author, November 3, 2009.)

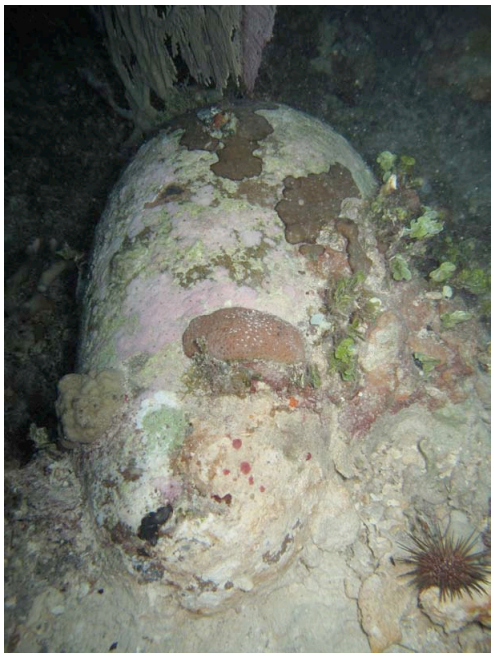


FIGURE 28. Overview of the Metallic Ovoid. The ovoid had very smooth convex curves on both of its sides, making it very unlikely that the ovoid was a gun or some kind of ammunition. The narrow tip (shown in the bottom of the picture) is about 16cm wide. (Photo by author, November 3 2009.)

The Metal Stock Anchor

The third scuba survey for Phase III was launched from the GPS coordinates of the carronade, the project's northernmost and westernmost underwater artifact. The survey's purpose was to locate and document additional artifacts, and to potentially ascertain the western boundary of the apparent artifact cluster. Three divers entered the water at the GPS coordinates of 18. 9'22.80 N, 78.02'57.30 W, established a movable jackstay with each diver 15 m apart from each other, and traveled southwest for approximately 125 m. Near the end of the dive a diver found an anchor with a metal stock standing upright with part of its shank embedded in a reef. Table 7 shows the anchor's measurements. Figure 29 contains the divers' sketches of the anchor. Unfortunately, there are no pictures of the metal stock anchor because there were technical difficulties with the underwater camera. The anchor's orientation from the crown to top of its shaft is 150 degrees, and its GPS Coordinates are 18.09'20.1 N, 78.03'00.5 W.

TABLE 7
METAL SHANK ANCHOR FROM PHASE III SURVEY IV, DIMENSIONS

Part of Anchor	**Measurement in Meters**	**Measurement in Inches**
Length of Shank	1.66 m	65.35 in
Width of Shank	.08 m	3.15 in
Length of Arms	.33 m	12.99 in
Thickness of Arms	.09 m	3.54 in
Length of Palms	.21 m	8.27 in
Breadth of Palms	.08 m	3.15 in
Thickness of Palms	.03 m	1.18 in
Length of Bill	.16 m	6.30 in
Diameter of Ring (interior)	.18 m	7.09 in
Length of Metallic Shank	1.80 m	70.87 in
Circumference of Metallic Shank	.14m	5.51 in

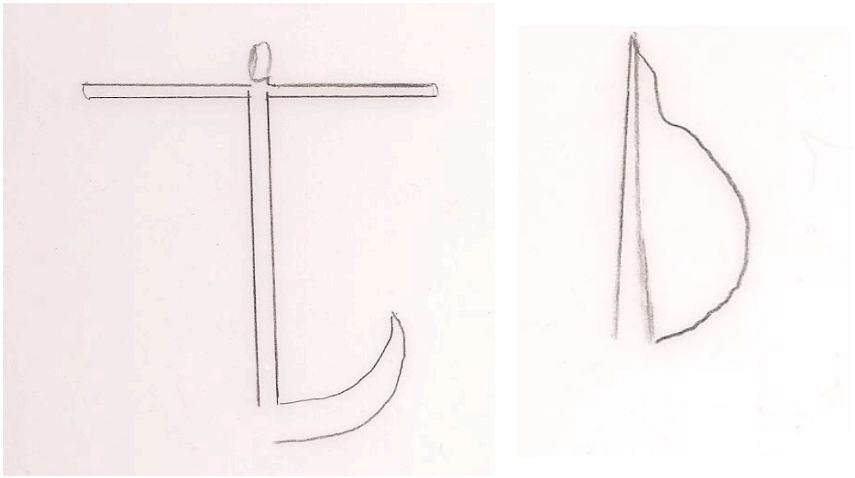


FIGURE 29. Sketches of Metal Shank Anchor. *Left*, Profile View of Anchor; and *right* Exterior View of the Anchor's Fluke. Note, drawings are not to scale, but intended to provide an understanding of the anchor's shape. (Drawings by Peter Campbell, November 5, 2009.)

While it is difficult to isolate the exact date of production for this anchor, it possesses several characteristics that allow for the creation of an estimate. First, the curved rather than angled arms of this anchor suggest that its production date was likely sometime after the Napoleonic Wars of the early nineteenth century, when the British and other European navies moved away from the angled arm design. Furthermore, the shape and design of the anchor's palms closely resembles those of the Board of Admiralty Anchor, developed by Admiral Sir William Parker in 1840-41, suggesting that it was a design of the mid to late nineteenth century (Lloyd's Register of Shipping 1920). Additionally, the anchor's metal stock, seems to confirm what the palm shapes suggest, that the anchor is of mid to late nineteenth-century design (Curryer 1999:83). Given this anchor's small size, it is unlikely that it weighs more than 51 kg, (112 lbs or 1 cwt) and

consequently could not have been used as a kedge aboard a ship-of-the-line, and could have only served as a bower for a ship of 20 tons or less (Hedderwick 1830).

The Iron Bar Survey

The fourth and final scuba survey that constituted Phase III consisted of another three manned movable jackstay search that was designed to test the artifact cluster's southeastern boundary. The divers started at the coordinates provided by Dina Bazzil for the "Iron Bar," the project's southernmost and easternmost reference point for a confirmed artifact, and used a moving jackstay technique to survey one hundred meters to the southeast. Though the search began at 18.09'3.5 N, 78.2'37.8 W in about ten meters of water, by the end of the dive surveyors found themselves in depths as shallow as five meters searching in the crevices of reefs that nearly breached the surface of the water. The "Iron Bar" was not found during this survey, nor were any other historical or cultural remains.

Results from Survey V: Watering Place Anchorage

Survey V searched an area of the bay where ships might have anchored while taking on freshwater from the watering place mentioned in John Leard's eighteenth-century sailing directions. The survey consisted of three north to south transects, and covered reef patches that matched the specifications in Leard's directions: they were a quarter mile (400 m) off the shore of the watering place, and in approximately five fathoms (9 m) of water (Leard 1791:36). Survey V revealed no artifacts (Figure 30).

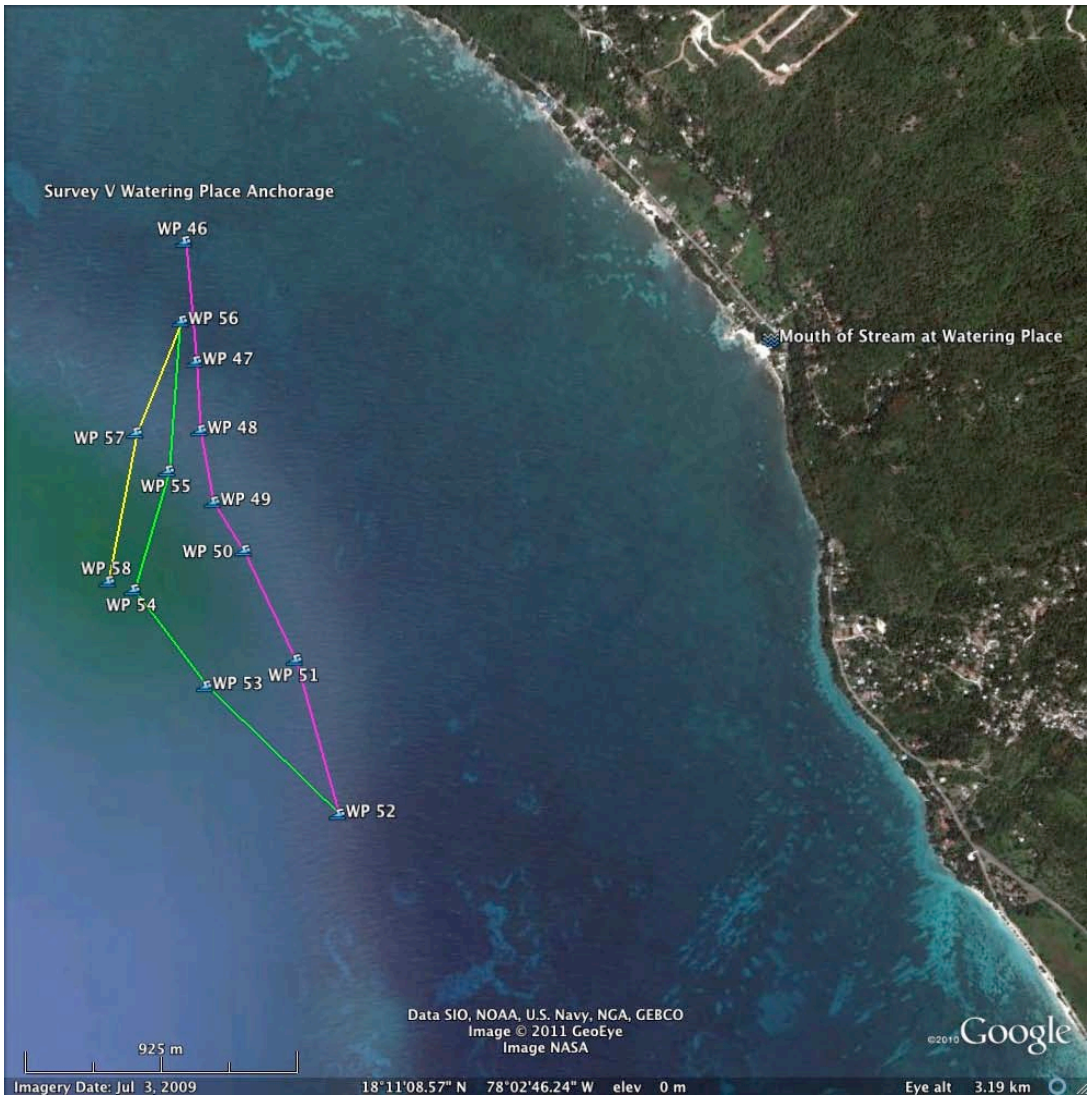


FIGURE 30. Survey V Results. *Waypoints forty-six through fifty-eight* denote the recorded location of the towboarder during transects one, two, and three, colored *pink*, *green* and *yellow* respectively. Surveyors were looking for reef patches in five fathoms of water where vessels might have anchored in order to make use of the watering place as described in John Leard's *Sailing Directions*. (Map by author, 2011.)

Results from Survey VI: The Belmont Battery

Survey VI searched the submerged areas around the northern part of Belmont Peninsula to locate the remains from a fortification or battery demarcated by historic charts and

maps of the area (Figure 31). Though skin divers examined the caves under the peninsula, as well as the submerged areas to the south, west, and north, of the northern extension of the peninsula, no structural or historic remains were found (Figure 32). While it is possible that the remains lie farther north on the peninsula, surveyors were not allowed to search there as they were denied access by the property's owners. The two maps in Figure 31 also offer insight into the peninsula's geomorphology. It would seem that since the eighteenth century, the peninsula's north side has become less pronounced.

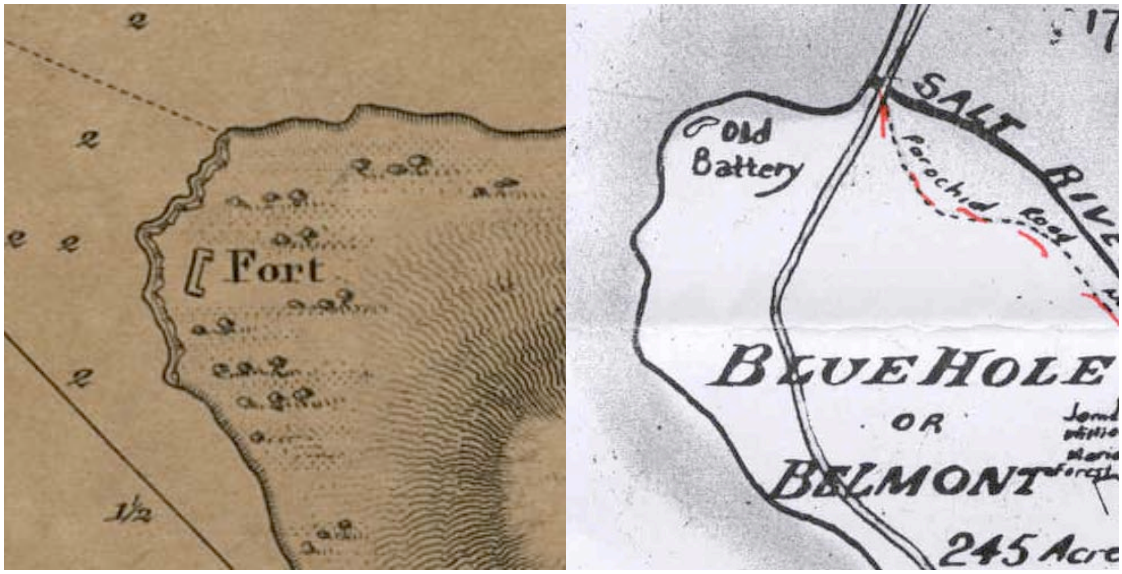


FIGURE 31. A juxtaposition of two images of Belmont Peninsula. On the *left* is a depiction from the chart found within John Leard's eighteenth-century *Sailing Directions*. On the *right* is a property map from the later nineteenth century (Cadastral Map). Note that both depict some kind of fortification or the remains of a battery, though in slightly different locations. Together these maps formed the blueprint for Survey VI. (Maps by Leard 1791, and courtesy of Spanish Town Archives, Jamaica.)

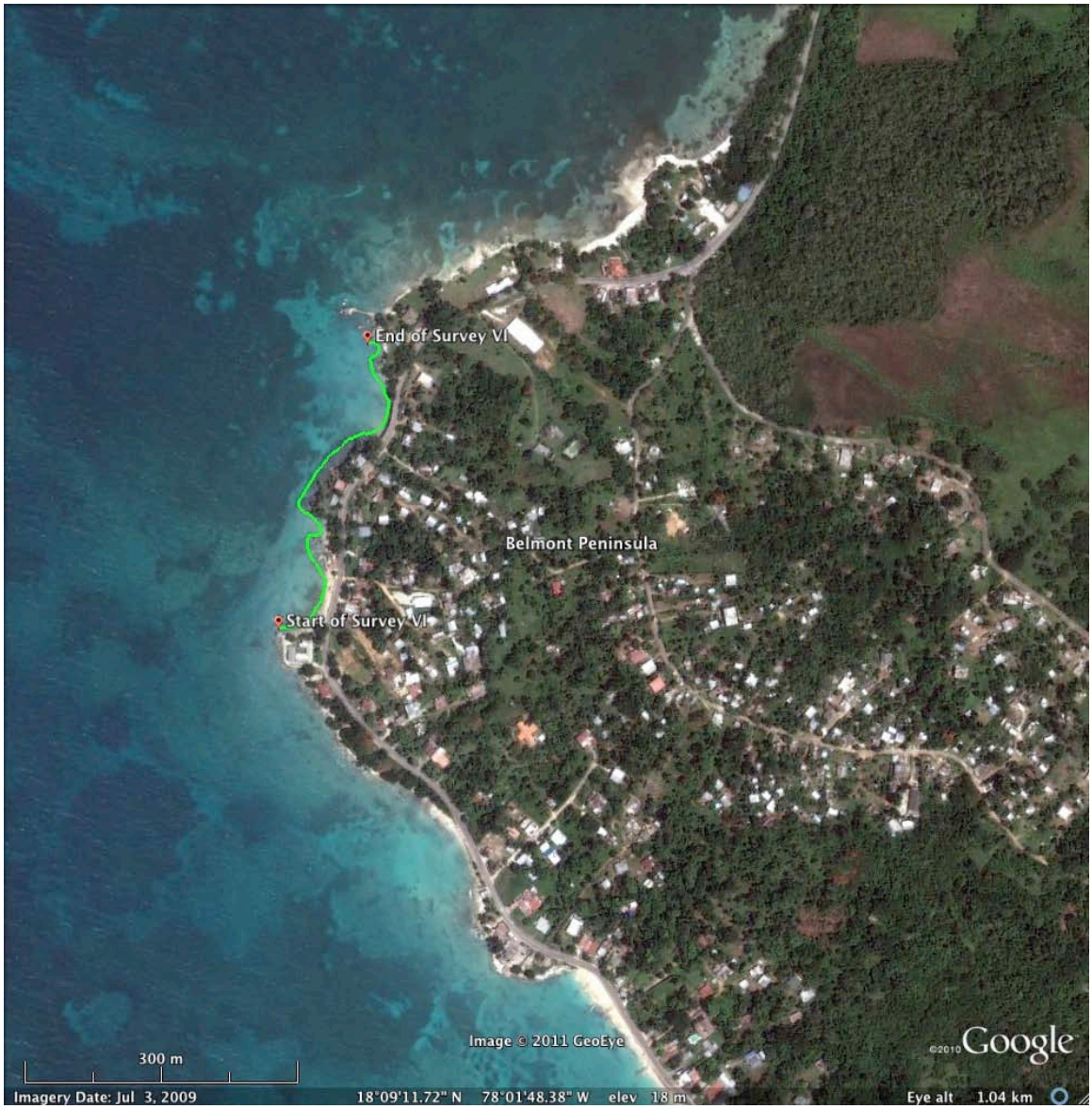


FIGURE 32. Survey VI Results. The *area marked in green* shows where skin divers examined the Belmont coastline. Wherever possible divers tried to inspect caves and caverns underneath the peninsula. The depth of the survey varied between 1.2 m and 2.4 m of water. (Map made by author, 2011.)

Results from Survey VII: The Fort Charles Site

The project's local liaison, Wolde Kristos, recommended the site examined during Survey VII who directed surveyors to the precise location of an abandoned cannon. While guiding the surveyors around property lines and to the site, Kristos referred to the area as "Fort Charles," but explained that it was probably more of a battery, or platform for cannon rather than a fort in the traditional sense (Wolde Kristos 2009, pers. comm.). The cannon was successfully relocated at 18.04'56.2 N and 78.01'41.1 W, lying no farther than 20 m from the ocean (Figures 33 and 34). The was found cannon lying upside down and from base ring to muzzle lying at a bearing of approximately 250 degrees. Surveyors failed to find any markings on the cannon, but this may have been because the vent field, and most of the topside of the cannon, was not visible. In addition to recording and photographing the cannon (Table 8 and Figures 35-37), four surveyors also conducted a visual survey of the surrounding cliff area, and two skin divers conducted two coordinated twenty-meter underwater circle searches designed to examine the sea floor for remains of some kind of battery. None of these surveys, however, yielded additional artifacts.

FIGURE 33. Survey VII Results. A surface search around the *cannon*, and two coordinated underwater surveys failed to reveal any additional artifacts. (Map by author, 2011.)

TABLE 8
FORT CHARLES CANNON FROM SURVEY VII, DIMENSIONS

Part of Cannon	**Measurement in Meters**	**Measurement in Inches**
Length from Button to Muzzle	1.64m	64.57 in
Length from Base Ring to Muzzle	1.48m	58.27 in
Length from Button to Base Ring	.16m	6.30 in
Length from Trunion to Trunion	.73m	28.74 in
Length of First Reinforce	.56m	22.05 in
Length of Second Reinforce	.31m	12.20 in
Length of Chase	.55m	21.65 in
Length of Trunnion	.11m	4.33 in
Diameter of Button	.09m	3.54 in
Diameter of Base Ring	.32m	12.60 in
Diameter of Trunions	.08m	3.15 in
Diameter of Neck	.20m	7.87 in
Diameter of Muzzle Swell	.25m	9.84 in
Diameter of Bore	.10m	3.94 in

FIGURE 34. Overview of the Fort Charles Cannon. Note that the cannon lies upside down, concealing its vent field and other potentially identifying marks. (Photo by author, October 27, 2009.)

FIGURES 35 *top left*, 36 *top right*, and 37 *bottom*. Detailed Photographs of the Fort Charles Cannon's *Cascabel*, *Trunnion,* and *Face,* respectively. (Photos by author, October 27, 2009.)

There are several details from the Fort Charles Cannon that suggest it was produced around the beginning of the eighteenth century (Table 8). First, the cannon's trunnions are approximately equal in length to the diameter of the bore. This suggests that the cannon was not produced earlier than the late seventeenth century (Lavery 1987: 97). Second, as the cascabel is less than two times the size of the caliber of the cannon, it seems likely that the gun was made before the cascabel length was standardized in 1768 to two and a quarter times that of the caliber (Padfield 1979). Finally, the cascable of the

cannon tapers off by means of fillets rather than a smooth curve, further suggesting that the cannon could not have been of late eighteenth-century make.

Given a production date somewhere between the late seventeenth and eighteenth centuries, as well as the cannon's relatively short length of 1.48 m, it seems possible that the cannon at the Fort Charles site is naval gun, either a British-made minion, or a Dutch-made 3-pounder. Minions were used widely in the 1600s, and their design, with a few modifications, remained in production and in use well into the eighteenth century. They were usually between 1.22 and 2.13 m (4 and 6.99 ft) in length, and robust. Dutch 3-pounders are similar to minions in size, varying between 1.37m and 1.83m (Muller 1768; Lavery 1987:103). Dutch 3-pounders were also produced and used aboard Royal Navy ships throughout the 1600s and early 1700s, though more sparingly as the eighteenth century progressed.

Though no other cultural remains were found near the Fort Charles Cannon, the presence of a colonial period cannon coupled with the location's "place name" (Fort Charles) suggest that the site may have been used for coastal defense. Referred to as "Fort Charles" by several locals (Wolde Kristos, Emsly, Michael Turner 2009, pers. comm.), it seems possible that the space acquired such a name through actual experiences in the seventeenth, eighteenth, and early nineteenth centuries and that the name has lived on in locals' cognitive understanding of their landscape through oral tradition (Westerdhal 2011:303). Moreover, the cannon's use of relatively small shot (3 pounds or less), and the fact that it was built for naval use but allegedly used at this site for land-based defense, suggest that "Fort Charles" might have been far more make-shift than the

place name might initially indicate. As Dr. Thomas Loftfield made evident in his study of colonial period fortifications in Barbados, defensive structures in the British Caribbean were often scantly built and ill-equipped because they were mandated by the colonial or imperial government, and often erected reluctantly and at locals' personal expense (Farnsworth 2001). Loftfield also noted that once out of use, defensive sites were quickly stripped down, as building materials were often scarce, expensive, and in high demand throughout the British West Indies. Consequently, even without surface remains of a structure, we cannot rule out the possibility that a colonial period fortification existed in (or at least near) the area examined during Survey VII.

Results from Survey VIII: The Oristano Fort and Cannon

Survey VIII covered the remains of another alleged fortification site known as "Oristano," and a nearby cannon, both within the property boundaries of the historic overseer's house on Bluefields Plantation. The current property owner led the surveyors to the historical remains by cutting through thick brush and vines with a machete. The entire Oristano site borders a cliff, and offers a commanding view of both the bay to the west, and of a small valley directly to the north. The cannon lies approximately seven meters downhill (and to the southwest) of the structure's remains (Figure 38 and 39).

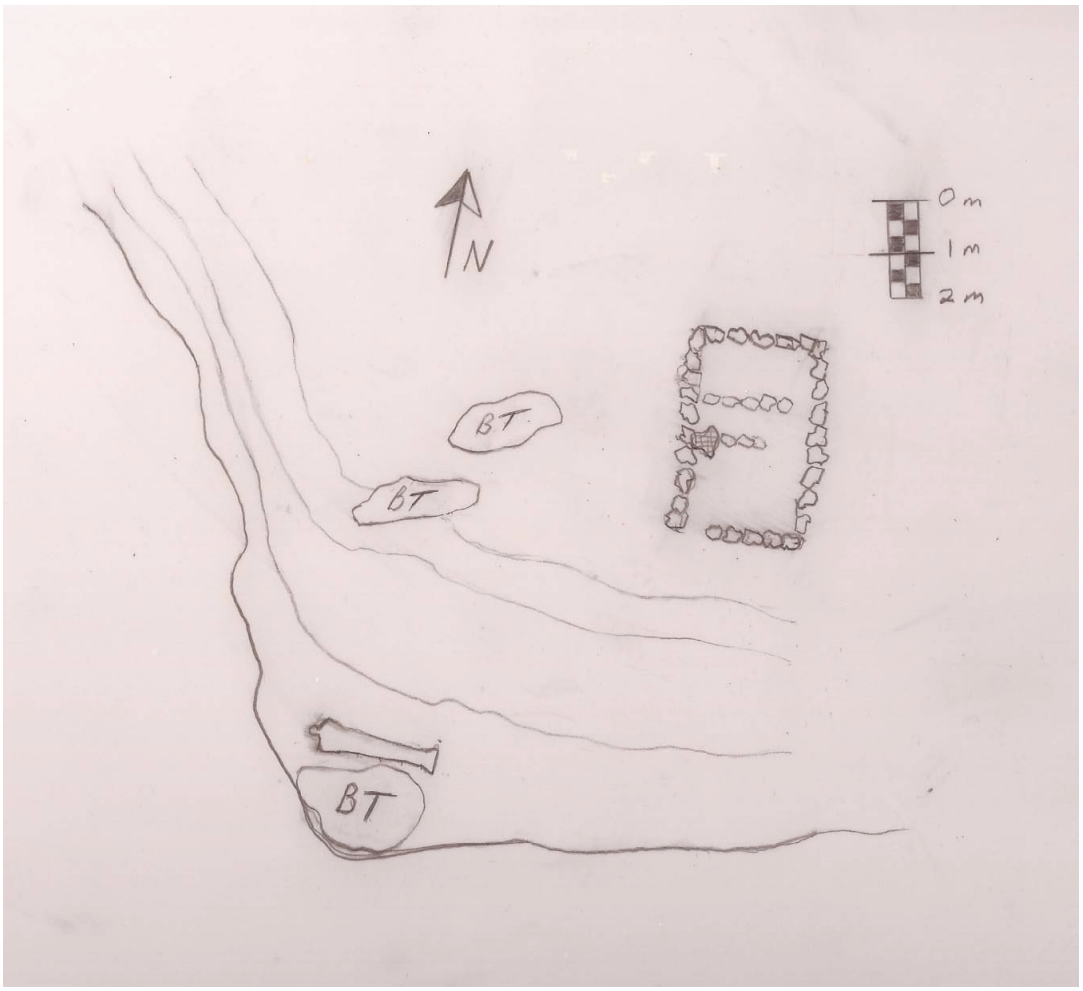


FIGURE 38. Oristano Site Plan. Note the contour lines that denote the cannon as being at a lower elevation than the fort. The abbreviation *BT* represent piles of "broken tabby" that appeared to be of the same type as the tabby forming the fortification. (Map by author, October 30, 2009.)

FIGURE 39. Results from Survey VIII. Survey VIII covered a historic site known locally as Oristano. Here surveyors documented a defensive structure as well as an associated cannon. Note the site's proximity to both Bluefields' Tavern and the Fort Charles Site. (Map by author, 2011.)

The Oristano Cannon

The muzzle of the Oristano cannon lies at 18.10'02.4 N, 78.01'27.0 W. From cascabel to muzzle the cannon was lying at an orientation of approximately 98 degrees. The cannon lay next to a pile of broken mortar that appeared to be the same type found in the fortification. Unfortunately, the cannon was upside down and could not be turned over. This prevented surveyors from examining the gun's vent field, and concealed any markings that might have been visible on the cannon's surface. Several measurements were taken, however, from the rest of the cannon and are displayed in Table 9. Figures 40 and 41 are both profiles views of the Oristano cannon, and show the muzzle or cascabel, respectively. Figure 42 shows details of the cannon's cascabel.

TABLE 9
ORISTANO CANNON FROM SURVEY VIII, DIMENSIONS

Part of Cannon	**Measurement in Meters**	**Measurement in Inches**
Length from Button to Muzzle	2.12 m	83.86 in
Length from Base Ring to Muzzle	1.96 m	77.17 in
Widest Diameter (at Cascabel)	.26 m	10.24 in
Narrowest Diameter (at Muzzle)	.17 m	6.69 in
Bore Diameter	.08 m	3.15 in
Diameter at First Reinforce	.24 m	9.45 in
Length of First Reinforce	.47 m	18.50 in
Diameter at Second Reinforce	.21 m	8.27 in
Length of Second Reinforce	.36 m	14.17 in
Diameter of Third Reinforce	.16 m	6.30 in
Length of Third Reinforce	.45 m	17.72 in
Diameter of Chase	.20 m	7.87 in
Length of Chase	.17 m	6.69 in
Diameter of Trunnion	.07 m	2.76 in
Length of Trunnion	.12 m	4.72 in
Length from Trunnion to Trunnion	.37 m	14.57 in

FIGURES 40 *top*, and 41 *bottom*. Views 1 and 2 of the Oristano cannon. Note that the cannon is upside down, exposing the side to which the trunnions are closest, but concealing the cannon's vent field and other possibly identify markings. (Photos by author, October 30, 2009.)

FIGURE 42. Detail of the Oristano cannon's cascabel. (Photo by author, October 30, 2009.)

With no distinguishing marks for clues, the identification of this cannon becomes a rather difficult task. Still, the ratio of 25 that exists between the cannon's bore diameter of .08 m and overall length of 1.96 m suggest that the cannon might be a British made culverin type, either a demi-culverin or a saker (Padfield 1974:31). If a demi-culverin, it is a small example, and was more than likely a "cutt," meaning the cannon was shortened after its founding, to achieve a specific range or effect. If this were the case, the cannon would have a potential production date ranging from the late sixteenth century through the early eighteenth century. The cannon's lack of ornate decorations, and the absence of bandings around its muzzle support this identification, as they suggest a production date sometime during the eighteenth (Manucy 1954). Alternatively, the cannon could be a saker type culverin. This would give the cannon a much narrower and earlier range of production, ranging sometime between the late sixteenth century and the 1660s. In either case, the relatively small size of it's bore, makes it unlikely that this cannon was designed to use shot any larger than 6 pounds (Griffith 1854). Furthermore, if it is either a demi-culverin or saker, it would mean that like the cannon found at the Fort Charles site, the Oristano cannon was not purpose built for use in a fort, but instead a sea gun that was reused for coastal defense after it had become outdated in naval tactics (Farnsworth 2001).

The Oristano Structure

The Oristano structure was found under considerable brush and had trees growing through it. Though virtually all of its walls were at least partially destroyed, enough of

each side remained so that a general outline of the structure was apparent. The western and eastern walls were approximately five meters long, and showed evidence of being connected by southern and northern walls each approximately three meters long (Figures 43-45). The highest preserved walls of the structure measured one meter, but no consistent height could be measured for any duration along any of the four walls. Though initially appearing to be built of rocks and mortar, upon closer inspection, the walls proved to be comprised of broken up pieces of tabby, a grayish and porous construction material. There were also two separate shards of tabby within the structure, lying perpendicular to the western wall (Figure 46). These were approximately a meter and a half in length, but it was unclear if they were interior walls, or pieces of other walls that had fallen in.

Tabby is an inexpensive, relatively old, and readily available type of mortar, comprised of lime, sand, oyster shell, and water (Wells 2004). Lime, which was the most difficult ingredient to obtain, was still accessible even in remote areas, as it could be extracted from oyster shells by burning them in large wooden pyres known as "ricks." Once the necessary elements were assembled, water could be added to create the liquid tabby, or slurry. This slurry could then be poured into bottomless rectangular molds to create the walls of a structure (Sheehan and Sickels-Taves 2002). The Spanish were the first to use this mortar in the New World, erecting tabby fortifications throughout the sixteenth, seventeenth, and eighteenth centuries, most famously in St. Augustine, Florida, and San Juan, Puerto Rico (Wells 2004:11). Once established in North America, however, British settlers and government officials quickly adopted this style of mortar

and used tabby to erect houses, fortifications, and other permanent structures, erecting major works like Fort Prince Frederick at Port Royal, South Carolina, (built entirely out of tabby) by 1732 (Sickels-Taves 1997:22).

The use of tabby in the Oristano structure, then, gives it a possible construction date ranging between the mid 1500s and early 1800s. Unfortunately, there are no distinguishing characteristics that denote whether the structure was Spanish or British built, so we are left to rely on the wisdom of Bluefields' locals for any further interpretation. When interviewed, the present day owner of the property, named Willy, claimed that the Spanish built the structure in the early 1600s for use as a fortification and magazine. Willy also claims that English ships blasted the fort to pieces with cannon fire during the hostile English take over of Jamaica in 1656 (Willy 2009, pers. comm.). While this explanation would certainly account for the ruined state of the structure, the displacement of the cannon, and the pieces of tabby scattered about the site, it does not match our estimated eighteenth-century production date of the Oristano Cannon. Moreover, Willy also mentioned that he sold another cannon from the site about ten years ago, which bore the crest of King George III (Willy 2009, pers. com.). As a British cannon produced between 1760 and 1820, the presence of this second cannon on the site would at least suggest that the structure was used by Englishmen in the later eighteenth century, even if it was not initially built by British colonists.

FIGURE 43. Exterior of the western wall of the Oristano Structure. (Photo by author, October 30, 2009.)

FIGURE 44. Interior of the eastern wall of the Oristano Structure. (Photo by author, October 30, 2009.)

FIGURE 45. Interior view of the Oristano Structure showing its two Interior Features. It is unclear if these are the remains of interior walls or pieces broken off from other fallen walls. (Photo by author, October 30, 2009.)

Results from Survey IX: The Lone Cannon

During Survey IX, skin diving surveyors successfully relocated the cannon first documented by Dina Bazzil's 2008 surveying crew at 18.8'46.4N and 78.1'43.2W. The cannon rests on a sandy bottom in about 2 m of water and approximately 100 m from the shore (Figure 46). Surveyors took the cannon's measurements, and conducted a 100 m circle search around it. Concretions and immovable bio-clutter concealed many of the cannon's construction details, but some information was still gathered (Table 10, Figures 47-50.) The circle search portion of Survey IX revealed no additional artifacts.

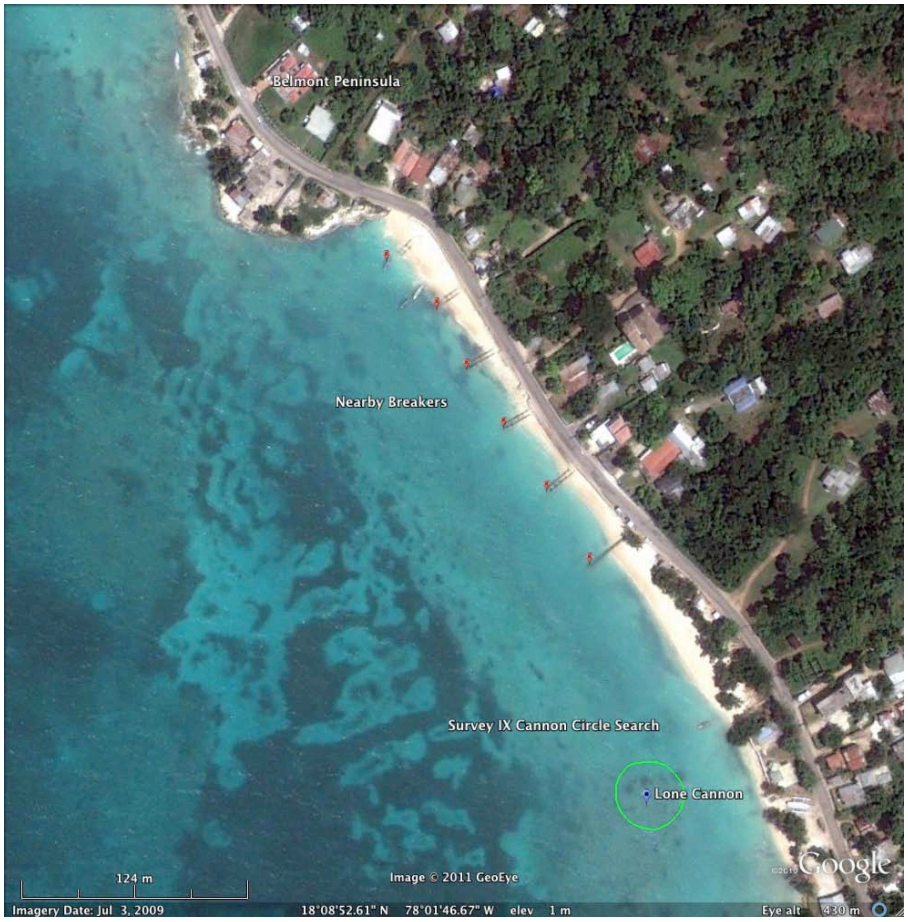


FIGURE 46. Survey IX Results. Note the cannon's proximity to Belmont Peninsula. Survey IX's circle search failed to find any debris in association with the cannon. (Map by author, 2011.)

TABLE 10
LONE CANNON FROM SURVEY IX, DIMENSIONS

Part of Cannon	**Measurement in Meters**	**Measurement in Inches**
Length Overall	1.45 m	57.09 in
Length from Base Ring to Muzzle	1.26 m	49.61 in
Length from Button to Base Ring	.13 m	5.12 in
Length from Trunion to Trunion	.63 m	24.80 in
Diameter of Button	.10 m	3.94 in
Diameter of Base Ring	.30 m	11.81 in
Diameter of Trunnions	.08 m	3.15 in
Diameter of Face	.21 m	8.27 in
Diameter of Bore	.08 m	3.15 in

With no distinguishing marks, and no associated debris, it is difficult to ascertain the make, and thus year of production of this cannon. What can be said though is that regardless of the year of the cannon's production, it is very small. With a length of 1.14 m (4.13 ft) and thus, a weight probably no greater than 203.21 kg (448 lbs. or 4 cwt), several seventeenth- and eighteenth-century gunners' and founders' charts suggest that the cannon was designed to fire shots no greater than 3 pounds (Muller 1768[2]:56;Padfield 1974:107; Lavery 1987:97-104). It should also be mentioned, that to be of any tactical use at sea, this cannon would have had to have been used aboard a relatively small vessel where it would have been accompanied by other similarly sized guns. In the company of significantly larger artillery, it is unlikely that there would have been an opportunity to fire such an ineffective and short range weapon (Lavery 1987). Alternatively, this cannon might have been purchased and used exclusively on land in Jamaica where it might have aided in coastal defense, or in the suppression of Jamaican slave revolts throughout the eighteenth century (Pitman 1967; Hall 1999). Regardless of the purpose it served, the cannon was most likely superficially deposited at its present location for use as a mooring. This was made evident at the time of the survey, because the cannon had several pieces of polypropylene line attached to it, and again, when surveyors realized that it sits only a short distance from a collection of breakwaters where a number of small fishing vessels tie-off and moor (Figure 46).

FIGURE 47 *top left*, FIGURE 48, *top right*, FIGURE 49 *bottom right*, and FIGURE 50 *bottom left*. Details of the Lone Cannon's cascabel, trunnion, bore, and muzzle respectively. Note the tremendous amount of hard coral growth and concretions which made it impossible for surveyors to find any distinguishing marks. (Photos by author, October 18, 2009.)

Results from Survey X: The Old Wharf

Survey X covered the coastline of Bluefields Bay from 18.09'41.3 N to 18.10'07.7 N and sought to find the remnants of an "Old Wharf" that is depicted in a property line map drawn sometime in the nineteenth century (Figure 51). The only structure(s) found during this survey were two groups of iron I-beam pilings, found between 18.09'44.9 N and 78.01'37.6W and 18.09'46.6 N and 78.01'37.0 W (Figure 52). The two groups of pilings are of identical pattern and number. They are each comprised of twenty-two I-beams that

form two parallel rows. The rows are perpendicular to the shoreline, nearly due east and west, and from the shoreline run approximately 24 m out to sea, and nearly 7 m inland. Within each row, the beams are approximately two and a half meters apart, and the rows are nearly two and a half meters apart throughout (Figures 53 and 54). The two groups of pilings lay just 50 m apart.

FIGURE 51. Property line map of Bluefields Bay from the late nineteenth- or early twentieth-century. When compared to Figure 52 it becomes clear that the road and other property lines have not changed significantly, making this map useful for defining the parameters of Survey X (Map courtesy of the Spanish Town Archives, Jamaica scanned by Dr. Wedenoja, 2008.)

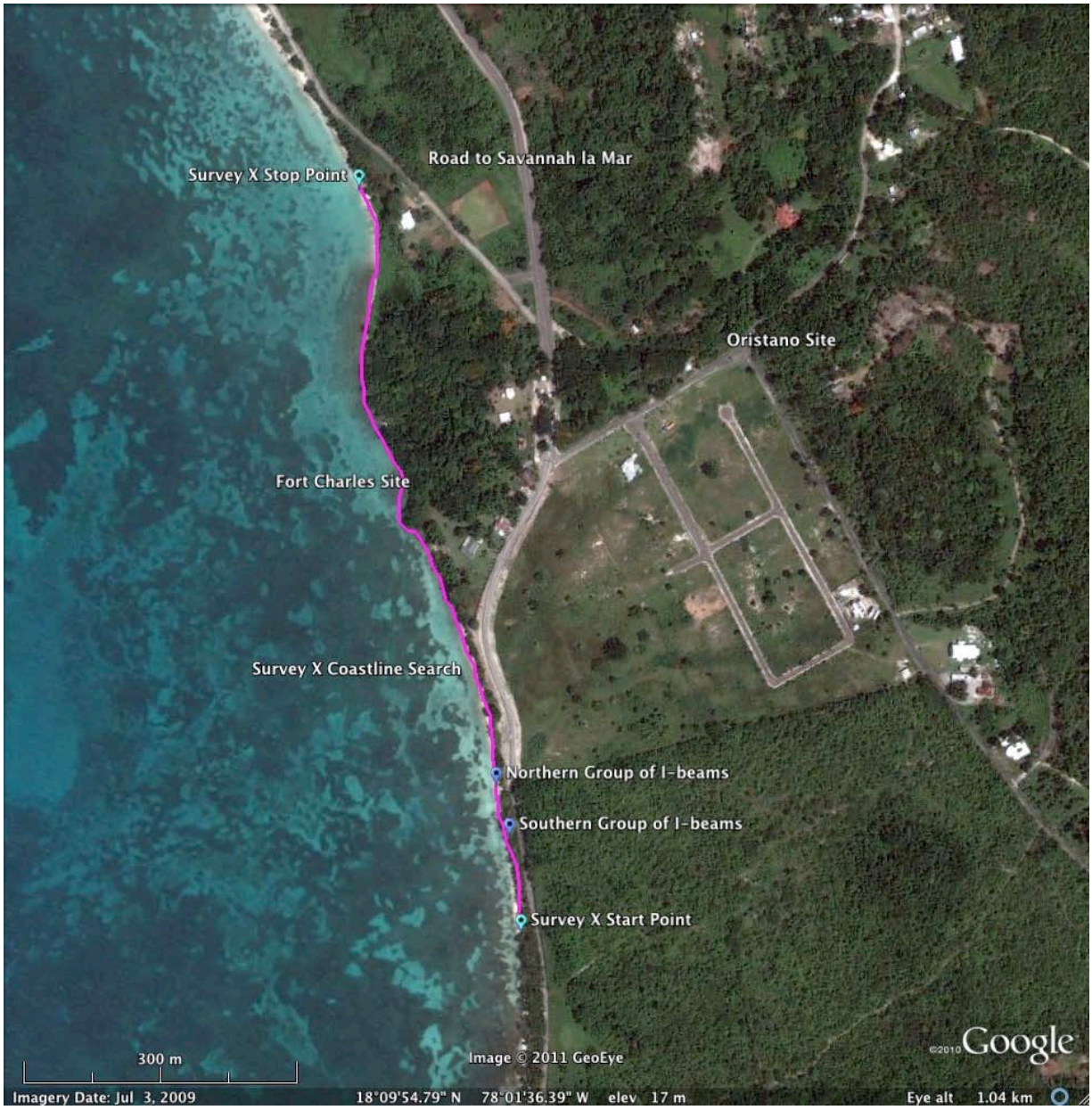


FIGURE 52. Survey X Results. Surveyors examined the highlighted area in search of evidence of the wharf structure depicted in Figure 48. The survey revealed two groups of late nineteenth or twentieth century iron I-beams that might have been pilings for a wharf or pier. (Map by author, 2011.)

FIGURE 53. Interior of the Southern Group of I-beam Pilings. Shot from their western extent facing east. Photo by author, October 25, 2009.)

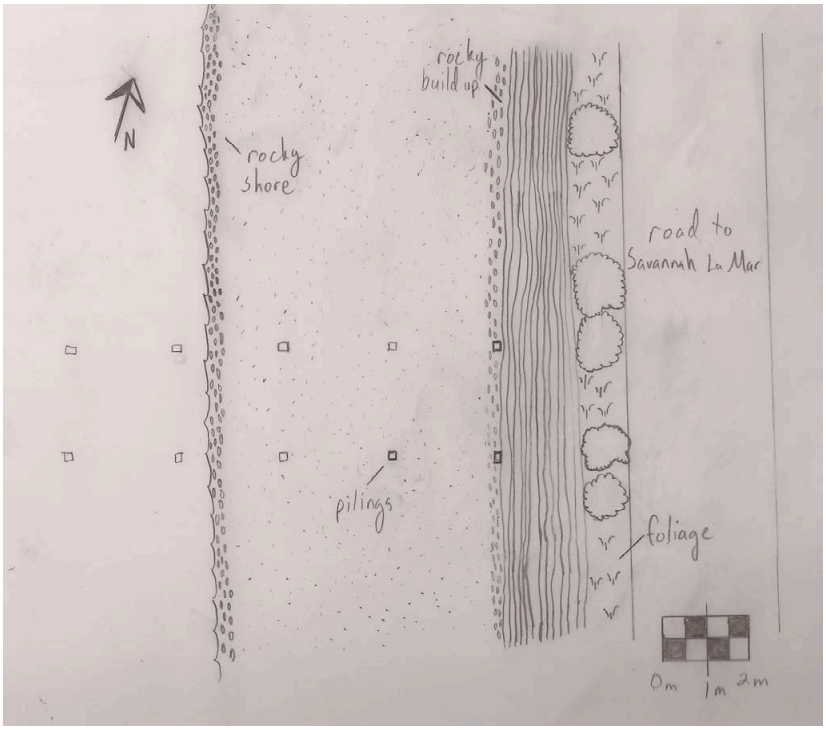


FIGURE 54. Plan View of the Southern I-beam Pilings near the Shoreline. Note how the pilings seem to end amidst the *rocky build up*. (Drawing by author, 2011.)

All of the I-beams from both groups are made of iron, and appear to be uniform in design. It seems likely that the I-beams were designed to be nearly 14 cm in width, as many were found of to be of this width, and none were found to be wider (Figure 55). It is much harder, though, to determine the I-beams' designed length, as it is unclear how much of each I-beam lies buried beneath the ocean floor. What can be said is that the maximum height recorded from any of the I-beams was 1.58 m from the sea floor to the top of the I-beam. Most of the I-beams however, showed moderate to severe signs of deterioration and some no longer pierce the surface of the water (Figures 56 and 57). In cases where the tops of the I-beams were still in decent condition, surveyors found two circular holes, 5 cm from the tip of the I-beam. These holes are 13 cm from each other, and about 2.5 cm in diameter (Figure 58).

The I-beams' uniform design, which required intense heat, powerful bending tools, and automated machinery to create, suggests that they were produced some time after the mid-nineteenth century (Peterson 1980). It is also clear that the pattern of these I-beams pilings, with each group consisting of two parallel rows running perpendicular to the shore, is similar to the designs used in metallic piers and wharves commonly built in North America during the late eighteenth and early nineteenth centuries (Greene 1917). Traditionally, such a pier would have had wooden walls to help the structure withstand wave action, and to make it possible for vessels to tie up against it. Furthermore, it would have had wooden planking across its surface to allow for men or horse drawn carts to bring goods to and from vessels using the pier (Greene 1917). While the surveyors' inability to find any associated wood debris might dissuade us from interpreting these

pilings as part of a pier, it should be acknowledged that the life expectancy of a nineteenth-century salt-water metallic pier was no greater than thirty to forty years, and that severe wave action as well as tropical storms and hurricanes could have easily dismantled and displaced any parts of the pier not driven into the ground (Greene 1917:17).

FIGURES 55, top *left*, 56, top *right*, 57, bottom *right*, and 58, bottom *left*. Photos showing the *I*-beam's designed width, an example with severe deterioration, designed holes, and their distinctive I-beam shape, respectively. (Photos by author, October 25, 2009.)

Another piece of evidence suggesting that these I-beams might have formed the "Old Wharf" is that throughout the shoreline examined during Survey X, there existed a

steep and rocky incline between the beach, and the nearby road. Under closer inspection, it became clear that the incline was artificially created by a build up of bound clusters of rock. During an interview Wolde Kristos, the project's local liaison, explained that these clusters were used in order to raise the twentieth-century paved version of the road to Savannah-la-Mar beyond the reach of waves (Wolde Kristos 2007, pers. comm.) (Figures 52, 54, and 59). This rocky build up was acutely noticed during the examination of the two I-beam piling groups, as the lines of pilings extended well into the build up, and seemingly lead to the location of the historic road (Figures 54 and 59).

While only smaller vessels could safely use such a small structure (recall that even the tallest I-beams protrude only 1.58 m from the seafloor), it should be acknowledged that a pier of any size would have eased the transportation of goods to and from Bluefields Bay. Without such a wharf, goods had to be carried by canoe to larger vessels at anchor in Bluefields' or transported by land along the long road to Savanah la Mar (Hall 1999). These piers, then, may have offered nineteenth-century Bluefields inhabitants with a viable alternative, the ability to use smaller, wind propelled, boats in the transport of goods either to and from visiting vessels or to the far busier markets in Savannah-la-Mar.

FIGURE 59. Rock clusters used for the road to Savannah-la-Mar. These rock clusters were found along the shore throughout Survey X. They were artificially placed here to raise the historic road of Savannah-la-Mar beyond the reach of storm surge and wave action. (Photo by, author October 11, 2009.)

Results from Survey XI: The Tavern Complex

Survey XI investigated the tavern building, and two nearby structures of potential historical value. Surveyors succeeded in capturing the present shape and condition of all three structures. The tavern building's northern face is 16 m wide, and the structure spans 14 m north to south. Its northeastern corner lies at 18 09'57.2 N 78 01'37.0 W, just 3 m from the road to Savannah-la-Mar (Figure 60). The structure is approximately sixteen meters wide, and eleven meters long from north corner to south corner (Figures 61-64). Though suspected of being in continuous use since its construction in the eighteenth century, the building's only recorded renovation was in the 1970s, when it was converted

into a police station. It remained in use as such until 2006, when the barracks in the station caught on fire (Dr. William Wedenoja 2009, pers. comm.). At the time of this writing, the building is abandoned and in very poor condition. Surveyors found modern debris throughout the structure, and noted that the second floor rooms have holes in the floor and are structurally unsound. While the building shows signs of containing a jail cell, there are few other construction details left at the surface for observation. Many of the building's walls are reinforced or plastered over, and the floors are covered with cement in some places, and modern tile in others.

FIGURE 60. Survey XI Results. Survey XI covered three buildings, the *Bluefields Tavern*, an adjoining *Oven*, and a *three-sided wall* nearby. Note the tavern's proximity to the *road to Savannah-la-Mar*. (Map by author, 2009.)

FIGURE 61 *top left*, 62, *top right*, 63 *bottom righ*t, and 64 *bottom left*. Photographs of the Tavern's northeastern corner, northwestern corner, northern side, and southern side, respectively. Notice how close the northeastern corner is to the road to Savannah-la-Mar. The southern side is most likely the view of the tavern that was available to ships entering the bay during the colonial period though in this picture it is heavily renovated. (Photos by author, October 26, 2009.)

The Oven

Just two and a half meters to the south of the tavern building is a smaller single roomed rectangular structure with a brick oven attached to its southern side. This building is made of brick and mortar that has been covered over with concrete, and has wooden support beams at its four corners (Figures 65-68). It also possesses a wooden doorframe on its northern side as well as wooden window frames on its eastern and western sides. It is three and a quarter meters wide on its northern side, and runs six meters long from

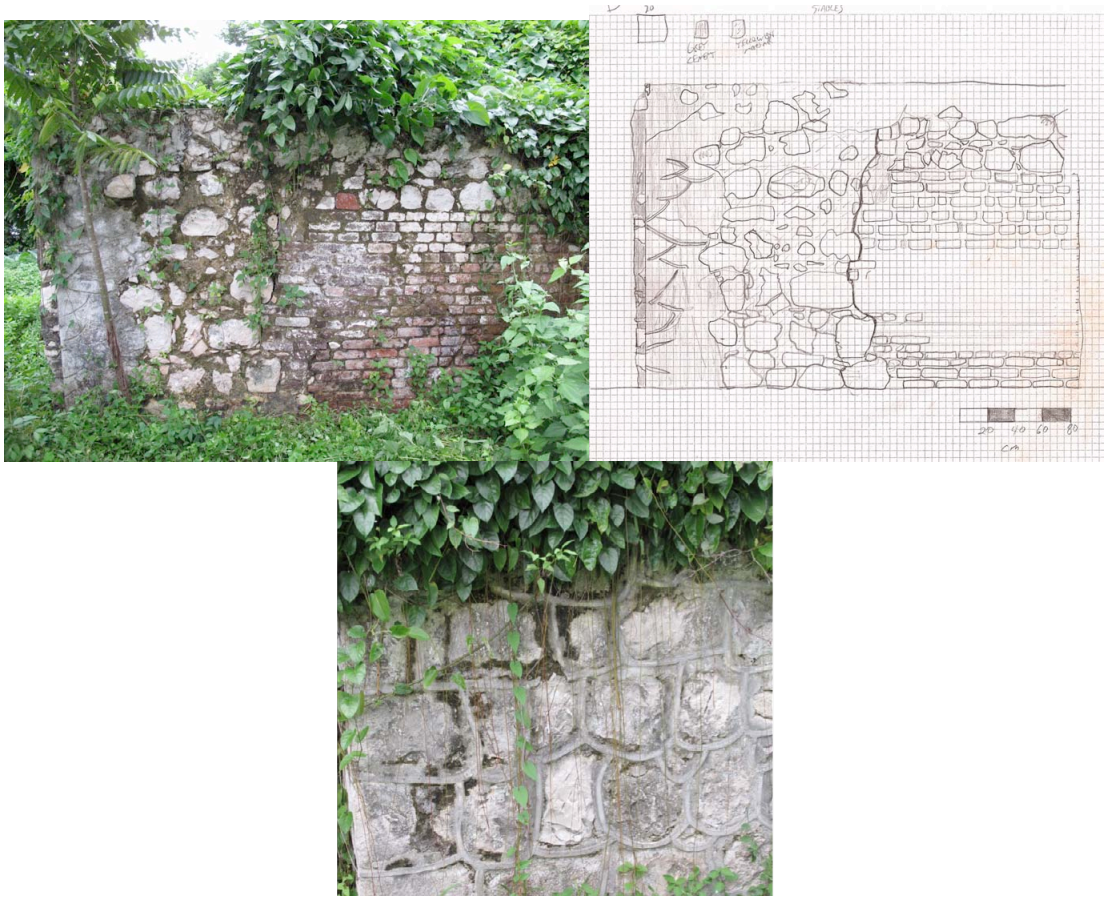
north to south. The structure also has a pre-fabricated tin roof, which based on its pattern and uniformity, may be from the twentieth or later nineteenth century.

The interior of the building lay in ruins, and only offered surveyors evidence of two ovens, one larger and one smaller, that are accessible in the southern wall.

FIGURES 65 *top left*, 66 *top right*, 67 *bottom right*, and 68 *bottom left*. Views of the Oven Building's north, east, and west sides, and an interior view of the oven from the south respectively. Notice the brick oven attached to the southernmost wall of the structure. In Figure 65 it appears to have two oven openings, a larger one on the left, and a smaller one on the right. (Photos by author, October 26, 2009.)

The Three-Sided Wall

The final structure in the tavern complex appears to be a stable or carriage house of some kind, as it is rectangular in shape but possesses only three walls. The stonewall lies approximately 15 m to the southwest of the Tavern. It is nearly 10 m wide, just under 5 m long, and stands with its open side facing almost due south. The wall's design is composed of at least three different styles of construction, a pattern using larger, presumably older stones and mortar, another pattern using bricks and mortar, and an identifiable twentieth century pattern that uses white stones mixed with concrete (Wolde Kristos 2009, pers. comm.) (Figures 69-71). Furthermore, parts of the wall are covered in concrete (Figure 72). Based on this evidence, it seems that the structure has undergone at least two reconstructions since it was first built. The northern interior of the wall also has three rectangular indentations, each approximately a third of the width of the wall apart (Figure 73).



FIGURES 69 *top left*, *70 top right*, and 71 *bottom*. Photograph and a measured drawing of the western interior side of the Three Sided-Wall, as well as a detail of eastern interior of the wall respectively. (Photos by author, October 26, 2009.)

FIGURES 72 *left*, and 73 *right*. North interior of the Three-Sided Wall, and a plan view of the wall, respectively. (Photo by author, October 29, 2009. Drawing by Joey Roberts, same date.)

All three of the tavern complex structures show signs of reconstruction and refurbishment, which in turn suggest dates of use. Each of the structures contains at least one construction material that is likely from the later nineteenth or twentieth century, including the tile and veranda on the tavern, the tin roof and concrete on the oven building, and the modern stone and concrete pattern on the wall. Other construction materials, like the stone and mortar, or bricks and mortar used throughout the complex, suggest that the buildings were built, rebuilt, and re-used several times between the eighteenth and twentieth centuries. Bluefields' historical record reinforces this interpretation, with late eighteenth-century memoirs and charts that mention and make use of the tavern as a navigational landmark (Hall 1999:290; Leard 1792:36) (Figure 2).

Results from Survey XII: John Leard's "Watering Place"

Survey XII investigated an area thought to contain the "Watering Place" as mentioned and depicted in John Leard's eighteenth-century *Sailing Directions*. Using Leard's navigational chart as reference, surveyors examined a prominent fresh water stream to the northwest of the tavern complex; an area known locally as "water wheel." The stream stems from the base of a rocky hill, approximately 100 m east of the coastline, and spills out into a shallow and sandy-bottomed bay (Figure 74). The stream's clear water and shallow depths allowed surveyors to visually inspect most of the stream, as well as a large portion of the bay's seafloor and coastline. While surveyors encountered some modern debris, the only potentially historic objects found were eight chunks of rock that sit within the stream itself. Surveyors established a datum for the stone chunks, at

18.11'30.23 N and 78.2'17.43 W, numbered and recorded them, and interviewed local property owners about the stream, its bay, and the stone chunks (Figure 75). Each chunk is comprised of gray, porous rocks and mortar, which the stream has turned black. Together the eight chunks form a loose line that stretches nine and a half meters across the width of the stream (Table 11) (Figures 76 and 77).

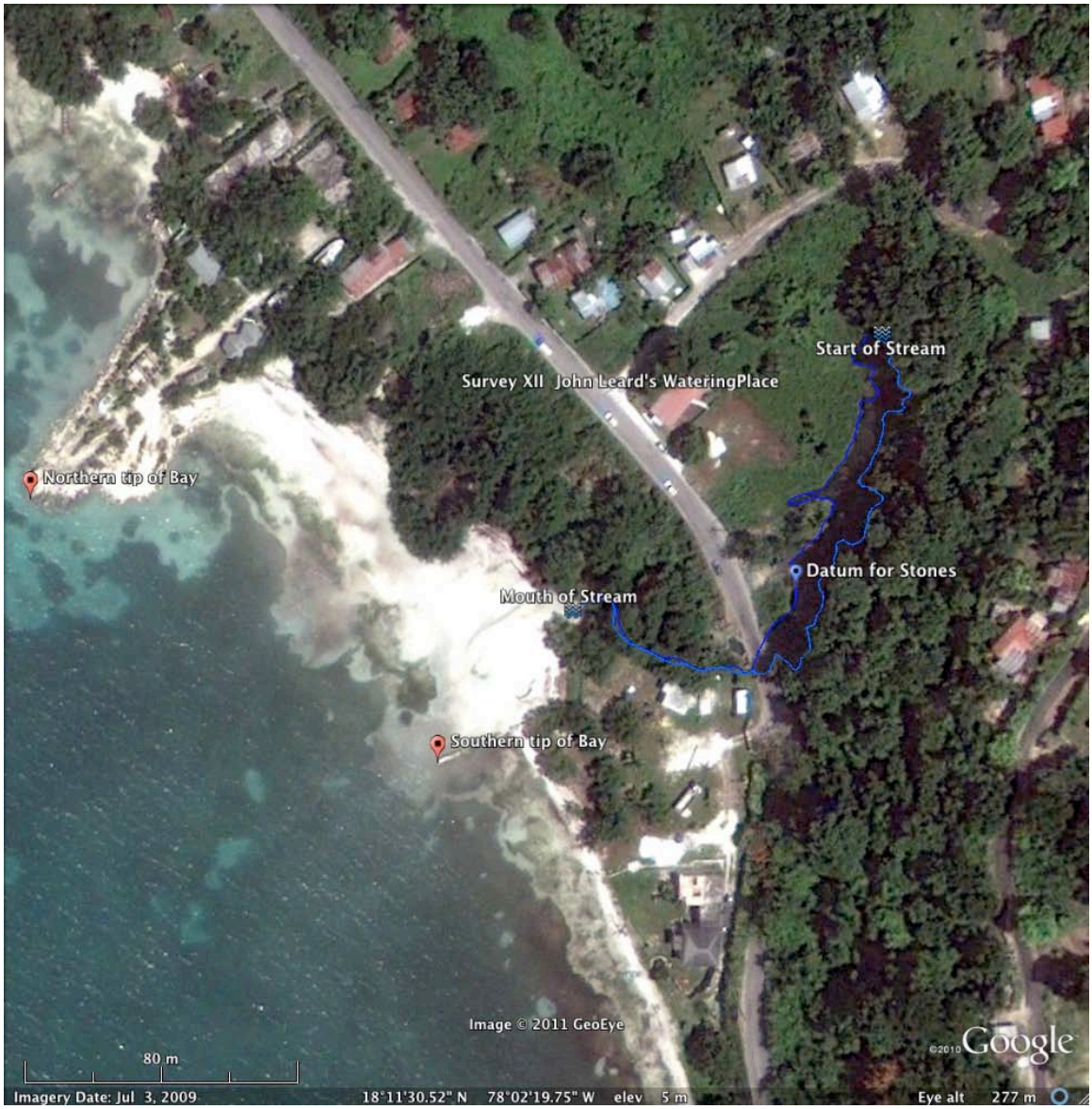


FIGURE 74. Survey XII Results. The prominent fresh water stream covered by Survey XII starts approximately one-hundred meters from the coast and spills out into a small sandy bottomed bay. The *datum* for the stone chunks found in the stream is marked in *blue*. (Map by author, 2009.)

FIGURE 75. Overview of Stone Chunks found at the Watering Place. Photo taken from the north side of the stream. Together the stone chunks stretch nine and a half meters across the width of the stream. (Photo by author, October 27, 2009.)

FIGURE 76. Detail of *Stone Chunks 5 on left* and *7 on right* Photo taken from the west. Notice how close the two chunks are, suggesting that these two pieces, as well as the others, were once part of a single structure. (Photo by author, October 27, 2009.)

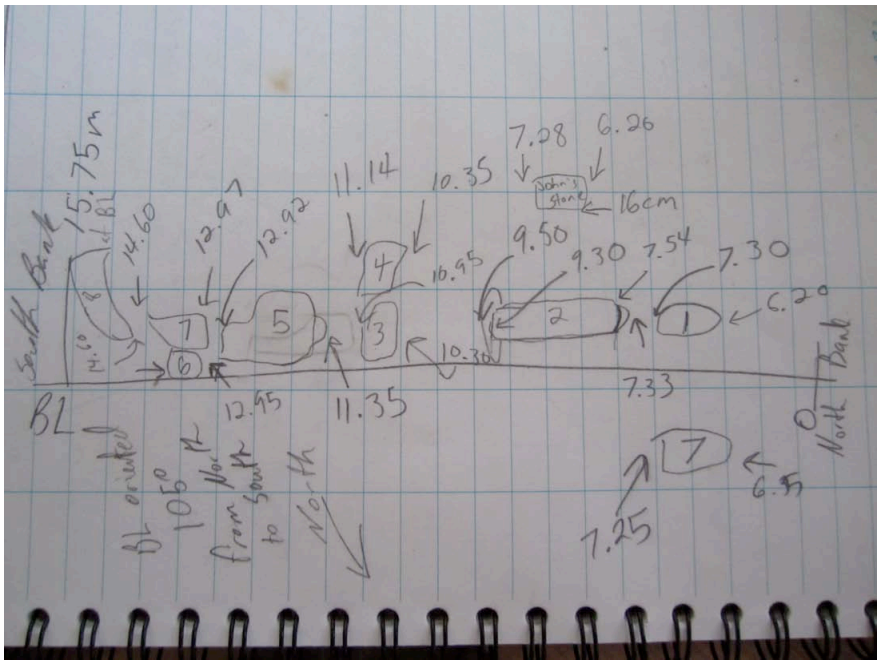


FIGURE 77. Field notes showing the lay out of the Stone Chunks, and their individual lengths as measured against Survey XII's baseline. Not drawn to scale. (Drawing by author, October 27, 2009.)

TABLE 11
LENGTH OF STONE CHUNKS FROM SURVEY XII, DIMENSIONS

Stone Number	**Measurement in Meters**	**Measurement in Inches**
Stone 1	.90 m	35.43 in
Stone 2	1.76 m	69.29 in
Stone 3	.65 m	25.59 in
Stone 4	.79 m	31.10 in
Stone 5	1.57 m	61.81 in
Stone 6	1.00 m	39.37 in
Stone 7	1.63 m	64.17 in
Stone 8	1.15 m	45.28 in

The stone chunks' pattern, combined with the fact that some of the chunks are very close together, (as narrow as three hundredths of a meter in some cases) strongly suggests that the stones were once part of a structure that at least partially sat within the stream. Though Survey XII did not reveal any further construction details from the stone

chunks, the historical account of life long local Owen Turner, suggests that the stones might have held a wheel in the stream for a mill turbine. When interviewed, Turner said the stones were about the same height for as long as he can recall. He further claimed that his grandparents used to tell him about how the stones once supported a wheel that would turn from the force of the stream (Owen Turner 2009, pers. comm.). Another local, named Stanford, has owned a piece of property adjacent to the stream for twenty years. While he was unable to comment on the nature of the stone chunks, he maintains that the stream has not significantly altered its path since he bought the property. Stanford also provided information about the bay created by the stream. According to Stanford, the bay's southern and northern edges are artificial and have relatively recent construction dates. The southern rock wall, which is partially covered in concrete, lies on his property, and was built with a permit from the National Environment and Planning Agency (NEPA) in 1991. He uses this wall as a dock for small boats. The northern end, he says, is still being built to this day, and is comprised of large boulders and modern debris (Stanford 2009, pers. comm.).

To better understand how the stone chunks might have formed part of a functioning mill, surveyors also investigated the more intact remains of the Calda-Shafston sugar mill located 6.23 km to the northeast of the stone chunks. When this eighteenth-century mill was in use, an aqueduct carried a constant flow of water from a nearby mountain and dropped it onto a waterwheel to power the mill's turbine (Roderick Ebanks 2009, pers. comm.). Though the wheel itself is no longer present, the four-sided structure that held the wheel in place still stands, and has two semicircular archways on

its eastern and western sides. These archways not only supported the axels of the waterwheel, but also allowed the wheel to connect to the sugar mill turbine located within a structure just to the east of the wheel. (Roderick Ebanks 2009, pers.comm.) (Figures 78-81).

FIGURES 78 *top left*, 79 *top right*, 80 *bottom right*, and 81 *bottom left*. Photographs of the Colldeer Shaftson Aqueduct from the south, Waterwheel Structure from the west, water leaving the Waterwheel Structure from the south, and water falling into the Waterwheel Structure from the north, respectively. (Photos by author, 2009.)

The use of a waterwheel structure at the nearby Calda-Shafston Mill makes it seem more likely that the stone chunks found during Survey XII could have been part of a wall for a similar type of waterwheel structure at the "watering place." In lieu of an aqueduct, however, the wheel at the "watering place" site would have been powered by the constant flow of the freshwater stream. If this were the case, the stone chunks might have formed the westernmost (or farthest downstream) wall of the waterwheel structure, with the large 80 cm gap between stones 2 and 3 serving as the outlet for water that has already run through the wheel (Figure 77.)

Results from Survey XIII: The Lime Kiln

As there are no historical references to the lime kiln in charts, maps, or literature on the area, Survey XIII sough to capture the lime kiln's GPS coordinates and to collect data from the kiln in an attempt to understand its design and origin. Unfortunately, the kiln's current owner, Mr. Howard Chin, cut Survey XIII short, and only allowed surveyors to quickly look at and photograph the kiln. The structure lies not 20 m east of the shore at 18.8'33.52 N and 78. 1'31.18 W (Figure 82). It is approximately nine meters long, three meters wide, and two meters tall (Figure 83). It features three firing pits, each with their own stoke holes, a flue, and a taller red brick chimney on its north side (Figures 84-88). There is also a modern pool with an unknown construction date immediately adjacent to the kiln's western wall. The kiln's finer details, such as the arches over the stoke holes and the firing pits are built out of bricks and mortar, while a combination of large grayish stones and mortar fill in the bulk of the structure's rectangular shape. The chimney,

though, is somewhat different. It includes bricks in the smokestack, and contains cleanly cut white porous stones at its base.

Lime kilns were used throughout the colonial period to burn naturally occurring forms of calcium carbonate (such as limestone, chalk, or oyster shell) at a temperature that expels carbon dioxide from the compound (approximately 900˚ C), leaving behind a powder consisting primarily of calcium oxide or "quicklime" (Sickels-Taves 1997). "Quicklime" could then be mixed with sand and water to produce mortar, the construction material used to hold bricks and stones together to form walls or the foundations of structures. Lime kilns were used throughout British North America and the Caribbean during the seventeenth, eighteenth, and nineteenth centuries, and were often built in particularly remote locations to produce lower quality, but substantially cheaper, lime than could be obtained from England (Vincent 1993:34). With the advent of crushed lime in the early twentieth century, however, lime kilns began to fall out of use (Nolan 1978).

FIGURE 82. Survey XIII Results. The *Lime Kiln* targeted by Survey XIII is south of Belmont Peninsula. The *Lone Cannon* and *Breakers* encountered during Survey IX have been marked on this map to add geographic context. (Map by author, 2009.)

Figure 83. Profile view of the *Lime Kiln*. Note that the *chimney* is on north side of the *Kiln.* The two surveyors standing on the south side can serve as a scale, as they are each approximately two meters tall. (Photo by Peter Campbell, November 6, 2009.)

The Bluefields lime kiln examined during Survey XIII has a number of characteristics that assist in estimating its date of construction and use. First, it is far larger than the seventeenth-century examples that have been examined in Jamestown, Virgina. Each of them only measured about 1.8 m long, and 1.8 m tall, making them well under a quarter of the size of the kiln at Bluefields (Bailey 1938). The Bluefields kiln is also distinctive as it possess three burning pits, each with their own stoke holes, a design similar to lime kilns built in Western Australia between the late eighteenth and early to mid nineteenth centuries. These kilns also had three stoke holes but used them to power just one firing pit (Pearson 1986:96) (Figure 89). The cast iron door (Figure 87), with its

round ended nails and machine riveted panels, would seem to confirm this turn of the nineteenth-century production date, because it is a displays metalworking techniques not readily available until about that period (Peterson 1980). Bearing these factors in mind, the kiln was probably built in the late eighteenth century or early 1800s, and used until the turn of the twentieth century, when crushed lime and other new construction materials came into fashion. In its heyday, it probably produced quicklime for both immediate use in Bluefields, as well as a trade good to sell in the imperial markets of Savannah-la-Mar.

FIGURES 84 *top left*, 85 *top right*, 86 *middle right*, 87 *bottom right*, and 88 *bottom left*. The Kiln's*:* eastern stoke holes, burning pits, southern flue, metal door, and red brick chimney respectively. Notice the *modern pool* just adjacent to the west side of the kiln, visible in Figure 85. (Photos by Peter Campbell, November 6, 2009.)

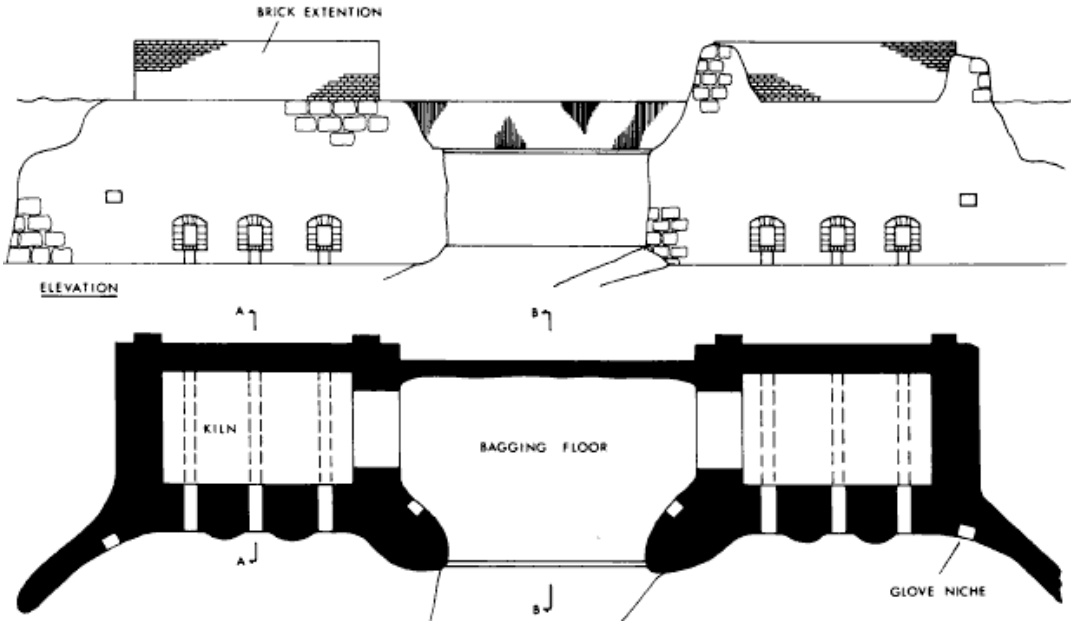


FIGURE 89. Example of a Lime Kiln erected in Western Australia around the turn of the nineteenth century. Note the presence of *three stoke holes* that were used to increase the temperature of the fires heating the limestone or chalk. (Diagram by Michael Pearson, 1986.)

Results from Survey XIV: The Pimento Factory

Survey XIV targeted a still operational pimento factory, the likes of which have been used in Westmoreland Parish Jamaica since the eighteenth-century (Roderick Ebanks 2009, pers. comm.). The factory was manned at the time of survey, so surveyors were only able to take a few photographs and document the factory's GPS coordinates. Located at 18.10'19.10 N and 78.1'17.80 W, this factory still makes use of eighteenth-century technology and processes to extract oil from Pimento leaves (Figure 90). The cast iron boiler heats the leaves. Once heated sufficiently, they secrete an oil that is transferred into a barrel of cool water. There it separates from the water it was boiled in and cools (Figure 91).

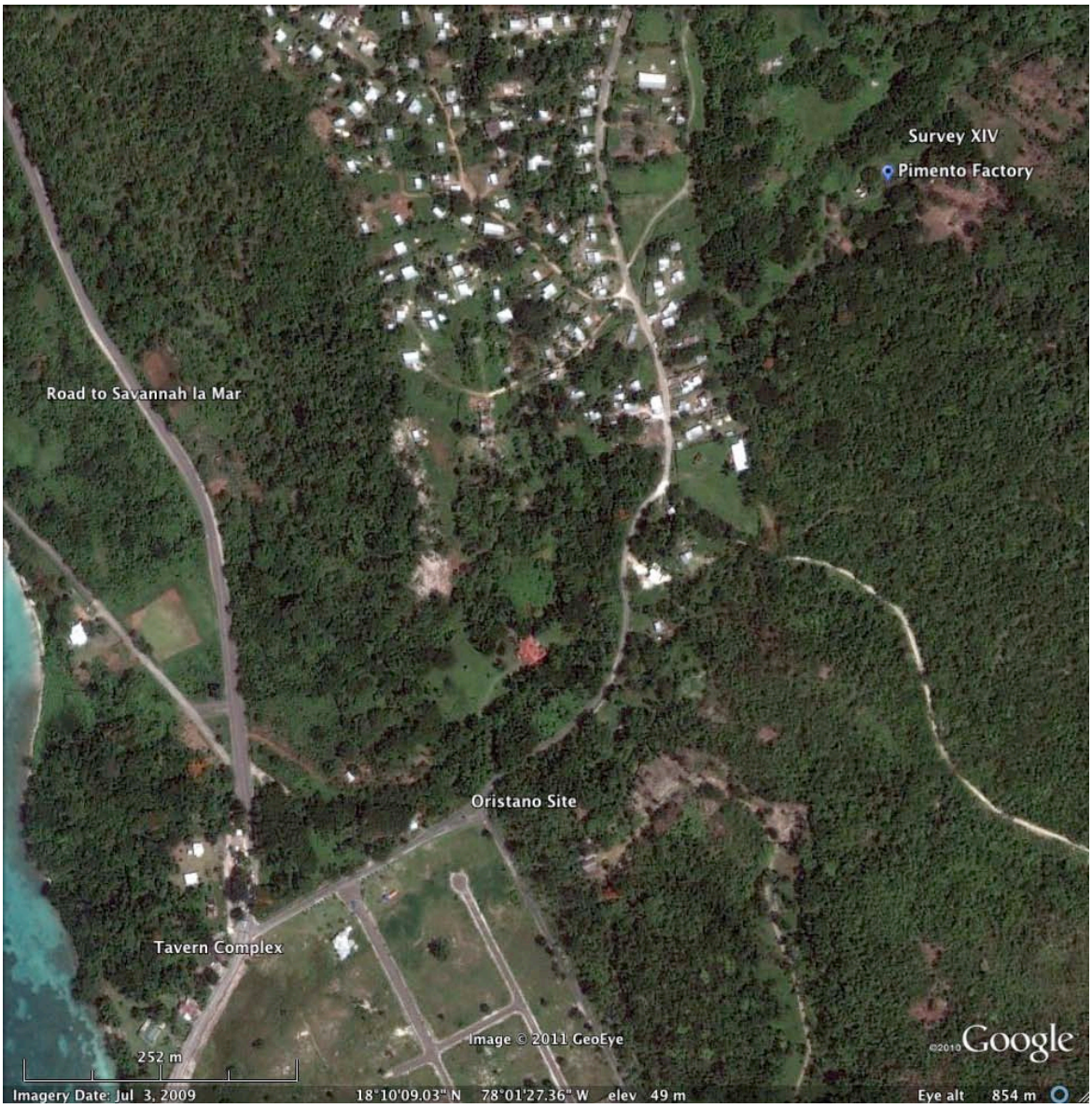


FIGURE 90. Survey XIV Results. Survey XIV documented a thriving Pimento Factory located to the northeast of the Oristano Site. The materials and techniques used at this factory are similar to those used in pimento factories throughout Jamaica. (Map by author, 2009.)

FIGURE 91. The Pimento Factory. Note the *cast iron boiler on the left*, the *bushels of pimento leaves on the right*, and the *cooling barrel at the bottom*. (Photo by author, October 13, 2009.)

Chapter 5: Interpretations

In the introduction to this thesis I proposed that a combined historical and archaeological investigation would further our understanding of both the physical and cognitive maritime landscape that existed in colonial Bluefields Bay, Jamaica. Specifically, I asked if any of the maritime activities suggested in Bluefields' historical record would coincide with the evidence found in the region's archaeological record. I wondered if the surveys would be able to locate Bluefields' historic shallow water anchorage and extract meaning from its surviving artifacts. And finally, I was curious to see if the historical and archaeological data collected for this project would allow us to characterize the imperial society that existed in colonial Bluefields, and identify the influences this culture might have had on the region's maritime cultural landscape. Having offered the findings of both my historical and archaeological investigations of Bluefields Bay elsewhere in this thesis, it is now my intention to answer these questions.

In response to my first question, I would suggest evidence from the Bluefields' archaeological record support several of the maritime activities mentioned within Bluefields' historical record. Indeed, at least one activity regarding maritime traffic, trade, and defense, proved to be consistent in both records. The notion that the bay harbored naval convoys in the late eighteenth and nineteenth centuries for example, is at least partially supported by the findings of Survey IV, which include three British longshank anchors large enough to be used on British ships-of-the-line, a British admiralty anchor likely to be from the nineteenth century, and a British carronade produced sometime between the 1780s, and 1820 (Wall 1932[2]:849; Wright and White 1969:173; Hall 1999:290). Similarly, just as the historic record suggested that Bluefields

planters might have needed niche products or crops to trade to compete in Britain's trans-atlantic economy, Surveys XIII (the Lime Kiln), and XIV (the Pimento Factory), confirmed the presence of industries in colonial Bluefields that could thrive because of the access to imperial markets afforded by nearby Savannah-la-Mar (Ragatz 1928; Pitman 1967; Hall 1999). The same pattern also holds true in terms of activities regarding the bay's coastal defense. Firsthand accounts from an eighteenth-century planter in Bluefields tell us that local planters' defensive efforts were self-funded and often therefore, meager and easy to disassemble after use, (Pares 1963:243; Hall 1999). The occupation of such flimsy fortifications seems to be confirmed by the findings of Surveys VII – X, which targeted areas thought to contain coastal fortifications. Though each of sites surveyed was either locally known by the place name of a fortification, or named as such on a historical chart, only Survey IX, the Oristano Site, yielded evidence of a permanent structure (Westerdahl 2011).

In response to my second question, have this project's surveys located Bluefields Bays' historic anchorage, I believe that through a conjunction of the results in Surveys I and IV this project has at least located *an* anchorage in Bluefields Bay, if not *the* definitive shallow water anchorage as described in John Leard's eighteenth-century *Sailing Directions*. As may be recalled, Survey I (John Leard's Route) targeted the seafloor along Leard's proposed route. Though it did not reveal any artifacts, it allowed surveyors to chart Leard's recommended route, and understand how some vessels might have deviated from his instructions. The five anchors, carronade, and other metallic debris relocated during Survey IV then further refined our understanding of the bay's flow of maritime traffic, as it suggested that at least some ships anchored slightly farther

to the southeast than Leard had proposed in his *Directions* (Figure 89). While it is not clear that this cluster represents the only historic anchorage in Bluefields, the cluster's abundance of artifacts contrasts sharply with the lack of artifacts found anywhere else during the project's underwater surveys. If this is not the bay's primary shallow water anchorage, it is at the very least a place where vessels tried to anchor. Future archaeological expeditions in Bluefields would do well to further investigate this artifact cluster, looking for either further signs of its use as an anchorage, or evidence that it might be associated with a wrecking event.

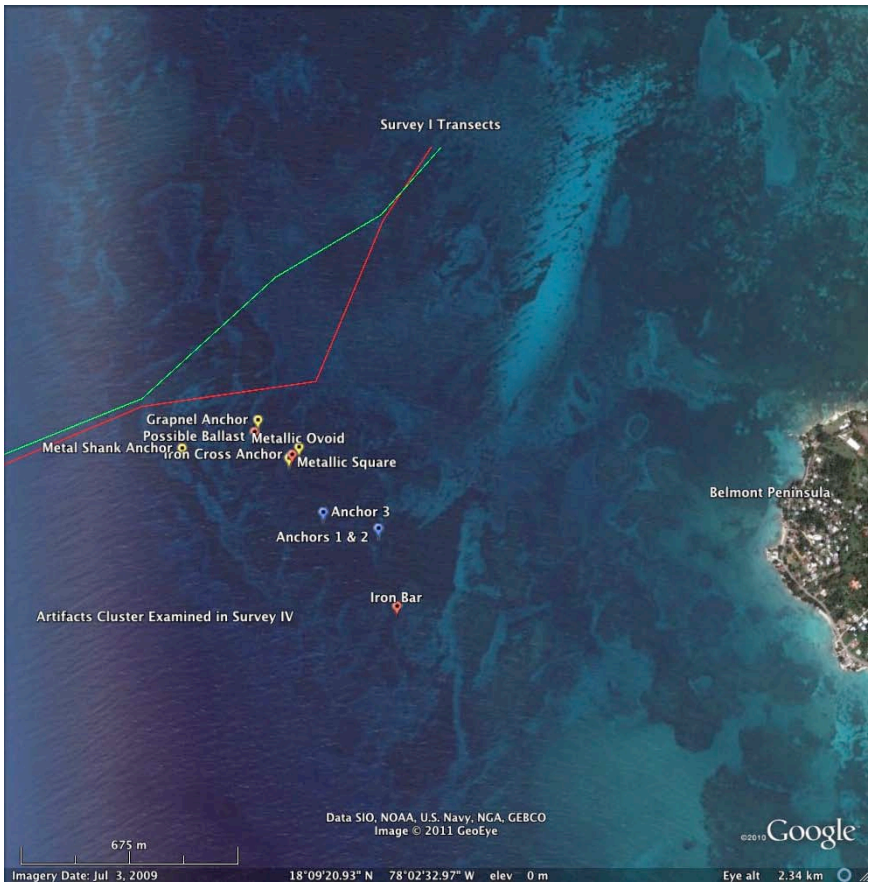


FIGURE 92. The *artifact cluster* thought to be Bluefields' historic shallow water anchorage. Note how Survey I follows John Leard's proposed route into the bay in his eighteenth-century *Sailing Directions*. The apparent artifact cluster discovered during Survey IV suggests that vessels were anchoring slightly to the southeast of Leard's directions. (Map by author, 2011.)

Finally, to answer my question regarding the characterization of Bluefields' imperial culture and the impact it might have had on Bluefield's colonial maritime landscape, we will need to apply several archaeological theories to the data collected during this project starting with Gidden's Structuration Theory (Westerdahl 1992; Jasinksi 1993; Flatman 2003). As explained in the introduction, Structuration Theory helps us identify the agents, agency, and societal structures that comprise a group's culture (Giddens 1984). Through our historical analysis of colonial Bluefields, we saw that the individuals, or agents, most responsible for the construction of bay's physical maritime landscape were the area's planters, and merchants (Hall 1999). As our archaeological investigation confirmed, these agents built a pimento factory, a lime kiln, and a local tavern (Surveys XI, XIII and XIV). They also used a wharf and constructed and manned coastal fortifications (Surveys VII, VIII, and X). But why did they create these objects, and why did they use these places? To answer these questions, we must view the archaeological remains in Bluefields as the physical manifestation of the agents' constant cognitive negotiation between the societal structures in place at Bluefields, and the physical and immaterial realties of life in the bay (Westerdahl 1992; Jasinksi 1993). To be sure, the agents in Bluefields confronted an incredibly powerful societal structure, one not only comprised of laws, economic regulations, and military orders created in London, but also of their financial constraints, dependency on imported goods, and inability to cause significant political or economic change (Giddens 1984). Coping with these divergent forces, but still invested in their own prosperity, the planters and merchants of Bluefields took the most practical courses of action (or what Giddens would describe as agency), which at times reinforced, while at others, resisted the societal

structure that surrounded them. (Giddens 1984; Dellino-Musgrave 2006:4). Through commercial actions, Bluefields' inhabitants seemingly reinforced parts of their societal structure. They produced niche goods like pimento and quicklime, rather than sugar, because they were relatively cheap, easy to make, and viable products in the imperial marketplace. They also reinforced the imperial economic system through their use of a nineteenth-century wharf and the region's historic road to transfer goods to and from Savannah-la-Mar. In so doing they actively acknowledged their role in the British Empire, exchanging their raw goods for manufactures that could only be obtained from the empire's metropol. But at other times, planters and merchants seemed to resist aspects of their societal structure. This is best demonstrated in their construction of fortifications, as they erected and manned forts only when required to by law, and even then, seemingly refused to build defensive structures of any real size or permanency. Through both their reinforcement and resistance of their society's structure, therefore, Bluefields' inhabitants allowed their imperially influenced culture to impact the maritime cultural landscape of Bluefields Bay (Giddens 1984; Westerdahl 1992; Dellino Musgrave 2006).

But what about those who visited colonial Bluefields aboard vessels. How did they perceive, use, and ultimately, impact the landscape of the bay? To find these answers, we must examine the evidence from Bluefields in light of a notion first posted by Bradley Duncan, that more than one cultural landscape can exist in the same region at a given time. (Duncan 2000). As explained in Duncan's honors thesis, cultural landscapes are comprised of perceptions of both physical and cognitive aspects of a social environment. If more than one party simultaneously uses and perceives the same areas differently, then it is possible for each group to create their own cognitive landscape of

the region based on their cultural beliefs and constraints (Duncan 2000:14). Duncan's theory seems to function well in Bluefields as the area's seaborne visitors were not burdened by the limited resources or lack of geographic mobility available to those living within bay. Moreover, rather than a landscape upon which they could either reinforce or resist their societal structures, the captains and seamen sailing into Bluefields probably viewed the landscape in a far more myopic fashion. For them, the landscape consisted of the route leading into the bay, the navigational hazards along that route, the bay's historic anchorage, and points on the coast where they could take on fresh water or goods. Interestingly, as a consequence of their more limited perception of the bay, mariners possess a far more limited capacity to leave a physical impact upon the region's landscape. By concerning themselves strictly with where they could take their vessels within the bay and why they would bring them there in the first place, colonial seafarers' decisions could determine whether or not they stopped in Bluefields, and if so, where they would anchor. Their impact on the physical landscape then, can only be described in terms of the archaeological findings of Survey IV, which revealed a collection of artifacts thought to be either an anchorage or wrecking event.

Another way to understand Bluefields colonial maritime landscape would be to employ Walter Christaller's Central Place Theory, to see how the landscape, as perceived by both its inhabitants and visitors, was influenced by the bay's proximity to the port city of Savannah-la-Mar. As Christaller posits in his *Central Places in Southern Germany*, central places produce goods and offer services consumed in the surrounding region and can be centers of commerce as well as traffic. He also suggested that the size of the region over which a central place has influence is malleable, and based upon a number of

dynamic forces that can alter the place-region relationship (Christaller 1996: 104-107). Ironically, to find the dominant central place impacting Bluefields' colonial maritime landscape, one needs to look to nearby Savannah-la-Mar, one of the larger colonial ports in Jamaica. Both Bluefields' historical and archaeological records confirm this theory, with the constant mention of Bluefields planters taking goods to Savannah-la-Mar in Thomas Thistlewood's eighteenth-century journal, and the archaeological remains of a meager nineteenth century wharf that was probably used only to ease the transportation of goods to this nearby port city. Locals, then, rather than constructing their own location for transatlantic trade, relied upon the commercial center of Savannah-la-Mar. Similarly, the way waterborne visitors used and perceived the bay's landscape was also impacted by the region's relatively short distance to Savannah-la-Mar. Lacking the diversity of goods and economic influence of the markets of the nearby port town, the visitors to colonial Bluefields' anchorage likely perceived the bay as a non-commercial setting, and might have visited the bay for a variety of non-commercial reasons including naval orders, seeking refugee from harsh seas, and a particular need for victuals or fresh water.

Finally, and perhaps most importantly, we must look at the maritime landscape in Bluefields Bay as a physical and cognitive part of the historic trans-atlantic route traversed by English and British ships throughout the colonial period. As the 1994 World Heritage Committee in Madrid recommended, it is worth considering that travel routes themselves are landscapes, as are their nodal points of arrival and departure, stopover/lodging places and watering holes (von Droste, 1995: 437, 439 and Duncan, 200: 13). While certainly not a major funnel of maritime traffic, Bluefields Bay did host trans-atlantic travelers. Instances in 1778, 1779, and 1782 when the bay was used in

wartime as a rendezvous point for transatlantic convoys show how Bluefields Bay was very much a part of British mariners' transatlantic route (Wright and White 1969:173; Hall 1999:290; New York Historical Society 1932[2]:849). The existence and republishing of John Leard's *Sailing Directions* in London throughout the 1780s and 90s, also shows that Bluefields Bay was part of a larger transatlantic system. Described as a remote but imperially controlled bay, it was clearly known by English navigators as a calm harbor with a useable watering place (Leard 1792:36).

Viewing Bluefields Bay as an extension of the transatlantic travel route can do much to help us understand how locals and visitors perceived and used the bay during the colonial period because it reminds us of how deeply connected the actions of those in Bluefields were to the actions of others performed throughout the British Empire. As subjects living in an extension of this much larger landscape, locals in Bluefields were compelled to act by imperial regulation, and economic need. Though thousands of miles away from Britain's metropol in London, both physical and cognitive aspects of Bluefields' maritime cultural landscape were influenced by the region's existence within the British Empire.

Conclusions

The historical and archaeological findings within this work have done much to further our understanding of the colonial history and landscape of Bluefields Bay, Jamaica. The history of colonial Bluefields offered here differs from the histories we often hear about Jamaica because the planters were far poorer than the absentee sugar planters discussed in most British Caribbean history text-books (Ragatz 1928; Pitman 1967; Craton and Walvin 1970). It is also different, because rather than studying a busy economic center like Port Royal, Kingston, or Montego Bay, this project focused on a far smaller and more decentralized region of the Island.

However, while one might have expected the uniqueness and remoteness of Bluefields Bay to have enabled its inhabitants to form a maritime landscape free of Imperial influence, the archaeological evidence from this thesis has shown that the colonial planters and visitors of Bluefields clearly shaped the region's landscape in a fashion that reflected their roles within the British transatlantic economy. Whether relying on the nearby port city of Savannah-la-Mar for markets to sell goods, or arriving by boat in Bluefields Bay to join a naval convoy, those who used Bluefields Bay definitely did so as British subjects.

Recommendations

While great efforts were taken to design this project's historically and archaeologically informed predictive model, the surveys performed during this study were inherently limited because they only examined the area's topmost surfaces on both the dry ground and sea floor. As a consequence, the next step in archaeological fieldwork at Bluefields would consist of terrestrial excavations at sites on the coast, and additional underwater surveys conducted with a sub-bottom profiler, such as a magnetometer. The terrestrial sites most ripe for test pits would certainly be those from Survey IX (the Oristano Fort and Cannon) and Survey XII (the Tavern Complex). Both of these sites have already yielded evidence suggesting heavy use, and each may yet reveal more about the dates of and reasons for their construction.

As for the proposed sub-bottom profiling surveys to be conducted in the bay, one would do well to use a magnetometer so that the readings will easily distinguish between a ferrous object and coral reef growth. This project lost interpretive data because during Phase II of Survey IV, underwater surveyors were unable to relocate several known artifacts. This happened because the artifacts were impossible to see against the backdrop of coral reefs. A magnetometer would also be useful because it would allow archaeologists to survey much farther to the west than the surveyors could during this study. Limited by budgetary constraints, this project's surveyors were forced to use a towboard and could only effectively investigate parts of the bay that were thirty meters and shallower. With adjustable depth remote sensing equipment the parameters of the underwater survey could be greatly expanded. In terms of explicitly defining areas of the bay that should be surveyed with a magnetometer or otherwise, I would strongly

encourage future surveyors to re-examine the artifact cluster found within the boundaries of Survey IV, as well as the reefs immediately to the west of Survey IV's western limits. The former is likely to contain additional artifacts associated with the known cluster, whether it prove to be a shallow anchorage, or a wrecking event. The latter could hold maritime clues that direct us towards the bay's deepwater anchorage as proposed by Leard in his eighteenth-century *Sailing Directions*.

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