

ARCHEOLOGICAL INVESTIGATIONS AT
FORT MATANZAS NATIONAL MONUMENT

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Section 2 of this report is based primarily on earlier historical research done by NPS historians Albert Manucy and Luis Arana, and Section 3 is the result of a natural resources survey of the monument done by monument personnel. Mr. George Fischer, National Park Service (SEAC), reviewed the manuscript in rough form, however any errors in fact or interpretation are my own.

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Section 1

INTRODUCTION

From April 1, 1975 until April 30, 1975, excavations were carried out in various parts of The Fort Matanzas National Monument, St. Johns County, Florida. The work was done by students in The Florida State University Field School, under the direction of Dr. Kathleen Deagan.

Fort Matanzas and the area of the monument have played a significant role in the culture history of northeast Florida, from prehistoric times until the present. The known history of the monument is outlined in section two of this report. There were many things that were not known, however, including the extent of the cultural resources within the monument area, and many aspects of prehistoric and historic human occupation. This unknown information was believed to be in danger, particularly that which could be yielded from middens on Rattlesnake Island itself, which were eroding into the Matanzas River. (see Fig. 2). Plans for additional construction could not be made in the monument area until the potential danger to existing resources was assessed.

The purposes of the excavations in the monument area were: 1) the survey, location and testing of archaeological resources within the monument, and the preparation of an archaeological base map for use in planning purposes, and 2) gathering specific information about the extent, nature and processess of cultural occupation of the monument area. In addition to these objectives, treated below in detail, the restrictions of time (twenty working days) prohibited complete excavation of any area, and the testing of every portion of the monument. For this reason, a series of recommendations and priorities to guide future archaeological research at the monument are offered in section seven(7) of this report.

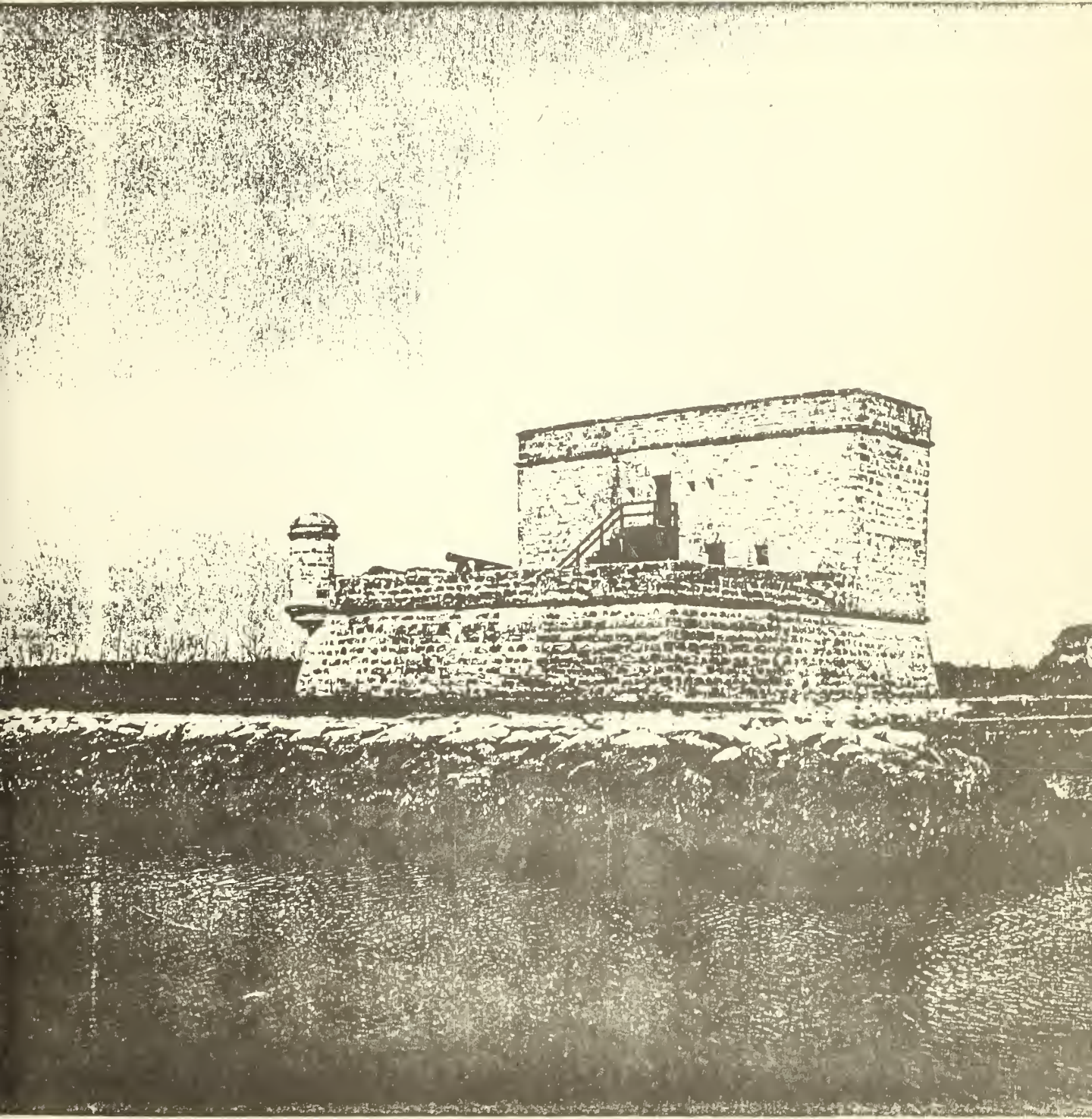


FIGURE 1

FORT MATANZAS NATIONAL MONUMENT

The first excavation purpose encompassed several specific goals. These were based on historical data and the results of a 1966 survey of the monument, (Gluckman:1966) (see below and section 2) and included the location and/or testing of several areas.

1. The Watchtower: This watchtower was known to have existed on the Anastasia Island portion of the monument, on the highest point of ground. This Spanish structure was of wood, erected in 1569 to watch the Atlantic Ocean, and the inlet and the Matanzas River. The highest point of ground is a large stable dune, on which a water tower had been constructed in the 1920's. This was the proposed area of the test.

2. The Massacre site: The site of the 1565 massacre of the French from Fort Caroline by Pedro Menendez is believed to be in or near the monument. Although the location of the site was considered highly unlikely, one goal was the testing of the area to the south of the visitor center, in which a marker noting the massacre had been placed.

3. Ancillary and possible earlier defense structures on Rattlesnake Island: Tests were to be carried out in the vicinity of Fort Matanzas in an attempt to locate any evidence for ancillary structures to the present fort, such as food preparation areas; privies, cisterns or storehouses, or earlier defense structures (Although the extant fort was constructed in 1742, there is no record of the presence or absence of previous construction).

4. The "Barracks Structure": There is shown a structure on Rattlesnake Island designated "barracks" on a map made in 1740 (Todman 1740).

Tests in the vicinity of the fort were to be carried out in an attempt to

locate this barracks structure, which may have housed soldiers prior to the construction of the extant fort; or workers building the fort.

5. The Middens: Two middens were located on Rattlesnake Island, one to the north of the fort and one to the west. The middens, particularly the north midden, are currently eroding, and dietary information, as well as possible information about aboriginal occupation of the area were objectives of those tests.

6. Visitor Center area: Since Gluckman's survey collected a large amount of extremely well-preserved Orange Fiber Tempered ceramics (ca. 2000-1000 B.C.) in the vicinity of the Visitor Center on Anastasia Island, tests were to be carried out in this area to gauge the extent and nature of pre-historic occupation.

The second purpose for excavation in the monument area, that of gathering specific information about the extent, nature and processes of cultural occupation, also had specific goals; which were the testing of three hypotheses :

1. Since Matanzas was occupied by hispanic soldiers during the first Spanish period, it is expected that they would have had access to food-stuffs from the situado. It is also expected that, being isolated from the center of population, hunting and fishing might have been a pastime, as well as a means of gathering food. A test of the middens should reveal the balance between use of supplied foods and the use of local resources in the soldier's diet. If aboriginal levels are present in the midden, a comparison could be made between aboriginal and European food resource use, and we would expect a shift from seasonal to year round exploitation

paralleling a shift from aboriginal to European occupation.

2. The hypothesis that ethnic affiliations, and degrees of acculturation on historic sites can be gauged by the presence of specific patterns of aboriginal-European artifacts, has been used in St. Augustine by Deagan (1974 a,b) and can be tested at Matanzas. Since Matanzas was occupied by European military personnel rather than families or mixed Indian-mestizo-European household units, we would not expect a strong indication of acculturation to be present. The indices used to gauge acculturation in the town include:

- a) Preference for San Marcos ceramics over European utilitarian earthenwares.
- b) Presence of aboriginal food preparation techniques
- c) Heavy dependence on local food resources with intermittent use of imported and domestic foods
- d) Presence of aboriginal items of hunting, fishing or trapping technology

3. The presence and/or persistence of aboriginal occupation of this coastal area is unknown archaeologically. Evidence provided by surveys indicates that Archaic and St. John's I,a-b occupations were followed by a hiatus until historic times (Gluckman 1966, Goggin 1952). An alternative hypothesis suggests that there may have been only seasonal occupation of the coastal area by later St. John's I and St. John's II people. This is suggested by the distribution of aboriginal groups at the time of contact (see Deagan n.d.). Excavation in the park were expected to yield information supporting one or the other of these hypotheses.

In order to achieve the goals outlined above, excavations were carried out in three locations on Rattlesnake Island and two locations on Anastasia Island. Augering tests were made extensively on both Anastasia and Rattlesnake Islands; and a resurvey was made of the entire monument area. These archaeological procedures are fully discussed in section IV of this report.

Archaeological Background of the Monument Area

Sites located in the area between the Crescent Beach Bridge and Marine land (see Fig. 2) reveal occupation ranging from Paleo Indian, through Orange, St. John's I, St. John's IIc, to historic times. Material from the late St. John's I and early St. John's II times (Goggin 1952) are scarce. Table I shows the sites in the area, and Figure 2 reveals their approximate locations.

Within the monument itself, four sites were known prior to excavation, including SJ - 28 (midden near Fort Matanzas - Webb 1885) and SJ- 44 (Fort Matanzas itself). In addition to these recorded sites, a survey conducted by Stephen Gluckman in 1966 revealed several other concentrations of cultural material within the monument. These will be referred to as Gluckman 1-5, and are located on Figs 2 and 6. Gluckman 1 is the midden to the north of the Fort, believed to be the same as SJ- 28. Gluckman recovered a wide range of historic material at this midden. Gluckman 2 is the midden located to the west of the Fort, yielding primarily 18th century material. Gluckman 3 is the area near the massacre marker midden, where 33 Orange period fiber tempered sherds were collected; and Gluckman 4 is the area east of the extant Johnson house, which yielded three sherds and 47 glass fragments.

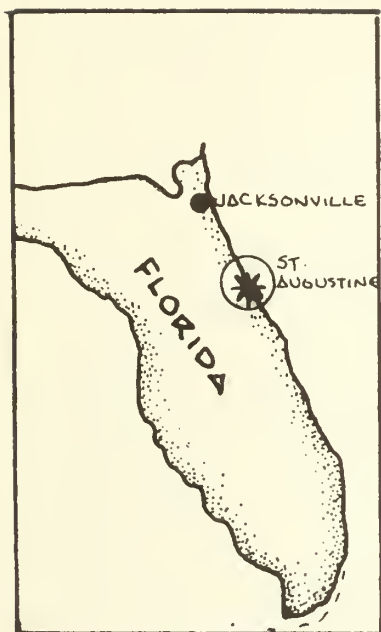

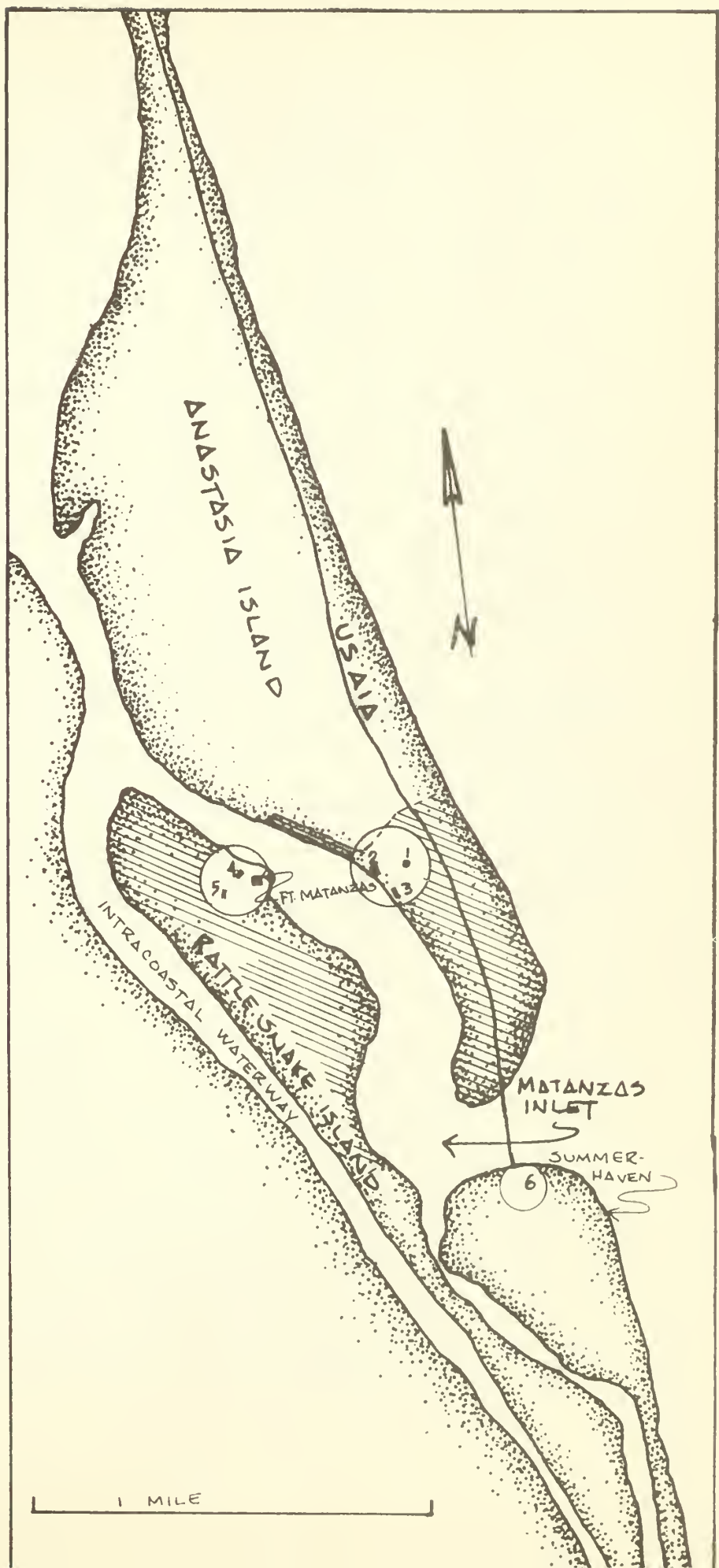


FIG. 1-2

MATANZAS VICINITY

WATCH TOWER SITE
VISITOR CENTER SITE SJ-28
MASSACRE MARKER
MATANZAS, NORTH MIDDEN
MATANZAS, WEST MIDDEN
SUMMER HAVEN MIDDEN

 FT. MATANZAS
NATIONAL MONUMENT



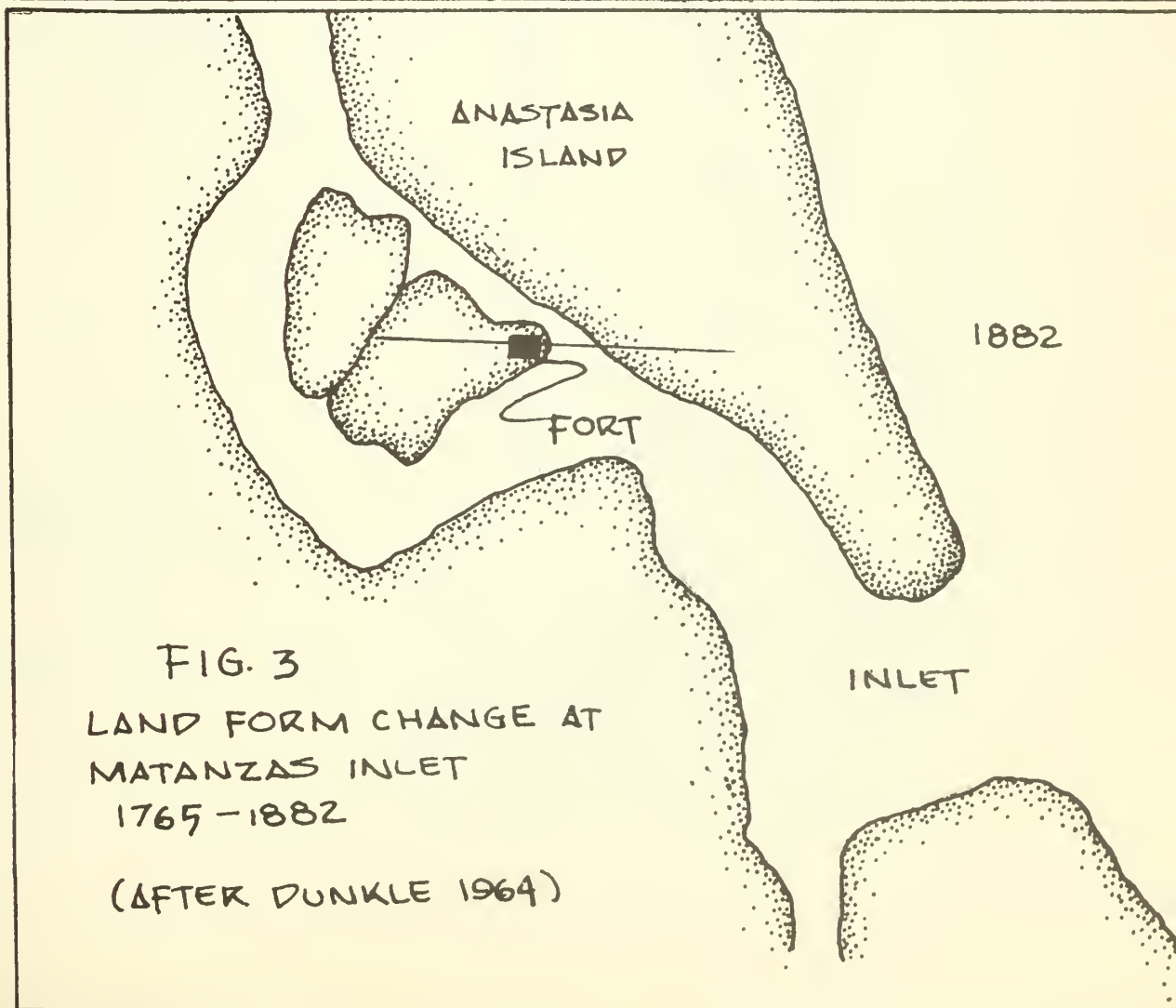
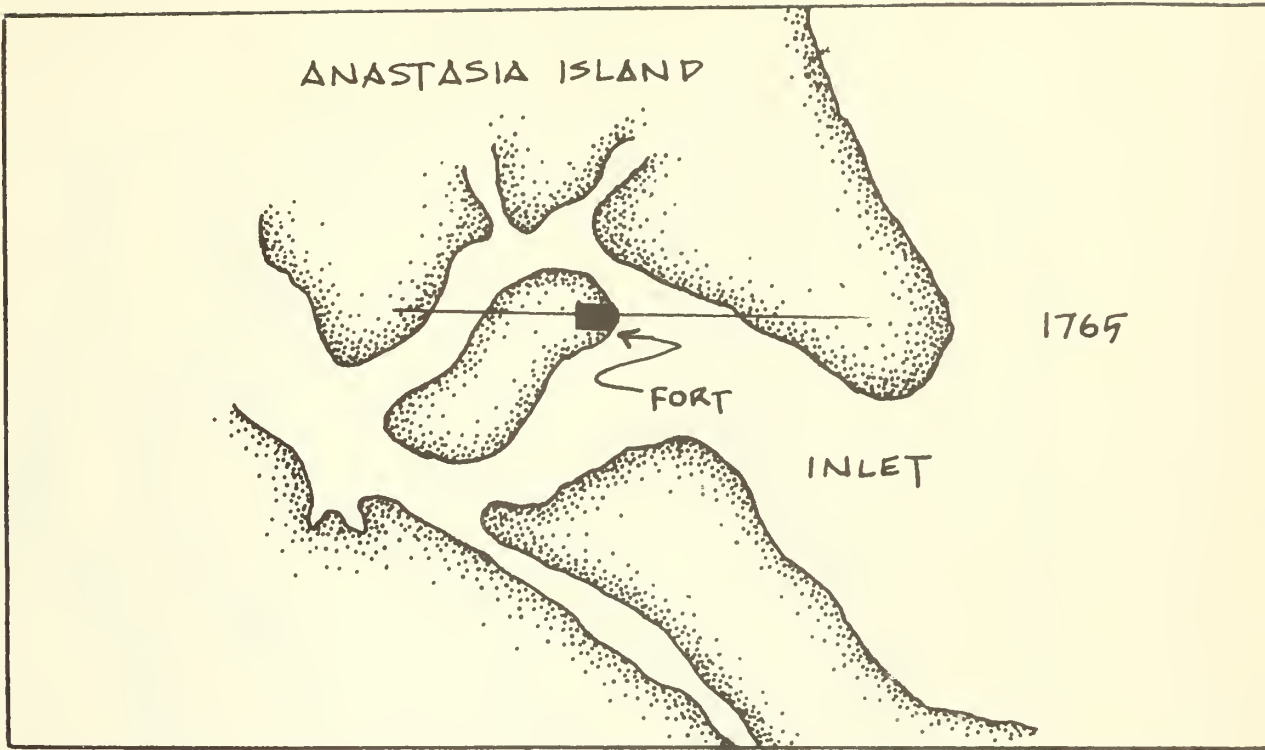
Gluckman 5 was in the vicinity of the visitors center, and sherds ranging from fiber tempered to olive jar were recovered here. It should be cautioned that Gluckman reports finding no material at site 5, and states that all of the sherds were found by rangers prior to the 1966 survey. Results of excavation in this area did not correspond in any way with the material believed to have been found at Gluckman 5.

In addition to Gluckman's survey collections, material has been collected and accessioned by rangers at the monument. Most of this is of unknown provenience, with the exception of 26 San Marcos series sherds (Smith 1948) which were found in the roots of an oak tree uprooted during a 1964 hurricane (see Fig. 6) Table 2 lists all material found in the Matanzas monument area between 1935 and 1975.

One other pertinent find was recorded in the monument in 1893, when human bones were washed out of the eroding east bank of the Matanzas River. Figure 6 shows the location, which is now some 75 feet out into the Matanzas River, due to shift and erosion of the inlet & river mouth areas. Undoubtedly a great deal of evidence for cultural occupation has been destroyed by land erosion (see below).

Land Form Shift and Alteration

The land and water formations present today at the Matanzas Inlet and the southend of Anastasia Island are radically different from those of the Spanish Colonial Period. This has been due to natural forces operating in an unstable beach environment, as well as dredging operations carried out in the Matanzas River. Figures 3-5 show the evolution of land form changes in this area, indicating the important effect this has



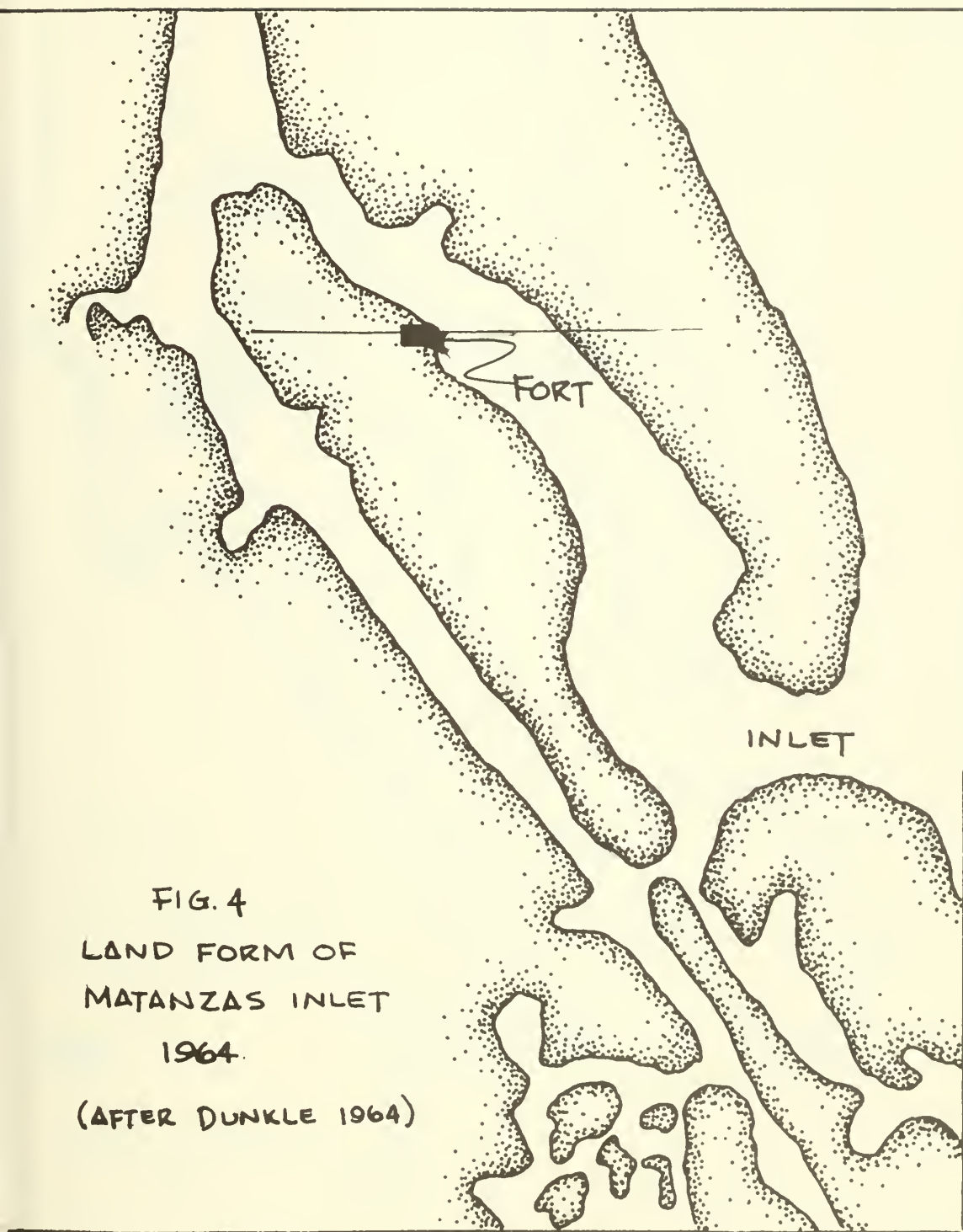
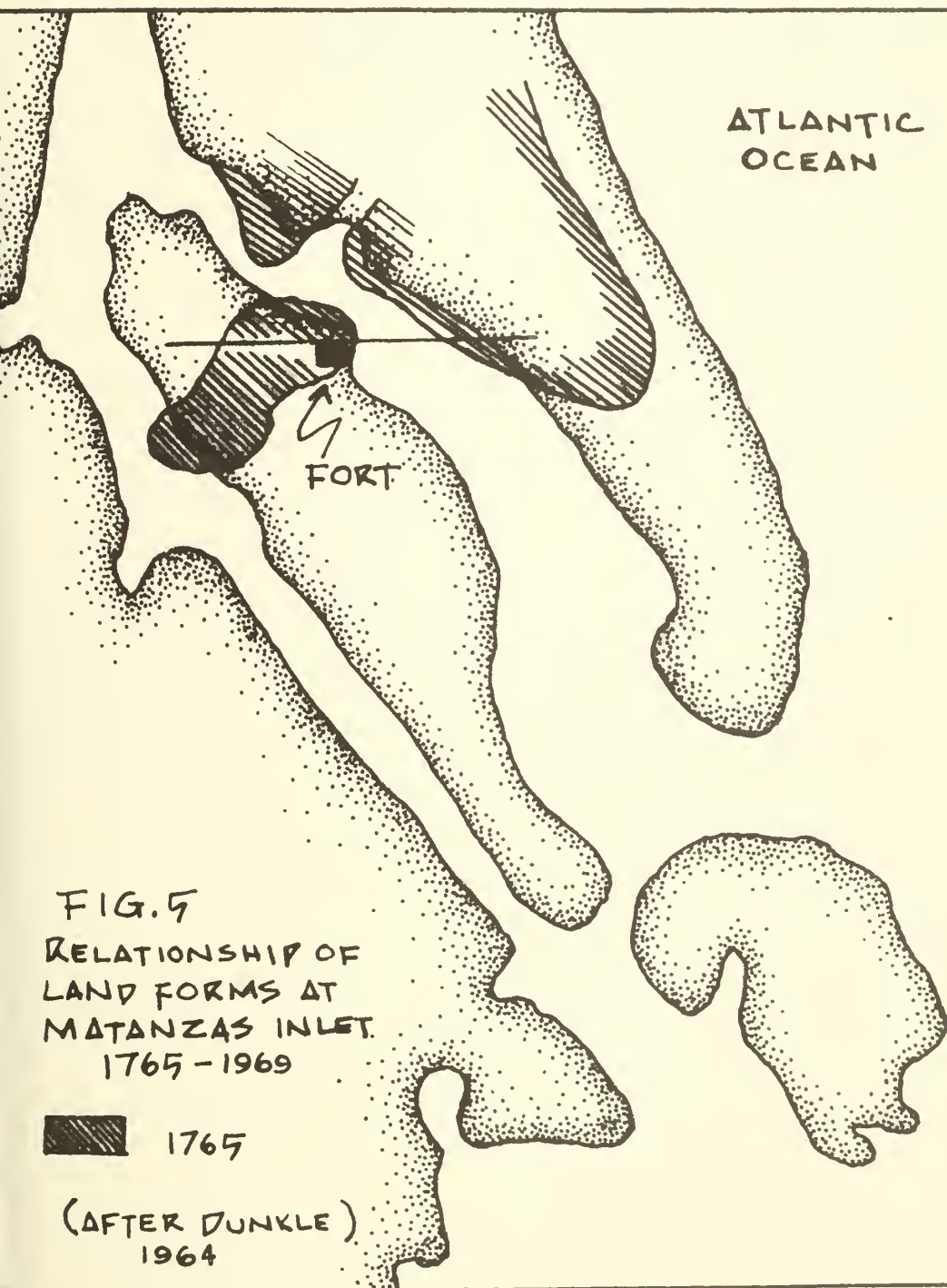


FIG. 4
LAND FORM OF
MATANZAS INLET
1964.
(AFTER DUNKLE 1964)



on the location of sites in the monument area. The map information is derived from Dunkle (1964). One of the most interesting results of these data is the fact that the marker of the 1565 massacre site is located on land that was probably not present in 1765. Since Anastasia Island has been building steadily to the south, it is even more likely that the marker site was under water in 1565. This problem is considered in section 4.

TABLE 1:
SITES IN THE MATANZAS AREA

<u>Site</u>	<u>Cultural Affiliation</u>	<u>Reference</u>
Front mound (FL2)	St. John's IIc	Douglass 1885
Wilder Creek mound (SJ35)	St. John's IIc	Goggin 1952, Douglass 1885
Matanzas Mound (FL4)	St. John's II	Douglass 1885, Goggin 1952
Matanzas Midden (FL3)		Douglass 1885, Goggin 1952
Terra Farm (FL5)	Paleo Indian	Goggin 1952, Connery 1932
Lineland Midden (FL6)	St. John's II a-b	Webb 1894
Matanzas bar midden (SJ30)	St. John's II a-b	Webb 1894, Goggin 1952
Emerhaven midden (SJ46)	Orange Period	Goggin 1952, Bullen & Bullen
Escent Beach midden (SJ43)	Orange-St. John's	Goggin 1952
Wilder Creek mound (SJ30)		Douglass 1885, Goggin 1952
Mat Matanzas midden (SJ28)	Spanish-English-American	Goggin 1952, Gluckman 1966
Mat Matanzas (SJ44)	Spanish-English-American	
Matanzas West midden	Spanish-English	Gluckman 1966
Matanzas visitor center site	San Marcos, Orange period	Gluckman 1966

ARCHEOLOGICAL BASE MAP

Fort Matanzas
National
Monument

Atlantic Ocean

Matanzas River

Anastasia Island

Island

Rattlesnake

Fort Matanzas

NPS Visitor Center

Johnson House

Park Boundary

LEGEND

- Present Island Boundaries
- 1765 Island Boundaries
- Marsh
- 31 North Midden
- 32 West Midden
- 33 Original Midden
- 34 Filled Ground
- 35 1893 Bone Exposure
- 36 Visitor Center Midden
- 37 Mosaic Marker
- 38 Water Tower Dune
- 0 200 400 Feet
- 0 60 120 Meters

TABLE 2
ARCHAEOLOGICAL MATERIAL FOUND AT
FORT MATANZAS NM BETWEEN 1935 AND 1975

I. Prior to 1955 - Provenience unknown

- 1 archaic stemmed point
- 2 sherds, St. Johns check-stamped
- 1 sherd, San Marcos stamped
- 1 fragment, green glazed olive jar
- 1 fragment, neck and mouth of green glazed olive jar
- 1 fragment, neck and mouth of green glazed olive jar
- 1 fragment, mouth of green glazed olive jar
- 9 fragments, green glass wine bottles
- 2 net floats, clear glass
- 1 bone, upper portion of thigh
- 1 bone, portion of cranium

II. Bottles - Provenience unknown

- 1 olive green wine bottle base
- 2 "black glass" 3-piece mold bottles
- 4 "blob top" green bottles
- 1 brown 2-piece mold, applied neck, beer or soft drink bottle
- 1 green 2-piece mold (machine-turned) bottle
- 2 corked green wine bottles

III. Oak tree uprooted in 1964 storm

- 19 sherds, San Marcos stamped
- 7 sherds, San Marcos plain, miscellaneous animal bones

IV. Gluckman's Survey, 1966

A. Visitors' Center Area

- 88 sherds, Orange period
- 1 worked bone pin
- 1 Spanish olive jar
- 1 fragment, Chinese porcelain
- 2 salt-glazed stoneware, miscellaneous fish and animal bones

B. Midden west of the fort

- 2 olive jar sherds
- 2 slipware sherds
- 3 delftware sherds
- 7 green "case bottle" fragments
- 11 green wine bottle fragments
- 1 wrought nail
- 1 brass button, British
- 1 lead-glazed earthenware
- 1 salt-glazed stoneware

C. Midden north of the fort

- 17 San Marcos stamped sherds
- 5 slipware sherds
- 2 creamware sherds
- 2 fragments clear tumbler glass
- 11 lead-glazed earthenware
- 1 shell-edge pearlware
- 1 painted pearlware
- 8 olive jar fragments
- 15 green glass wine bottle fragments
- 1 chert chunk

D. North end of Rattlesnake Island

- 1 green glazed olive jar fragment, middle period

E. Area east of Johnson House

- 1 fiber tempered sherd
- 1 San Marcos stamped sherd
- 39 green glass wine bottle fragments
- 1 lead-glazed stoneware sherd
- 8 blue green glass fragments

F. Area of marker midden south of Johnson House

- 33 Orange fiber tempered sherds

Section 2

1

Historical Setting

The history of the Matanzas National Monument began with the founding of Florida, and the area played an important defensive role for as long as St. Augustine was subject to attack by sea.

A defense structure of some sort has stood at the Matanzas inlet within the monument boundaries for the last 400 years. The Matanzas River provides an alternate route to St. Augustine's harbor and for this reason posed a threat to the defense of the town. It was therefore critically important that the Matanzas inlet be guarded, a situation demonstrated at least four times in the history of St. Augustine.

Matanzas received its name in 1565, with the slaughter of Jean Ribault's French forces. Ribault had been sent to France to bring reinforcements to the infant colony at Fort Caroline, Florida, under the command of Rene de Laudonniere. In the same month which Ribault arrived, Pedro Menendez de Aviles was sent to Florida by the crown of Spain to answer the French challenge to Spain's sovereignty in the new world. Barely a week after Menendez' arrival and initial settlement at St. Augustine, Ribault decided to sail to St. Augustine and attack Menendez. En route, a severe storm shipwrecked the French fleet about 22 kilometers to the south of St. Augustine, and the 476 survivors marched up the coast in two groups. Both groups were stopped by the waters of the Matanzas inlet, across which Pedro Menendez and his men were waiting. Both groups, with the exception of 200 men who marched back southward, surrendered to Menendez and were ferried ten at a time across the inlet. There they were placed at the point of a crossbow

1 Historical data is taken primarily from Manucy (1945, 1970) and Arana (1974)

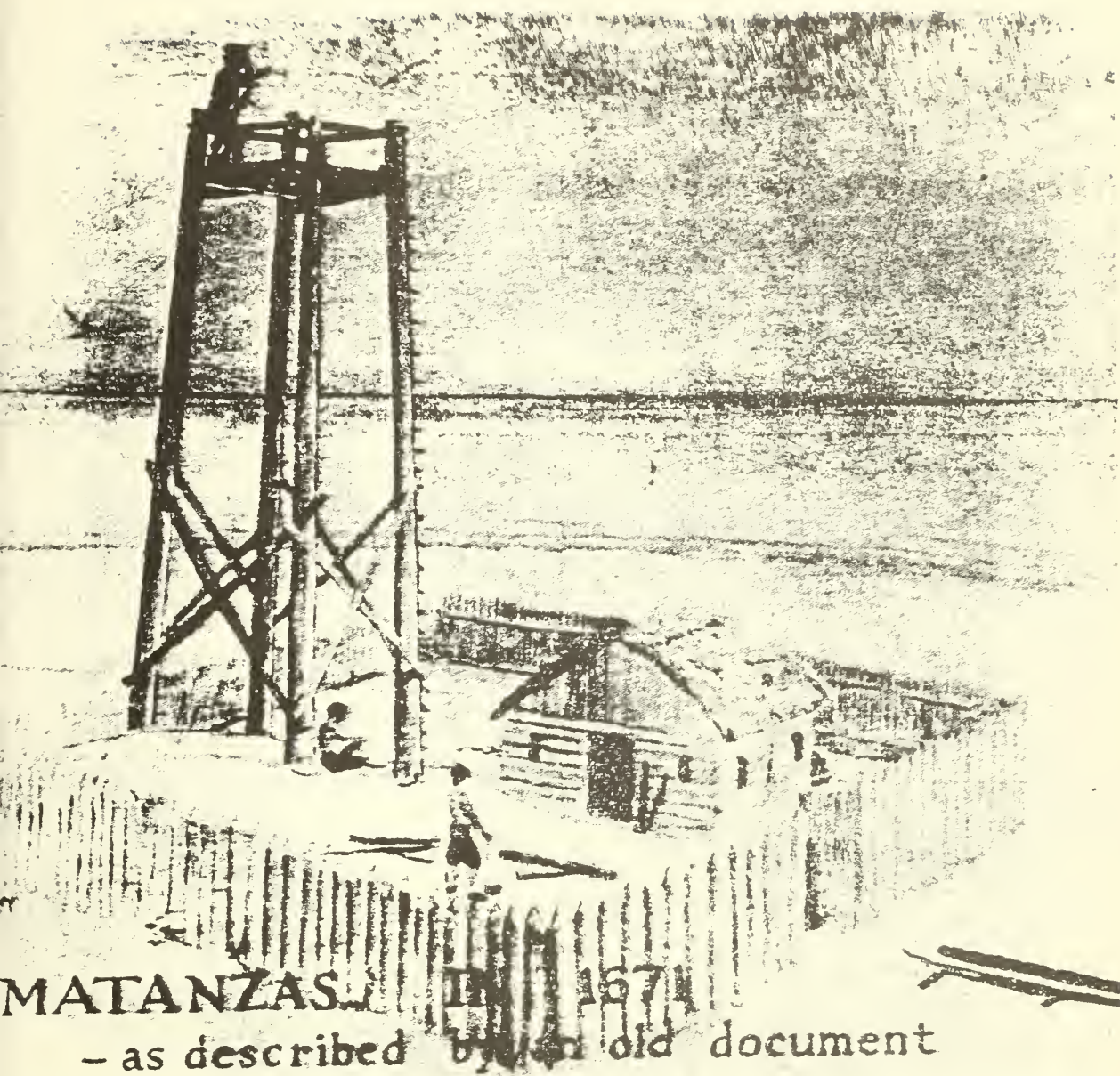


FIGURE 2-1

WATCHTOWER RECONSTRUCTION
(Albert Manucy in NPS n.d.)

shot's distance toward St. Augustine and all but 31 were put to the knife. The remaining 200 men were eventually hunted down by Menendez, and the area of the monument to this day bears the name "Matanzas", which in English meand "slaughters."

In 1569 a watchtower and sentry house were built at Matanzas as part of the coastal defense system of Spanish Florida. These typically housed six soldiers, and one or another of these wooden watchtowers (probably similar to the reconstruction by Albert Manucy shown in Figure 2-1) was present until 1742 when the extant stone fort was built on Rattlesnake Island. The sentries at Matanzas sent messages of approaching ships to St. Augustine, particularly of pirate corsairs. In 1683 and in 1686 pirates attempted to capture St. Augustine via Matanzas, and were narrowly defeated by ambush in the former instance.

The critical position of the Matanzas sentry was demonstrated in both the 1702 and 1704 seiges of St. Augustine by James Moore and James Oglethorpe respectively. Matanzas supplied a lifeline to Cuba for food and supplies during times of seige, and during the 1740 seige especially, St. Augustine would almost certainly have been starved into submission if the British had captured Matanzas.

It was after this seige that the importance of a strong defense at the inlet was fully realized, and construction of the stone fort on Rattlesnake Island was begun. The fort was finished in 1742, despite hostile Indian raids and unsuccessful attack by Oglethorpe, and it had 6 cannons and accomodations to garrison 50 men. The years between 1742 and 1763 were peaceful ones, and in 1763, the British took over Matanzas as part of the treaty by which England gained Florida. Through their 21 year occupation,

seven soldiers were usually in residence at Matanzas, and no attacks were made upon the fort.

Spain regained Florida in 1784 by treaty, and once again occupied Matanzas. By 1805, however, Spain could no longer afford to maintain the fort, and it was abandoned to fall into disrepair. In 1821 Matanzas was ceded to the United States along with the rest of Florida, and was transferred to the Department of the Interior in 1933. Between 1805 and 1933 the fort itself was abandoned and gradually fell to ruin.

There was activity in other portions of the present monument, however. A customs house was located on Anastasia Island opposite the fort during the Civil war, and was in operation for only 10 years. In the late 19th century, the Allen hotel was built on Anastasia Island in the monument area. Although no above-ground evidence of the hotel exists today, its location as well as the location of other structures are shown on the base map (Figure 6).

Relevance of historical data to archeological research at Matanzas:

Few clues are given in historical sources about the nature or location of occupation in the area prior to 1742. It is known only that a sentry and a watchtower existed there, and no detailed descriptions exist.

There is no historical indication that Rattlesnake Island contained any historic structures before 1740, when construction of the stone fort began. An account of the 1702 seige of St. Augustine discusses removing all craft from the Matanzas River, and described a raft located across the river from the Matanzas tower, on the west bank of the river (Arana n.d.). Obviously, the watchtower was on the Anastasia portion of the inlet at this date. This location of the watchtower is further evidenced by maps made in 1703, 1740, and 1724; all of which show a tower or structure on Anastasia Island (various maps in Dunkle 1964).

Two maps made by the British at the time of Oglethorpes 1740 seige show structures on both Anastasia and Rattlesnake Islands (Todiman 1740; Anon 1740), although the Rattlesnake Island structure is labelled "barracks." Since the fort construction was presumed not to have begun until after the threat demonstrated by the seige, it is possible that the "barracks" structure housed convicts who were known to have been working at the coquina quarries of El Penon, near present day Summerhaven. On both maps the "barracks" are directly across the river from the Anastasis Island watchtower, probably on or near the site of the extant fort.

After 1765, alterations of terrain due to natural forces, as well as human construction and activity in the monument area made changes which are critical to archeological concerns in the area.

From 1805 until the Civil war, no significant activity took place at Matanzas, although after this time construction occurred, which probably altered or destroyed sites in the monument area. The customs house and Allen hotel discussed above provide two instances of this construction, and other instances are provided by the construction of the Johnson or Corbett house and the construction of the present visitor center. Both of these structures are located on the high ground overlooking the Matanzas river, and would have been ideal locations for earlier occupation in the area.

A major event in the alteration of Anastasia Island's west shore was the hurricane of 1893, which washed away 75 to 100 feet of the then extant shore. In this process, a camp cottage associated with the Allen hotel was washed away, and a number of human bones were exposed nearby. These were believed to have been the remains of the 1565 massacre victims (Ogden 1940) but in view of the historical data discussed above, this now seems highly unlikely.

Unfortunately, none of the material is any longer in existence.

In 1915, the area became a national monument, and in 1933 came under the jurisdiction of the National Park Service.

The fort itself was subject to restoration procedures, which included rebuilding the walls and spreading the area immediately surrounding the fort with several feet (depth and width) of oyster shell for stabilization (Youngberg n.d.). This effectively eliminated the original ground surface and precluded the archeological investigation of the area surrounding the fort. It is also known that the bank areas to the northeast and southeast of the fort were filled in with earth and oyster shell as evidenced by photographs of the fort taken before and after the 1924 restoration (NPS files, Castillo de San Marcos). The extent of fill on the other non-marsh areas of Rattlesnake Island was unknown, and the results of auger tests in these areas is discussed in Section 5.

Post-1925 construction in the monument area included the widening and improvement of state highway A1A in 1950; the installation of a waterline into the monument in 1966, and various projects carried out by the occupants of the Johnson residence. Although these projects are not recorded, personal communication with Mr. James Shope (A monument employee and lifetime resident of the area) indicates that the present area of the massacre marker and presumed midden was at one time a tidal stream. Prior to the National Park Service acquisition of the Johnson property in 1962, the Johnsons had the stream filled in; probably with material from areas outside the monument.

All of the construction activity and natural events discussed above are relevant to the archeological study of the monument, since the

probability is high that they have altered the archeological record,
and these should be considered in the assessment of the monument's
cultural resources.

Section 3

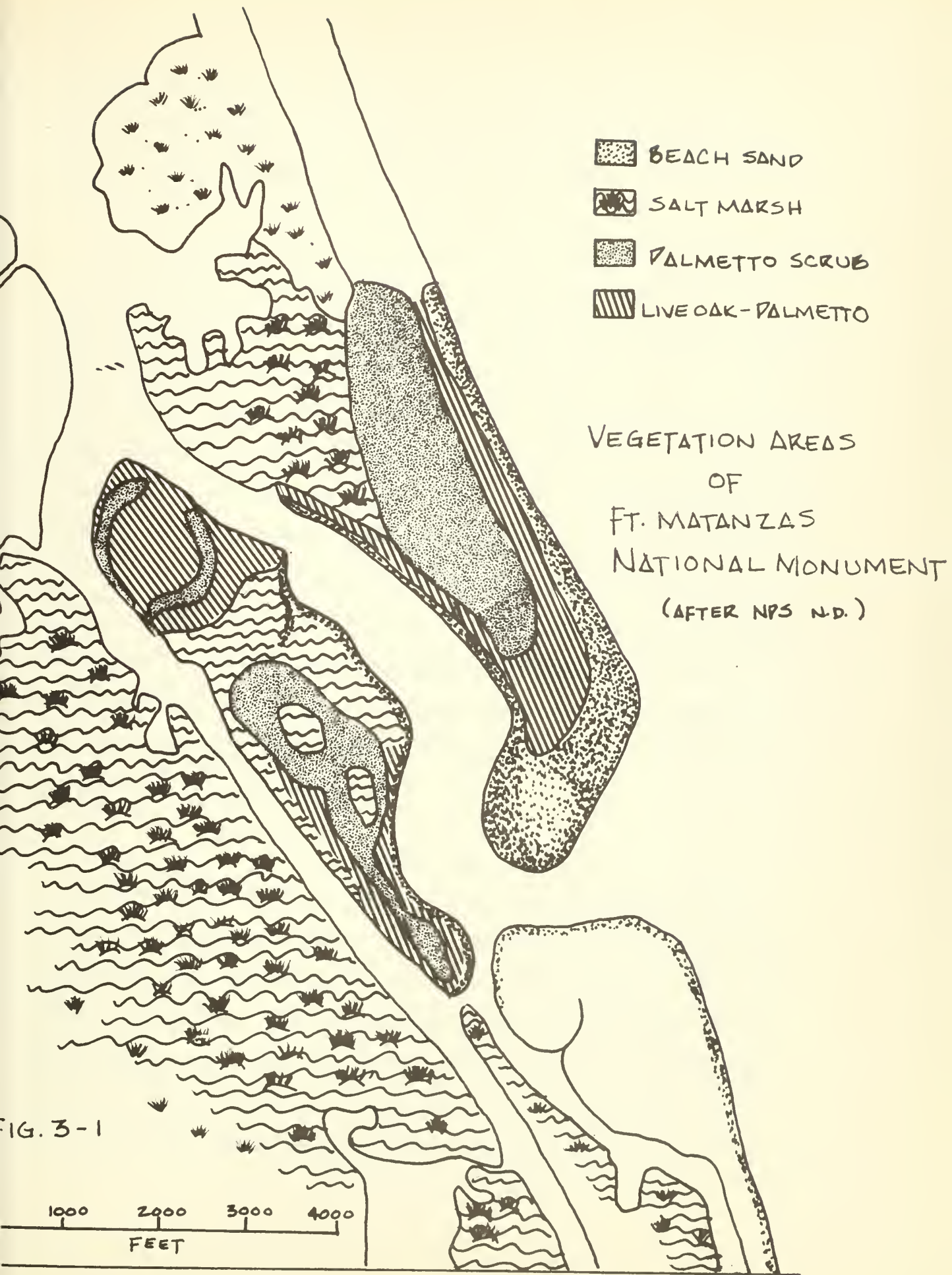
Ecological Setting

(Prepared by National Park Service Personnel at Fort Matanzas National Monument, 1975)

The natural environment of Fort Matanzas National Monument is characteristic of Florida's northeast coastline. Physiographically, the area is almost surrounded by bodies of water; on the east and the south by the Atlantic Ocean and Inlet, on the west by the intracoastal waterway and with the Matanzas River separating Rattlesnake Island from Anastasia Island. The only non-water boundary is to the north on Anastasia Island.

Considerable changes have occurred in the land form in the vicinity of the inlet. The inlet itself has migrated southward, a sample of the normal effects of the littoral drift action along the Atlantic Coast. A more complex change has occurred on Rattlesnake Island. This area at the time of the construction of Fort Matanzas was far smaller than today. Evidence indicates that the fort was built on the easternmost point of a very small marsh island and that the main channel of the Matanzas River flowed south and west of the site. Thus, the two-thirds or more of the present-day Rattlesnake Island lying south of the fort was not originally physically attached to the island, and very possibly much of it was below water level (Figs. 3 - 5).

The principal cause of the present configuration of Rattlesnake Island was the depositing of dredging material during construction of the intracoastal waterway. This caused not only changes in the size of the island but probably rather extensive changes in the vegetation and topography of those portions of this land which existed in the 18th century. For example, the northern (historically associated) end of the island



has apparently been built up to elevations of 10 to 15 feet above sea level by dredge deposits. This has eliminated most of the marsh characteristics west of the fort.

Vegetation

The Matanzas Inlet area consists of the Atlantic Ocean seashore, developing westerly into typical southeastern coastal barrier dunes, redeveloping westerly into backbay or marsh island and thence into the coastal plain vegetative type. Much of the Anastasia Island section is primarily dunes covered with a dense growth of Palmetto scrub. Rattlesnake Island is comprised of dunes and marshland. The soil is fine sand except where coastal area forest cover has developed a humus top soil. On the backshore side of the islands where the dunes have become well stabilized occurs a maritime forest dominated by sand live oak (Quercus virginiana) and the cabbage palmetto (Sabal palmetto). Associates to be found are southern redcedar (Juniperus sillicicola), wax myrtle (Myrica cerifera), sweet bay (Laurus nobilis), saw palmetto (Serenoa repens) and yucca or Spanish bayonet (Yucca aloifolia).

Beaches

The ocean face of the island is an unstable zone where the beach maintains an approximate equilibrium with the wave and current-generated forces which play upon them. Conditions of wind, wave, and tide are continually changing from season to season and adjusting the beach profile accordingly. Storm conditions produce greater changes in the beach face profile. During extreme high tides and heavy wave attacks, the loose beach-face sand is moved and deposited on the backshore side of the barrier

dunes where it may become stabilized if vegetation can get its start; or if the elements persist, then this sand may be blown about in an ever-continuing shifting process.

At locations where the volume of sand movement across the barrier dune is not too great, and where overwash is not too frequent, a thin cover of grass can usually get a start. Sea oats (Uniola paniculata) and the American beach grass (Ammophila breviliquolata), form new roots closer to the surface as they are buried and thereby are effective in dune stabilization. These hardy grasses trap and tend to stabilize the sand that moves into the area, resulting in the building of a low dune.

The river shoreline on the western side of Anastasia Island and the eastern side of Rattlesnake Island is much less affected by the tidal action of the ocean but the equalizing forces of the waves and current with the beach are constantly causing shoreline changes.

The monument's marshland areas and maritime forest hammocks provide a wide variety of potential food resources, for human exploitation. The following Tables (3-8) show the plant and animal resources within the monument area, and Figure 3-1 shows the general vegetation zones.

Animal resources abundant in the marsh and liveoak-palmetto areas include birds, mammals, fish, mollusc, crustaceans, reptiles and amphibians. Littoral resources such as fish, crab, oysters, clams and whelks probably would provide a dietary base, with other mammal (deer, squirrel, rabbit, fox, raccoon), bird and reptile-amphibian sources (turtles, snake) also used. The actual faunal remains recovered at the monument are discussed in section V, and compared to the available resources.

TABLE 3
BIRDS OF FORT MATANZAS NATIONAL MONUMENT

GAVIIFORMES

- | | | |
|----|--------------------|----------|
| 1. | Loon, Common | common |
| 2. | Loon, Red-throated | uncommon |

PODICIPEDIFORMES

- | | | |
|----|--------------------|----------|
| 1. | Grebe, Horned | uncommon |
| 2. | Grebe, Pied-billed | common |

PROCELLARIIFORMES

- | | | |
|-----|-----------------------|----------|
| 1. | Shearwater, Greater | offshore |
| *2. | Shearwater, Audubon's | offshore |
| *3. | Shearwater, Sooty | offshore |

PELECANIFORMES

- | | | |
|-----|---------------------------|------------|
| 1. | Pelican, Brown | common |
| 2. | Pelican, White | occasional |
| 3. | Gannet | occasional |
| 4. | Cormorant, Double-crested | common |
| *5. | Anhinga | -- |

CICONIIFORMES

- | | | |
|------|-----------------------------|------------|
| 1. | Heron, Great Blue | common |
| 2. | Heron, Green | common |
| 3. | Heron, Little Blue | common |
| 4. | Heron, Louisiana | common |
| 5. | Egret, Cattle | common |
| 6. | Egret, Common | common |
| 7. | Egret, Snowy | common |
| 8. | Night Heron, Black-crowned | common |
| 9. | Night Heron, Yellow-crowned | uncommon |
| 10. | Stork, Wood | common |
| 11. | Ibis, White | common |
| 12. | Spoonbill, Roseate | occasional |
| 13. | Flamingo | escapee |
| *14. | Bittern, Least | -- |
| *15. | Bittern, American | -- |

ANSERIFORMES

- | | | |
|-----|-------------------------|------------|
| 1. | Mallard | occasional |
| *2. | Teal, Blue-winged | occasional |
| *3. | Scaup, Lesser | occasional |
| 4. | Ruddy Duck | occasional |
| 5. | Merganser, Red-breasted | common |
| 6. | Merganser, Hooded | occasional |

(* denotes birds not confirmed but ranges take in Monument)

FALCONIFORMES

1.	Vulture, Turkey	common
2.	Vulture, Black	common
3.	Hawk, Sharpe-shinned	uncommon
4.	Hawk, Cooper's	occasional
5.	Hawk, Marsh	common
6.	Hawk, Red-shouldered	occasional
7.	Hawk, Red-tailed	common
8.	Eagle, Bald	occasional
9.	Osprey	common
10.	Falcon, Peregrine	rare
11.	Kestrel, American (Sparrow Hawk)	common

GALLIFORMES

1.	Bobwhite	common
----	----------	--------

GRUIFORMES

1.	Rail, Clapper	common
2.	Sora	common
3.	Coot, American	--

CHARADRIIFORMES

1.	Oystercatcher, American	occasional
2.	Plover, Semipalmated	common
3.	Plover, Piping	common
4.	Plover, Wilson's	common
5.	Killdeer	uncommon
6.	Plover, Black-bellied	occasional
7.	Turnstone, Ruddy	common
8.	Snipe, Common	rare
9.	Whimbrel	rare
10.	Sandpiper, Spotted	common
11.	Sandpiper, Solitary	rare
12.	Willet	common
13.	Knot	--
14.	Sandpiper, Least	uncommon
15.	Dunlin	common
16.	Sandpiper, Semipalmated	common
17.	Sandpiper, Western	common
18.	Sanderling	common
19.	Gull, Glaucous	rare
20.	Gull, Great Black-backed	occasional
21.	Gull, Herring	common
22.	Gull, Ring-billed	common
23.	Gull, Laughing	common
24.	Gull, Bonaparte's	common
25.	Tern, Gull-billed	occasional

CHARADRIIFORMES (continued)

26.	Tern, Forster's	common
27.	Tern, Common	common
28.	Tern, Sooty	rare
29.	Tern, Least	common
30.	Tern, Royal	common
31.	Tern, Sandwich	occasional
32.	Tern, Caspian	common
33.	Tern, Black	occasional
34.	Skimmer, Black	common

COLUMBIFORMES

1.	Dove, Rock	--
2.	Dove, Mourning	common
3.	Dove, Ground	common

CUCULIFORMES

1.	Cuckoo, Yellow-billed	common
----	-----------------------	--------

STRIGIFORMES

*1.	Owl, Screech	occasional
2.	Owl, Great-horned	occasional
*3.	Owl, Short-eared	occasional
*4.	Owl, Barred	occasional

CAPRIMULGIFORMES

1.	Chuck-will's-widow	common
2.	Nighthawk, Common	common

APODIFORMES

1.	Swift, Chimney	common
2.	Hummingbird, Ruby-throated	common

CORACIIFORMES

1.	Kingfisher, Belted	common
----	--------------------	--------

PICIFORMES

1.	Flicker, Common	common
2.	Woodpecker, Red-bellied	common
3.	Woodpecker, Red-headed	common
4.	Sapsucker, Yellow-bellied	common
5.	Woodpecker, Downy	common

(* denotes birds not confirmed but ranges take in Monument)

SERIFORMES (by the families)

TYRANNIDAE

- | | |
|------------------------------|--------|
| 1. Kingbird, Eastern | common |
| 2. Kingbird, Gray | common |
| 3. Flycatcher, Great Crested | common |
| 4. Phoebe, Eastern | common |
| 5. Pewee, Eastern Wood | common |

HIRUNDINIDAE

- | | |
|-------------------|----------|
| 1. Swallow, Tree | abundant |
| 2. Swallow, Barn | common |
| 3. Martin, Purple | common |

CORVIDAE

- | | |
|---------------|--------|
| 1. Jay, Blue | common |
| 2. Crow, Fish | common |

PARIDAE

- | | |
|-------------------------|----|
| *1. Chickadee, Carolina | -- |
| 2. Titmouse, Tufted | -- |

SITTIDAE

- | | |
|---------------------------|------------|
| 1. Nuthatch, Red-breasted | occasional |
|---------------------------|------------|

CERTHIIDAE

- | | |
|-------------------|------|
| 1. Creeper, Brown | rare |
|-------------------|------|

TROGLODYTIDAE

- | | |
|-----------------------------|------------|
| 1. Wren, House | common |
| 2. Wren, Carolina | common |
| 3. Wren, Long-billed Marsh | occasional |
| 4. Wren, Short-billed Marsh | occasional |

MIMIDAE

- | | |
|--------------------|----------|
| 1. Mockingbird | abundant |
| 2. Catbird, Gray | abundant |
| 3. Thrasher, Brown | common |

TURDIDAE

- | | |
|-------------------------|------------|
| 1. Robin | common |
| 2. Thrush, Hermit | rare |
| 3. Thrush, Olive-backed | occasional |
| 4. Thrush, Gray-cheeked | rare |
| 5. Veery | occasional |

(* denotes birds not confirmed but ranges take in Monument)

SYLVIIDAE

- | | |
|----------------------------|------------|
| 1. Gnatcatcher, Blue-gray | occasional |
| 2. Kinglet, Golden-crowned | rare |
| 3. Kinglet, Ruby-crowned | common |

BOMBYCILLIDAE

- | | |
|-------------------|------------|
| 1. Waxwing, Cedar | occasional |
|-------------------|------------|

LANIIDAE

- | | |
|-----------------------|------------|
| 1. Shrike, Loggerhead | occasional |
|-----------------------|------------|

STURNIDAE

- | | |
|-------------|--------|
| 1. Starling | common |
|-------------|--------|

VIREONIDAE

- | | |
|----------------------|--------|
| 1. Vireo, Solitary | rare |
| 2. Vireo, Red-eyed | common |
| 3. Vireo, White-eyed | common |

PARULIDAE

- | | |
|---------------------------------|------------|
| 1. Warbler, Black and White | common |
| 2. Warbler, Prothonotary | rare |
| 3. Warbler, Worm-eating | occasional |
| 4. Parula, Northern | common |
| 5. Warbler, Yellow | common |
| 6. Warbler, Magnolia | rare |
| 7. Warbler, Cape May | common |
| 8. Warbler, Black-throated Blue | common |
| 9. Warbler, Myrtle | common |
| 10. Warbler, Yellow-throated | common |
| 11. Warbler, Blackpoll | common |
| 12. Warbler, Pine | rare |
| 13. Warbler, Prairie | common |
| 14. Warbler, Palm | common |
| 15. Ovenbird | common |
| 16. Waterthrush, Northern | occasional |
| 17. Yellowthroat, Common | common |
| 18. Warbler, Hooded | rare |
| 19. Redstart, American | common |

PLOCEIDAE

- | | |
|--------------------------|------------|
| 1. Bobolink | occasional |
| 2. Meadowlark, Eastern | common |
| 3. Blackbird, Red-winged | common |
| 4. Oriole, Baltimore | occasional |

THRAUPIDAE

- | | | |
|----|------------------|------------|
| 1. | Tanager, Summer | common |
| 2. | Tanager, Scarlet | occasional |

FRINGILLIDAE

- | | | |
|-----|-------------------------|------------|
| 1. | Cardinal | common |
| 2. | Grosbeak, Rose-breasted | uncommon |
| 3. | Grosbeak, Evening | rare |
| 4. | Grosbeak, Blue | uncommon |
| 5. | Bunting, Indigo | uncommon |
| 6. | Bunting, Painted | common |
| 7. | Finch, Purple | occasional |
| 8. | Goldfinch, American | common |
| 9. | Towhee, Rufous-sided | common |
| 10. | Sparrow, Savannah | common |
| 11. | Sparrow, Sharp-tailed | common |
| 12. | Sparrow, Seaside | occasional |
| 13. | Sparrow, Lark | occasional |
| 14. | Sparrow, Chipping | common |
| 15. | Sparrow, Field | uncommon |
| 16. | Sparrow, White-throated | common |
| 17. | Sparrow, Song | common |

TABLE 4

MAMMALS OF FORT MATANZAS NATIONAL MONUMENT

1. Raccoon	<u>Procyon lotor</u>
2. Opposum	<u>Dilodelphis marsupialis</u>
3. Gray Squirrel	<u>Sciurus carolinensis</u>
4. Bobcat	<u>Lynx rufus</u>
5. Eastern Pipistrel Bat	<u>Pipistrellus subflavus</u>
6. Manatee	<u>Trichechus manatus</u>
7. Gray Fox	<u>Urocyon cinereoargenteus</u>
8. Marsh Rabbit	<u>Sylvilagus palustris</u>
9. Eastern Cottontail	<u>Sylvilagus floridanus</u>
10. Whitetail Deer	<u>Odocoileus virginianus</u>
11. Eastern Mole	<u>Scalopus aquaticus</u>
12. Southern Flying Squirrel	<u>Glaucomys volans</u>
13. Armadillo	<u>Dasypus novemcinctus</u>
14. Stripped Skunk	<u>Mephitis mephitis</u>
15. Spotted Skunk	<u>Spilogale putorius</u>
16. Southeastern Shrew	<u>Sorex longirostris</u>
17. Least Shrew	<u>Cryptotis parva</u>
18. Short Tail Shrew	<u>Blarina brevicauda</u>
19. Hoary Bat	<u>Lasiurus cinereus</u>
20. Seminole Bat	<u>Lasiurus seminolus</u>
21. Evening Bat	<u>Nycticeius humeralis</u>
22. Eastern Yellow Bat	<u>Lasiurus intermedius</u>
23. Eastern Big Ear Bat	<u>Plecotus rafinesquei</u>
24. Mexican Freetail Bat	<u>Tadarida brasiliensis</u>
25. Long Tail Weasel	<u>Mustela frenata</u>
26. Mink	<u>Mustela vison</u>
27. Southeastern Pocket Gopher	<u>Geomys pinetis</u>
28. Eastern Harvest Mouse	<u>Reithrodontomys montanus</u>
29. Old Field Mouse	<u>Peromyscus polionotus</u>
30. Cotton Mouse	<u>Peromyscus gossypinus</u>
31. Golden Mouse	<u>Peromyscus nuttalli</u>
32. Eastern Woodrat	<u>Neotoma floridana</u>
33. Rice Rat	<u>Oryzomys palustris</u>
34. Hispid Cotton Rat	<u>Sigmodon hispidus</u>
35. Norway Rat	<u>Rattus norvegicus</u>
36. House Mouse	<u>Mus musculus</u>

(* denotes mammals that may inhabit Fort Matanzas National Monument but sightings not reported. Reference: A Field Guide to the Mammals by William H. Burt and Richard P. Grossenheider)

TABLE 5

REPTILES OF FORT MATANZAS NATIONAL MONUMENT

TURTLES

1. Atlantic Loggerhead Sea Turtle (nest on beaches)
2. Gopher Tortoise
3. Alligator Snapping Turtle
4. Common Snapping Turtle
5. Box Turtle
6. Soft Shell Turtle
7. Florida Box Turtle
8. Diamondback Turtle
9. Chicken Turtle
10. Slider
11. Florida Soft Shell
12. Musk Turtle
13. Mud Turtle
14. Wood Turtle

(The large number of freshwater turtles are due to the two freshwater impoundments located in the Monument.)

SNAKES

1. Eastern Diamondback Rattler
2. Dusky Pigmy Rattler
3. Coral Snake
4. Eastern Indigo
5. Red Rat (Corn Snake)
6. Eastern Coachwhip
7. Eastern Hognose
8. Blue Racer (Black Snake)
9. Yellow Rat Snake
10. Grass Snake
11. Garter Snake
12. Banded Water Snake
13. Ribbon Snake
14. Scarlet King
15. King Snake
16. Florida Pine
17. Bull Snake
18. Cottonmouth Moccasin

LIZARDS

1. Chameleon (Green Anole).
2. Southeastern Five-Lined Skink
3. Island Glass Lizard

TABLE 6

FISH OF THE FORT MATANZAS AREA

<u>Family</u>		<u>Common Name</u>
idae	<u>Elops prurus</u>	Lady fish
idae	<u>Brevoortia tyrannus</u>	Atlantic menhadn
	<u>Opiathonema Oglinum</u>	Atlantic thread herring
raulidae	<u>Anchoa hep</u>	Striped anchovy
	<u>Anchoa michilli</u>	Bay anchovy
odontidae	<u>Synodus fontens</u>	inshore lizard fish
idae	<u>Arius felis</u>	Sea catfish
rachoididae	<u>Opsamus Tau</u>	Oyster toadfish
onidae	<u>Strongyiura marina</u>	Atlantic needlefish
rinodontidae	<u>Cyprinodon variegatus</u>	Sheepshead minnow
	<u>Fundulus grandis</u>	Gulf Killifish
	<u>Fundus heteroclitus</u>	Mummichog
	<u>Fundus majalis</u>	Striped Killifish
ciliidae	<u>Gambusia affinis</u>	Mosquito Fish
	<u>Poecilia latipinna</u>	Sailfin molly
erinidae	<u>Menidia beryllina</u>	Tidewater silverside
gnathidae	<u>Syngnathus Floridae</u>	Dusky pipefish
angidae	<u>Caranx hippos</u>	Creville jack
	<u>Chloroscombro chrysurus</u>	Atlantic bumper
	<u>Seiemo Vomer</u>	Lookdown
angidae	<u>Trachinotus Falcatus</u>	Fermit
janidae	<u>Lutjanus griscus</u>	Grey snapper

TABLE 6

<u>Family</u>		<u>Common Name</u>
reidae	<u>Diapterus olisthostomas</u>	Irish pompano
	<u>Eucinostomous organteus</u>	Spotfin mujarra
	<u>Eucinostomous gula</u>	Silver jenny
	<u>Cerrus cinereus</u>	Yellowfin mujarra
aridae	<u>Archosargus probatocephalus</u>	Sheepsherd
	<u>Lagodon rhomboides</u>	Pinfish
senidas	<u>Bairdiella chrysura</u>	Silver perch
	<u>Cynoscion nebulosus</u>	Spotted seatrout
	<u>Lelostomus xanthurus</u>	Spot
	<u>Micropogon undulatus</u>	Atlantic croaker
	<u>Pogonias cronis</u>	Black drum
	<u>Sciaenops ocellata</u>	Red drum
hippidae	<u>Chactodipterus faber</u>	Atlantic Spadefish
gilidae	<u>Mugil cephalus</u>	Striped mullet
	<u>Mugil curema</u>	White mullet
idae	<u>Gobionellus boleosoma</u>	Darter goby
	<u>Gobionellus hastatus</u>	Sharptail goby
	<u>Gobionellus smaragdus</u>	Emerald goby
	<u>Gobiosoma bosc</u>	Naked goby
	<u>Microgobius gulosas</u>	Clown goby
glidae	<u>Prionotus tribulus</u>	Bighead searobin
hidae	<u>Citharichthys spilopterus</u>	Bay whiff
	<u>Etropus crossotus</u>	Fringed flounder
	<u>Paralichthys lethostigma</u>	Southern flounder
oglonsidae	<u>Symphurus plagiuna</u>	Blackcheek tonguefish
raiklontidae	<u>Sphueroidan nephaluo</u>	Southern puffer

TABLE 7
INVERTEBRATES OF FORT MATANZAS*

PHYLUM MOLLUSCA

CLASS GASTROPODA

1. <u>Diodora cayenensis</u>	Keyhole Limpet
2. <u>Calliostoma euglyptum</u>	Sculptured Top-Shell
3. <u>Turbo castaneus</u>	Chestnut Turban
4. <u>Neritina virginea</u>	Virgin Nerite
5. <u>Neritina reclivata</u>	Olive Nerite
6. <u>Littorina irrorata</u>	Marsh Periwinkle
7. <u>Modulus modulus</u>	Atlantic Modulus
8. <u>Cerithidea scalariformis</u>	Ladder Horn Shell
9. <u>Batillaria minima</u>	False Cerith
10. <u>Cerithium floridanum</u>	Florida Cerith
11. <u>Bittium varium</u>	Variable Bittium
12. <u>Cerithiopsis greeni</u>	Miniature Cerith
13. <u>Seila adamsi</u>	Miniature Cerith
14. <u>Triphora nigrocincta</u>	Black-Lined Trifora
15. <u>Epitonium angulatum</u>	Angulate Wentletrap
16. <u>Crepidula fornicata</u>	Atlantic Slipper Shell
17. <u>Crepidula aculeata</u>	Spiny Slipper Shell
18. <u>Crepidula plana</u>	Eastern White Slipper Shell
19. <u>Polinices duplicatus</u>	Shark Eye
20. <u>Urosalpinx cinerea</u>	Atlantic Oyster Drill
21. <u>Thais haemastoma floridana</u>	Florida Rock Shell
22. <u>Anachis avara</u>	Greedy Dove-Shell
23. <u>Anachis obesa</u>	Fat Dove-Shell
24. <u>Mitrella lunata</u>	Lunar Dove-Shell
25. <u>Cantharus tinctus</u>	Tinted Cantharus
26. <u>Melongena corona</u>	Crown Conch
27. <u>Busycon carica</u>	Knobbed Whelk
28. <u>Busycon contrarium</u>	Lightning Whelk
29. <u>Busycon canaliculatum</u>	Channeled Whelk
30. <u>Nassarius vibex</u>	Eastern Nassa
31. <u>Nassarius obsoletus</u>	Mud Snail
32. <u>Olivella mutica</u>	Variable Dwarf Olive
33. <u>Bulla occidentalis</u>	West Indian Bubble
34. <u>Aplysia willcoxi</u>	Sea Hare
35. <u>Odostomia impressa</u>	Impressed Odostome
36. <u>Chaetopleura apiculata</u>	Eastern Chiton

CLASS PELECYPODA

1. <u>Anadara transversa</u>	Transverse Ark
2. <u>Noetia ponderosa</u>	Ponderous Ark
3. <u>Glycymeris pectinata</u>	Comb Bittersweet
4. <u>Modiolus americanus</u>	Tulip Mussel
5. <u>Brachidontes exustus</u>	Scorched Mussel
6. <u>Brachidontes recurvus</u>	Hooked Mussel

(* partial list of invertebrates that may occur in the Fort Matanzas area; compiled by State of Florida)

CLASS PELECYPODA (continued)

7. <u>Amygdalum papyria</u>	Paper Mussel
8. <u>Lithophaga bisulcata</u>	Mahogany Date Mussel
9. <u>Anomia simplex</u>	Jingle Shell
10. <u>Ostrea equestris</u>	Crested Oyster
11. <u>Crassostrea virginica</u>	Eastern Oyster
12. <u>Polymesoda caroliniana</u>	Carolina Marsh Clam
13. <u>Pseudocyrena floridana</u>	Florida Marsh Clam
14. <u>Congeria leucophaeata</u>	Conrads False Mussel
15. <u>Laevicardium mortoni</u>	Mortons Egg Cockle
16. <u>Mercenaria mercenaria</u>	Northern Quahog
17. <u>Mercenaria campechiensis</u>	Southern Quahog
18. <u>Chione cancellata</u>	Cross-Barred Venus
19. <u>Tellina lineata</u>	Rose Petal Tellin
20. <u>Abra aequalis</u>	Common Atlantic Abra
21. <u>Tagelus plebius</u>	Stout Tegelus
22. <u>Tagelus divisus</u>	Purplish Tagelus
23. <u>Ensis minor</u>	Jackknife Clam
24. <u>Mulinia lateralis</u>	Dwarf Surf Clam
25. <u>Rangia cuneata</u>	Common Rangia
26. <u>Corbula contracta</u>	Contracted Corbula
27. <u>Barnea costata</u>	Angel Wing
28. <u>Martesia cuneiformis</u>	Wedge-Shaped Martesia

PHYLUM ARTHROPODA

CLASS CRUSTACEA

ORDER CIRRIPIEDIA

1. <u>Balanus balanoides</u>	Common Barnacle
2. <u>Balanus eburneus</u>	Ivory Barnacle
3. <u>Chthamalus fragilis</u>	Barnacle

ORDER STOMATOPODA

1. <u>Choridella empusa</u>	Mantis Shrimp
-----------------------------	---------------

ORDER DECAPODA

FAMILY PENAEIDAE

1. <u>Penaeus setiferus</u>	White Shrimp
2. <u>Penaeus duorarum</u>	Pink Shrimp
3. <u>Penaeus aztecus</u>	Brown Shrimp

FAMILY SERGESTIDAE

1. <u>Acetes americanus carolinae</u>	
2. <u>Lucifer faxoni</u>	

ORDER DECAPODA (continued)

FAMILY PALAEMONIDAE

- | | | |
|----|--|--------------|
| 1. | <u>Macrobrachium</u> <u>acanthurus</u> | |
| 2. | <u>Palaemonetes</u> <u>vulgaris</u> | Glass Shrimp |
| 3. | <u>Palaemonetes</u> <u>intermedius</u> | Glass Shrimp |
| 4. | <u>Palaemonetes</u> <u>pugio</u> | Glass Shrimp |

FAMILY ALPHEIDAE

- | | | |
|----|-------------------------------------|-----------------|
| 1. | <u>Alpheus</u> <u>heterochaelis</u> | Snapping Shrimp |
|----|-------------------------------------|-----------------|

FAMILY OGYRIDES

- | | | |
|----|---------------------------------|--|
| 1. | <u>Ogyrides</u> <u>limicola</u> | |
|----|---------------------------------|--|

FAMILY CALLIANASSIDAE

- | | | |
|----|--------------------------------|------------------|
| 1. | <u>Upogebia</u> <u>affinis</u> | Burrowing Shrimp |
|----|--------------------------------|------------------|

FAMILY PORCELLANIDAE

- | | | |
|----|------------------------------------|--|
| 1. | <u>Petrolisthes</u> <u>armatus</u> | |
| 2. | <u>Polyonyx</u> <u>gibbesi</u> | |

FAMILY PAGURIDAE

- | | | |
|----|------------------------------------|---------------------|
| 1. | <u>Clibanarius</u> <u>vittatus</u> | Striped Hermit Crab |
| 2. | <u>Pagurus</u> <u>longicarpus</u> | Small Hermit Crab |
| 3. | <u>Pagurus</u> <u>annulipes</u> | Hermit Crab |
| 4. | <u>Pagurus</u> <u>pollicavivis</u> | Large Hermit Crab |

FAMILY PORTUNIDAE

- | | | |
|----|-----------------------------------|-----------|
| 1. | <u>Callinectes</u> <u>sapidus</u> | Blue Crab |
| 2. | <u>Callinectes</u> <u>ornatus</u> | |

FAMILY XANTHIDAE

- | | | |
|----|---|-----------------|
| 1. | <u>Menippe</u> <u>mercenaria</u> | Stone Crab |
| 2. | <u>Rithropanopeus</u> <u>harrisii</u> | |
| 3. | <u>Hexapanopeus</u> <u>augustifrons</u> | Narrow Mud Crab |
| 4. | <u>Neopanope</u> <u>texana sayi</u> | |
| 5. | <u>Eurypanopeus</u> <u>depressus</u> | Flat Mud Crab |
| 6. | <u>Panopeus</u> <u>herbstii</u> | Common Mud Crab |
| 7. | <u>Panopeus</u> <u>occidentalis</u> | |
| 8. | <u>Eurytium</u> <u>limosum</u> | |

ORDER DECAPODA (continued)

FAMILY PINNOTHERIDAE

- | | | |
|----|------------------------------|-------------|
| 1. | <u>Pinnotheres ostreum</u> | Oyster Crab |
| 2. | <u>Pinnotheres maculatus</u> | Mussel Crab |
| 3. | <u>Pinnixa chaetopleura</u> | |
| 4. | <u>Pinnixa retinens</u> | |

FAMILY GRAPSIDAE

- | | | |
|----|---------------------------------|---------------------|
| 1. | <u>Paehygrapsus transversus</u> | Mottled Shore Crab |
| 2. | <u>Sesarma reticulatum</u> | |
| 3. | <u>Sesarma cinereum</u> | Wharf Crab |
| 4. | <u>Uca minax</u> | Red-Jointed Fiddler |
| 5. | <u>Uca pugnax</u> | Mud Fiddler |
| 6. | <u>Uca pugilator</u> | Sand Fiddler |

FAMILY MAJIDAE

- | | | |
|----|---------------------------|-------------|
| 1. | <u>Libinia emarginata</u> | Spider Crab |
|----|---------------------------|-------------|

CLASS ARACHNOIDEA

SUBCLASS XIPOSURA

- | | | |
|----|---------------------------|----------------|
| 1. | <u>Limulus polyphemus</u> | Horseshoe Crab |
|----|---------------------------|----------------|

(partial list of invertebrates that may occur in the Fort Matanzas area; compiled by State of Florida)

TABLE 8
VEGETATION OF FORT MATANZAS NATIONAL MONUMENT

SALT MARSH

1.	<u>Spartina alterniflora</u>	Marsh Grass
2.	<u>Avicennia germinans</u>	Black Mangrove
3.	<u>Batis maritima</u>	Saltwort
4.	<u>Salicornia virginica</u>	Perrenial Saltwort
5.	<u>Borrchia frutescens</u>	Sea Ox-Eye
6.	<u>Sporobolus virginicus</u>	Virginia Dropseed
7.	<u>Sesuvium portulacastrum</u>	Sea-Purslane
8.	<u>Solidago sempervirens var. mexicana</u>	Mexican-Goldenrod
9.	<u>Iva imbricata</u>	Imbricated Marsh Elder
10.	<u>Portulaca pilosa</u>	Purslane
11.	<u>Juncus roemerianus</u>	Black Rush
12.	<u>Spartina bakeri</u>	Broom Grass
13.	<u>Distichlis spicata</u>	Salt Grass

LIVE OAK - PALMETTO

1.	<u>Quercus virginiana</u>	Sand Live Oak
2.	<u>Sabal palmetto</u>	Cabbage Palm
3.	<u>Persea borbonia</u>	Red Bay
4.	<u>Juniperus silicicola</u>	Southern Red Cedar
5.	<u>Magnolia virginiana</u>	Sweet Bay
6.	<u>Yucca aloifolia</u>	Spanish Bayonet
7.	<u>Callicarpa americana</u>	Beauty Berry
8.	<u>Magnolia grandiflora</u>	Magnolia
9.	<u>Ilex vomitoria</u>	Yaupon Holly
10.	<u>Vitis species</u>	Grape
11.	<u>Parthenocissus quinquefolia</u>	Virginia Creeper
12.	<u>Rhus radicans</u>	Poison Ivy
13.	<u>Rhus toxicodendron</u>	Poison Oak
14.	<u>Cnidoscolus stimulosus</u>	Stinging Nettle
15.	<u>Dryopteris ludoviciana</u>	Florida Shield Fern
16.	<u>Polypodium polypodiodes</u>	Resurrection Fern
17.	<u>Myrica cerifera</u>	Wax Myrtle
18.	<u>Vernonia species</u>	Iron Weed
19.	<u>Agave neglecta</u>	Wild Century Plant
20.	<u>Xanthoxylum Clava-Hercules</u>	Hercules Club
21.	<u>Phytolacca rigida</u>	Pokeweed
22.	<u>Solidago sempervirens</u>	Goldenrod
23.	<u>Monarda punctata</u>	Horsemint
24.	<u>Lantana camara</u>	Lantana
25.	<u>Serenda repens</u>	Saw Palmetto
26.	<u>Zamia umbrosa</u>	Coontie
27.	<u>Cynodon dactylon</u>	Bermuda Grass
28.	<u>Prunus serotina</u>	Black Cherry
29.	<u>Pteridium pseudoeaudatum</u>	Brachen Fern
30.	<u>Cinnamonum camphora</u>	Camphor Tree

LIVE OAK - PALMETTO (continued)

- | | |
|-------------------------------------|---------------------|
| 31. <u>Lippia nodiflora</u> | Capeweed |
| 32. <u>Erythrina arborea</u> | Cherokee Bean |
| 33. <u>Commelina virginica</u> | Virginia Day Flower |
| 34. <u>Eupatorium capillifolium</u> | Dog Fennel |
| 35. <u>Asimina parviflora</u> | Dwarf Paw Paw |
| 36. <u>Panicum dichotumiflorum</u> | Fall Panicum |
| 37. <u>Gaillardia lanceolata</u> | Gaillardia |
| 38. <u>Ulex europaens</u> | Ulex |
| 39. <u>Aralia spinosa</u> | Hercules Club |
| 40. <u>Smilax Laurifolia</u> | Laurel Greenbrier |
| 41. <u>Nerium oleander</u> | Oleander |
| 42. <u>Euphorbia heterophylla</u> | Painted Leaf |
| 43. <u>Passiflora incarnata</u> | Passion Flower |
| 44. <u>Asimina triloba</u> | Paw Paw |
| 45. <u>Diospyros virginiana</u> | Persimmon |
| 46. <u>Spigelia marylandica</u> | Pink Root |
| 47. <u>Phytolacca americana</u> | Pokeweed |
| 48. <u>Punica granatum</u> | Pomegranate |
| 49. <u>Opuntia opuntia</u> | Prickly Pear |
| 50. <u>Persea borbonia</u> | Red Bay |
| 51. <u>Pinus elliottii</u> | Slash Pine |
| 52. <u>Sapindus sponaria</u> | Wingleaf Soapberry |
| 53. <u>Juniperus silicicola</u> | S. Red Cedar |
| 54. <u>Tillandsia usneoides</u> | Spanish Moss |
| 55. <u>Tradescantia virginiana</u> | Spiderwort |
| 56. <u>Quercus nigra</u> | Water Oak |
| 57. <u>Aristida dichotoma</u> | Wiregrass |
| 58. <u>Rhus capallina</u> | Winged Sumac |

SAND DUNES - PALMETTO SCRUB

- | | |
|------------------------------------|--------------------------|
| 1. <u>Uniola paniculata</u> | Sea Oats |
| 2. <u>Opuntia stricta</u> | Prickly Pear |
| 3. <u>Sabal palmetto</u> | Cabbage Palm |
| 4. <u>Cakile eduntula</u> | Sea Rocket |
| 5. <u>Spartina patens</u> | Saltmeadow Cordgrass |
| 6. <u>Ipomea stoloniferae</u> | Morning-Glory family |
| 7. <u>Oenothera humifusa</u> | Seaside Evening Primrose |
| 8. <u>Ipomea pes-caprae var.</u> | |
| 8. <u>emarginata</u> | Railroad Vine |
| 9. <u>Hydrocotyle bonariensis</u> | Water Pennywort |
| 10. <u>Helianthus debilis</u> | Sunflower family |
| 11. <u>Panicum amarulum</u> | Beachgrass |
| 12. <u>Smilax auriculata</u> | Greenbrier |
| 13. <u>Sesuvium portulacastrum</u> | Sea purslane |
| 14. <u>Cassia fasciculata</u> | Partridge-Pea |
| 15. <u>Chloris petraea</u> | Fingergrass |

SAND DUNES - PALMETTO SCRUB (continued)

16.	<u>Rumex pulcher</u>	Fiddle-Dock
17.	<u>Cenchrus species</u>	Sandspur
18.	<u>Heterotheca subaxillaris</u>	Camphorweed
19.	<u>Atriplex arenaria</u>	Sand Atriplex
20.	<u>Salsola kali</u>	Common Saltwort (annual)
21.	<u>Psilotum nudum</u>	Whiskfern
22.	<u>Anmophila breviligulata</u>	American Beach Grass
23.	<u>Aristida species</u>	Three-Awn Grass
24.	<u>Baccharis halimifolia</u>	Sea Myrtle
25.	<u>Cakile edentula</u>	Sea Rocket
26.	<u>Yucca aloifolia</u>	Spanish Bayonet

Section 5 The Excavations

Excavations were carried out on both Rattlesnake and Anastasia Islands in an attempt to achieve the goals outlined in section 1. In addition to the various test trenches described below; foot surveys and soil auger tests were made in those areas of the monument known to have been dry land in 1765.

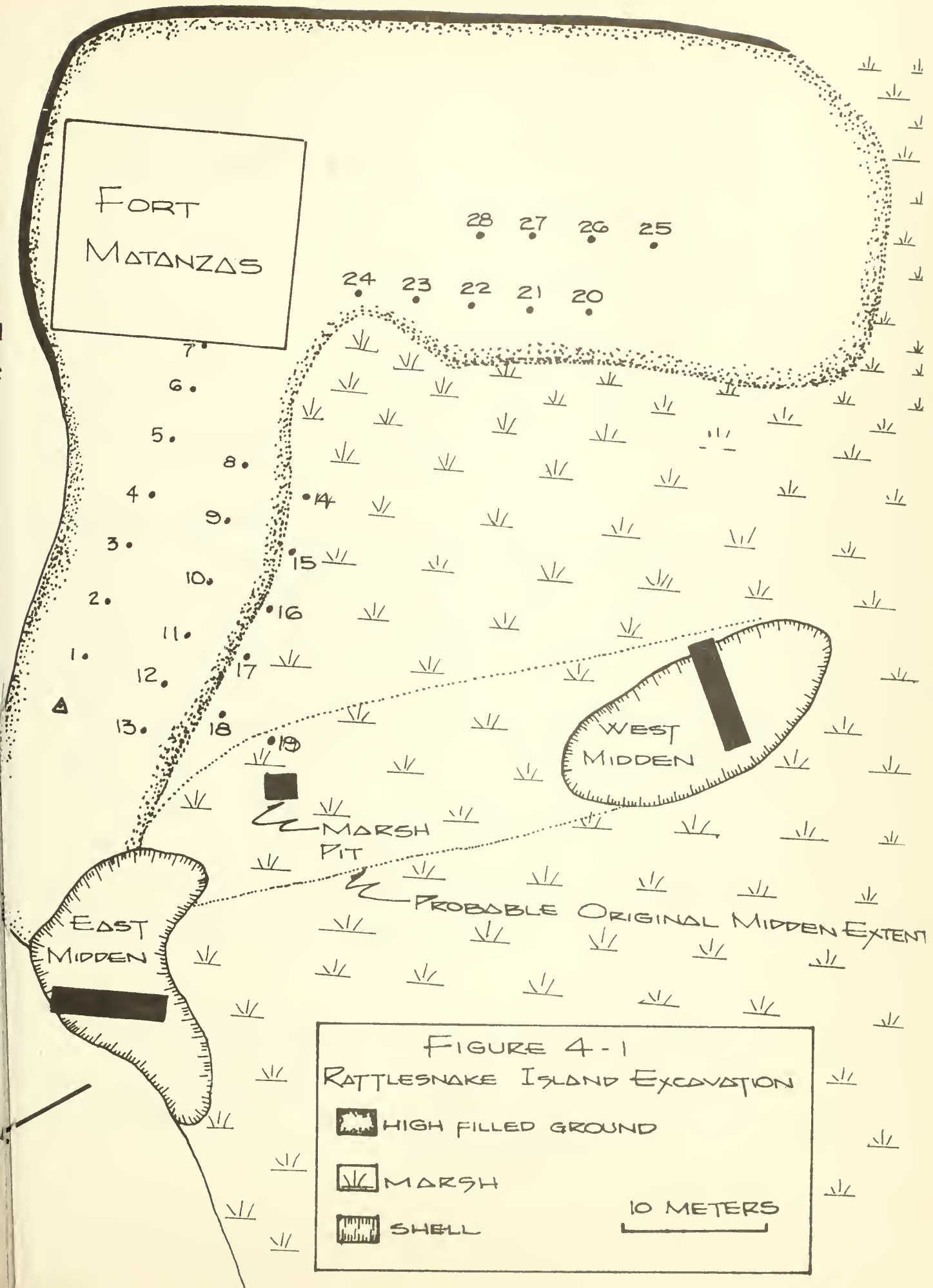
Excavation procedures and controls were common to all trenches. Vertical control was maintained with a transit, with all depth measurements measured down from an arbitrary datum, the location of which is described in the discussions of each test. Since the tests each consisted of a single trench, horizontal control was maintained by tying the trench corners into a point described in the discussions of each test. Excavation was done by 15cm levels, and all material was water screened through 1/4" mesh screens. Water on Rattlesnake Island was provided by hoses attached to a pump placed in the Matanzas River, and on Anastasia Island hoses from the Visitor Center spigot were used.

Material was bagged and labeled by provenience; which was either a midden level or a feature. Appendix I shows the field specimen numbers assigned, their proveniences and their cultural affiliation.

The work at Matanzas was carried out over a period of 22, eight hour days; by eight crew members plus two field supervisors. This included surveying, excavation and backfilling, for a total of 1,760 worker-hours in the field.

Survey

The entire monument area on both islands was resurveyed on foot. Other than the sherds found on the surface of the Rattlesnake Island



middens, the only material found was one Olive Jar sherd at the location of the visitor center test (see below) and one fiber tempered sherd at about fifteen yards northeast of the Massacre Marker. No indication of any sites other than those located by Gluckman was present; and our survey did not recover any material in either the vicinity of the Johnson house or the massacre marker area, which would indicate that a site was present. The survey results, combined with the fact that Gluckman considered his findings on Anastasia Island to be inconclusive; influenced the decision to concentrate the tests on Rattlesnake Island, the visitor center area and the watchtower location.

Rattlesnake Island Tests

Figure 4-1 shows the location of the middens and the trenches excavated in them, in relation to the fort. In addition to the trenches on the shell ridges, a test pit was excavated in the marsh to the west of the fort, and a series of auger tests were made.

Test trench locations were tied into a key stake, used as a transit station. The location of the key stake is: to the northwest corner of the fort: Distance: 28.7 meters, Angle: $152^{\circ}10'$ east of north.

Figure 4-1 also shows the extent of Rattlesnake Island in 1765, revealing that the north and west shell middens were located along the approximate periphery of the island at that time.

Auger Tests

A series of auger holes were drilled in the positions indicated in Figure 4-1, in order to locate any evidence of midden debris or other cultural activity on the high ground adjacent to the fort. The tests

were also an attempt to determine the extent to which this ground was shifted and filled in during the dredging of the Matanzas River; and the 1916 and other fort stabilization projects.

The holes were drilled with a gasoline powered auger with a 3" bit, to a depth of about .54 meters below the ground surface. The material from each hole was examined, and each hole was checked and measured to determine the water table at low and high tides.

None of the 27 auger holes revealed any cultural information; in fact they all contained only white beach sand, with the exception of numbers 17 and 18 (Figure 4-1). These auger holes revealed the presence of shell in the marsh area between the north midden and the fort, and resulted in the excavation of the Marsh pit (see below).

In all of the auger tests to the north of the fort, the water table (at low tide) was higher than the base of the hole. Since only beach sand was above this water table level it is assumed that either no cultural refuse was located in the area during the fort occupation; or that subsequent natural and dredging action has destroyed any evidence present.

The tests to the southwest of the fort were done in an area of higher ground than those described above. The water table was not encountered in the test holes; however, no indication of cultural material or influence was encountered. Since it is also known that much of this area was filled in during fort stabilization procedures (see section 2), it is considered unlikely that any archaeological data is contained within that area.

North Midden

The north midden is located to the north of Fort Matanzas, and is shown on Figure 4-1. It extends in a SW - NE direction for approximately 25 meters;

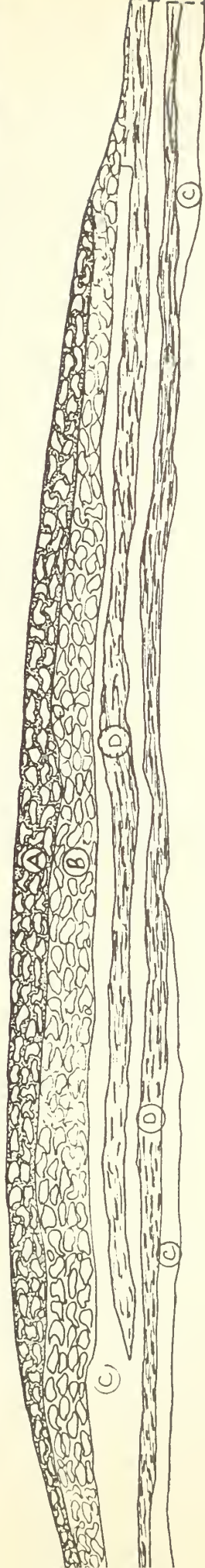


FIG. 4-2
NORTH MIDDEN
NORTH PROFILE

- A. HUMUS & SHELL
- B. SHELL
- C. STERILE SAND
- D. CRUSHED SHELL

1 METER
SCALE 1.20 M.

with a maximum width of 10 meters, tapering to a width of from 4 to 7 meters at either end. The east edge of the midden is being eroded by the wash action of the Matanzas River, however at normal tide levels the river does not extend over the edge of the midden. A trench was laid out near the center of the midden, across and perpendicular to the length of it. The trench, measuring 7.5 meters by 1.5 meters, was intended to span the east-west width of the midden as well as the area immediately adjacent to it.

Location of North Midden Trench:

To NE corner from key stake: angle: $308^{\circ} 24'$ east of north
distance: 22.7 meters

To NW corner from key stake: angle: $289^{\circ} 8'$ east of north
distance: 21.6 meters

(See also Figure 4-1)

Figure 4-2 shows that the depth of the midden at the thickest point was .7 meters. Five 15 cm. levels were excavated, and seven features, were encountered.

The locations of the features are shown in Figure 4-3, indicating a clustering at the east end of the midden. With the exceptions of Features 3, 5, 7 and 8, they all represent the results of river action on the east edge of the midden. Features 1, 2, 4 and 6 were thin layers (none deeper than 5 cm) of crushed shell, interspersed with thin layers of sterile sand; all believed to be erosion wash residue.

Feature 3 was a small pit at the west end of the midden; beneath the midden itself and intruding into sterile soil. Unfortunately the pit contained only faunal remains and 2 wrought nails, and so was not tightly dated.

Feature 5 was an area of burnt shell, sand and ash, below a wash of sterile sand, and covering parts of Features 7 and 4. The terminus post quem for this feature was 1680, provided by a sherd of San Marcos pottery. Unfortunately, no other material than pipestems, one button and glass was recovered from Feature 5.

Feature 7 and 8 were defined as large concentrations of shell, ash and animal bone; only 3 cm deep. These intruded into sterile subsoil, and were partially overlain by Feature 5. The terminus post quem for Feature 7 was provided by a single sherd of burnt pearlware. Feature 8, which underlay Feature 7, yielded only faunal remains.

The use and construction of the midden seem to have taken place over a relatively short period of time. Material found within it suggest a range of mid 18th century until 1790 (see section 5), and this is supported by documentary evidence. The earlier stage of the midden use appears to have been somewhat sporadic, represented in profile by the lower 5 layers of alternating shell and sterile sand, and represented by the materials from levels 4 and 5. The most concentrated use of the midden and buildup of material occurred later, represented in profile by the upper two layers of solid shell, and represented by levels 1-3 in excavation. The material recovered from the midden is discussed in section 5.

West Midden

The location and extent of the west midden are shown on Figure 4-1. This midden is located to the northwest of the fort, on what would have been near the northwest edge of Rattlesnake Island in 1765. At high tide the midden is surrounded by water, or very wet marsh. We feel that this midden extended at one time to the southeast, toward the fort, however this area is today covered by 10-15 cm. of marsh mud, and restrictions of time prohibited



WEST MIDDEN
NORTH & EAST PROFILES

FIG 4-4

- A. BEACH SAND & SHELL
- B. HUMUS & SHELL
- C. STERILE SAND
- D. CRUSHED SHELL
- E. HUMUS

1 METER
SCALE 1:20 M.

thorough testing of the area. Augering was done at the east edge of the midden, revealing that the visible shell at that point today is the result of wash from the main portion of the midden. The auger holes showed a vertical sequence of: (1) a few cm. of shell (2) 8-12 cm. marsh mud (3) mixture of white beach sand and water.

Location of the West Midden Trench:

From the key stake to the west midden SW stake: angle: $218^{\circ} 12'$ east of north
distance: 43.1 meters

From the key stake to the west midden SE stake: angle: $233^{\circ} 11'$ east of north
distance: 41.87 meters

The trench was aligned in a general north-south position across the most concentrated area of the midden.

The trench measured 7.5 x 1.5 meters, and was intended to cross-cut the width of the approximate center of the midden, as well as the immediate adjacent area.

Figure 4-4 shows the midden in profile as alternating layers of soil and shell. The midden deposit at its thickest point was 45 cm deep; somewhat thinner than the north midden. Three 15 cm. levels were excavated in addition to an exploratory trench in the NW corner designated Trench A (See Figure 4-5). Three features were encountered as well as four "areas" designated A-D. These were not assigned feature numbers since they were believed to have been the result of natural, rather than cultural actions. A trash pit, designated Pit E, was excavated in the southwest corner of the trench. (See Figure 4-5).

The nature of the proveniences in this trench are best considered within the construction sequence for the midden. The initial build-up of shell appears to have been from southwest to northeast, represented in profile by zone D, (crushed shell), and in excavation by the provenience designated

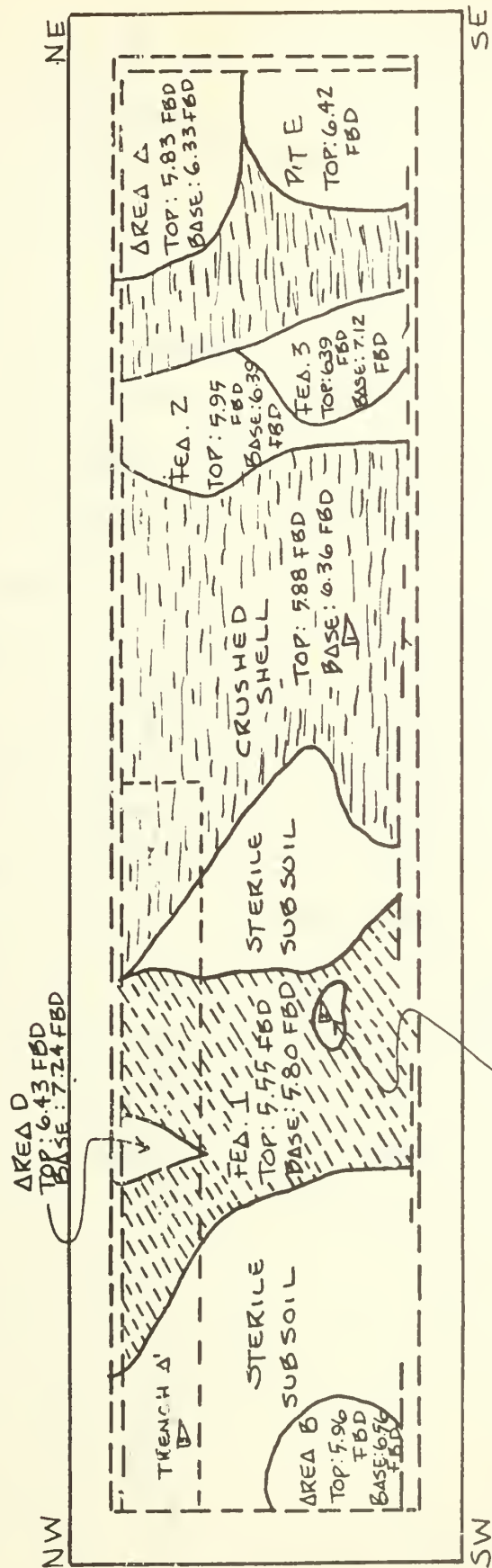


FIGURE 4-5

"crushed shell lens" (See Appendix 1; Figure 4-5). Features 2 and 3, as well as Area C and Pit E, are associated with this stage of midden activity and intrude from this zone into sterile soil.

Following the deposition represented above, a layer of sterile sand was deposited, represented in profile by Zone C (sterile), and in excavation by level 3 and Trench A. The main concentration of midden material occurred above this level, represented in profile by Zone B, and in excavation by levels 1 and 2. Feature 1 and Area B are both intrusive to sterile from this level, and are associated with the main period of midden construction.

Trench A was excavated in the NE corner of the test trench, below Feature 1, to ascertain that no cultural deposition was present below the apparent base of the midden. A single small concentration of shell and charcoal was encountered at 5.3 inches below the top of Trench A, and persisted for 8.26 inches. This appeared to have been an isolated pocket of material in this very unstable midden.

The range of material found in the midden indicates use from the time of fort construction until the early 19th century. Levels 1 and 2; and Pit E were the only proveniences which yielded dateable material. The terminus post quem for Pit E, representing the earlier phase of midden construction, was provided by San Marcos ceramics (1680-1763). The terminus post quem for levels 1 & 2, both part of the later midden construction, was provided by annular pearlware (post-1790). The midden was less concentrated than the north midden, and seems to have been a later area of deposit (See section 5)

The Marsh Pit

As a result of auger tests in the marshy area between the west midden and the north midden, a small test pit was excavated in that area, measuring 1.5

meters square (Figure 4-1). The auger revealed about 10 cm of marsh mud and plant growth covering shell midden of unknown depth, and the test was carried out to determine the composition, date range and depth of midden deposit.

Location of Marsh Pit Northwest Stake:

From the key stake: angle: $231^{\circ} 51'$ east of north
distance: 17 meters

Although pumps, sump holes and hand bailing were simultaneously employed, the midden deposit was below the water table, and water was a major problem. Mapping was impossible and profiles were not visible. The excavation was 40cm deep, carried out in 2 levels of 15cm each after the removal of the upper 10cm of mud. The base of Level 2 coincided with the base of the midden deposit itself.

Although most of the material recovered dated from the mid 18th century, the terminus post quem for this test pit was provided by hand painted pearlware (1785-1800), found in Level 2. A complete discussion of the results of the test can be found in section 5.

Anastasia Island Excavations:

Excavations on Anastasia Island were carried out in the area designated by Gluckman as the visitor center site; and on the top of the dune believed to have been the site of the pre-1742 watchtower.

Watchtower Excavations:

The large stable dune located along the south side of the parking lot area (Figure 4-6) was selected by the Gluckman report, the FSU field party and the monument personnel familiar with the area as the most likely

watchtower location. This was primarily due to the size of the dune, and the heavy vegetation cover which includes numerous large oak trees. The dune was also the site of a water tower which has been subsequently torn down, although disturbance of the dune surface apparently was limited to the four cement corner foundations upon which the tower was constructed.

Two tranches were excavated on the top of the dune, testing all existing possible areas of watchtower location. Trench A was a five meter by 1.5 meter excavation, aligned in a general north to south direction. It was tied into the U.S.G.S. benchmark on the top of the dune: From the center of the benchmark to the northwest corner of Trench A: angle: $173^{\circ} 23'$ east of north ; distance: 1.75 meter. The trench was designed to test the area which would have been below the water tower, as well as the area adjacent to the north. The trench was excavated by 15cm levels, and no disturbance of any kind, or feature, or cultural evidence was recovered in the course of excavation, which extended to .75 meters below ground surface (Figure 4-7).

A second trench designated Trench B was excavated, to the north of Trench A. This trench measured 6 meters by 1.5 meters, and was tied into the U.S.G.S. benchmark on the top of the sand dune: from center of benchmark to northwest corner of Trench B: angle: $320^{\circ} 35'$ east of north ; distance: 1.17 meters. The second trench was excavated in 15cm levels to a depth of .5 meters, and was aligned in a general north to south direction. across the area to the south of Trench A. This area was not subject to any prior construction or disturbance, and constituted the only other reasonably level surface on the dune. No cultural debris, materials or disturbance was found in the course of excavation, and it can only be

concluded that if the watchtower were present here, there is no remaining above or below ground evidence. This problem is considered further in Section 7.

Visitor Center Area

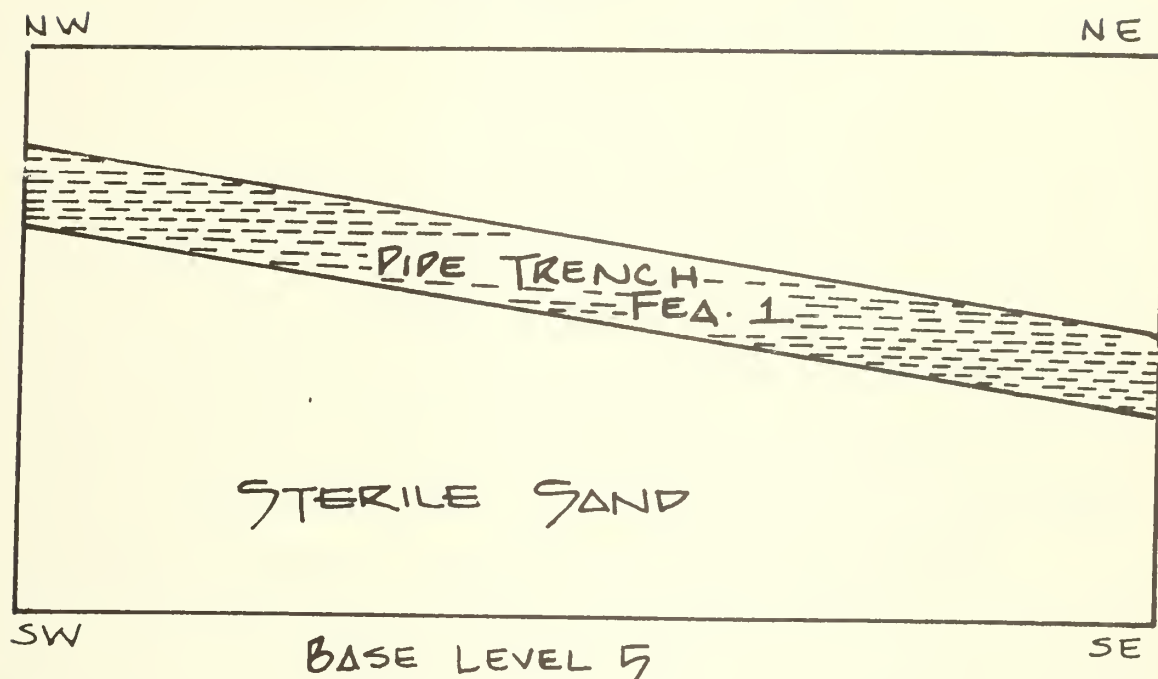
One 3 meter by 1.5 meter test pit was excavated in the vicinity of Gluckman's visitor center site (Figure 4-6). Since materials presumably recovered on the surface of this area were primarily Orange period fiber tempered ceramics (ca 2000-1000 BC), it was expected that information about aboriginal occupation of the monument area would have been recovered; however, as section 6 reveals, this was not the case.

The test pit was aligned in a general east-west direction, and it was located south of the sidewalk on the south side of the parking lot, adjacent to a stand of prickly pear cactus and Spanish bayonet planted there to discourage visitors from taking the sherds which apparently were abundant in this area (J. Shope, personal communication F.M.N.M., 1975). Excavation was tied in to an N.P.S. benchmark located directly to the south of the east end of the parking area (Figure 4-6): from the N.P.S. benchmark to the southwest stake of the pit : $245^{\circ} 0'$ east of north; distance: 36.62 meters. From N.P.S. benchmark to northeast stake of pit: angle: $246^{\circ} 11'$; distance: 33.23 meters. The test pit was excavated in five 15cm levels. Figure 4-8 reveals the extent of cultural deposition, which was 30-35 cm thick. All material recovered was of the Spanish-Indian period, and probably represents at least a peripheral area of the pre-1742 occupation of the monument area.

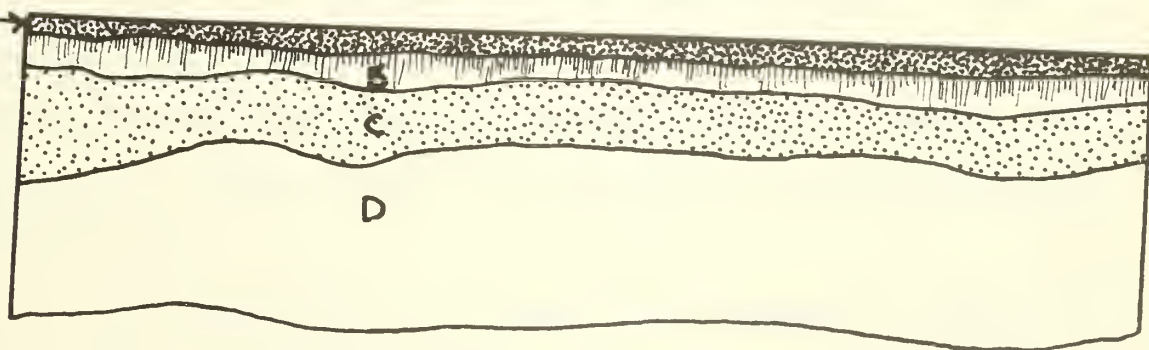
Massacre Marker Midden

Although this area was designated as a focus of investigation in the research design, excavations were not carried out here for four reasons:

FIG. 4-8
VISITOR CENTER
MIDDEN



SCALE 1:20 M.



SOUTH PROFILE

- A. MODERN BLACK HUMUS
- B. LEACH ZONE
- C. BROWN SANDY MIDDEN
- D. YELLOW SAND

SCALE 1:20 M.

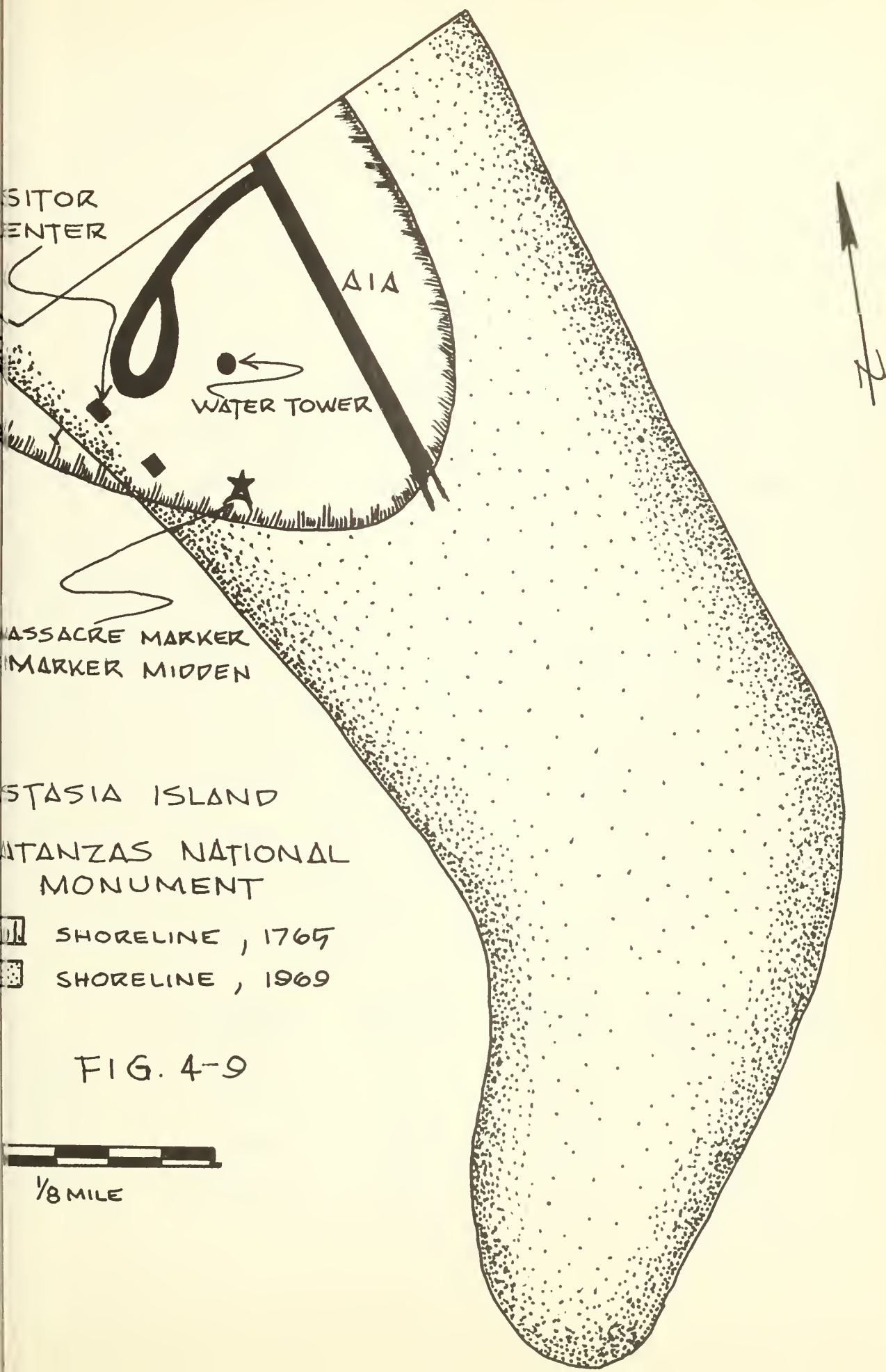
1. Despite the results of Gluckman's survey (1966) we were unable to locate the shell deposit noted as being in this area. It quite likely had been washed away, covered over, or eroded by weather action since 1966. We also only found a single sherd of Orange fiber tempered pottery in the area.

2. Based on Dunkie's (1964) study of coastline change at Matanzas Inlet, it appears that the massacre marker is located at a point which, in 1765, was either just offshore of the south end of Anastasia island, or at the edge of the beach (Figure 4-9). Since the island has been building to the south, this marker area was probably even farther off shore in 1565 or in prehistoric times. If it were located either on the edge of the beach or offshore; this location would not be ecologically appropriate for aboriginal occupation; and would not be the site of Menendez' massacre of Ribault's forces, as it is described historically (see section 2)

3. Personal communication with Mr. James Shope, an employee at Fort Matanzas National Monument and a lifetime resident of the area, revealed that the marker midden is located at the site of an old tidal stream which was filled in by the former residents of the Johnson house prior to institution of the area as a national monument. Material found at that site, therefore, could have been brought in from an area outside of the monument.

4. Time limitations in the project, which allowed four weeks in the field, forced a careful selection of areas to be excavated according to expected results; and because of the above three reasons, the marker area was accorded a low priority.

The analysis of material recovered from the excavations on both Rattlesnake and Anastasia islands is presented in section 5, and synthesized with other data in section 6.



Section 5

Excavation Results

Since no significant features were encountered in any of the excavations and associations were discussed in the previous section, the excavation results analyzed below include artifact material, faunal remains, and negative evidence.

All ceramic types discussed conform to the standard type descriptions unless specified otherwise. For British ceramics see Noel-Hume (1970); for Majolica see Goggin (1968); for Olive jar see Goggin (1960); for San Marcos ceramics see Smith (1948); for other hispanic wares see Smith (1960), Deagan (1976).

Artifact Material

North Midden, Rattlesnake Island - Ceramics

Tables 9 and 10 show the distribution of ceramic and non-ceramic materials by level for the north midden. Although the range of material indicates use of the middens through the entire period of fort occupancy, the beach wash and erosion caused mixing and disturbance within the midden, as shown by the ceramic terminus post quem for the levels. The heaviest use of the midden appears to have been during the first Spanish occupation from from 1742 until 1763 as indicated in the table below:

	<u>San Marcos</u>	<u>18th cent. Hispanic</u>	<u>18th cent. British</u>	<u>Refined earthenware</u>
Level 1	60.36%	16.7%	11.7%	10.35%
Level 2	57.69%	12.01%	12.49%	15.77%
Level 3	53.63%	20.99%	9.39%	15.44%
Level 4	47.82%	21.81%	17.37%	13.04%

	LEVEL 1 # %	LEVEL 2 # %	FEA. 1 # %	FEA. 2 # %	LEVEL 3 # %	FEA. 5 # %	LEVEL 4 # %	FEA. 7 # %	TOTAL # %
Majolica:									
Puebla b/w *		1 .48							1 .002
San Luis poly.**		1 .48							1 .0002
Unidentified	2 .9				1 .91				3 .005
Plain white		1 .48					1 4.34		3 .005
Delft:									
Polychrome		1 .48							1 .005
Blue on white	2 .9	6 2.88			1 .91				9 .016
undecorated	1 .45						1 4.34		2 .004
Earthenwares:									
San Marcos	134 60.36	120 57.69	4 66.66	2 100	59 53.63	2 50.0	11 47.82		332 .575
Slipware	17 7.65	10 4.81			5 4.54		2 8.69	1 50.	35 .060
Olive jar	13 5.85	9 4.33			17 15.45		3 13.04		42 .073
Marine ware	2 .90	6 2.88					1 4.34		9 .016
El Morro ware	12 5.40	4 1.92			3 2.72				19 .033
Rey ware	6 2.70	3 1.44			2 1.81				11 .020
Black lead glazed	1 .45		1 16.66				1 4.34		3 .005
Refined Earthenwares:									
Agate ware		1 .48							1 .002
Creamware	12 5.40	22 10.57	1 16.66		13 11.81		3 13.04		51 .088
Wheildon ware		1 .48							1 .002
plain pearlware	6 2.70	5 2.40			1 .91				13 .022
Feather - edge	1 .45								1 .002
Transfer printed									
pearlware		7 3.36						1 50.	7 .012
Shell- edge	1 .45								1 .002
Early painted									
pearlware	3 1.35	2 .96			1 .91				6 .010
late painted pearl.					2 1.81				2 .004
Annular ware		1 .48							1 .002
Stoneware:									
White salt glazed	3 1.35	4 1.92			1 .91				8 .014
Brown salt glazed	5 2.25	1 .48			1 .91				7 .010
Grey salt glazed	1 .45	1 .48			2 1.81	2 50.0			6 .012
Oriental Porcelain		1 .48							1 .002
Totals:	222 99.96	208 99.96	6 99.98	2 100	110 99.95	4 100.0	23 99.95	2 100	577 .999

* - blue on white ** - polychrome

FIGURE 5-1

NORTH MIDDEN CERAMICS --

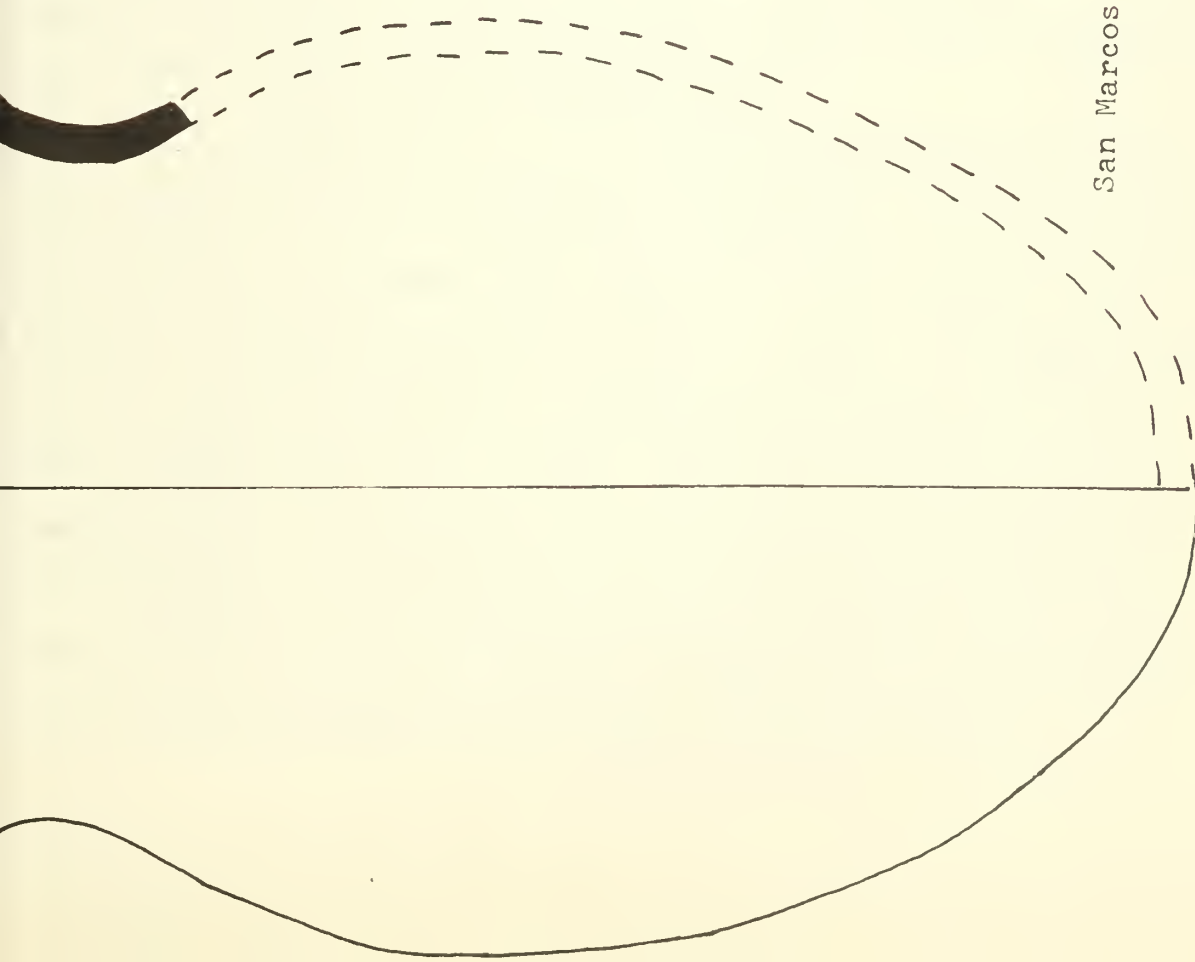
a - e : El Morro ware; d : San Marcos

Nearly 70% of the material from each level is attributable to the first Spanish occupation of the fort, and no radical differences are seen in the proportions of the assemblages from top to bottom of the midden.

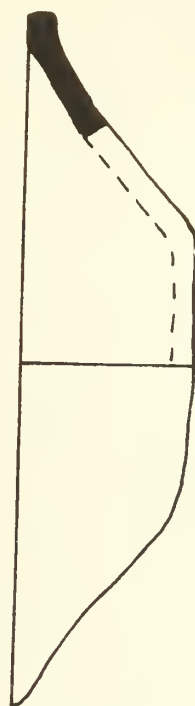
Ceramic material was recovered from five (5) features, (1,2,4,5,7). The terminus post quem for features 2 and 5 was provided by San Marcos ceramics (ca. 1680-1763), for feature 4 by Agate ware (1740-1775), for feature 1 by Creamware (1750-1800: see Deagan 1975) and for feature 7 by pearlware. Material from 2, 4 and 5 can be attributed to early fort occupation, while features 1 and 7 probably date from the second Spanish (1781-1806) or British (1763-1781) occupations. The application of the mean ceramic date formula (South 1972) to the north midden material resulted in a date of 1742.2. While this was much earlier than the historic midpoint date (1775), it serves to suggest that the use of the midden was concentrated in the 1st Spanish period of occupation.

Most of the material recovered was very fragmentary and little evidence of vessel form was available. Slipware was found in a pipkin handle and a mug handle, suggesting that this ware was primarily a utilitarian mug and bowl ware. Mug fragments were also found in white salt glazed stoneware and grey salt glazed stoneware.

Two fragments of El Morro lead glazed earthenware were found, which indicated the vessel forms used at Matanzas during the period of north midden usage. One of these was a platter form, glazed on the interior only; and the other was a shallow bowl form, glazed on the interior surface, and bearing a layer of soot on the exterior surface, indicating use in cooking. These forms are shown in Figure 5-2.



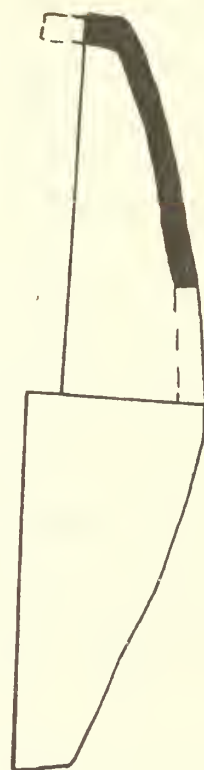
San Marcos



El Morro



El Morro



Rey ware

FIGURE 5-2
EARTHENWARE VESSEL FORMS

San Marcos ceramics, the most frequently encountered ceramic form, showed only one vessel form indication; that of a deep jar shown in Figure 5-2. This is a typical San Marcos vessel form and there is no reason to believe that the other San Marcos vessel forms were not present at the site (Otto & Lewis 1974). The only unusual aspects of the San Marcos ceramic industry at the Rattlesnake Island midden is a higher incidence of undecorated ware and shell tempering than is found on most sites in St. Augustine (see discussion in Section 6).

Olive jar fragments were from the standard-shaped amphora-like vessels. What are apparently plate or saucer rims are found in pearlware and creamware, while majolica was found in small plate or bowl rims, and a portion of a cup or bowl footring.

Of the material dating to the first Spanish occupation of Matanzas, very little was found in forms that would suggest formal tableware. Only majolica was present in plate forms and only seven (7) sherds of majolica were found. All other types were mugs or bowls. *

Material dating to the British and second Spanish occupations of the fort included the refined earthenwares developed after the 1750's (Creamware and Pearlware), which were present primarily in plate or saucer forms. From the distribution of material at the north midden, it is suggested that the first Spanish period soldiers prepared and ate foods in utilitarian wares, primarily bowls, jars and mugs. Later period soldiers apparently used more plate and saucer forms, and this probably can be attributed to the development of refined earthenwares which were commonly made in these forms; as well as the cultural change in occupation of the area, which may have increased the soldiers access to those refined earthenwares.

FIGURE 5-3
UNNAMED BLUE AND BROWN MAJOLICA

The only unusual and significant ceramic items found were three majolica sherds of unnamed type. These were polychrom blue, brown, pale brown and white, shown in Figure 5-3, and similar to Goggin's unnamed majolica variety "A" (1968, pl. 7) (Figure 5-3).

Non ceramic material: North midden

Table 10 shows the distribution by provenience of non ceramic items in the north midden. The bulk of this material was comprised of glass fragments, iron fragments and nails, and surprisingly little material of military nature was found.

Level 1 was badly disturbed, probably due to modern visitation of the monument. The terminus post quem for this level was provided by air gun pellets, plastic, .22 slugs and wire nails. Level 2 yielded wire nails with no other modern materials, and levels 3-5 as well as all of the features were free of 19th or 20th century items.

Glass was primarily from olive green wine bottles. Fourteen (14) base fragments (not reconstructable) were recovered, as well as one (1) partial kickup portion and a nearly complete base. The nearly whole bases were of the shape associated with mid-18th century glass wine bottles (Noel-Hume 1970: 66-67). A single string rim fragment was also found. The only other glass form apparent in the north midden assemblage was a base fragment from a clear glass goblet.

Other than the nails and spikes indicated in Table 9, the only recognizable iron artifact was a portion of a musket lock with the flint still embedded in what is now ferrous oxide (Figure 5-4). Certainly in a salt water environment such as Matanzas, little if any iron can be expected to have survived 200 years of burial.

	<u>Level 1</u>	<u>Level 4</u>	<u>Level 5</u>	<u>Total</u>
Plastic	1			
Basaltic Rock	21			
Airgun Pellets	2			
.22 Long Slugs	1			
Misc.				
		1 Uni.D.Stone	1 Poss.Mano	

FIGURE 5-4

NORTH MIDDEN NON-CERAMIC MATERIAL

- a: mano fragment; b: bone knife handle;
- c: bone buttons and button blank
- d: red clay pipebowl

A flat brass fragment found in level 4 was 4cm x 5cm, and had two square holes which were undoubtedly wrought nail holes. This was probably a portion of a musket buttplate or sideplate.

Thirteen buttons or button fragments and one bone blank were recovered from the north midden, as indicated in Table 10. Eight of these are single holed bone buttons (Figure 5-4) and a flat piece of bone found in level 4, has had buttons carved from it (Figure 5-4), indicating that the soldiers at Matanzas were making and replacing their own buttons with local materials.

The single iron button is so badly corroded as to be unidentifiable, and two undecorated brass buttons were recovered, one of 2cm. in diameter and whole, and one of 1 cm. in diameter. (The larger of the two was from level 1). Two copper buttons were also found, but were so corroded as to be unidentifiable. The large brass button from level 1 was similar to Souths' type 7, dated at Brunswick town between 1726 and 1776 (South 1964). These buttons are also frequently recovered from first Spanish period contexts in St. Augustine. The bone discs (Figure 5-4) are irregular in shape, and appear to have been crudely made at the site.

Kaolin pipe remains were also recovered; 61 stem fragments and 18 bowl fragments. The pipestem dating formulas (Binford 1962; Helgton and Deagan 1972) were not applied due to the inadequate sample size; although, as Table 9 indicates, most of the pipes measured 5/64" in stem bore diameter. A single bone fragment had "T D" marked on the spur.

In addition to the Kaolin pipes, 3 bowl fragments of stemless, red clay pipebowls were encountered. These pipes are similar in form to those found in the British colonies dating to 1770-1820 (Noel-Hume 1970: 303),

FIGURE 5-5
FLINTS FROM FORT MATANZAS

although one specimen is so crudely formed that it appears to have been an effort of local modelling (Figure 5-4).

Four gunflints, and 21 flint fragments were found, all from levels 1 and 2. Only one grey prismatic flint was found, the others being of the variety termed "gunspall" by Hume (1970:221). One of these was crudely chipped from marbled Florida chert (Figure 5-5). Seventeen flint fragments were also recovered, 9 of which were "honey colored" flint, and eight were of grey flint. Most of these were carefully worked or very worn on one edge, and broken on the other, and appear to be fragments of actual gunflints rather than chipping debitage (Figure 5-5).

Only three other items recovered from the north midden were of cultural interest, and are shown in Figure 5-4. These included a possible mano fragment of volcanic basalt, which suggests that either the soldiers were grinding their own corn, or that there was somebody at the Matanzas fort who was doing it for them. This item was found at the base of the midden in level 5.

A bone knife handle was recovered from level 3. This was carved in the "pistol grip" style typical of the early 18th century (Figure 5-4; Noel-Hume 1970:182), but of a manufacturing technique (riveted bone plates) typical of mid-18th century (ibid). The third miscellaneous item was not a food preparation or consumption item, but was the only decorative element found in the midden. This was a paste rhinestone, found in level 2, possibly a cuff button or ornament, lost probably by a visitor to the fort.

West Midden, Rattlesnake Island

Ceramics

The west midden yielded far fewer sherds than the north midden: 119 as compared to 577. Table 11 shows the distribution of this material through

TABLE 11

WEST MIDDEN CERAMIC MATERIAL

	Level 1		Level 2		Pit E		Totals
	#	%	#	%	#	%	
<u>Majolica:</u>							
Puebla B/W			1	8.33			1
Delft B/W	1	.96	1	8.33			2
Delft bisque	1	.96					
Delft Plain	2	1.92					3
<u>Earthenwares:</u>							
San Marcos	25	24.03	3	25.00	3	100	31
St. Johns			2	16.66			2
Slipware	6	5.76					6
Olive Jar	6	5.76	1	8.33			7
Marine ware	9	8.65	1	8.33			10
El Morro ware	7	6.73					7
Honey colored	1	.96					1
Rey wa re	1	.96					1
Creamware	32	30.76	3	25.00			35
<u>Pearlware:</u>							
Plain	3	2.88					3
Transfer print	5	4.81					5
Pearlware							
Shell edge	1	.96					1
Late Painted	1	.96					1
Annular	1	.96					1
<u>Stonewares:</u>							
White Salt glazed	1	.96					1
Brown Salt-glazed	1	.96					1
Totals	104	99.94	12	99.98	3		119

the three proveniences in which it was found.

The discussion of west midden stratigraphy in the preceding section: indicated that levels 1 and 2 represent the later, main concentration of midden buildup, while the earlier sequence (prior to the wash of sterile sand underlying levels 1 and 2) was represented by areas D and C; Pit E, and features 2 and 3.

The distribution of material in levels 1 and 2 indicate a later use period than that in the north midden:

	<u>San Marcos</u>	<u>18th cent. Hispanic</u>	<u>18th cent. British</u>	<u>Refined Earthenwares</u>	<u>Other</u>
Level 1	24.03%	23.06%	11.62%	41.33%	--
Level 2	25.00%	16.66%	8.33%	25.00%	16.66%
Pit E	100.00% (3 sherds)	-	-	-	-

Although the material found in the west midden includes date ranges spanning the entire occupation of the fort, the ceramics manufactured after the 1750's, and not found in first Spanish period contexts, predominate. The mean ceramic date formula, however yields a date of 1757.75, still earlier than the historic midpoint date of 1775. This might be accounted for (in both middens) by the presence of San Marcos ceramics, which often tends to have a skewing effect to an earlier date for reasons which are not yet fully understood. If San Marcos ceramics were removed from the assemblage for dating purposes; the remaining sherds would not constitute an adequate sample. For the present, the mean ceramic date formula provides another illustration that the west midden deposit is more recent than the north midden.

Very little evidence of vessel form was recovered from the west midden. One fragment of undecorated delftware was an everted rim from a drug jar;

FIGURE 5-6

WEST MIDDEN MATERIAL

- a: Rey ware sherd; b: metal knife fragment
c: gunflint embedded in metal

and the base of mug handle was found in lead glazed earthenware. One rimsherd of El Morro lead-glazed earthenware indicated bowl form used at Matanzas, and shown in Figure 5-2. Other than these items, the only other evident forms were saucer or plate rims in edged pearlware and in creamware.

No previously unnoted or otherwise unusual ceramic items were recovered at the west midden.

Non Ceramic Material: West Midden

Table 12 shows the distribution of non ceramic material from the west midden. The majority of the items are glass fragments and metal scraps of unidentifiable origin. The material shows that although the use of the west midden was slightly later than that of the north midden; the midden itself was less disturbed. No 20th century material was found either on the surface or in level 1. This is certainly due to the location of this midden farther into what is now marsh area, and its relative inaccessability to fort visitors, compared to the north midden.

The only evidence of form among the 108 glass fragments were 2 base fragments, 1 neck fragment from an olive green wine bottle, and a single case bottle fragment.

Iron artifacts were expectedly deteriorated, although a number of nails and a spike could be identified as having been wrought. The only other identifiable object was a portion of an iron knife blade and handle (Figure 5-6).

Buttons included only 2 single hole bone buttons, and no other material of a clothing related or decorative nature was found.

TABLE 12

WEST MIDDEN NON-CERAMIC MATERIAL

	<u>LEVEL 1</u>	<u>LEVEL 2</u>	<u>AREA B</u>	<u>PIT A</u>	<u>TOTAL</u>
<u>GLASS</u>					
Green	75	14	1	1	91
Case bottle	1				1
Clear	7	7			14
Blue-green	2				2
<u>NAILS</u>					
Wrought	42	4	3		49
Wire					
<u>WROUGHT SPIKES</u>					
Iron	1				1
Strapfrags	11	2			13
Iron Scraps	41	15	2	2	60
Other Iron		1	1 Knife blade & handle)		1
<u>BUTTONS</u>					
Bone	1	1			2
<u>PIPES</u>					
Kaolin Stem	5 (5/64)	1			6
Kaolin Stem	2 (6/64)	1			3
Bowls					
<u>FLINT</u>					
Lt. Grey	1				1
Honey Colored	1				1
Dark Grey					
<u>TILE-EARTHENWARE</u>					
		1			1
<u>BRICK RUBBLE</u>					
	9	7			16
<u>COQUINA RUBBLE</u>					
	23	33	2	3	61
<u>CHARCOAL</u>					
	4	26	1	2	33
<u>FERROUS OXIDE</u>					
	22				22
TOTALS	247	113	9	8	377

FIGURE 5-7

MARSH PIT CERAMICS

a: slipware sherd; b: creamware base

c: red clay pipebowl

Fragments of two gunflints were present in level 1; one honey colored and one pale grey; probably from a French flint and a spall, respectively (Figure 5-5).

Marsh Pit, Rattlesnake Island-Ceramics

Table 13 shows the distribution of the 61 fragments of pottery found in the 2 levels of the marsh pit. This material should be treated as a single deposit, because the latest items in the assemblage were found at the lowest midden level; due either to a use period over a longer time period but subsequently, shifted and disturbed by the rising and lowering of the water table.

Four sherds of pearlware were recovered from level 2, dating between 1780 and 1820 (Noel Hume 1970:128) and providing a terminus post quem for the midden deposit. The proportions of 18th century hispanic, 18th century British, San Marcos and refined (post 1750's) earthenwares is shown below:

	<u>18th Century Hispanic</u>	<u>San Marcos</u>	<u>18th Century British</u>	<u>Refined Earthenwares</u>
Level 1	12.00%	44.00%	32.00%	12.00%
Level 2	25.00%	47.00%	16.64%	11.10%

The high proportion of 18th century hispanic ceramics in level 2 is misleading in this case, since 19.44% of that figure is from Olive jar sherds, which could have been used by either first or second Spanish period soldiers.

This rough distribution compares most closely with the distribution found at the north midden; but having a lower proportion of San Marcos and hispanic ceramics, and a higher proportion of British 18th century ceramics. This suggests a position in time and use for the marsh pit midden between

TABLE 13

MARSH PIT CERAMICS

	<u>LEVEL 1</u>		<u>LEVEL 2</u>		<u>TOTAL</u>
	#	%	#	%	
<u>Majolica:</u>					
Unidentified blue-	1	4.00	1	2.77	2
on white					
Delft B/W	2	8.00			2
Delft Plain	1	4.00			1
San Marcos	11	44.00	17	47.22	28
Slipwares	2	8.00	2	5.55	4
Olive Jar	1	4.00	7	19.44	8
El Morro	1	4.00	1	2.77	2
Leaded Glazed (Black)	1	4.00			1
Agate Ware			1	2.77	1
Creamware (Burned)	3	12.00			3
Pearlware Plain			3	8.33	3
Pearlware Early Painted			1	2.77	1
Stone Ware:			2	5.55	2
Brown salt glazed					
Grey salt glazed	2	8.00	1	2.77	3
TOTALS	25	100.00	36	99.94	61

the north and west middens. Caution should be made, however; that this suggestion is made on a very limited sample, and based upon ceramic distribution only. The problem is discussed in section 6 in more detail.

The only information about vessel form was provided by 1 base sherd from a pearlware plate, 1 fragment of a scalloped-rim, slipware platter; a tankard base of grey salt-glazed stoneware, and single base fragment from a creamware bowl (Figure 5-7).

The unidentified majolica sherds were not given identification due to their small size, which made assignment to types dubious. Both of these small majolica sherds were blue and white.

Non-Ceramic Material - Marsh Pit:

As in the north and west middens, glass fragments and unidentifiable metal constituted the major part of the non ceramic assemblage from the marsh pit, shown in Table 14. Two identifiable glass fragments were recovered; one aqua green base portion from a bottle with a kick-up; and an olive green string rim.

The two gunflints recovered were both reworked. The honey colored flint had been reduced to a spall, while the grey, prismatic flint was reworked on at least three sides (Figure 5-5).

A red clay pipebowl fragment was found, similar to, but much more finely molded than that from the north midden

Building Materials - Rattlesnake Island

Special mention should be given to the building construction rubble found in all three test excavations on Rattlesnake Island. This material included very poorly fired red brick; one red-brick tile with a grey core, similar to those found in first Spanish period St. Augustine (See Deagan 1976);

TABLE 14

MARSH PIT NON-CERAMIC MATERIAL

	<u>LEVEL 1</u>	<u>LEVEL 2</u>	<u>TOTAL</u>
<u>GLASS</u>			
Green	24	59	83
Blue Green	1	3	4
Clear	2	3	5
<u>NAILS</u>			
Wrought	16	8	24
Spikes	5	7	12
Strap Frags	4	13	17
Miscellaneous Frags	21	26	47
Kaolin Pipe Stems		1	1
Kaolin Pipe Bowl		1	1
Red Clay Bowl		1	1
<u>FLINT</u>			
Dark Grey		2 (1 frag)	
Honey Colored	2 (1 frag)		2
<u>WOOD FRAGS</u>			
Coquina Rubble	11	51	51
Charcoal Fragments		2	14
Tabby Fragments		18	18
		1	

FIGURE 5--8
BUILDING MATERIALS FROM RATTLESNAKE
ISLAND

a: earthenware tile; b: "Spanish sandwich" brick
c: tabby

earthenware flat tile with plaster adhering; a portion of a barrel roof tile; fine composition tabby chunks and much coquina rubble (Figure 5-8).

The tile brick, barrel tile, earthenware tiles and brick rubble make it unlikely that this was debris from fort repair. Moreover, most of this material is concentrated in levels 3-5 of the north midden, although some does appear in levels 1-2 of the west midden. The marsh pit contained only coquina and tabby rubble, which could have resulted from renovation of the fort.

The distribution of the material suggest either building or tearing down during the early part of the occupation of the fort. From the inadequate remains; an ancillary structure with a tile floor (the brick tiles are commonly used for flooring in St. Augustine); a barrel tile roof; coquina or wood walls (although if we are to judge by the proportion of remains; no formal walls would be suggested) and a structure of poorly fired, probably local brick. The most logical suggestions at this point seem either a separate cooking area with a brick oven; or the remains of the "barracks" structure noted on the 1740 map of the island (see section 3). The possibility of the former suggestion is discussed further in section 6.

Visitors Center Midden, Anastasia Island-Ceramics

Table 15 shows the distribution of ceramics at the visitors center midden excavation. This site yielded only San Marcos ceramics, with the exception of 2 sherds of San Luis Polychrome majolica (Goggin 1968) and a single Olive jar sherd.

The San Marcos ceramics from the visitor's center midden were almost exclusively cross-simple stamped, sand tempered, and apparently made in the traditional San Marcos forms typical of first Spanish period Florida (See Otto and Lewis 1974) (Figure 5-9). No shell tempered sherds were present.

FIGURE 5-9
CERAMICS FROM THE VISITOR CENTER SITE

a-c: San Marcos Stamped ware
d-e: San Luis polychrome majolica

VISITOR CENTER MIDDEN: CERAMICS

	LEVEL 1 #	LEVEL 2 #	LEVEL 3 #	LEVEL 4 #	LEVEL 5 #	FEATURE 1 #	TOTAL #	%
San Marcos	60	103	99.03	158	98.75	3	330	99.1
San Luis Polychrome	1	.97	1	.62			2	.6
Olive Jar			1	.62			1	.3
TOTAL	60	104	160	3	3	3	333	

TABLE 16

VISITOR CENTER MIDDEN: NON CERAMICS

	LEVEL 1	LEVEL 2	LEVEL 3
Green glass	1		
Iron:			
Wrought nail		4	2
Wire nail	6		
Wrought spike		3	
Fragment	9	1	
Modern fragments	2		

The occupation of this area is undoubtedly confined to the first Spanish occupation of Matanzas, and most probably to the pre-1742 watchtower on Anastasia Island. The few remains suggest that this area was on the periphery of the main living area.

Non Ceramic Material- Visitor Center Midden

Table 16 shows the meagre non-ceramic material from this test pit. Level 1 is obviously disturbed by modern visitor action, but levels 2 and 3 appear relatively undisturbed.

Iron nails and spikes were badly corroded, and no other identifiable items were present.

Faunal remains - Rattlesnake Island

Tables 17-19 show the faunal material and its distribution recovered from the north and west middens on Rattlesnake Island. The greatest part of the faunal assemblage is from wild resources, particularly in the north midden, although a large part of the dietary input probably came from the large domestic mammals found less frequently. The most heavily emphasized resource was fish and shellfish, which comprised the highest proportion of the individual animals, as well as the widest range of species. Mammals accounted for a much smaller number of individuals with wild and domestic species in approximately the same proportions. Turtles were a frequently encountered resource, and birds were scarce. The contribution of molluscs to the diet cannot be accurately gauged, but was certainly important.

Only a small proportion of the available local resources were selected for use: possibly a result of dependence on imported foods not reflected archeologically. The particular resources emphasized and the environmental zones exploited will be discussed separately for each midden, since they are believed to have been the results of different cultural occupations. Table 19 shows the MNI (minimum number of individuals) and percent of faunal remains in the two middens, divided into "early" and "late" groups based on the provenience information discussed in section 4 and above.

North Midden

While fish represent approximately 90% of the remains by MNI, 70% of these remains are from catfish and drum. Another 16% are sheephead remains, while 14% are from sharks, mullet, flounder, croaker and sawfish. The north midden, therefore, is characterized by emphasis on selected fish resources; those found primarily in shallow water marine estuaries and typically pro-

Percent of Faunal Groups by MNI* and Proveniences

	Domestic mammals		Wild mammals		Fish		Birds		Turtles		Total MNI
	MNI	%	MNI	%	MNI	%	MNI	%	MNI	%	
North Midden - early	2	2.36	2	2.36	74	84.06	1	1.23	6	7.14	84
North Midden - late	1	1.22	2	2.44	77	93.94			2	2.44	82
West Midden - early	5	6.40			64	81.92	2	2.56	7	8.96	78
West Midden - late	4	14.80	3	11.10	16	59.20	1	3.70	3	11.10	27
Total MNI	12		7		231		3		18		271

*MNI - Minimum Number of Individuals

Provenience data: (See also Appendix 1; Section 4 of this report)

North Midden - early - Levels 4-5, Feature 6

North Midden - late - Levels 1-3

West Midden - early - Level 3; Areas D,C; Features 2,3; Pit E; Trench A

West Midden - late - Levels 1,2; Feature 1

FAUNAL SPECIES FROM NORTH MIDDEN

	Level 1	Level 2	Level 3	Level 4	Level 5	Total
	Frag.	Frag.	Frag.	Frag.	Frag.	Frag.
	MNI	MNI	MNI	MNI	MNI	MNI
Mammals:						
<u>Sus scrofa</u> (pig)	16	1			6	32
<u>Odocoileus virginianus</u> (white-tailed deer)			2		1	1
cf <u>Odocoileus</u>	1	1	1			2
<u>Bos taurus</u> (cow)					5	5
cf <u>Bos</u>	1					1
cf <u>Procyon lotor</u> (raccoon)	1					1
<u>Didelphus virginianus</u> (possum)					1	1
Turtles:						
<u>Gopherus polyphemus</u> (gopher turtle)	1	1	24	13	36	80
<u>Malaclemys terrapin</u> (diamondback turtle)			1	1		2
<u>Emydidae</u>	1					
cf <u>Chrysemys</u> (cooter)			1			1
<u>Cheloniidae</u> (sea turtle)			1			1
<u>Caretta caretta</u> (loggerhead)				1	1	2
Fish						
<u>Ariidae</u> (marine catfish)	48	21	15	20	19	146
<u>Arius felis</u> (sea catfish)	10		19	28	20	87
<u>Bagre marinus</u> (gafftopsail catfish)	4		5	2	7	18
<u>Mugil sp.</u> (mullet)	1	1				
<u>Sciaenops ocellata</u> (red drum)	17	8	5	5	19	30
<u>Cynoscion</u> cf <u>C. arenarius</u> (sand sea trout)	1		10	11	17	75
<u>Micropogon sp.</u> (croaker)	6	4	2	3	5	1
						6
						4

cured by hook and line fishing. The cartilagenous sawfish and sharks are exceptions as deepwater fish, while mullet are typically netted rather than hooked (Cumbaa 1975). These resources constitute only a small portion of the available fish resources in the area (Table 6).

Mammal resources accounted for 7% of the remains by MNI, with three individuals each of domestic (cow and pig) and wild (deer, raccoon and possum) species. Turtles were frequently eaten, with six species comprising nearly half of the total range of turtle species in the area. Half of these were freshwater and half were saltwater turtles. Only one bird individual (a blue winged teal) was found, suggesting that birds were not an important part of the diet, despite the abundance of edible birds inhabiting the area (see Table 3).

North midden faunal remains indicate that those resources found in salt marshes, rivers and estuaries, and which could be procured by gathering or line fishing techniques, were the most important dietary elements.

West Midden

The west midden analysis indicated that the "early" and "late" proveniences in Table 19 were reflected by distinctly different patterns of faunal remains. This was not the case for the north midden material.

The west midden showed a high proportion of fish in the diet, although somewhat less than the fish proportions in the north midden. Of the fish, sheepshead constituted 32.5% of the sample, considerably higher than the sheepshead proportion for the north midden. Catfish and drum together constituted 32.5% of the fish individuals, less than half of their proportion in the north midden. Sharks and mullet each contributed 8.7% of the fish MNI, and the remaining 17.6% by croaker, flounder, toadfish, sawfish and

FAUNAL SPECIES FROM WEST MIDDEN

[illegible]

sp.		1	1	2	1	1		5
ish)	1							
is								
vatis				1				1
gray)								
scors		1	1		3	1		4
e wing teal)								
lae (pigeon)							1	1
								1

Unidentified fragments:

fish	523
turtle	92
bird	19
rodent	1
mammal	464
bone	421

stingray. Like that from the north midden, the west midden fish assemblage indicates a limited selection of the total available fish resources. With the exceptions of the cartilagenous sharks and sawfishes, all species are marine, shallow water inshore fishes, common around seawalls and pilings (Cumbaa 1975). The differences between the fish samples in the north and the west middens include a higher proportion of carilagenous, open water fishes in the west midden, possibly indicating increased sea fishing during the occupation period resulting in the west midden. Mullet are also much more frequent in the west midden; an interesting difference due to the procurement technique for mullet, which is typically netted rather than hooked (ibid). Sheepshead were the most frequently encountered fish in the west midden, with double the proportion of sheepshead in the north midden. These fish are also typically netted or speared rather than caught on a line.

Although fish provided the highest proportion by species and MNI in the west midden, large domestic mammals probably accounted for a major portion of the dietary input. Nine individuals accounted for approximately 9% of the MNI, nearly three times that of the north midden. Six of these individuals were pigs and three were cows. Three wild mammals were identified: one each of deer, possum and racoon, comprising approximately 3% of the total MNI. This distribution is comparable to the north midden, suggesting that wild mammal resources were exploited in the same pattern during the occupations of both middens.

Both birds and turtles were present in slightly higher proportions in the west midden than in the north midden. Three individual birds accounted for approximately 3% of the total MNI, while turtles accounted for nearly 10%.

The "late" proveniences of the west midden have the highest proportion of turtles on Rattlesnake Island. If the west midden does represent the final military occupation of the fort, as suggested above, it is perhaps significant that the preference for turtles as food elements increased at the same time that the Minorcan population of St. Augustine increased. The Minorcans expressed a strong preference for turtles in their diet (Griffin n.d.); a trend which may have influenced civilian and military dietary preferences in late 18th and early 19th century St. Augustine.

The faunal assemblages from both middens provide an interesting contrast to that from the Summerhaven site, SJ-46 (Figure 2; Bullen and Bullen 1961) and analyzed by Cumbaa (1975). The faunal diet was comprised of the following proportions by MNI:

Fish - 35.5%	Birds - 3.4%
Wild mammals - 34.1%	Turtles - 21.6% Snake - 5.4%

A far greater emphasis was placed on wild mammal resources at the prehistoric site, a not unexpected phenomena, since military duties may have precluded later concentration on game animal hunting. Consequently, fish played a less important part in the aboriginal diet than in the soldiers diet, if we are to judge by the proportion of food remains. The range of fishes exploited at the Summerhaven site was most similar to the fish distribution of the north midden; 58% of the fish were drum, while 21% were catfish (these fish together accounted for 70% of the fish remains at the north midden). No mullet or sheepshead were found at the Summerhaven site, a marked difference from the Matanzas west midden.

Turtles were an important food source at the prehistoric site, constituting over twice the proportion of turtles in the soldiers diet. An important difference in the turtle species present between the sites should

be considered, however. At the Summerhaven site, 32% of the turtles were sea turtles (Cheloniidae), suggesting a preferential procurement of these animals. Only one sea turtle individual was present in the Matanzas middens, where primarily gopher turtles were collected.

Section 6

Summary and Synthesis

Archeological research at Fort Matanzas National Monument was oriented to the recovery of specific information concerning the location and extent of certain historic structures and sites within the monument area; as well as the testing of certain hypotheses outlined in section 1. In this section, the results of the investigations into these questions will be summarized and interpreted.

Historic sites and structures - Anastasia Island

The Watchtower site

Extensive trenching in the area deemed most likely to have been the pre-1742 wooden watchtower site yielded no evidence of cultural activity whatsoever. It is concluded that the top of the large stable dune as it exists today was not the ground upon which the watchtower was constructed. It is possible that the 17th century dune surface has long since eroded and been rebuilt by wind and storm action; or that the dune is not as old as would be necessary for it to have supported the watchtower. Not only was no structural evidence encountered, but no midden debris either. If a sentry or sentries lived nearby the tower, we would certainly have expected to have found evidence of that occupation.

The visitor center vicinity:

While no evidence was recovered from the suspected watchtower site, some unexpected information was yielded from the visitor center vicinity. Reports of fiber-tempered ceramics on the surface suggested an early prehistoric occupation in the area of the test. Excavation revealed a single-component, Spanish-Indian occupation instead, with San Luis polychrome majolica providing a late 17th century terminus post quem. The material recovered from the single test pit indicated a primarily San Marcos ceramic midden deposit of the late 17th or early 18th century.

Since there is no historical indication of any occupation prior to 1740 in the monument area other than the wooden watchtower, it is suggested that the visitor center site is associated with the sentries; occupation, probably close by the watchtower itself. A fruitful search might be focused on the high ground to the southeast of the test excavation.

Massacre marker site:

The location of the site of Pedro Menéndez' 1565 massacre of Ribault's French forces was a tentative goal of the project, and was correctly considered to be a highly unlikely prospect.

Study of the land form evolution at Matanzas Inlet (section 1) indicates that the present massacre marker is located at what would have been the south beachline of Anastasia Island in 1765, and probably some distance into the inlet in 1565. If there is any remaining evidence for the massacre (a probability considered highly unlikely in itself) the consideration of shoreline change and historical documentation would suggest a location closer to the visitor center itself.

Historic sites and structures - Rattlesnake Island

Ancillary structures in the vicinity of Fort Matanzas:

The possible location of any ancillary or defensive structures associated with Fort Matanzas (and including the "barracks" structure indicated on the 1740 map (Todiman 1740)) was one of the objectives of the project.

Historical data and a series of soil auger tests in the vicinity of the fort revealed that any such structures either did not exist, or any evidence for them had been destroyed by erosion and fill. Various preservation projects on Fort Matanzas itself resulted in removal of the ground area surrounding the fort; a deposit of stabilizing oyster shell, and extensive land fill for stabilization in these areas. This activity obscured or destroyed any evidence for structures adjacent to the fort, where they might be logically expected.

Twenty-seven auger holes confirmed the fact that the high ground surrounding the fort was built of sterile beach sand down to the water table.

Indirect evidence for an ancillary structure on Rattlesnake Island was recovered from the middens excavations. This was a variety of construction materials not found in the fort itself including red brick, tabby, earthenware floor tile and barrel roof tile. It was suggested in section 5 that this material may have been either from a separate structure with a brick oven for cooking, or from the earlier "barracks" structure.

Rattlesnake Island middens:

Two middens, one to the north and one to the west of the fort, were located prior to excavation, and were to be tested. During the course of the project the middens were revealed to be more extensive than originally believed, extending along the northwest edge of the marsh to the northwest of the fort. The middens also extended into the marshy area between the west midden and the fort, although this portion is covered with marsh mud today.

The area of the midden identifiable as the north midden was probably in use during the First Spanish Period portion of the fort occupation (1742-1763). During the subsequent British and second Spanish periods midden deposition shifted away from the river toward the west until by the 19th century the major portion of the west midden was built up. Trenches were excavated in the north and west midden portions, as well as in the marsh covered midden between them. The intermediate marsh midden area is believed to have been deposited primarily during the British period (1764-1781) occupation. While the west and marsh middens appeared to be fairly stable; the north midden was characterized by alternate layers of sterile wash and crushed shell resulting from erosion along the east edge of the Matanzas River.

No evidence for aboriginal occupation was encountered on any part of Rattlesnake Island.

Results of hypotheses tests

1. Nature and extent of aboriginal occupation in the monument area:

Alternate hypotheses concerning prehistoric aboriginal occupation of the area were tested at Matanzas. These suggested that: 1. Aboriginal occupation on the coast did not occur between early St. Johns I (early woodland) times and St. Johns IIc (protohistoric) and 2. that occupation during this period was characterized by seasonal occupation on the coast, and would be reflected in dietary remains associated with prehistoric ceramics. None of the test excavations on either Rattlesnake or Anastasia Island yielded any aboriginal components, and although a few St. Johns period sherds were recovered; no St. Johns period occupation was indicated either by surface survey or excavation.

Table 1 (p.8) shows the known sites in the Matanzas area, and reveals aboriginal occupation to have been in Paleo-Indian, Orange and late St. Johns period. On the basis of this distribution, in addition to the excavation results, the first hypothesis (suggested by Goggin (1952)) that the area was not occupied during the early and middle woodland times was supported.

We feel as a result of this project, however, that the second hypothesis was not negated. The areas of the monument most likely to have been seasonal camps--high bluffs overlooking the Matanzas River--were not tested due to the presence of the visitor center and the Johnson residence.

2. Nature of the soldiers' diet:

The excavation of the north and west middens on Rattlesnake Island yielded faunal material which provided dietary information. Prior to the project it was suggested that such dietary information could tell us what relative use was made of wild versus domestic foods; and to what extent the soldiers at Matanzas exploited their environment. As it became evident that the middens represented different use periods by different cultural groups, the analysis of dietary remains was able to illuminate change through time and affiliation.

Both the north midden (first Spanish Period) remains and the west midden (British to second Spanish period) remains indicated a heavy use of local riverine resources, but with a limited selection from the range of possible species. Fish were the most heavily emphasized resources, with a slightly higher portion of fish in the north midden remains than in the west midden. The species emphasized were also somewhat different in each midden. Catfish and drum were the most frequently encountered in the north midden. While catfish and drum were encountered in the west midden also, they were in much smaller proportion than those species in the north midden. Mullet and sharks were also more frequent in the west midden, possibly indicating an increase in open sea and net fishing, or a higher level of dependency on market fish. Other than the mullet and open water cartilaginous fishes, the fish species encountered were marine, shallow-water inshore fishes.

Other wild species exploited by the soldiers at Matanzas included birds, turtles and mammals. Mammals in each midden were represented by one species of deer, opossum and raccoon. Overall, the proportion of wild mammals in the diets of both middens were comparable (2.4% in the north midden and 2.8% in the west midden), suggesting that the pattern of wild mammal exploitation (hunting) was not markedly changed between the different cultural periods. In both cases, wild mammals probably constituted an occasional addition to the diet.

Turtles and birds were found in both middens, but in the highest proportion in the late proveniences of the west midden, which coincides with the establishment of a significant population element in St. Augustine (the Minor-cans) who had a dietary preference for turtles. Blue-winged teal was the favored bird at Matanzas, and was the only wild form exploited out of the numerous birds that inhabit the area.

Domestic animals, cow and pig, constituted 1.8% of the remains from the north midden and 8.5% of the remains in the west midden (These proportions reflect the minimum number of individuals present, and do not of course, necessarily represent the proportional contribution to the diet). These differing proportions were not unexpected, given the historical-economic situations. First Spanish period Florida was characterized by a chronic meat shortage, particularly following Moore's raids in 1702 (Gannon 1965; Arnade 1965). The transport of domestic meat to Matanzas probably would have been not only intermittent, but risky as well, since enemy Indians continued harassment of the colony hinterlands through the first Spanish period (Ibid). This situation was remedied by the end of the first Spanish period, and a more regular supply of domestic meat to outlying garrisons might be expected.

Indirect dietary evidence was provided by items of food preparation technology in both middens. A single basalt mano fragment was found in the north midden, indicating that corn grinding took place at Matanzas during the period of north midden occupation. Food preparation ceramics were San Marcos wares and various Hispanic utilitarian wares. The following table shows the distribution of these materials between the two middens:

	San Marcos		Utilitarian Hispanic		Majolica		British refined Earthenwares		Slipware & Delft	
	#	%	#	%	#	%	#	%	#	%
North midden	332	57.5	84	14.6	8	1.4	82	14.2	48	8.3
West midden	33	27.2	26	21.8	1	.8	49	41.2	11	9.2

San Marcos ceramics occur in much higher proportions in the north midden than in the west midden; while hispanic utilitarian ceramics occur more

frequently in the west midden. One factor in this distribution is certainly the fact that San Marcos ceramics were not produced after the first Spanish period, when the Florida Indian makers of the ware left Florida along with the Spaniards.

The nature of the San Marcos ceramics in the north midden, combined with the mano fragment and the differences in food procurement from the west midden, suggests the interesting possibility that Indian women may have been present at Matanzas during the first Spanish period.

The San Marcos ceramics found on Rattlesnake Island are unusual in their shell tempering and surface smoothing, and may have been produced either specifically for use at the fort, or near the fort itself, since San Marcos pottery with the characteristics described above, do not normally occur on domestic sites in St. Augustine. Pottery making is assumed to have been a female activity both traditionally, and specifically in St. Augustine (Hill 1966; Deetz 1965; Deagan 1974). Another female activity was the grinding of corn, and the presence of a mano in the north midden also suggests the possibility that women may have been present during the time of midden deposition.

The domestic food resources patterns between the two midden excavations are understandable as a result of change in the historic economic situation of the colony. Throughout the period covered by the occupations of the middens, however, the wild food resources obtainable in the area remained constant, while the items actually selected for use underwent considerable change. This change is particularly reflected in the fish procured. The north midden fish were predominantly shallow water species (catfish, drum) typically caught with lines; while the sheepshead and mullet predominating in the west midden are typically procured by spearing or netting. The fish remains from the north midden are most similar to the pattern of remains from the de la Cruz site,

an 18th century mestizo household in St. Augustine (Deagan 1974, Cumbaa 1975): while the deep water and net fishes found in the west midden are more typical of sites participating in a market or non-aboriginal procurement system in St. Augustine (Cumbaa 1975).

The differences in the fish distributions in the north and west middens could be explained by the presence of Indian women in the first Spanish period and their absence in the second. Garrison soldiers might not have had the opportunity to line fish on a large scale, but such fishing could have been done by Indian women. In the absence of such women, fish procured by deep sea or specialized procurement techniques, or through a market could have been used primarily. As a highly tentative hypothesis, the above lacks the predictive strength of an a priori hypothesis; however, it may be a useful test hypothesis at military sites to be excavated in the future. The fishing patterns alone would not account for the presence of women, but considered along with the nature of the San Marcos ceramics, the presence of the mano, and a rich military tradition of camp followers, it becomes viable.

The expected male procurement activities of hunting and possibly trapping (particularly of wild mammals) showed no change in pattern from the north to the west midden occupations.

3. Acculturation indices:

Since Fort Matanzas was occupied by Spanish soldiers during the first Spanish period, it was hoped that excavation would provide a test of the validity of certain material culture indices used on St. Augustine sites as a gauge for the degree of Spanish-Indian acculturation. Presumably, the soldiers at the garrison would be supplied directly from the government subsidy and should thus not have been subject to the acculturational patterns

existing in the town during the same time period. The indices developed for degree of hispanic acculturation by aboriginal culture in St. Augustine include:

1. Predominant presence of San Marcos ceramics as food preparation wares, and the relative scarcity of hispanic utilitarian wares
2. The presence of aboriginal food preparation techniques
3. The nature of the particular pattern of local versus domestic food resources present (Deagan 1974; Cumbaa 1975)
4. The presence of evidence for aboriginal food preparation techniques.

The excavations at Fort Matanzas could not provide a valid test for the accuracy of these indices. Only the north midden, and the visitor center vicinity test could be attributed to the first Spanish period occupation of the area. At the north midden, data accumulated during the course of the project suggested that hispanic soldiers may not have been the only occupants of the area, thus negating the value of the material excavated as a control. At the visitor center site, the possibility of sampling error is too high to use it as a test of any hypothesis, since the single test pit may have been located at a peripheral or special use area of the main site.

In general, the pattern of ceramic and dietary information conforms most closely to that found at a first Spanish period site in St. Augustine known to have been occupied by an Indian woman and her Spanish soldier husband, described by Deagan (1974) Cumbaa (1975) and MacMurray (1975).

Summary: Military life at Matanzas - 1700-1800

The archeological investigation at Fort Matanzas National Monument did not provide information concerning the aboriginal occupation of the area; or of any occupation earlier than about A.D. 1700, although the nature of land form changes

discussed in section 1 suggests that the infamous massacre of the French soldiers by Pedro Menendez de Aviles took place somewhat to the north of the of the presently indicated site.

Until 1742, the watchtower and sentinel at Matanzas were located on Anastasia Island. Excavations did not reveal the exact location of these, but a dense Spanish-Indian midden located near the visisor center suggests that the watchtower was located nearby, since no other historic occupation is known during that period.

Life was simple at the wooden watchtower, and very few items indicating anything other than ceramics were found. The soldiers probably ate from San Marcos vessels, although Olive Jar and at least one majolica plate were present. Wrought nails and spikes indicated a wooden structure nearby, and no other building material or rubble was found.

Between 1740 and 1742, the extant stone fort on Rattlesnake Island was constructed, and is believed to have been the earliest structure on the island. A map of 1740, however, depicted a structure marked "barracks," which may have been the fort in an early stage of construction, or else barracks to house the convicts who were working the coquina quarries at nearby El Penon (today known as Summerhaven). While no structural evidence for this earlier structure was found during the project, building materials recovered from the middens on Rattlesnake Island (tile, tabby, brick) may have been from this "barracks".

The excavation of the shell middens on Rattlesnake Island revealed more information about the life of the soldiers living there than was available for the earlier wooden tower on Anastasia Island. During the first Spanish period, the soldiers dumped their trash along the east bank of the Matanzas River, some meters to the north of the fort. They subsisted primarily

upon fish and shellfish, beef and pork. Occasionally hunting provided wild game intermittently. It has also been suggested that women may have been present during this period. If this were the case, the women probably made or procured the predominant San Marcos pottery, fished for catfish and drum, ground corn and cooked.

Utilitarian mugs and bowls were the most commonly discarded (and thus broken and used) vessel forms. These were found in lead-glazed earthenware, slipware, and stoneware. A few items of delft and majolica tablewares were also present at the fort.

Very little military material reached the midden, and gun flints were reworked until unuseable before they were discarded.

As time passed at Fort Matanzas, and the nationality of the soldiers in occupation changed, garbage was gradually dumped to the west away from the river and along the edge of the marsh to the north of the fort (See base map, Fig. 6). The area of midden deposition in the 18th century was probably the farthest point from the fort itself which could be reached on dry ground. The section between what are now recognized as the north and west middens was briefly used as a midden, although it is now covered by marsh mud. It is believed to have been used primarily during the British period of occupation. No dietary, and little new material culture information was yielded from the test in that area.

By the second Spanish period of fort occupation, garbage was dumped in the area designated today as the west midden. During this time (1781-1805) the soldiers at the fort had a somewhat different diet from the first Spanish period soldiers. A shift is seen to more domestic pork and beef, as well as to market or net fish rather than local line fishes. There was no evidence that corn was ground at Matanzas during this period, or any other evidence for the presence of women (not unexpected, since by this time there were no Indians other than

the Seminoles in Florida). Communication and economic improvements in the second Spanish period of Florida are reflected not only in the increased proportion of domestic meat in the diet, but also in the higher incidence of refined earthenware ceramics, and tableware forms such as plates, cups and saucers.

Little military material was discarded in this midden as in the north midden, and gunflints were extensively reworked. Tobacco smoking and wine drinking also occurred during this occupation period, and a wider range of glass vessels was present, including possible medicinal vials, a glass goblet and a case bottle (frequently used for gin or other spirits). There is no indication that either buttons or pipes were made during the period in which the west midden was constructed.

From 1805 until today, Fort Matanzas has been abandoned. Various dredge and fill projects, fort restoration projects and natural processes have altered the shape and surface of Rattlesnake Island and particularly Fort Matanzas itself, so that little remains of what was present when the fort was occupied by soldiers.

Matanzas was an isolated, although important outpost throughout its occupied history, particularly during the first Spanish period. The inhabitants of the fort apparently depended considerably upon local environmental resources, and it was probably not until the latest periods of military occupation that the soldiers at Matanzas primarily used and subsisted on supplies provided by the government they served.

Recommendations

The 1975 project at Matanzas answered many questions, but left many unanswered. Because we feel that the monument retains the potential for

answering these questions; recommendations concerning future research, salvage and construction are offered for use in planning in the monument area.

1. Most importantly, any park construction or renovation of buildings, sidewalks or docks should be accompanied by archeological reconnaissance.

The only exception to this would be in the area of high ground immediately surrounding Fort Matanzas, which has been tested and which appears to consist of sterile fill down to the water table.

2. The watchtower and sentinel site: The next research project at the monument should be the expansion and exploration of the visitor center vicinity sites and test excavation. Since this was a late 17th century midden, we feel that it holds the highest potential for both the location of the watchtower and for yielding presently nonexistent information about Spanish coastal sentinels. Certainly the ridge to the southeast of the test trench deserves further investigation. It is also suggested that core samples from trees growing on the large sand dune previously believed to have been the site of the watchtower be taken in an attempt to determine the age of the dune. Examination of the dune by geologists may also shed some light on its age, and thus on the possible location of the watchtower.

3. The Johnson house and visitor center: These structures are located on sites which have the greatest potential for aboriginal habitation. Should any future renovation, rebuilding or removal be planned, we might expect to recover badly needed information concerning the nature and extent of aboriginal occupation in the monument area.

4. Rattlesnake Island: The middens on Rattlesnake Island each were tested with a single trench, and certainly could use more testing. The marsh area midden, however, is felt to have the greatest potential for yielding information, due to the fine preservation conditions of the wet, buried midden. This encompasses the area between the fort and the west midden, and is not currently

endangered. This would be a major project, and would require the use of special equipment such as multiple pumps and well points. If any projects involving possible disturbance or fill being placed in this part of the marsh is planned, archeological recovery of the area should be carried out, since organic and other remains can be expected to have been preserved in the mud.

5. Underwater survey: Since much of the monument area today is of a considerably different landform than that of 200 years ago, an underwater survey of the monument portion of the Matanzas River and inlet may yield much information not obtainable through land archeology. This would be particularly applicable along the west shore of Anastasia Island which has eroded rather than been built up, and was formerly some 75 feet into the Matanzas River. Information about earlier structures, aboriginal occupation and possibly the massacre site might be recovered.

Appendix 1

Provenience Data Information

<u>Site</u>	<u>Field Specimen #</u>	<u>Location</u>	<u>Terminus post quem</u>
Visitor Center Midden	1	Level 1 (0-15 cm)	Wire nail
Visitor Center Midden	2	Level 2 (15-30 cm)	San Luis polychrome
Visitor Center Midden	3	Level 3 (30-45 cm)	San Marcos
Visitor Center Midden	4	Level 4 (45-60 cm)	San Marcos
Visitor Center Midden	5	Fea.1 - pipe trench	San Marcos
Visitor Center Midden	6	Level 5 (60-75 cm)	San Marcos
East Midden, Rattlesnake Island	1	Level 1	bone
East Midden, Rattlesnake Island	2	Level 2	plastic, pearlware
East Midden, Rattlesnake Island	3	Area "A"	
East Midden, Rattlesnake Island	4	Level 2	creamware
East Midden, Rattlesnake Island	5	Level 2	bone
East Midden, Rattlesnake Island	6	Feature 1	bone
East Midden, Rattlesnake Island	7	Area "B"	non-dateable
East Midden, Rattlesnake Island	8	Pit E	San Marcos ceramics
East Midden, Rattlesnake Island	9	Feature 2	non-dateable
East Midden, Rattlesnake Island	10	Feature 3	non-dateable
East Midden, Rattlesnake Island	11	Level 3	non-dateable
East Midden, Rattlesnake Island	12	Area "C"	non-dateable
East Midden, Rattlesnake Island	13	Shell lens & wash area	non-dateable
East Midden, Rattlesnake Island	14	"Trench A"	non-dateable
East Midden, Rattlesnake Island	15	Area "D"	non-dateable
East Midden, Rattlesnake Island	16	shell sample	non-dateable
East Midden, Rattlesnake Island	17	shell sample	non-dateable

ersh Pit,Rattlesnake Island	18	Level 1 (10-25 cm)	Grey Stoneware
ersh Pit,Rattlesnake Island	19	Level 2 (25-38 cm)	painting pearlware
erth Midden,Rattlesnake Island	1	Level (0-15 cm)	shell edge pearlware
erth Midden,Rattlesnake Island	2	Level 1 (bone)	
erth Midden,Rattlesnake Island	3	Level 2 (15-30 cm)	transfer print pearlware
erth Midden,Rattlesnake Island	4	Level 2 (bone)	
erth Midden,Rattlesnake Island	5	Feature 2 (bone)	
erth Midden,Rattlesnake Island	6	Feature 2	San Marcos pottery
erth Midden,Rattlesnake Island	7	Feature 3	
erth Midden,Rattlesnake Island	8	Level 3 (30-45 cm)	painting pearlware
erth Midden,Rattlesnake Island	9	Level 3 (faunal)	
erth Midden,Rattlesnake Island	10	Level 3 (shell sample)	
erth Midden,Rattlesnake Island	11	Feature 4	San Marcos
erth Midden,Rattlesnake Island	12	Feature 5	San Marcos
erth Midden,Rattlesnake Island	13	Feature 6	
erth Midden,Rattlesnake Island	14	Feature 8	
erth Midden,Rattlesnake Island	15	Level 4 (45-60 cm)	creamware
erth Midden,Rattlesnake Island	16	Level 4 (faunal)	
erth Midden,Rattlesnake Island	17	Level 4 (shell sample)	
erth Midden,Rattlesnake Island	18	Feature 7	pearlware
erth Midden,Rattlesnake Island	19	Level 5 (60-69 cm)	
erth Midden,Rattlesnake Island	20	Level 5 (faunal)	
erth Midden,Rattlesnake Island	21	Level 5 (shell sample)	
erth Midden,Rattlesnake Island	22	Surface Collection	

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