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# Zooarchaeological investigations of an early ceramic age frontier community in the Caribbean: The Maisabel site, Puerto Rico

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## I. Introduction

Archaeological sites on the islands of the Caribbean offer excellent opportunities to assess the development of ecological adaptations and subsistence systems. From the Archaic period to post-Contact times the cultures of the Caribbean demonstrate varying degrees of reliance on terrestrial and marine resources. Environmental variation among islands (e.g., reef structure, shelf width, lagoonal formations, freshwater sources) is responsible for some of the synchronic variation in subsistence adaptations (Watters and Rouse 1989). In conjunction with the role of environmental variation on synchronic subsistence strategies, it is also possible to investigate diachronic similarities and changes in subsistence patterns throughout the Lesser and Greater Antilles as well as the Bahamas (e.g., Wing and Reitz 1982).

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This research is concerned with reconstructing the vertebrate and invertebrate components of the subsistence economy of the inhabitants of the early ceramic, or Saladoid and Elenan Ostionoid site, Maisabel, located on the north coast of Puerto Rico (Figure 1). By means of the analysis of zooarchaeological remains from Maisabel, I have been able to document the pattern of Saladoid and Elenan Ostionoid subsistence and ecological adaptation in this geographical area. The data from Maisabel have also been used to generate a broader understanding of the processes of prehistoric Antillean subsistence adaptations and transformations by means of comparisons with other faunal assemblages and models of subsistence.

The analysis of diachronic similarities and changes in Caribbean subsistence patterns during the Saladoid and Elenan Ostionoid time periods is possible because of two factors. First, although there is no agreement on whether Archaic peoples originated from continental Central America or South America, it is generally agreed that the early ceramic-age populations of the Caribbean share a common source of origin: the northeastern coast of South America (Rouse 1986:134). Subsistence patterns would have been modified by specific ecological constraints; however, it can be hypothesized that subsistence strategies developed in northern South America were attempted as colonization of the Caribbean took place. Efforts to recreate similar subsistence systems should be manifest in the archaeological record in the forms of settlement location, ecological zones exploited, and subsistence remains.

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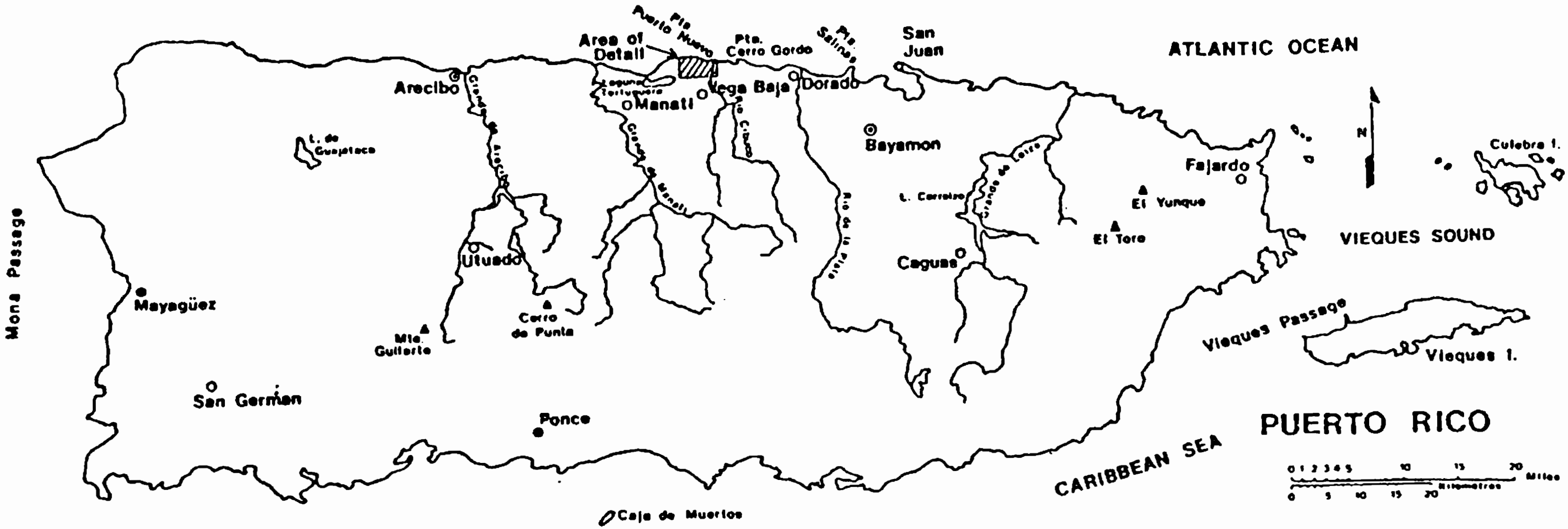



FIGURE 1
LOCATION OF MAISABEL IN PUERTO RICO

from these Archaic populations indicate that a maritime economy was an adaptational advantage in an island ecosystem for these non-horticultural peoples.

In contrast, archaeological sites of the horticultural Saladoid peoples, who supplemented their diets with terrestrial or aquatic animal proteins, exhibit variation in both settlement and subsistence patterns. Through the combined results of settlement analyses and zooarchaeological data, researchers have attempted to document the pattern of Saladoid colonization and island adaptation. Settlement patterns of early Saladoid sites in the Lesser Antilles correspond to riverine settings documented in eastern Venezuela (Goodwin 1980; Jones 1985; Rouse. 1986). It has been proposed that initial Saladoid settlements in the Lesser Antilles were located on floodplains that were most suitable for manioc production. In the Greater Antilles, particularly Puerto Rico, early Saladoid settlements appear to have been primarily located in coastal settings (Rouse 1952; Roe 1985).

Archaeological studies of settlement and subsistence in some areas have documented a shift from riverine to coastal settlements, and a concomitant shift from the use of terrestrial (most importantly land crabs) to aquatic resources (shellfish and marine fish) (e.g., Goodwin 1980; Jones 1985). In other areas, stratigraphic evidence reveals that the dietary shift occurred within single sites (e.g., Rainey 1940). Shifting resource use has been observed at a number of archaeological sites both in the Lesser Antilles (Goodwin 1980; Jones 1980, 1985; Wing and Scudder 1980) and the Greater Antilles (Rouse 1937; Rainey 1940; Siegel and Bernstein 1987). Significantly, many of these early observations of subsistence change were based primarily on stratigraphic evidence only (e.g., Rainey 1940; Rouse 1937), while more recent studies have included zooarchaeological analyses (Goodwin 1980; Jones 1985).

A variety of hypotheses to explain this shift in resource utilization and/or settlement patterns has been proposed. These hypotheses include pan-Caribbean models such as secondary population migrations (Rainey 1940), microclimatic changes (Carbone 1980), intensification and diversification as a result of population pressure (Goodwin 1980), and diet-breadth expansion from reduced cost-benefit ratios (Keegan 1985). Other researchers have suggested that these shifts represent local developments in the Virgin Islands and Puerto Rico where these resources were most abundant (Rouse 1986:120). Still others have suggested that due to the variety of forces that impinged on local developments it is probably impossible to identify a single cause for the transition (Jones 1985:523).

In addition to reviewing these previous models, a methodology for assessing the dietary aspects of this transition is presented (part IV [p.

27]). This methodology is based on modern and zooarchaeological remains of the blue land crab, *Cardisoma guanhumi*, a species that has been identified at a number of the Antillean sites. This technique allows researchers to examine the population size or population structure of the terrestrial crabs that were prehistorically exploited. Although the methodology is applied in a specific case study, it should be applicable to other faunal assemblages from different geographical areas or different time periods that also contain terrestrial crab remains.

Based on the results of this methodology and the composition of the assemblage, it is possible to assess the applicability of broad-based theoretical models to the study of Caribbean dietary transitions in different geographical locations. In part VI (p. 74), I review the previous subsistence models in light of the zooarchaeological material from Maisabel. Emphasis is also placed on assessing the role of terrestrial versus marine resources in Saladoid and Ostionoid settlement/subsistence transitions and further colonization of the islands. The Maisabel assemblage exhibits variation in Saladoid and Elenan Ostionoid resource exploitation that can be attributed to both the range of aquatic habitats in proximity to the site and the probable development of greater skill and technologies for the exploitation of marine habitats.

The cultural, environmental, and zooarchaeological data used to interpret the subsistence economy of the Maisabel inhabitants are summarized in part VII (p. 77). These combined lines of evidence indicate that future Caribbean subsistence research should integrate both features of the historical processes of colonization with island ecological variation to interpret accurately zooarchaeological remains.

## II. Prehistoric cultural setting and previous subsistence models

### *Cultural Background*

The following discussion presents an overview of the cultural history of the occupants of the Maisabel site. Radiocarbon dates from Maisabel have extended the Saladoid occupation in Puerto Rico back to at least 100 B.C. According to ceramic typologies and radiocarbon dates, Maisabel has components dating from the earliest phase of Saladoid occupation, Hacienda Grande (ca. 100 B.C.-A.D. 400) through the Elenan Ostionoid occupations (ca. A.D. 600-A.D. 1200). The entry of ceramic age populations into the Antillean islands has received considerable attention. Most recently, Rouse (1986) synthesized a number of theories and views. The following discussion summarizes cultural and temporal information relevant to the Maisabel occupation based on archaeological data.

The movement of Arawakan-speaking peoples from the Orinoco Valley to the north coast of Venezuela, the Guiana coastal plain, and into Trinidad and Tobago during the last century B.C. is documented by archaeological data, primarily zoned-incised crosshatched and white-on-red painted ceramics of the Saladoid series (Cruxent and Rouse 1958-1959; Harris 1973; Rouse and Allaire 1978; Boomert 1983; Rouse 1986). Colonization of the Lesser Antilles may have begun as early as 500 B.C. The ceramic series of the initial Arawakan colonizers of the Caribbean has been termed Saladoid after the Saladero type site in Venezuela (Cruxent and Rouse 1958-1959:244-245). Saladoid peoples colonized the Lesser Antilles, the Virgin Islands, Puerto Rico, and eastern Hispaniola (Rouse and Allaire 1978; Rouse 1986:134). In addition to introducing ceramics to the islands of the Caribbean, these Arawakan peoples presumably brought methods of horticulture as suggested by the presence of clay griddles for use with manioc or maize.

As the Saladoid populations migrated through the islands, preceramic Archaic hunter-gatherers who previously had occupied the Lesser Antilles were probably encountered in the Greater Antilles (Veloz and Vega 1982). These Archaic populations were apparently displaced and they subsequently migrated further west, eventually settling in remote parts of Haiti and Cuba.

Following the Saladoid series, the ceramics of subsequent occupants of Greater Antillean sites are classified in the Ostionoid series. This series contains several geographically discrete subseries, and ranges temporally from approximately A.D. 600 to A.D. 1500. The Elenan subseries has been identified in eastern Puerto Rico where Maisabel is located (Rouse 1986:143). Further westward expansion into Haiti and Jamaica occurred during Ostionan Ostionoid times (Rouse and Allaire 1978:473).

Several aspects of colonization are of interest to the present research. Colonization of the Caribbean islands during the Saladoid time period required the use of watercraft. Sea level was undoubtedly lower during the aceramic Archaic colonization of the islands more than 5,000 years ago. Although a consensus has not been reached on the maximum extent of sea level rise, one estimate suggests a rise of at least 55 m within the Holocene period (Blackwelder et al. 1979 in Ruppé 1980:331). During the Archaic period, the number of islands was greater and they were more closely spaced than today. A "stepping-stone" migration into the islands rather than a long sea voyage would have been eminently possible (Nicholson 1976:20). The Archaic and Arawakan colonizations of the Antilles required the use of ocean-going watercraft.

The construction and use of watercraft indicate a knowledge of marine habitats and potential subsistence resources. In addition, the fossil record of vertebrate species in the Caribbean and prehistoric archaeological evidence of species exploitation and distributions suggest that several types of fauna (e.g., hutias, dogs, agoutis) as well as a variety of flora, probably including manioc and maize, were prehistorically transported by human agents into the islands (Harris 1965; Roosevelt 1980; Olson 1982; Morgan and Woods 1986).

The ease of water travel in the Caribbean is reflected by the occurrence of greater cultural similarities (e.g. ceramics, religious paraphernalia) between adjacent islands than within single islands, especially in the larger land masses of the Greater Antilles. Rouse (1951, 1982) suggests that inter-island water passages were easily traversed by canoe, thereby facilitating greater interaction between peoples of different islands than between inhabitants of opposite ends of the same island. On Puerto Rico, there were east and west interaction zones (Rouse 1951, 1952). The west zone was comprised of land areas on both sides of the Mona Passage. It included approximately the eastern half of the Dominican Republic and the western half of Puerto Rico. The remaining eastern half of Puerto Rico, including the Maisabel site, the Virgin Islands, and Vieques Island off the coast of Puerto Rico, is in the Vieques Sound Cultural Area.

Within these cultural areas, settlement patterns of the early ceramic inhabitants provide insight into which habitats were selected for exploitation. Island settlement patterns can be correlated with ecological productivity to predict specific island adaptations. The Caribbean islands are not uniform in physical features or accessibility to food resources. Therefore, settlement pattern variation both between different cultural groups and within single populations can reflect either insular variability in different food resources availability or differences in subsistence systems or both (Watters and Rouse 1989).

During the Saladoid period, colonizers may have attempted to recreate settlement locations and patterns of food use that were employed on the northern South American mainland. These patterns would have been modified by the specific constraints of the Caribbean islands. Colonization and settlement of a Caribbean island included a critical period of initial settlement, exploration, and rapid adaptation to local resources to ensure the survival of the colonists and continued population growth. This critical period in island colonization has been termed the "beachhead bottleneck" (Keegan and Diamond 1987:74). During the initial settlement, human-transported fauna and flora would be established on the new island and local food resources would have been added to the diet. The primary cultigens, either manioc or maize, would have required approximately six months or more to produce harvestible products (Roosevelt 1980:125). The paucity of terrestrial fauna would have led to the exploitation of new food items. These probably included indigenous rodents and the land crabs. Terrestrial crabs are believed to have been incorporated into the diet in the Windward Islands (Allaire n.d. in Rouse 1986:139).

Settlement patterns and rates of colonization of the Caribbean islands reflect knowledge of the variability in environmental productivity and resource availability. It is hypothesized that early Saladoid settlements in the Lesser Antilles were located on inland river terraces best suited for horticulture (e.g., Goodwin 1980; Jones 1985; Rouse 1986). A shift to a more coastal setting within the Saladoid period has been documented on St. Kitts (Goodwin 1979, 1980). In addition, as colonization proceeded through the Lesser Antilles and into the Greater Antilles, the location of initial settlements shifted. By the time Puerto Rico was colonized, early settlements were established on the coast, particularly on the eastern coast in the area of biologically highly productive offshore fringing reefs (Roe 1985). Once early ceramic populations reached the Greater Antilles, there was a slowing of the rate of colonization as evidenced by the density and distribution of sites. This reduction is possibly attributable to the greater amount of time needed to explore and settle the larger land areas or possibly because Archaic hunter-gatherer populations were encountered (Rouse 1986:139).

Adaptation to specific local conditions are evidenced in the form of settlement patterns within and among prehistoric Antillean sites. The process of settlement is related to both the existing subsistence system of the cultural group in question and the environmental parameters of the area being inhabited. It has been documented archaeologically that settlement locations vary between the Archaic hunter-gatherer-shellfishers and the horticultural early ceramic populations (Goodwin 1978; Davis 1982).

A major research objective of the systematic excavations at Maisabel was to obtain data that would allow the reconstruction of site settlement and spatial organization (Siegel and Bernstein 1987; Siegel 1989, 1990). The present faunal analysis is focused on the adaptational and settlement variation between the earlier Archaic peoples and the ceramic-age populations in order to understand diachronic changes in subsistence patterns and the specific subsistence orientation of the Maisabel occupants. The environmental setting of Maisabel is presented to demonstrate the types of resources that were available near the site. Prior to discussing the environmental setting of Maisabel, previous models of Saladoid subsistence are presented in greater detail.

*Models of Saladoid Subsistence*

Current knowledge concerning patterns of Saladoid subsistence has resulted from the slow accumulation of new archaeological and environmental data. Our ability to refute earlier models has been accomplished through the testing of previously proposed hypotheses and the application of new methods and techniques in subsistence studies. Early models of the observed changes in Saladoid subsistence are primarily descriptive studies concerned with explaining population migrations. One such model was proposed by Rainey (1940) after examination and excavation of several stratified early ceramic age sites on Puerto Rico. Based on empirical observations of stratigraphic changes from land crab refuse to shellfish refuse and changes in ceramic styles and forms at Puerto Rican and other Caribbean island sites, Rainey suggested that a second migration of peoples from South America had displaced the crab consuming inhabitants and reoccupied sites that contained terrestrial crab refuse. Rainey designated these two assemblages the Crab and the Shell Cultures. He argued that a shift toward the exploitation of marine resources was the explanation for the stratigraphic changes from crab refuse to marine shellfish. Although none of the other food remains were quantified, Rainey (1940:14) noted that both strata at a number of the sites contained similar vertebrate faunal refuse (e.g., manatee, birds, hutia, turtle, and fishes).

Subsequent to Rainey's report, archaeologists have used material cultural remains to refute the hypothesis that the crab to shell transition was the result of a second migration of peoples. Technological and stylistic studies of ceramics at Saladoid centers have been used to demonstrate that the ceramics of the so-called Crab Culture (Saladoid) contained many of the styles, techniques, and decorations present in the subsequent Shell Culture ceramic series or Ostionoid series (Rouse 1986:134). In addition, the subsistence shift has been documented as occurring within the Saladoid time period at sites in the Lesser Antilles rather than being exclusively a post-Saladoid or transitional Saladoid phenomenon (Rouse 1986:136). Rouse (1986:120) proposes that the subsistence shift was the result of intra-island, rather than inter-island movement.

More recent students of Saladoid subsistence have attempted to develop and apply environmental models to explain the observed settlement and subsistence shift. One such model, proposed by Carbone (1980), includes a pan-eastern Caribbean explanation for cultural change based on environmental fluctuations; in this case microclimatic changes in the paleoenvironment of the Caribbean. Carbone (1980:100) stresses the need for analysis of localized environmental perturbations; however, he suggests that certain periodic changes, such as temperature and precipitation, would have resulted in general trends that could be correlated, spatially and temporally, with archaeological data.

In specific reference to the crab-shell transition, Carbone (1980:103) proposes that a reduction in humidity and increased aridity in the Caribbean, especially in Puerto Rico, would have increased the mortality rate of the land crab (*Cardisoma guanhumi*) and reduced the area suitable for crab habitation. Carbone further suggests that field observations of soil profiles from a prehistoric site in southern Puerto Rico indicate alternating wet-dry episodes, the type of microchange that may have reduced humidity and led to the demise of the land crab.

Carbone's study represents one of the earliest efforts to correlate paleoenvironmental data with cultural sequences and transitions in the Caribbean. According to Watters (1986) this type of research has frequently been disregarded in Antillean studies. Unfortunately, the explanation presented for the crab-shell transition has not been supported as additional archaeological and paleoenvironmental data have been gathered. First, the archaeological data indicate that the crab-shell transition occurred in different geographical locations and at different times within the eastern Caribbean (Goodwin 1980; Jones 1985; Siegel and Bernstein 1987). In contrast to a temporally bounded, geographically widespread shift, the transition occurs progressively later in time as one travels northward in the Antillean archipelago and westward in the Greater Antilles.

In terms of paleoclimatic data, the subjective field observations presented by Carbone (1980:104, 123) are insufficient to support his hypothesis of increased aridity. Although geological data do indicate that sea level rise and tectonic shifting have occurred within the Recent period (Ruppé 1980), these processes do not appear to have resulted in such widespread microclimatic changes as reductions in humidity or increased aridity.

Rather than seek a pan-eastern Caribbean explanation based on an environmentally deterministic model, other researchers have examined this change as a local phenomenon, as Rouse proposes (1986: 127), or as a process related to Arawak colonization (Keegan 1985; Keegan and Diamond 1987). The question that should be addressed is why the shift occurred in so many areas and at different time periods.

One application of a general theoretical model to the study of Saladoid subsistence behavior is presented by Goodwin (1979, 1980) in the analysis of prehistoric occupations on St. Kitts, Lesser Antilles. Through a combination of island biogeographical theory and ethnographic precedents, Goodwin applies a formal economic model of density-dependent growth to study the migration and settlement of the Saladoid populations. Goodwin (1980:47) argues that population pressure resulted in population stress that necessitated the intensification and diversification of subsistence economic systems, thereby resulting in the observed shifts in resource utilization. Archaeological evidence for an increase in population size on St. Kitts includes increases in site numbers and density, from early to middle Saladoid occupations, and diachronic settlement shifts from interior riverine locations to coastal locations, resulting in the progressive occupation of lands less suited for horticulture (Goodwin 1980:54, 57).

Goodwin suggests that due to the natural limits of the Caribbean terrestrial habitats, subsistence intensification and diversification would have been in the direction of the marine biome. Faunal data from two sites on St. Kitts that show a progressive decline in the utilization of terrestrial fauna (Wing and Scudder 1980) are cited by Goodwin as evidence confirming this hypothesis. In addition, the Lotka-Volterra predator-prey model was used in the analysis of land crab (*Gecarcinus lateralis*) remains from the Cayon site (Goodwin 1980). The model is applied to estimates of observed and predicted crab biomass based on the weights of stratigraphically divided samples of archaeologically recovered crab claws. The decline in the number of crab claws recovered in the more recent strata is cited by Goodwin (1980:61) as evidence that during the early Saladoid occupation human predation substantially reduced the crab population.

At the Sugar Factory Pier site a "crab exploitation index" was derived using frequencies of crab claws in relation to frequencies of potsherds from various levels and strata (Goodwin 1980). The crab indices for excavated levels and strata were seriated and plotted. This crab seriation was cross-checked against a ceramic seriation that was used to produce a relative chronology for the site. The crab seriation curve, when correlated with the ceramic data, indicates a progressive decline in crab exploitation through time. Vertebrate faunal remains recovered from this site also indicate decreased reliance on terrestrial fauna through time and a corresponding increase in the exploitation of offshore marine fishes (Wing and Scudder 1980).

The survey, excavation, and faunal data from St. Kitts are among the most comprehensive for the Lesser Antilles. The small size of St. Kitts allowed the reconstruction of diachronic perspectives on settlement and subsistence. Goodwin (1980, 1987) attributes the rise of marine resource exploitation to population-induced stress resulting from the rapid growth of an immigrating population combined with the natural constraints of the local environment.

Goodwin (1980:61) further suggests that terrestrial crabs were overexploited by the island's inhabitants, possibly resulting from the capture of gravid females during their seasonal migrations to coastal waters to spawn. Although the archaeological data do indicate that fewer crabs were exploited through time, the data do not sufficiently demonstrate that human predation was affecting the population structure of the terrestrial crabs (*Gecarcinus lateralis*), as Goodwin suggests.

This is especially true in evaluating the results of the Lotka-Volterra predator-prey analysis. As Jones (1985:523) correctly indicates, an assumption in Goodwin's application of the model is that predation of adult specimens resulted in a reduction of viable crab offspring. However, the females of the land crabs in question release their fertilized eggs in shallow marine or brackish waters. These eggs produce free swimming larvae that remain in an aquatic habitat for an unknown period of time but possibly for as long as several months (Gifford 1962:210). Therefore, predation of adults may have only temporarily reduced the adult population until the larvae matured and replenished the population. If only gravid females enroute to deposit eggs were exploited selectively, the structure of the crab population may have been impacted. Unfortunately, archaeological confirmation of the preferential selection of females is nearly impossible due to fragmentation of the sexually characteristic exoskeletal features (e.g., abdomen) (Gifford 1962:212).

It remains to be demonstrated that Saladoid peoples significantly impacted the land crab populations. The presence of fewer crab remains through time, in terms of both numbers of specimens and represented biomass, may indicate diminished returns from the use of crabs due to increases in human population size. Rather than actual numbers of crabs having been reduced, the use of alternative food items (e.g., mollusks or fishes) may simply have increased (Jones 1985:523).

In addition to criticizing Goodwin's analysis, Alick Jones (1980, 1985) addresses the crab-shell transition using information from a large Saladoid period site, Indian Creek, on Antigua. Jones (1985:523, 533) states that no single cause can be attributed to the transition nor can a single model be used to provide an explanation. However, Jones (1985:533) suggests that the Indian Creek data might best be understood in terms of "catastrophe theory" (i.e., a punctuated equilibrium evolutionary model). At Indian Creek, the dominance of marine bivalves in the diet by approximately A.D. 850 may represent a rapid change that manifested itself after a long period of minor dietary changes. For example, both horizontal and vertical deposits of faunal remains suggest that there were fluctuations in exploitation of rice rats and fishes through time and in different areas of the site. Various internal and external forces (e.g., invasion of new cultural traditions or such population-independent factors as climatic change) may have helped spur the subsistence changes (Jones 1985).

The observed transition is considered one of "necessity" due to population pressure (Jones 1985:533). In the scenario Jones provides, the first ceramic age settlers of the island found pristine environments abundant in terrestrial species of land crabs, rice rats, and ground nesting birds. Skill in the capture of these resources, as well as cultural values and preferences, are believed to have led to their utilization (Jones 1985:532). Human settlement and horticulture, particularly manioc, are postulated as having reduced the area suitable for crab habitation, through land clearing and other human activities. Jones (1985:523) recognizes that more data on this subject are needed before human over-exploitation or impacts can be verified.

As the terrestrial resources declined in dietary importance due to ecological pressure, littoral resources, particularly bivalves, gained dietary prominence due to greater abundance (Jones 1985:533). Crabs continued to be exploited but in reduced numbers. Interestingly, Indian Creek is located approximately 800 m from the coast and a shift to a coastal settlement does not occur until the subsequent period.

Jones's analysis of the faunal data and settlement size are used to predict prehistoric population size. He suggests that Indian Creek was inhabited by roughly 25 to 50 occupants, and definitely less than 100 (Jones 1985:531). The assumptions used to derive these figures are extremely tenuous. However, the low population estimate is necessary to support his view that human predation was not a major force in causing the dietary shift. The study is a good review of the factors that could have resulted in the shift, but the study is particularistic and does not help elucidate the pattern of change in Saladoid subsistence or the rise of maritime resource exploitation. I agree with Jones that simple explanations or single causes are not likely to produce answers; however, it is profitable to search for broadly applicable explanations.

The results of another recent analysis, which does attempt to apply a general model to the study of Saladoid island adaptations and subsistence, in contrast to Jones's study, are presented by Keegan (1985). Keegan combines microeconomic and biogeographical concepts with optimal foraging theory to reconstruct the pattern and probable rate of Arawak expansion and settlement, particularly settlement of the Bahama Islands. Based on these concepts, the initial settlement of Saladoid peoples on inland river terraces suggests that manioc and land crabs provided the highest average returns (Keegan 1985:54). Population size is believed to have grown rapidly; therefore, inland settlements quickly reached a point where higher returns were being provided from other areas (e.g., other islands in the case of the Lesser Antilles or coastal habitats). Although terrestrial resources are believed to have been exploited heavily during initial settlement, possibly along with a few economically high-ranked marine items, a greater reliance on marine foods occurred through time as terrestrial resources declined in availability and population increased (Keegan 1985:72). The intensification of food systems (production or supply) is related to spatial regularity of settlements and increased population (demand).

The archaeological data from the Bahamas are cited as supporting this model of diet-breadth expansion. Human occupation of the Bahama Islands postdates the Saladoid period by several hundred years; yet, archaeological deposits exhibit initial use of terrestrial resources, followed by intensive marine resource exploitation. Archaeological sites in the Bahama Islands indicate that late in the prehistoric period maize was adopted and became a significant food item in terms of dietary protein (Keegan 1985:188).

This model of resource utilization is supported by data from stable carbon and nitrogen isotopic analyses conducted on human bone collagen. Carbon and nitrogen isotopes are assimilated by plants and animals in different ratios. These isotopic ratios are maintained in animals through their consumption patterns. Bone collagen provides evidence of an animal's diet by incorporating carbon and nitrogen. Therefore, analysis of the composition of bone collagen reveals the ratios of carbon and nitrogen and can be used to reconstruct past dietary patterns in terms of food groups (e.g., root crops, terrestrial animals, reef fish) (Keegan 1985:177). Stable isotope analyses of Bahamian human skeletal samples support the view that early settlers, especially those in the southern part of the archipelago, were dependent on terrestrial food sources (Keegan 1985:185). Further, a single individual from the early Saladoid site, Hacienda Grande on Puerto Rico, exhibits an isotopic signature suggesting a 93% (±7%) reliance on terrestrial foods (Keegan and DeNiro 1988). This value is far greater than those from the Lucayan Taino individuals from the Bahamas.

The model and interpretations Keegan presents are based on a rigorous body of data on site size, distribution, density, and local ecology. I agree with a number of Keegan's interpretations. Specifically, the interpretation that expansion or colonization of other Caribbean islands occurred prior to an island being overpopulated is well argued. Also, the stable isotopic analysis of consumption is a method which, in conjunction with faunal data, can be used to provide a far more accurate interpretation of past subsistence systems. The Maisabel faunal analysis will be aided by the results of a stable isotopic analysis of approximately 32 human skeletons dating to the transitional Saladoid/early Ostionoid time period. Although the analysis is scientific and predictive, I disagree with the resulting resource ranking provided by Keegan (1985:Table 14:166-167) that forms the foundation of his study. I will briefly reiterate these concepts and discuss some of the problems with their application, specifically in relation to non-Bahamian data.

Optimal foraging theory and a cost minimization model in the analysis of subsistence resources are used to define the most cost-efficient means of meeting subsistence requirements. Efficiency is defined in terms of time spent on procurement. In order to assess the maximization model, food resources are ranked as currency based on the time needed to secure a particular food item. The goal of individuals is to maximize the results of their time expenditure by exploiting resources that yield the greatest rate of currency return (Keegan 1985:122-123).

Keegan's ranking of Lucayan Taino food items is based on modern collecting and processing studies, zooarchaeological data, ethnohistoric accounts, and ethnographic analogy (Keegan 1985:Table 14:167-168). It is recognized that the most highly ranked resources may not always be available in quantities to satisfy total needs. Therefore, time must be spent on the collection and consumption of a set of lower ranking resources, whose average return rate is greater than the marginal return of the lowest ranked resource in the set (Keegan 1985:123). The three highest ranking resources, in terms of calories per handling hour, are sea turtle (*Chelonidae*), hutia (*Geocapromys* spp.), and land crab (*Cardisoma* spp.), respectively. Of these, the latter two are terrestrial. It is possible that all three were captured on terrestrial habitats if sea turtles were taken while they were nesting on beaches, as is often hypothesized (e.g., Wing 1968; Wing and Reitz 1982). The high ranking of the terrestrial resources suggests that they were the object of human predation, particularly during early occupations of the islands. The terrestrial resources are viewed as lower risk, higher value items that were depleted rapidly as the colonizing populations grew. The shift to consumption of lower-ranked food items, as higher ranked foods began to provide lower marginal return rates, fits the model of diet-breadth expansion (Keegan 1985).

My main criticism with this model is that the return rates and rankings proposed by Keegan were calculated specifically for Lucayan Taino food items and may have limited applicability outside of the Bahamas. Although many of the food resources do not vary between geographical areas, some of the resources exhibit variability in density and distribution. Therefore these resources may be highly ranked in terms of handling time, however, average return rates for these resources may have differed substantially between geographical areas within the Caribbean. For example, the hutia (*Geocapromys*) is commonly identified in Bahamian samples, while in the Greater Antilles, Allen's hutia (*Isolobodon portoricensis*) is more frequently identified (Wing 1989). Paleontological samples from the Greater Antilles suggest that *Isolobodon* may not have been indigenous to Puerto Rico, but instead were introduced prehistorically by humans from the neighboring island of Hispaniola, where Pleistocene fossil sites have produced remains (Morgan and Woods 1986:179). Fossil evidence for this hutia may yet be recovered from Puerto Rico; however, if this hutia was introduced by human agents, its population density and availability may have differed significantly from that calculated for *Geocapromys* in the Bahamas.

A similar problem exists for the land crab. The population densities for prehistoric land crabs in the Bahamas are based primarily on Gifford's observations of Cardisoma burrows (1962:208). In terms of edible meat weight provided by land crabs, Keegan's data may be exaggerated. Keegan states that adult land crabs provide an edible average meat weight of 0.2 kg (200 g). A sample of 25 land *crabs (Cardisoma guanhumi)* collected by myself during the summer of 1986 in Puerto Rico, contained no modern specimens with total live weights of 200 g. The largest individual collected weighed 179 g, of which approximately 60%, or 107 g, would have been edible. This variation may be due to contrasting sizes and weights of the land crabs in different geographical areas or the intensity of modern exploitation in Puerto Rico (Mora 1981). In either case, it suggests that biological data on food species should be specific to the geographical area under consideration.

These examples are presented as illustrations of the relatively restricted focus of the food source rankings. Although these rankings may be appropriate for the Bahamas, they must be expanded to include a greater diversity of food items. Data are also needed on species densities in different geographical areas in order to estimate average return rates. Archaeologists working in the Caribbean have begun to recognize that the environmental diversity of the Caribbean has resulted in different cultural trajectories and adaptations on different islands (Watters 1982, 1983). It has long been recognized that zoogeographical diversity and extinctions in the Caribbean are the result of a long history of human and natural interventions (Olson 1982). Before an optimal foraging and microeconomic model of diet-breadth expansion can be applied to all of the eastern Caribbean, the food resource ranking must be refined. The stable isotopic analysis of larger samples from both the Lesser and Greater Antilles would be of value, as would further archaeological or zooarchaeological confirmation of over-exploitation of terrestrial faunas.

This discussion has outlined the major hypotheses proposed as explanations for the crab-shell dietary shift. A recurrent theme in many of these models is that human over-exploitation of terrestrial resources necessitated the use of marine resources. Many of these studies lack zooarchaeological or biological evidence for the over-exploitation of specific food items. The presentation of the Maisabel environmental setting and the composition of the faunal assemblage attempts to demonstrate the diversity of habitats available for exploitation and the range of resources used. These data are also examined for evidence of shifting resource use that could be attributed to either reduced food yields or over-exploitation.

## III. Environmental setting

Many researchers view the various islands of the Caribbean as homogeneous and stable in environmental structure, setting, and composition. Critics of this view have attempted to demonstrate that the Caribbean islands differ with regard to environmental zones and potential food resources due to geological factors of island formation (e.g., volcanic versus sedimentary formations, tectonic activity, and coastal geomorphology) (Watters 1981, 1982, 1986). These processes have resulted in islands that are variable in access to reef structures, shelf zones, shallow water lagoons, and freshwater sources (Watters and Rouse 1989). In addition to dynamic geological processes, biological productivity and species availability can be variable within islands and in offshore waters depending on wind and shoreline features (e.g., Wing and Scudder 1983).

Island size is also a factor in the availability of diverse ecological zones, water sources, and soils suitable for horticulture. The islands of the Lesser Antilles, particularly the igneous formations, are much lower in environmental diversity and soil development than the Greater Antilles. In contrast, the Greater Antilles are comprised of rock series that are older and more complex than those of the Lesser Antilles (Case and Holcombe 1980; Watters 1981). As noted earlier, reduction in the rate of colonization after the larger land masses were encountered may have been the result of their greater ecological diversity (Rouse 1986:139).

The following discussion presents the environmental setting of Maisabel with an emphasis on the potential subsistence habitats in the site's vicinity. The site setting and the exploitable terrestrial and aquatic biomes are outlined.

Maisabel is located approximately 30 km west of San Juan on the northern coastal plain (Figure 1). The north central coastal plain is approximately 3 km wide, from the shoreline to the Cordillera Central. It is traversed by a number of rivers and swamp drainage systems. Inland, there are many karst solution features including lagoons, mangrove swamps, and marshes (Torres-González and Díaz 1984:8). Soil development along this area varies depending on proximity to the coast and drainage systems. The Quarternary age alluvium and blanket sand deposits of the coastal plain are underlain by predominantly limestone deposits dating to the Oligocene and Miocene ages (Torres-González and Díaz 1984:6).

In the vicinity of Maisabel, both terrestrial and varied aquatic habitats would have been available (Figure 2). Maisabel is bounded to the north by the Atlantic Ocean. To the immediate south of the site is a small pond. Although the age of this feature has not been ascertained,

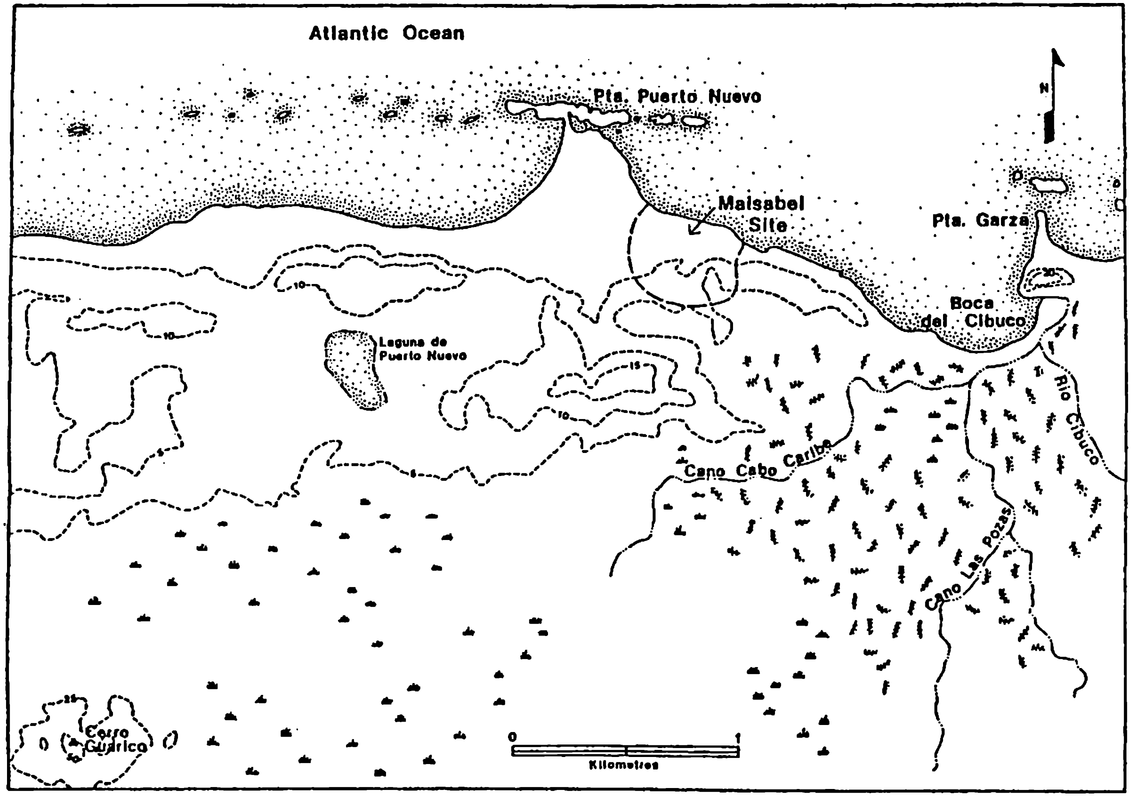



FIGURE 2
LOCATION OF MAISABEL AND SURROUNDING ENVIRONS

it may be a small sinkhole that was present when the site was occupied. Further east is a massive mangrove swamp and drainage system associated with the Cibuco River, which is roughly 1 km east of the site. To the east and west of the site there is a low coastline with sandy beach, exposed lithified sand dunes (eolianite), and beachrock deposits (Kaye 1959). Further west and south of the site, approximately half a kilometer from the shore, is a large interior lagoon, the Laguna de Puerto Nuevo (Figure 2).

According to a recent compilation of data on the hydrological features of the Cibuco River, the site proper was outside of the maximum floodplain of the river (Torres-González and Díaz 1984:Figure 3.2-1). The soils of the site are classified as predominantly fine-grained sands (Carricoles Sands) suitable for food crops (Acevido 1982:Sheet 8). Prehistorically, the soils could have supported tropical horticultural products.

The site is located in an area that was suitable for horticulture and also allowed access to several terrestrial habitats. Most notably, the mangrove swamp located to the east would have provided a large number of terrestrial crabs. It is on the fringes of this swamp that land crabs (*Cardisoma guanhumi*) are harvested today. The mangrove swamp grades from predominantly red to black mangrove as one travels south on the river into more freshwater habitats.

Compared to the terrestrial habitats, the aquatic zones in the vicinity of the site were more diverse. The Cibuco River to the east would have provided potable water and a variety of aquatic habitats along its course, ranging from freshwater to estuarine closer to the mouth of the river. Modern studies of the rate and volume of flow of the river, in conjunction with the tropical climate and annual rainfall figures (Torres-González and Díaz 1984) suggest that the river would have been navigable a good distance inland year round. Freshwater species could have been captured further inland and a variety of marine fishes would have been available near the mouth of the river. Some marine species may also have been available as far as 1.5 km inland during the drier seasons of the year, as dense wedges of intruding salt water have been recorded up to 1.75 km upstream (Torres-González and Díaz 1984:36).

The estuarine and mangrove habitats along the lower course of the river would have served as a nursery ground for many of the marine species. The shallow waters and protective covering of the mangrove prop roots, especially red mangrove roots, on river banks are frequently inhabited by juvenile fishes that later move to pelagic waters or to coral reef communities (Odum *et al.* 1982:50). Adults of a number of species, such as snook (*Centropomus* spp.), sleepers (*Eleotridae*), mullet (*Mugil* spp.), mojarras (*Diapterus* spp.), and several species of snappers (*Lutjanus* spp.) would also have inhabited the area. Mangroves located on the fringes of oceanic bays and lagoonal communities also increase habitat diversity along these relatively homogeneous coasts and they provide leaf litter that is a source of energy for detritus-based food webs (Odum *et al.* 1982:56).

In addition to the riverine system, a number of marine aquatic habitats were located in the site's vicinity. The description of these habitats follows standard oceanographic classifications as presented by Watters (1983). In this scheme, humans primarily use three distinguishable realms of islands. The coastal region and the littoral province are the first two and they refer to land surfaces. The third realm, the neritic province, refers to the water above the littoral land surfaces. Within these realms there are various subdivisions (Figure 3).

The coastal region is the landward side of an island, comprised of non-water surfaces including beaches, coasts, shores, and deltas (Watters 1981:5). The seaward side of an island is generally divided into two regions or realms: pelagic and benthic. The pelagic waters are comprised of two provinces: neritic and oceanic. The benthic region designates the land or seabed and associated marine organisms below the water. It also consists of two provinces: the littoral and the deep sea province. The littoral province, which extends to roughly 200 km offshore, is further subdivided into three zones, depending on proximity to the shore: the supralittoral, eulittoral, and sublittoral (Watters 1983).

The ecotonal interface of the littoral and neritic provinces with the coastal region is viewed by Watters as the area where most human-maritime interaction occurs. In addition, the oceanic province of the pelagic realm was utilized for interisland travel and exploitation of deeper water marine species. In the case of Maisabel, the littoral and neritic ecotonal interface is also the area of estuarine development near the mouth of the Cibuco River and a number of accessible habitats along the coast. A description of these areas follows.

The Boca del Cibuco, a protected lunate bay, is situated at the mouth of the Cibuco River. A steep rocky promontory protects the bay from intense wave action. The supralittoral zone is sandy beach, while further offshore, in the eulittoral zone, submerged limestone is present. The biological productivity of this area and coral reef development may have been hampered in prehistoric times because of the excessive freshwater runoff from the river and the turbidity of the shallow littoral province in this area. Today, quantities of sediment that are discharged from the river and into the bay impede light penetration, thereby inhibiting coral growth (Kaye 1959:107).

Further westward, the coast and littoral provinces are mixed eolianite, sandy beach, and beachrock. The exposed limestone on the northern coast is a small portion of an extensive submerged limestone shelf, the Puerto Rican trench, which was formerly exposed along

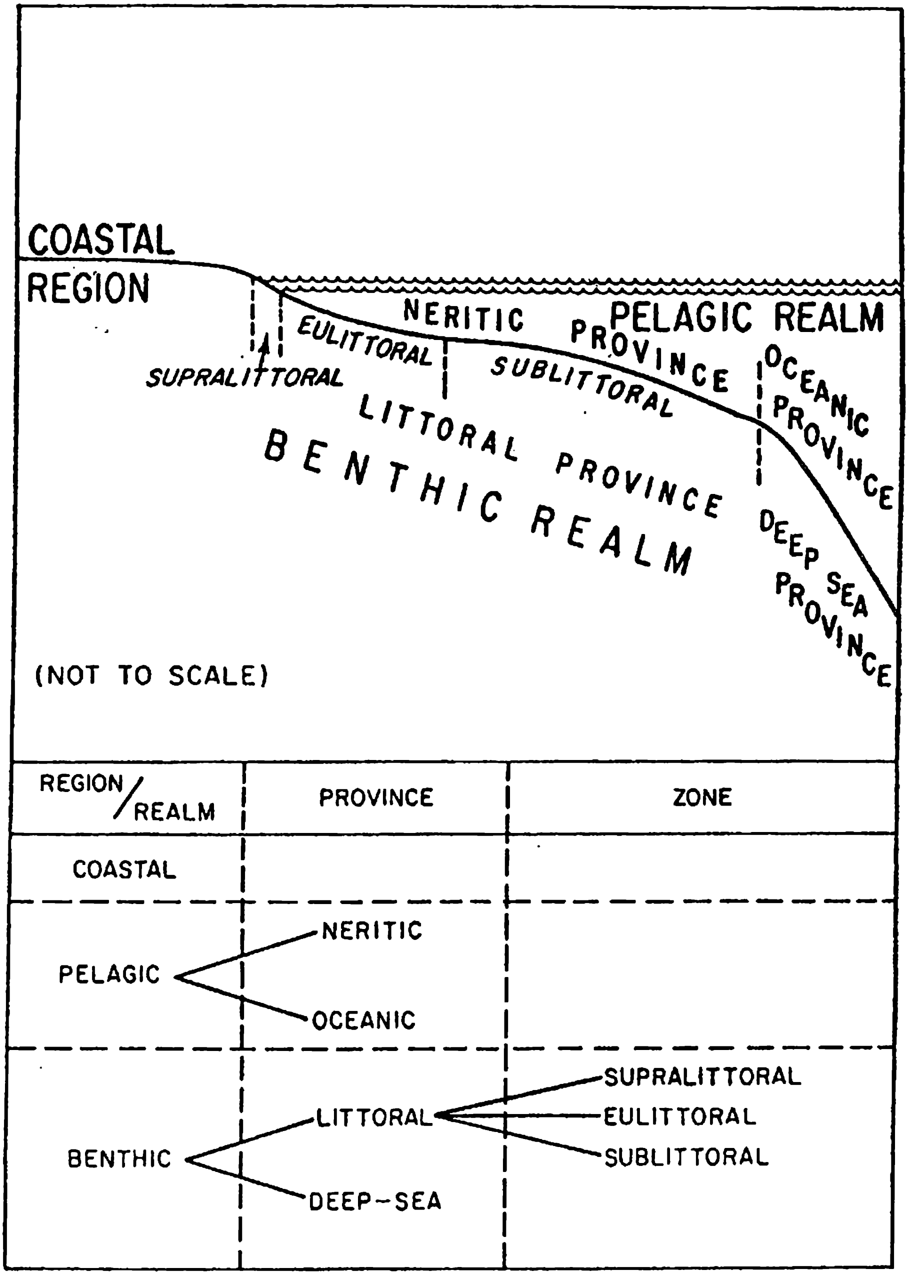



FIGURE 3
MARINE HABITATS
(source: Watters 1983)

northern Puerto Rico to the Virgin Islands (Moussa *et al.* 1987:435). The coast is a high energy shore that receives direct wave action from the ocean.

In the shoreline between the Cibuco Bay and Maisabel, a large portion of exposed eolianite substrate was tidally inundated (Figure 2). During low tide I observed a large number of littoral molluscan species attached to rock surfaces of the intertidal and supralittoral splash zones. These included chitons, nerites, neritinas, periwinkles, and the West Indian Top-Shell. The tidal moat on the landward side of this exposure was periodically occupied by many marine fish species (e.g., needlefishes, gobies, and small unidentified schooling fishes).

Unfortunately, it is not known whether the present configuration of the shoreline existed during the Saladoid and Ostionoid time periods. Moussa *et al.* (1987:434) indicate that the north coast of Puerto Rico has been subsiding as a result of tectonic activity since Miocene-Pliocene times, resulting in marine transgression into modern times. This model is supported by archaeological evidence in the form of petroglyphs carved in the shoreline beachrock that constitutes the north-west boundary of the site. These carvings are tidally inundated today; but presumably were placed originally in an area of greater visibility. Therefore, prehistorically the outer arc of limestone and associated faunal resources may have been further from the shore and the tidal moat feature discussed above may not have existed.

Roughly half a kilometer west of the site is a series of large exposed eolianite ridges that form Punta Puerto Nuevo. These rocks constitute the eastern and northern boundary for a second protected semi-lunate bay. The western section of this ridge has been broken into smaller segments due to the ongoing processes of subsidence and erosion from wave action. The now isolated eolianite cays that form the northern boundary of the bay were at one time a single ridge (Kaye 1959:66). Prehistorically, and possibly at the time of occupation, the bay would have been more enclosed and protected.

The bay possesses a number of potentially exploitable habitats. The southwestern portion of the bay contains dense beds of the marine angiosperm, *Thalassia* spp. *Thalassia* sea grass beds serve to stabilize the shallow sandy littoral bay surfaces and protect them from wave action. These beds also support a variety of molluscs and molluscan predatory fish species (Jackson 1972, 1973). Other vertebrate species, primarily fishes, would have been common in the area. Resident adult populations of fishes such as bonefishes, porgies, and mojarras would have inhabited the areas. Juvenile specimens of reef fishes are reported to occupy grass beds during the day. At night, a variety of adult reef species, both carnivorous and omnivorous, enter the grass flats to feed (e.g., snappers, jacks, and parrotfishes) (Randall 1965; Ehrlich 1975;

Keegan 1986). In addition, non-piscian vertebrates, such as sea turtles and marine mammals, occasionally may have entered the grass beds to feed, although these species were likely to be more common further offshore. If the northern boundary of the bay was a more extensive ridge during prehistoric times than today, the grass beds within the area would have been more widespread.

Within the bay there is also a large quantity of submerged limestone that is protected from strong wave action. This area was inhabited by a great diversity of fishes (e.g., wrasses, eels, gobies) that sought protective cover in the crevasses of the rock. Other common tropical fish species would have entered this area to feed as well.

Further offshore, the littoral province is primarily submerged limestone trench. Kaye (1959:107) reports that due to the high energy features of the northern coast (e.g., strong waves, turbid sediments, and river runoff), coral reefs are not well developed in the north-central area. The submerged limestone trench would have provided shelter and resources (e.g., algae, other fishes) similar to that of a coral reef; therefore, it would have supported a number of both omnivorous and carnivorous tropical marine fishes.

The terrestrial and aquatic habitats supported a wide range of vertebrate and invertebrate species. The analysis of Maisabel faunal remains indicates which habitats were of primary economic importance. In the following chapter I discuss the samples selected for analysis and the analytical methods employed.

## IV. Methods and materials

### *Sampling and Proveniences Selected*

The extensive excavations at Maisabel produced a substantial quantity of faunal remains. A sub-sample of these remains was selected for zooarchaeological analysis. The samples were chosen from contexts representing both the stratigraphic and chronological range of the site, as well as the areal distribution of the excavations. In order to address the proposed research questions, an effort was made to select contexts that appeared to contain well-preserved and large amounts of faunal remains. The samples chosen were from both volumetric flotation samples that were processed with 1.6 mm (1/16") mesh and from dry-screened materials that were processed with either 3.2 mm (1/8") or 6.4 mm (1/4") mesh.

From each ten cm level or feature deposit, a volumetric sample was taken for flotation. During the first phases of excavation the remaining excavated earth was dry-screened with 3.2 mm screen and flotation samples averaged 3 l per level. As the excavations proceeded, the dry screen was changed to 6.4 mm so that larger areas could be excavated more rapidly. In conjunction, the volume of the flotation samples was increased to 10 l per level. In some areas, the volume per sample varied slightly depending on the nature of the deposits. A comparative study of recovery rates with coarse fraction, 6.4 mm or 3.2 mm mesh, and 1.6 mm mesh was made for three of the areas sampled and is discussed later in this report. Where units contained contemporaneous strata, the faunal data from individual flotation samples were analytically combined to produce a single column.

Samples were selected from six areas of the site based on these criteria (Figure 4). According to a topographic map that was constructed based on the weights of ceramic remains recovered in machine test pits, the contexts sampled are among the densest areas of cultural refuse. The following discussion presents temporal and excavation information on the contexts from which faunal remains were selected for analysis. Table 1 summarizes this provenience information. Appendix A (p. 89) presents specific volumetric and temporal information on the analyzed flotation samples and the coarse screened materials.

A stratigraphic column of material, 1.6 m deep, from an excavation unit located on Mound 1 (north mound), N96W13, was analyzed. This mound is roughly 70 m in diameter and dates to the Hacienda Grande phase of Saladoid occupation. All of Mound 1 dates to the Hacienda Grande period (100 B.C. - A.D. 400) based on C-14 dates and artifact styles. At this time, the Hacienda Grande style cannot be subdivided into smaller temporal units; therefore, the entire column has been analytically combined. A similar stratigraphic column, 1.2 m deep, was analyzed from a unit in Mound 2, S36W18. This mound is oblong and measures roughly 100 m east-west by 30 m north-south. This context dates to the transitional Hacienda Grande-Cuevas occupation of the site (Siegel 1990).

The rich deposits of these two mounds were also used in a study of biases resulting from screen size. The faunal remains from coarse-screened 10 cm levels in each of the mounds were analyzed and compared to faunal remains recovered in 3 and 8 l flotation samples. Both were selected from the dense cultural deposits in the mounds: Mound 1, N98W13: 60-70 cm below surface (3 l sample) and Mound 2, S36W18: 50-60 cm below surface (8 l sample).

Another zone of Saladoid occupation located on the northern end of the site, Unit N112W88, was analyzed. The material from a 40 cm column was examined as was the material from a Saladoid pit feature that was uncovered deeper in the unit (Feature 104). From this feature, both flotation samples and 1/4" screened samples were analyzed. Both contexts date to the Hacienda Grande phase.

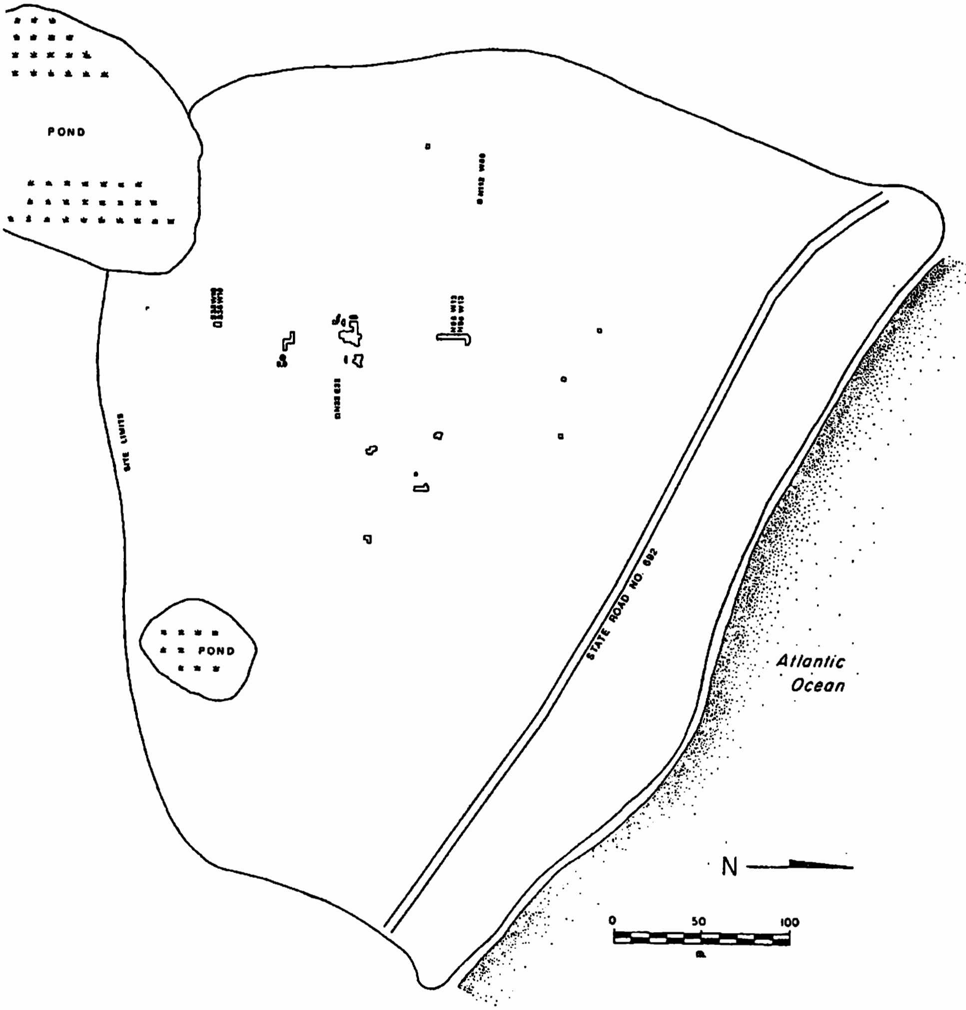



FIGURE 4
SITE MAP OF EXCAVATIONS AND ANALYZED CONTEXTS

TABLE 1
ANALYZED CONTEXTS

| Context | Location | Levels (cm) | Recovery Method |
|---|---|---|---|
| N98W13 | Mound 1 | 0 - 160 | flotation column |
| N98W13 | | 60 - 70 | coarse fraction, 1/8" |
| | | 60 - 70 | flotation sample |
| S38W18 | Mound 2 | 0 - 120 | flotation column |
| S36W18 | | 50 - 60 | coarse fraction, 1/4" |
| | | 50 - 60 | flotation sample |
| N112W88 | General levels | 20 - 60 | flotation sample |
| | | 30 - 40 | coarse fraction, 1/4" |
| | | 80 - 90 | flotation sample |
| | | 80 - 113 | coarse fraction, 1/4" |
| N32E32 | General levels | 20 - 40 | flotation samples |
| N43W08 | Feature 101 | pedestal | flotation samples |
| N43W10 | in Macroblock | | |
| N42W14 | | | |
| N42W18 | | | |

A small sample of material was analyzed from a context dating to transitional Saladoid/Ostionoid time periods or the Cuevas phase of late Saladoid occupation. Two strata from N32E32, dating to this later phase, were analyzed. Although this sample is comparatively small, it is one of the few samples dating to this time period.

Faunal remains were also studied from an extensive area of excavation between the two mounds termed the macroblock (Figure 5). The area dates to the subsequent Ostionoid occupation. Within these excavations was exposed a large linear feature (#101), approximately 80 cm wide, north-south, and 22 m long, east-west. The feature curves to the south on the western edge. Based on ethnographic analogy with South American lowland peoples and the other features associated with the linear stain (hearths, pits, burials, and numerous post molds), Siegel and Bernstein (1987) proposed that Feature 101 was a ditch surrounding a large oblong structure that is estimated to have measured 25 m east-west by 15 m north-south. It is believed to have prevented flooding of the structure by facilitating water drainage. The excavation strategy consisted of isolating the feature and taking flotation samples in each

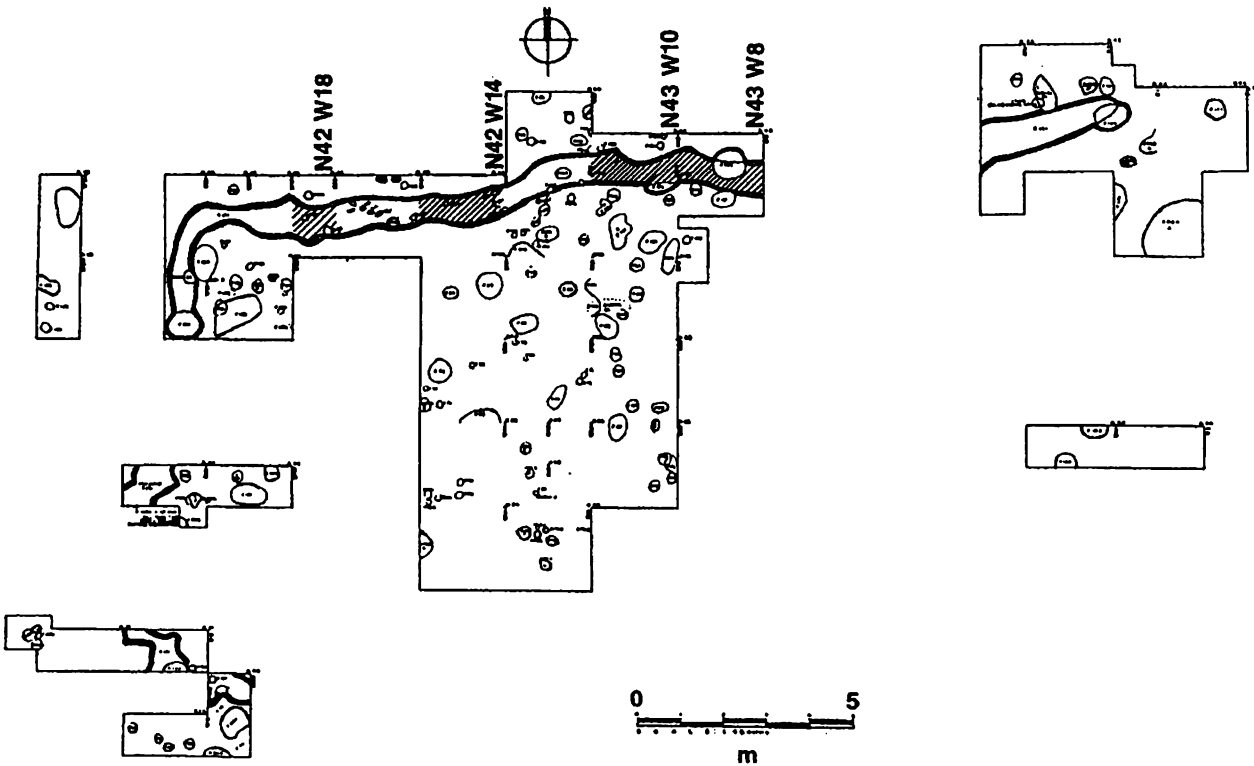



FIGURE 5
MACROBLOCK EXCAVATIONS AND ANALYZED CONTEXTS

of the units in which the linear stain was exposed. Zooarchaeological flotation samples from four of the units that contained the feature were examined. These samples were analytically combined to produce a single sample.

Other areas of the site also produced faunal remains; however, exclusive of the mounds, faunal densities are relatively low. The areas selected for zooarchaeological analysis are believed to represent the areal, temporal, and stratigraphic range of the site. The methods of identification and quantification are discussed below.

*Identification and Quantification*

The excavation and flotation sample processing was conducted under the supervision of Peter Siegel for the Centro de Investigaciones Indigenas de Puerto Rico (CIIPR)[1]. Once processing was completed, both the flotation samples and the coarse-screened faunal materials of bone, shell, and crab were shipped to the author. Identification of the faunal remains was done using the comparative collections of the Florida Museum of Natural History's Zooarchaeology and Malacology Laboratories at the University of Florida. Identification of the Maisabel remains was facilitated by the availability of 218 modern specimens of fishes and crabs collected by the author while in Vega Baja, Puerto Rico, during the summer of 1986 under the sponsorship of the CIIPR.

All of the remains were identified to the species level or next highest taxonomic grouping. In some instances, elements could not be posi-

[1]The Centro de Investigaciones Indígenas de Puerto Rico (CIIPR) is a nonprofit anthropological research center founded and supported by Gaspar Roca. It is dedicated to the study of the Amerindian heritage in the Caribbean Basin. Archaeological and ethnographic research is conducted to realize the goals of the CIIPR. Chartered in April 1985, it has thus far sponsored two major projects: (1) Ethnographic and ethnoarchaeological expeditions to two villages of the Waiwai Indians, one in southern Guyana on the Upper Essequibo River and the other in northern Brazil on the Jatapuzim River. In addition to important demographic, social organizational, and cosmological data, this projected resulted in a large and diverse collection of Amerindian material culture of groups from the region. (2) A large-scale interdisciplinary archaeological project centered on the early ceramic age site of Maisabel, which is located on the north coast of Puerto Rico. As part of this project, the CIIPR has supported investigations in zooarchaeology, archaeobotany, and human osteology. The present volume discusses Maisabel from a zooarchaeological perspective. Project staff are now completing the analysis of the artifacts and features recovered in the 14 month excavation. These data will be published as a separate monograph.

The South Amerindian ethnographic and the Maisabel archaeological specimens represent the nucleus of a collection planned to be used in a research center devoted to Amerindian lifeways, cultures, and adaptive strategies in the Caribbean. The research center will have both teaching and display goals, focusing especially on how interpretive conclusions are tively identified; however, an approximate identification to a species or family was possible. In these instances, the identification is preceded by "cf," which indicates that the specimen was most similar to the designated taxon, but, not positively identifiable as that taxon.

Elements that were only identifiable to the genus are followed by the abbreviations "spp." or "sp." The designation spp. signifies that an element was non-diagnostic (e.g., dorsal spines, vertebrae fragments) and could have been from one of several species of that genus. If the designation "sp." is used, the element was a diagnostic one (i.e., from only one species) but positive identification was not possible.

Remains of chiton, or coat-of-mail shells, were identified only to the class level due to the difficulty in distinguishing fragments of chitons. Chiton s.l. (Chiton *sensu latu* or in the broad sense) is the designation given to coat-of-mail shell. It is probable that at least two species are represented in the remains based on the collection of two species of chiton within the vicinity of the site.

Once identification was completed several methods were employed to quantify the remains. There has been much debate over which quantitative measures provide the best indications of species abundance and dietary contributions (e.g., Grayson 1984; Reitz *et al.* 1987). The methods employed in the present study are discussed and the merits and drawbacks of the various measures employed are briefly outlined. It must be emphasized that no single method is without its drawbacks. However, when used in combination, the different measures provide data that serve as an interpretive framework. The data generated can

derived by researchers from diverse perspectives. In this regard it will show how anthropology is a *dynamic* and *didactic* enterprise rather than the dismal display of static "culture facts" that so often characterizes anthropology museums.

Over the last five years the CIIPR has been building an extensive research library devoted to Caribbean archaeology, ethnography, and ethnohistory as well as to general anthropological/archaeological method and theory. Currently the institution subscribes to 50 journals and has more than a thousand books in its holdings. Along with maps, photographs, and video/sound documentation this library is an important archive for Caribbean research.

The CIIPR supports graduate-level instruction and seminars in archaeological method and theory by visiting scholars at the Centro de Estudios Avanzados de Puerto Rico y el Caribe and has directly disseminated its findings by sending CIIPR staff to present papers at national and international conferences of archaeology and anthropology.

Finally, as this book attests, the CIIPR is committed to the support of scholarly interactions related to Caribbean studies. This is the second major publication sponsored by the institute. The first, an edited volume entitled "Early Ceramic Population Lifeways and Adaptive Strategies in the Caribbean," was published by British Archaeological Reports in their International Series. With the combined research and publication efforts the CIIPR is striving to make an important contribution to the furtherance and dissemination of knowledge about the heritage of the Caribbean peoples to both the scientific and lay communities.

then be used to address specific research questions, in this case, questions concerning the subsistence and adaptive strategies of Saladoid and Ostionoid peoples on the north coast of Puerto Rico.

Fine-screened flotation samples produced a large number of small specimens and unidentifiable fragments. Fragment counts or Numbers of Individual Specimens per taxon (NISP) have been viewed as one standard measure of relative abundance in the study of archaeofaunas (Grayson 1984). Fragmentation of archaeologically deposited bone can be the result of depositional practices, post-depositional processes, or cultural practices (e.g., butchering techniques or processing methods). Therefore, this measure is of limited value in assessing the original relative abundance or dietary contributions of the various taxa. Despite these limitations, NISP values are provided for the Maisabel data. All of the fragments identifiable to class or to a more specific level (e.g., family, genus, species) were counted. The fragmentation of large numbers of unidentifiable bony fish and molluscan elements made counting these remains an unprofitable exercise. In these instances only weights of the specimens are provided. Specimen counts are provided for the numerous commensal land snails that were present in the samples; however, they were not used in calculating the percentages of NISP or in any other calculations.

The estimation of Minimum Numbers of Individuals (MNI) is also recognized as a standard measure of relative abundance. Although calculations of individuals are not subject to the same biases that may affect bone counts, making assessments of dietary contributions based on MNI can be difficult, due to the extreme size variation that can be exhibited by individuals representing different taxa, for example, the dietary contribution of a parrotfish versus that of a sea turtle. Yet, estimates of MNI when used in conjunction with NISP can provide an indication of the degree of bone fragmentation. Information on the sizes and ages of individuals within a taxon or variation in individuals between taxon can also be used to reconstruct patterns of exploitation or habitat use and possibly season of exploitation.

Estimates of MNI are provided for the Maisabel samples. In those areas where samples were analytically combined to produce single columns, the minimum distinction method of calculation was used. In this method, all of the contemporaneous samples are treated as a single unit. Estimates are based on paired elements as well as size and age variation. MNI estimates are not provided for the presumably commensal species of land snails. MNI estimates are, however, provided for a number of small marine forms and small reptiles and amphibians, which may or may not have been consumed. If specimens are presumed to have been non-food items, no additional measures of abundance are provided.

Bone weight has also been widely used as a measure of abundance. However, bone weight can be affected by factors of deposition (e.g., leaching, mineralization, decay) and cultural factors such as methods of preparation (e.g., roasting, boiling). The bone mass of different taxa is also variable and therefore bone weights that differ between taxa may be the result of different bone densities or, alternatively, variation in relative abundance. For the present study, bone weight was recorded for all of the specimens considered to be food items. Although bone weight has been simplistically used in reconstructing estimates of total body weight, this measure can be manipulated to derive allometrically scaled estimates of live weight and edible meat weight (Reitz *et al.* 1987).

An additional method that can be used to determine the relative abundance of the taxa represented and their contribution to the diet is that of skeletal or shell mass allometry, a form of allometric scaling. Allometric scaling is based on the linear relationship between body size and mass and various morphological and physiological variables (Schmidt-Nielsen 1984:15). The allometric principle is that as body weight or size increases, the bone or shell weight or size exhibits a proportional increase. The allometric relationship can be expressed by the least squares linear regression equation:

$$Y = ax^b \text{ or } \text{Log } Y = \text{Log } a + b\ (\text{Log } X)$$

where "b" is the slope of the line and "a" the y-intercept (Peters 1983:10-23; Simpson *et al.* 1960:397). The values for the constant of allometry (b) and the y-intercept (a) were derived using specimens whose total body weights were known in the zooarchaeological comparative collections housed at the Florida Museum of Natural History and the University of Georgia. The independent (x) and dependent variables (y) can be defined in a variety of forms (Reitz *et al.* 1987, Table 1) depending on the questions being asked.

In this study one definition of these variables is x = skeletal or shell weight and y = edible meat weight. This relationship, termed skeletal or shell mass allometry, provides an estimate of edible meat weight or the amount of meat or muscle tissue that theoretically adhered to the archaeologically recovered bone. Edible meat weight provides an estimate of muscle tissue represented rather than biomass or whole animal weight. Because different taxa, or classes of taxa, have varying proportions of edible meat weight due to variation in hair, teeth, and skeleton (especially exoskeletons), it is necessary to make comparisons between edible meat weight rather than whole biomass. Since these estimates are based on bone or shell weight, they can be adversely modified by post-depositional or culturally induced changes in bone or shell weight. However, this method appears to have great utility in assessing the dietary contribution of the fauna represented by providing accurate measures of edible meat weight (Wing and Brown 1979; Reitz *et al.* 1987).

For the Maisabel study, values for the slope and y-intercept of the line were developed from modern specimens (Table 2). Estimates of edible meat weight were calculated for all identified taxa that are considered to represent food items. For the remains identifiable only as vertebrata and mollusca, the allometric values for the two most abundant vertebrate and invertebrate classes of fauna were used to generate estimates of edible meat weight. The substitute values for vertebrates and mollusks are those of Osteichthyes and Gastropoda, respectively.

Mass allometry provides a minimum estimate of edible meat weight as it is based only on the weight of the archaeologically recovered bone or shell. In contrast, dimensional allometry provides a maximum estimate of biomass or edible meat weight of a specific individual represented archaeologically. Dimensional allometry is based on the relationship between linear dimensions and body mass or body size (Wing and Brown 1979:127).

Dimensional allometric scaling has been used to correlate such features as atlas width of teleost fishes to live weight or total length, greatest width of the mammalian femur head to body weight, and whelk aperture width to meat weight (Wing and Brown 1979:128; Reitz *et al.* 1987:311). In order to produce accurate body weight or size predictions, a collection of modern specimens must be accurately weighed and measured to derive values for the slope and intercept of the line. Also, the dimensional measurement should be on an element that is relatively frequent in the zooarchaeological remains (Wing and Brown 1979:127).

Dimensional allometry can be used to provide edible meat weight values based specifically on the sizes of the individuals represented. However, this measure can be of lesser value in attempting to determine the dietary contribution of the taxa represented than skeletal mass allometry because it provides an estimate of edible meat weight for the entire individual rather than only for the remains represented archaeologically. In most instances where small individuals have been identified, it can be assumed that the whole organism was represented and consumed rather than only a portion. However, this is probably not true for taxa that are represented only by large specimens, which were probably divided between a number of individuals or households. In these cases, estimating the contribution of edible meat weight for the entire individual results in an overrepresentation of the meat that was actually available.

For this analysis, dimensional allometry is used to calculate size estimates of the fish and crab species that are represented archaeologically. The data from these applications allows the reconstruction of size classes and allows inferences to be drawn concerning marine habitats exploited, procurement technologies, and possible human predation pressure.

TABLE 2
ALLOMETRIC FORMULA AND VALUES USED IN THIS STUDY.

| Taxon | n | Log a | b | $r^2$ | Source |
|---|---|---|---|---|---|
| Mammals | 40 | 1.41 | .81 | .81 | Quitmyer (1985) |
| Aves | 39 | 1.24 | .84 | .84 | |
| Testudines | 9 | 1.65 | .53 | .74 | |
| Serpentes | 14 | 1.06 | .94 | .98 | |
| Osteichthyes | 80 | 1.34 | .90 | .96 | Hale and Walker (1986) |
| Osteichthyes[1] | 99 | .70 | 2.57 | .98 | Quitmyer (1985) |
| Carcharhinidae | 11 | .94 | 1.38 | .98 | |
| Rajiformes | 12 | 2.61 | .89 | .95 | |
| Brachyura[2] | 25 | 1.52 | .46 | .51 | Appendix B, Table 1 |
| Bivalvia | 135 | -0.16 | .92 | .89 | Hale *et al.* (n. d.) |
| Chitons | 15 | -0.32 | 1.08 | .84 | Appendix B, Table 1 |
| Gastropods | 80 | .02 | .68 | .83 | Hale *et al.* (n. d.) |

Allometric Regression Formula: $y = ax^b$

Transformed: Log y = Log a + b(Log x)

Where: x = skeletal/shell weight (g)
y = usable meat weight (g)
a = y intercept
b = slope of the line

[1]for Osteichthyes: x = anterior width of atlas or non-caudal vertebrae (mm)
y = maximum edible meat weight

[2]for Brachyura: x = shell weight (g)
y = live weight (60% usable meat weight (g) based on Blue Crab specimens, Quitmyer 1985)

Further, dimensional allometric scaling is applied to archaeological elements of the blue land crab (*Cardisoma guanhumi*) to produce estimates of total carapace width and average live weight. Due to the fragility of the land crab exoskeleton, the most commonly identified crab remains are whole and fragmented chelae. It is often not possible to side the claws or determine the dominant chelae. Therefore, they are not amenable to dimensional allometric scaling. Another durable element that has been recovered in the archaeological deposits is the mandible. The paired mandibles are small, roughly triangular shaped elements located on the ventral side of the body nearest to the midline in the buccal cavity. They are covered by an operculum-like third maxilliped (Figure 6). The mandible has proven to be amenable to dimensional allometric scaling for predicting carapace width and average live weight.

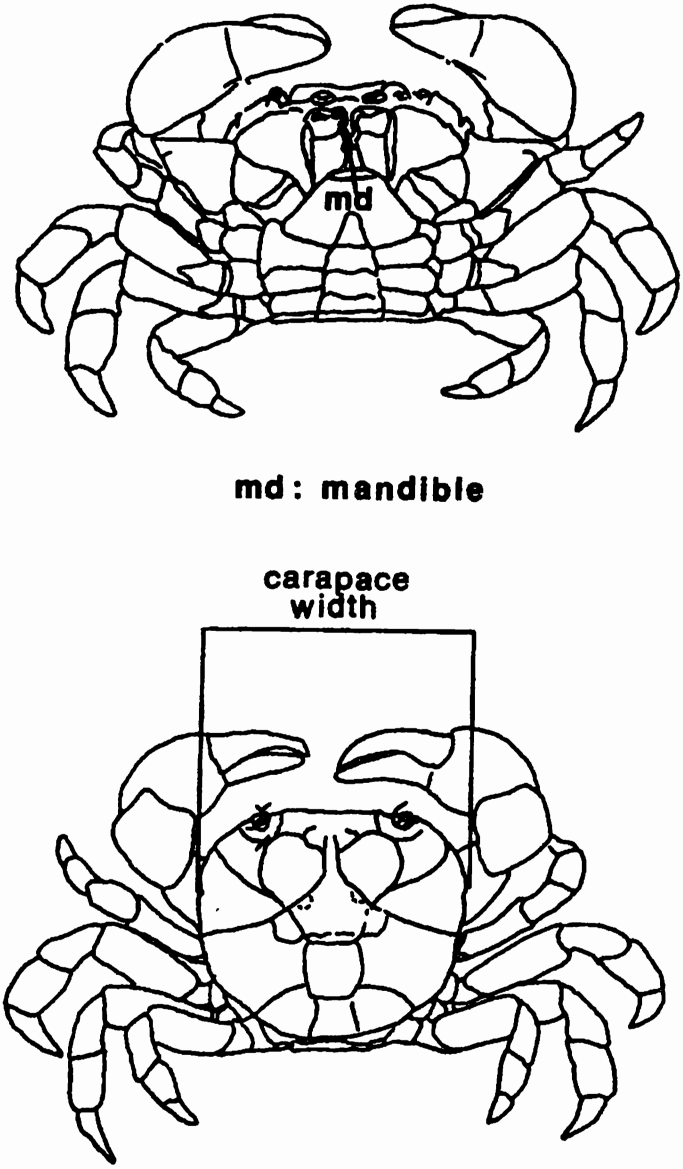



FIGURE 6
LOCATION OF CRAB MANDIBLE AND CARAPACE WIDTH

The height of the mandible was measured on a sample population of 25 modern individuals of *Cardisoma guanhumi* to generate the allometric values used in this study (Figure 7 and Table 3). Appendix B (p.91) presents dimensional information on the modern specimens used in the study. The relationship of mandible height to carapace width shows a strong correlation, and therefore provides a good estimate of carapace size (Table 4).

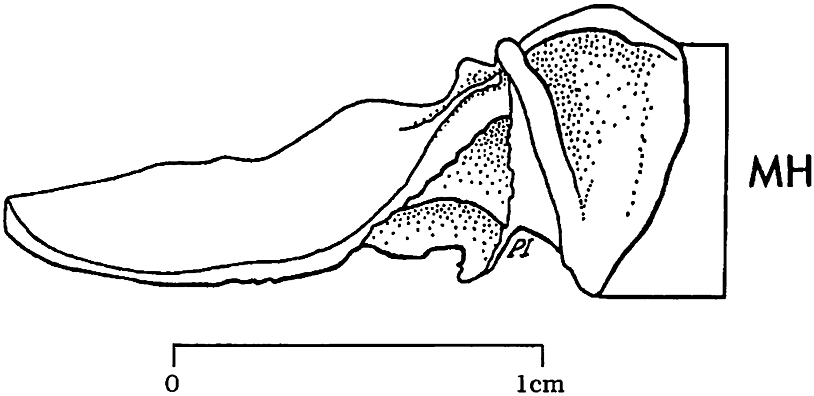



FIGURE 7
CRAB MANDIBLE AND LOCATION OF MEASUREMENT
(LEFT MANDIBLE, INTERIOR VIEW)
MH = mandible height

Table 3
Dimensional Allometric Formulas for the Blue Land Crab, *Cardisoma guanhumi.*

1. Height of mandible (mm) to carapace width (mm)
   Log y = 1.1.21 + .787 (log x); R = .76, n = 19
   x = merus height (mm) of mandible
   y = maximum carapace width (mm)

2. Height of Mandible (mm) to Average Live Weight (g)
   Log y = .508 + 1.842 (log x); R = .90, n = 5 (total sample = 25)
   x = merus height (mm) of mandible
   y = estimated average live weight (g)

TABLE 4
WEIGHTS AND MEASUREMENTS USED TO DERIVE VALUES FOR
ESTIMATING LAND CRAB CARAPACE WIDTH

| Specimen Field Number | Carapace Width (mm) | Mandible Height (mm) | Live Weight (g) |
|---|---|---|---|
| 212 | 55.7 | 6.7 | 125 |
| 209 | 56.8 | 6.3 | 99 |
| 208 | 57.0 | 6.3 | 98 |
| 214 | 57.4 | 6.6 | 90 |
| 216 | 60.5 | 6.9 | 104 |
| 191 | 60.5 | 6.9 | 120 |
| 217 | 60.8 | 6.8 | 130 |
| 204 | 60.8 | 7.1 | 106 |
| 183 | 61.4 | 7.8 | 110 |
| 210 | 62.0 | 7.2 | 94 |
| 215 | 62.8 | 7.5 | 120 |
| 187 | 63.4 | 7.5 | 105 |
| 189 | 64.5 | 7.5 | 147 |
| 188 | 65.3 | 7.0 | 142 |
| 185 | 66.3 | 7.7 | 140 |
| 184 | 67.2 | 8.0 | 152 |
| 193 | 67.8 | 7.6 | 139 |
| 211 | 69.7 | 8.0 | 179 |
| 205 | 71.0 | 8.0 | 162 |

The relationship between mandible height and live weight is somewhat less reliable when all 25 observations are independently used to derive the slope and y-intercept of the line. This is due to the large range of variability in weight exhibited by the crabs of a very small size range (see Appendix B). This weight variability is undoubtedly related to the process of crab growth through molting or shedding of the exoskeleton. Once shedding is complete, weight gain is accomplished through water uptake, tissue formation, and the deposition of carbonate to the shell prior to the subsequent molt (Gifford 1962). Therefore, several crabs with similar dimensional measurements may exhibit substantial weight differences depending on their phase of growth or proximity to molt. The modern specimens, collected in conjunction with the Maisabel project, exhibited as much as 57 g difference in weight based on small size variation.

In order to produce allometric values that account for the molting aspect of growth, the crabs are clustered into five groups based on size of the mandible. The average height of the mandible (x independent variable) for each of the clusters is plotted in relation to the average live weight (y dependent variable) of that cluster (Table 5). This reduces the number of observations to five but indicates a strong correlation.

It must be emphasized that these regression values produce only an estimate of average live weight. For example, the live weight of an in-

TABLE 5
WEIGHTS AND MEASUREMENTS USED TO DERIVE VALUES FOR ESTIMATES OF AVERAGE CRAB WEIGHT

| Cluster | Field Number | Mandible Height (mm) | Mean (mm) | Live Weight (g) | Mean (mm) |
|---|---|---|---|---|---|
| 1 | 208 | 6.3 | 6.1 | 98 | 98.5 |
| | 209 | 6.3 | | 99 | |
| 2 | 214 | 6.6 | | 90 | |
| | 207 | 6.7 | | 94 | |
| | 212 | 6.7 | 6.8 | 125 | 110.5 |
| | 217 | 6.8 | | 130 | |
| | 191 | 6.9 | | 120 | |
| | 216 | 6.9 | | 104 | |
| 3 | 206 | 7.0 | | 115 | |
| | 188 | 7.0 | | 142 | |
| | 204 | 7.1 | 7.1 | 106 | 114.5 |
| | 190 | 7.1 | | 90 | |
| | 210 | 7.2 | | 94 | |
| | 213 | 7.4 | | 140 | |
| 4 | 187 | 7.5 | | 105 | |
| | 215 | 7.5 | | 120 | |
| | 193 | 7.6 | 7.6 | 139 | 126.8 |
| | 189 | 7.5 | | 147 | |
| | 185 | 7.7 | | 140 | |
| | 183 | 7.8 | | 110 | |
| 5 | 184 | 8.0 | | 152 | |
| | 205 | 8.0 | 8.1 | 162 | 161.6 |
| | 211 | 8.0 | | 162 | |
| | 186 | 8.6 | | 152 | |

dividual based upon an archaeologically recovered mandible may actually be in excess of 50 g, above or below the predicted live weight. These live weight estimates are only presented as a relative indication of the body weight of the harvested crabs. If the sample size of the crabs used to generate the values was increased it might be possible to refine the allometric values. These applications and the results of all of the methods of quantification are discussed in the following chapter.

## V. The faunal assemblage

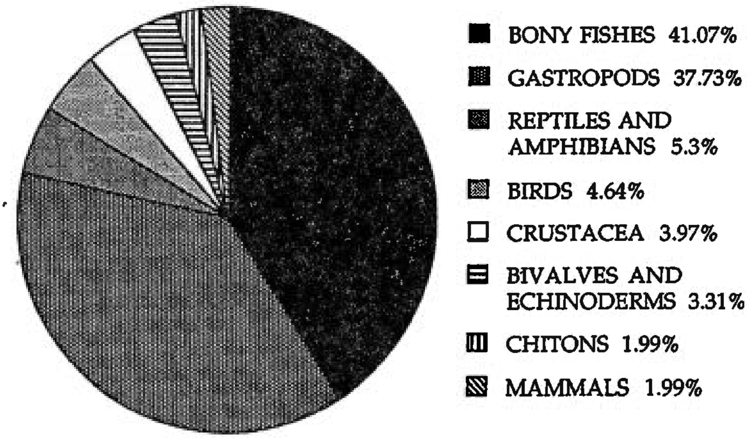
*Sample Size and Preservation*

The 12 contexts from which faunal remains were analyzed produced a sample of 25,394 vertebrate and invertebrate elements, representing a minimum of 4,957 individuals. When the samples are combined, invertebrates account for 58% of the fragments and 85% of the MNI. However, the vertebrate species were apparently of greater dietary importance because they provide 77% of the estimated usable meat weight. Information on the MNI and edible meat weight provided by the vertebrates and invertebrates is presented in Table 6. Appendix C (p. 95) presents the species lists and estimates of relative abundance for the 12 contexts.

The samples indicate that the Maisabel occupants used a diverse range of faunal resources. All vertebrate and invertebrate species are considered to have been edible, with the exception of small-sized parasitic forms that would have been unintentionally deposited in the midden. The species that can be considered food items consist of six species of mammals, at least eight species of birds, and six species of reptiles, including two species each of turtles, snakes, and lizards. The fishes are represented by three cartilaginous species and 64 species of bony fishes. The invertebrates that can be considered food items include one species of crustacea, 43 marine gastropods, at least two species of chitons, and 20 species of bivalves. The terrestrial gastropods are represented by 13 species yet, based on size, only one of these, *Caracolus* spp., can be considered edible. All of the other terrestrial gastropods are represented by extremely small individuals.

The relative abundance of the faunal classes, in terms of MNI and estimated usable meat weight, are presented in Figures 8-19. Other aspects of species composition, and variability between contexts, are considered in light of broader subsistence interpretations and inferences, which are presented in the following section.

## N96W13 0-160cm FLOTATION
## MINIMUM NUMBER OF INDIVIDUALS




## N96W13 0-160cm FLOTATION
## EDIBLE MEAT WEIGHT

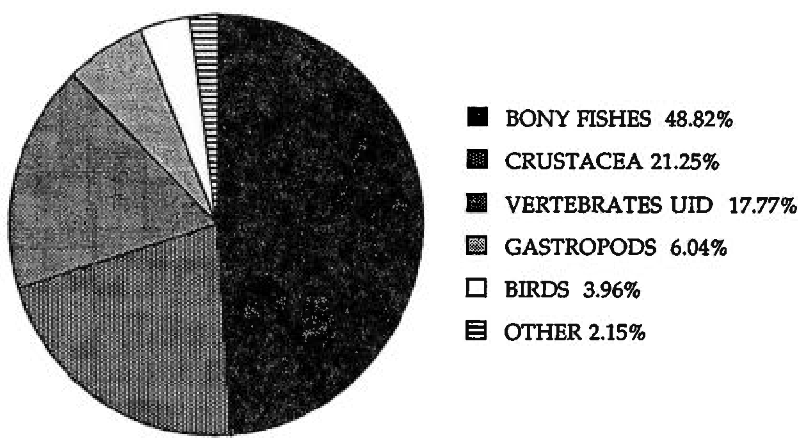
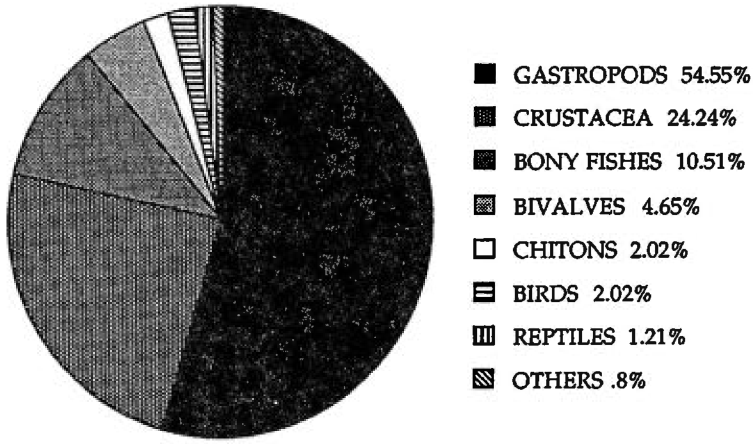



FIGURE 8
MINIMUM NUMBERS OF INDIVIDUALS AND EDIBLE MEAT WEIGHT SUMMARIES FOR FAUNAL CLASSES, N96W13 COLUMN

## N98W13 60-70cm COARSE
## MINIMUM NUMBER OF INDIVIDUALS




## N98W13 60-70cm COARSE
## EDIBLE MEAT WEIGHT

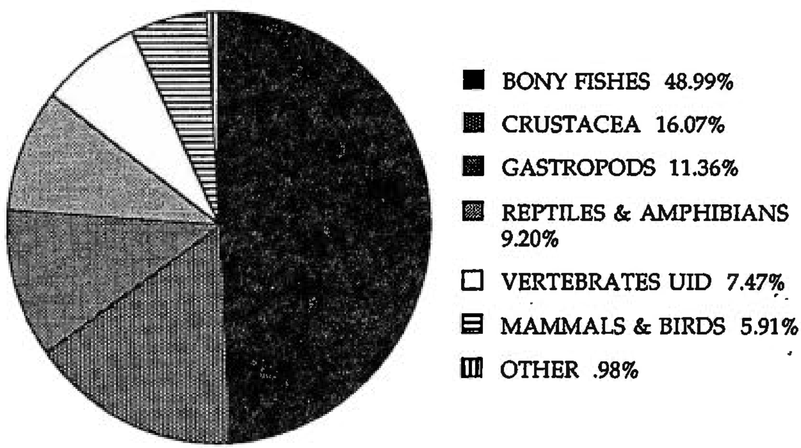
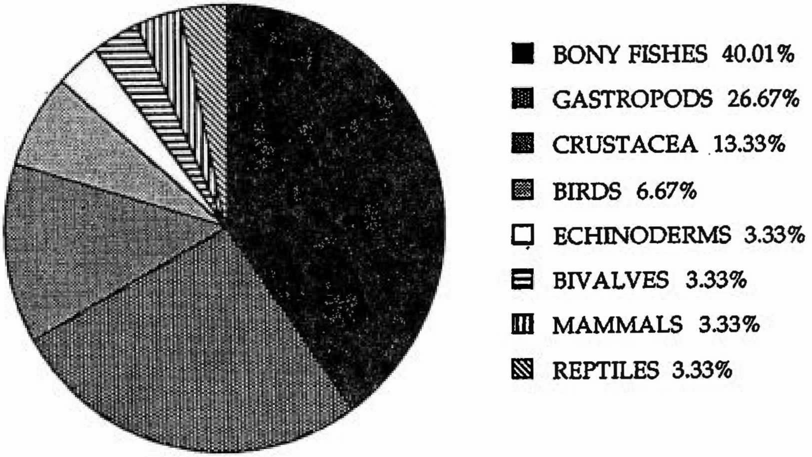



FIGURE 9
MINIMUM NUMBERS OF INDIVIDUALS AND EDIBLE MEAT WEIGHT SUMMARIES FOR FAUNAL CLASSES, N96W13 COARSE

## N98W13 60-70cm FLOTATION
## MINIMUM NUMBER OF INDIVIDUALS




## N98W13 60-70cm FLOTATION
## EDIBLE MEAT WEIGHT

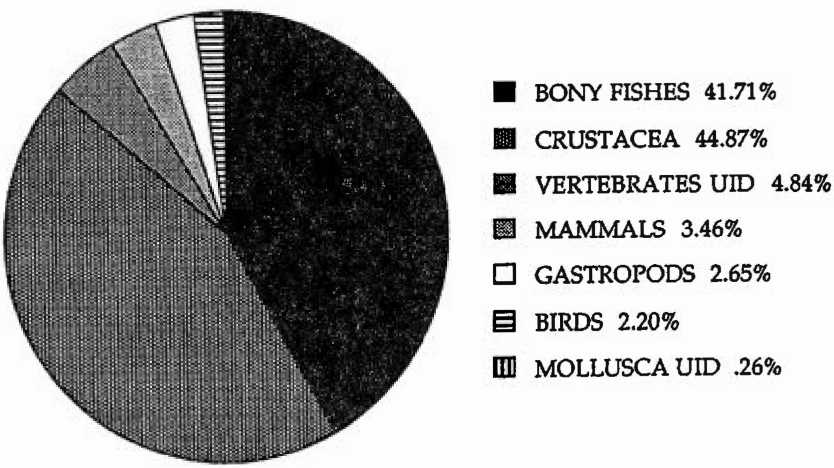
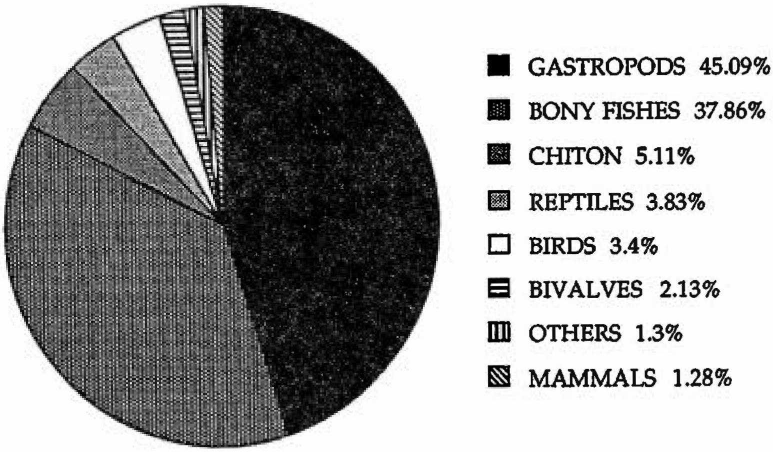



FIGURE 10
MINIMUM NUMBERS OF INDIVIDUALS AND EDIBLE MEAT WEIGHT SUMMARIES FOR FAUNAL CLASSES, N96W13 FLOTATION

## S38W18 0-120cm FLOTATION
## MINIMUM NUMBER OF INDIVIDUALS




## S38W18 0-120cm FLOTATION
## EDIBLE MEAT WEIGHT

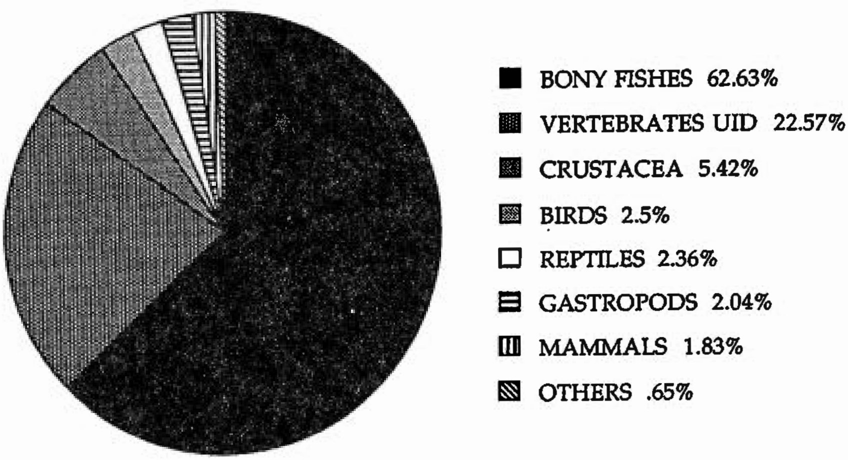
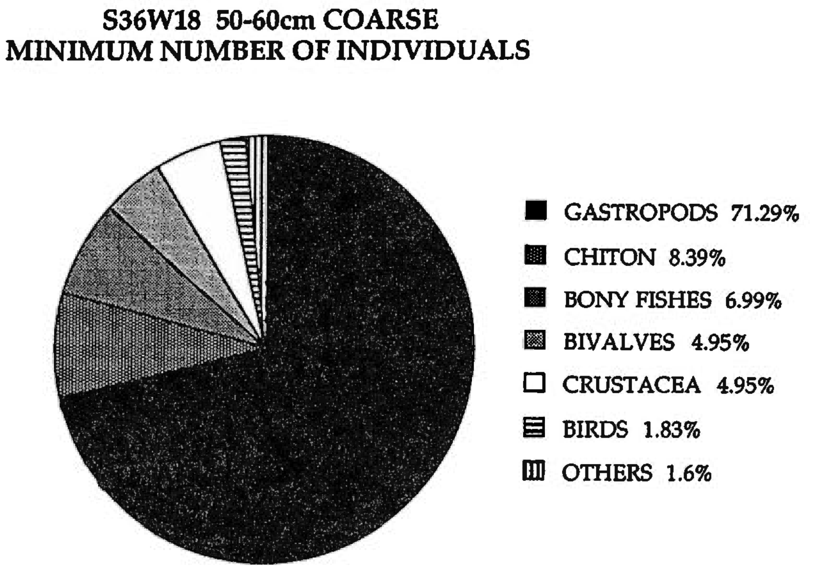



FIGURE 11

MINIMUM NUMBERS OF INDIVIDUALS AND EDIBLE MEAT WEIGHT SUMMARIES FOR FAUNAL CLASSES, S38W18 COLUMN



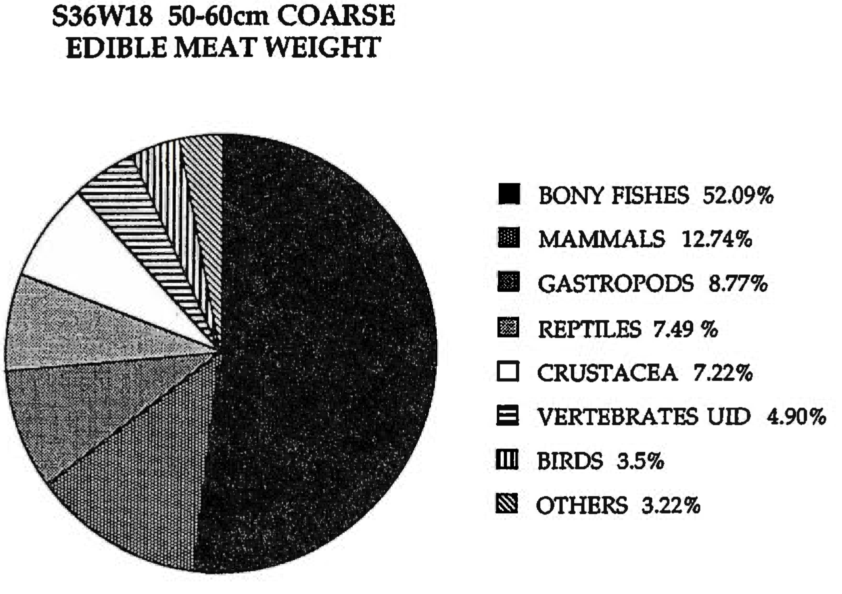
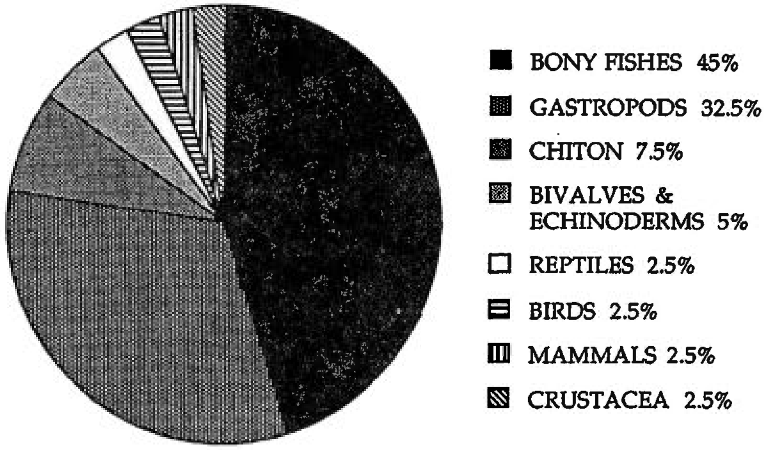




FIGURE 12
MINIMUM NUMBERS OF INDIVIDUALS AND EDIBLE MEAT WEIGHT SUMMARIES FOR FAUNAL CLASSES, S36W18 COARSE

**S36W18 50-60cm FLOTATION**
**MINIMUM NUMBER OF INDIVIDUALS**




**S36W18 50-60cm FLOTATION**
**EDIBLE MEAT WEIGHT**

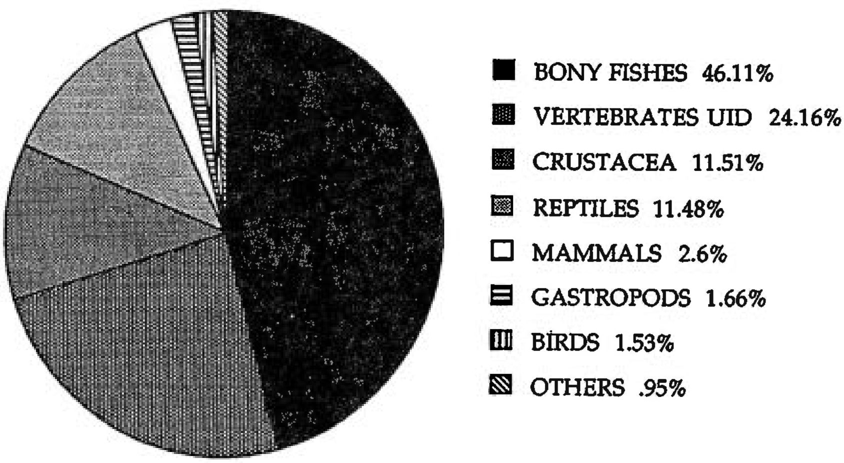
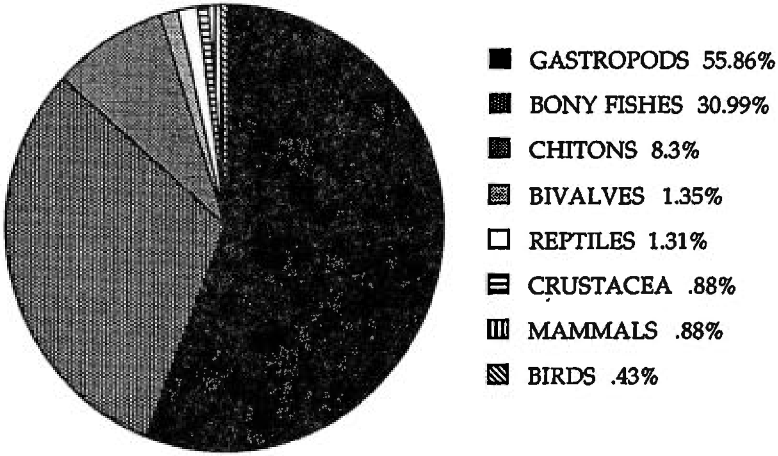



FIGURE 13
MINIMUM NUMBERS OF INDIVIDUALS AND EDIBLE MEAT WEIGHT SUMMARIES FOR FAUNAL CLASSES, S36W18 FLOTATION

## N112W88 20-60cm FLOTATION
## MINIMUM NUMBER OF INDIVIDUALS




## N112W88 20-60cm FLOTATION
## EDIBLE MEAT WEIGHT

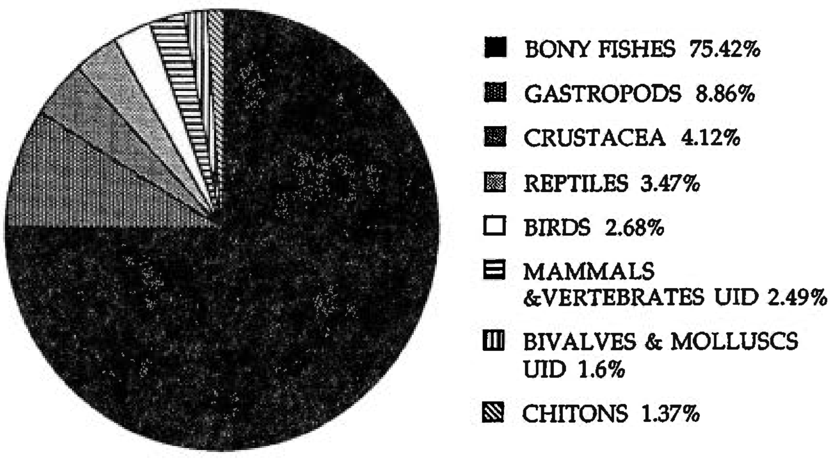
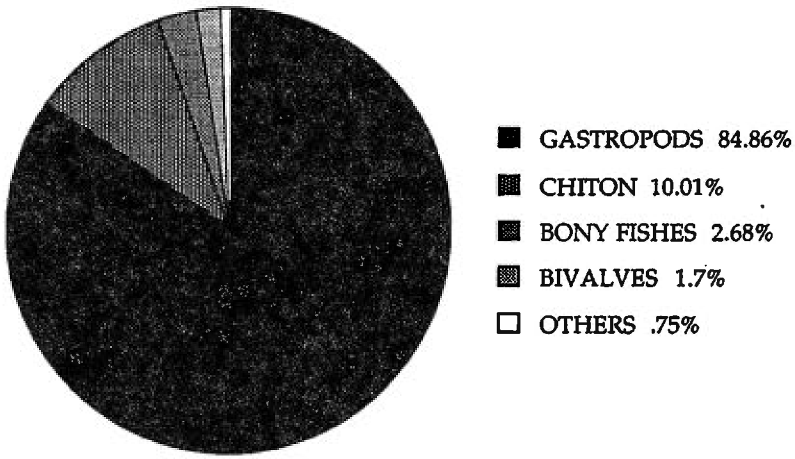



FIGURE 14
MINIMUM NUMBERS OF INDIVIDUALS AND EDIBLE MEAT WEIGHT SUMMARIES FOR FAUNAL CLASSES, N112W88 FLOTATION

**N112W88 30-40cm COARSE**
**MINIMUM NUMBER OF INDIVIDUALS**




**N112W88 30-40cm COARSE**
**EDIBLE MEAT WEIGHT**

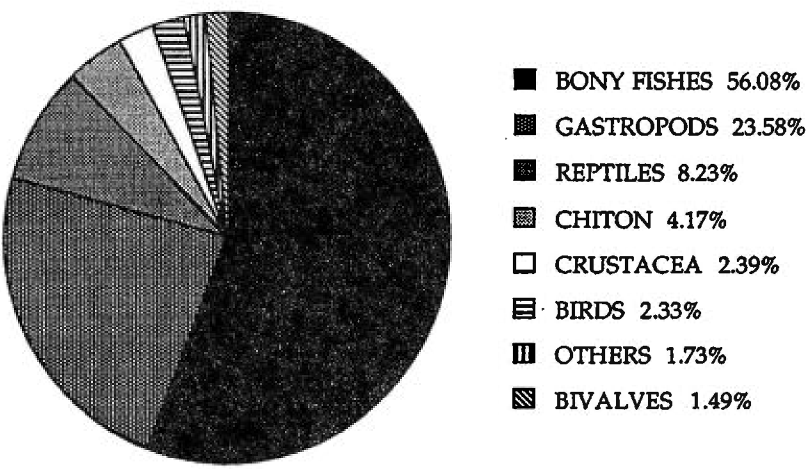
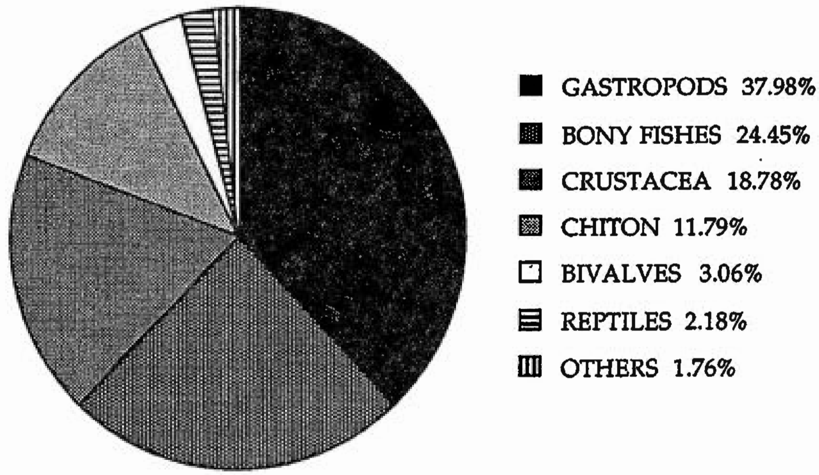



FIGURE 15
MINIMUM NUMBERS OF INDIVIDUALS AND EDIBLE MEAT WEIGHT SUMMARIES FOR FAUNAL CLASSES, N112W88 COARSE

N112W88 FEATURE 104 FLOTATION
MINIMUM NUMBER OF INDIVIDUALS




N112W88 FEATURE 104 FLOTATION
EDIBLE MEAT WEIGHT

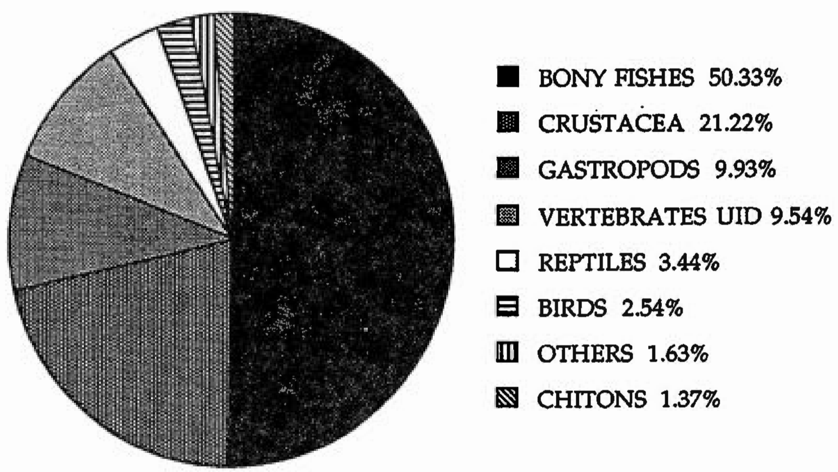
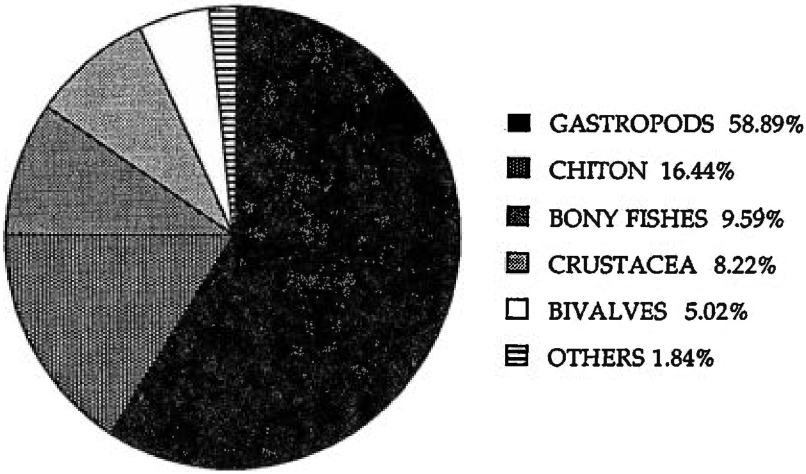



FIGURE 16
MINIMUM NUMBERS OF INDIVIDUALS AND EDIBLE MEAT WEIGHT SUMMARIES FOR FAUNAL CLASSES, N112W88 FEATURE 104, FLOTATION

## N112W88 FEATURE 104 COARSE
## MINIMUM NUMBER OF INDIVIDUALS




## N112W88 FEATURE 104 COARSE
## EDIBLE MEAT WEIGHT

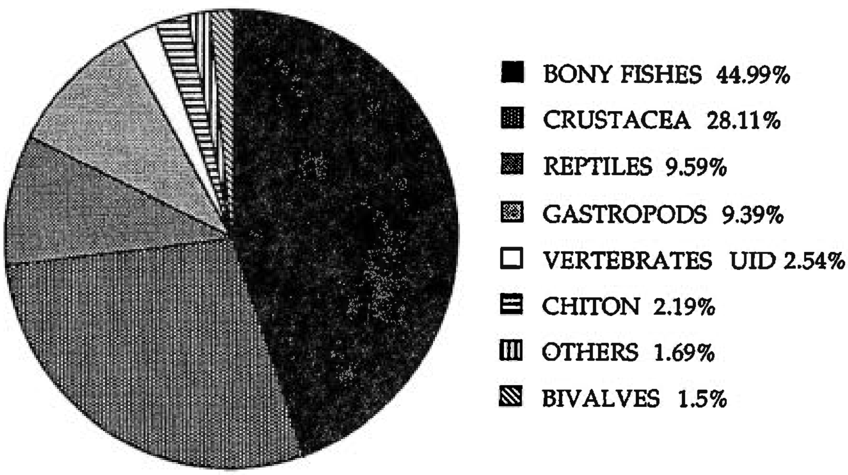
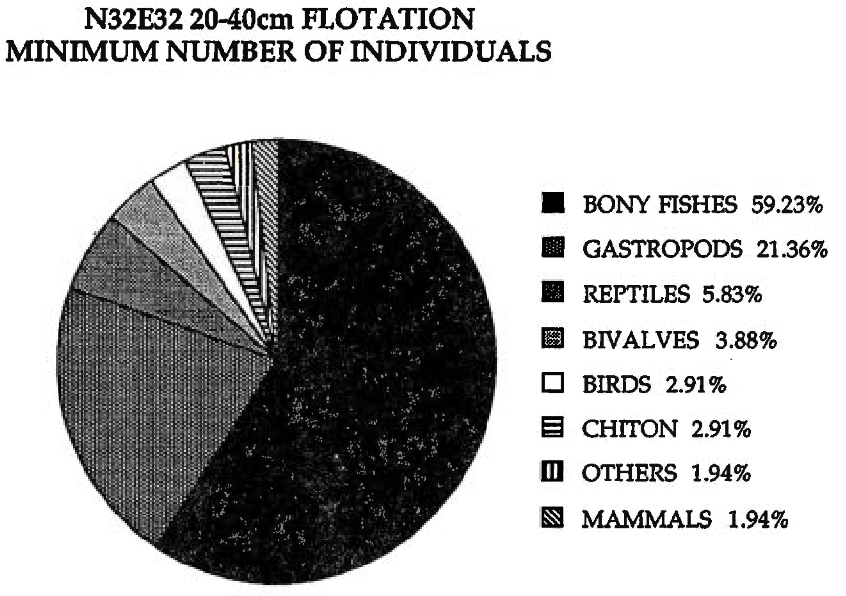



FIGURE 17
MINIMUM NUMBERS OF INDIVIDUALS AND EDIBLE MEAT WEIGHT SUMMARIES FOR FAUNAL CLASSES, N112W88 FEATURE 104, COARSE



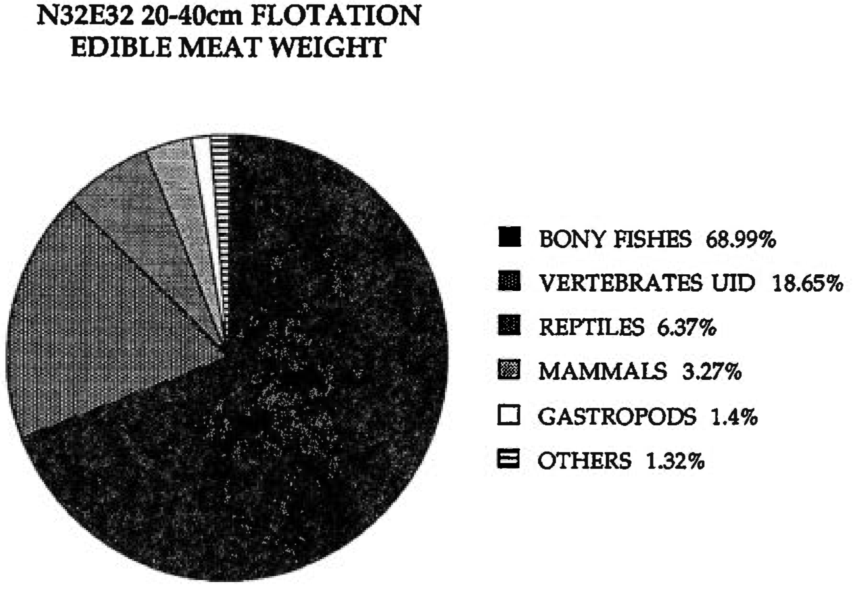
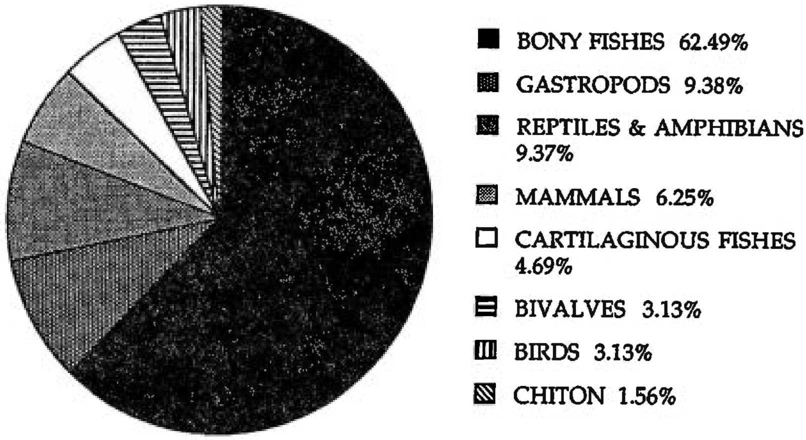




FIGURE 18
MINIMUM NUMBERS OF INDIVIDUALS AND EDIBLE MEAT WEIGHT SUMMARIES FOR FAUNAL CLASSES, N32E32 FLOTATION

**FEATURE 101 FLOTATION**
**MINIMUM NUMBER OF INDIVIDUALS**




**FEATURE 101 FLOTATION**
**EDIBLE MEAT WEIGHT**

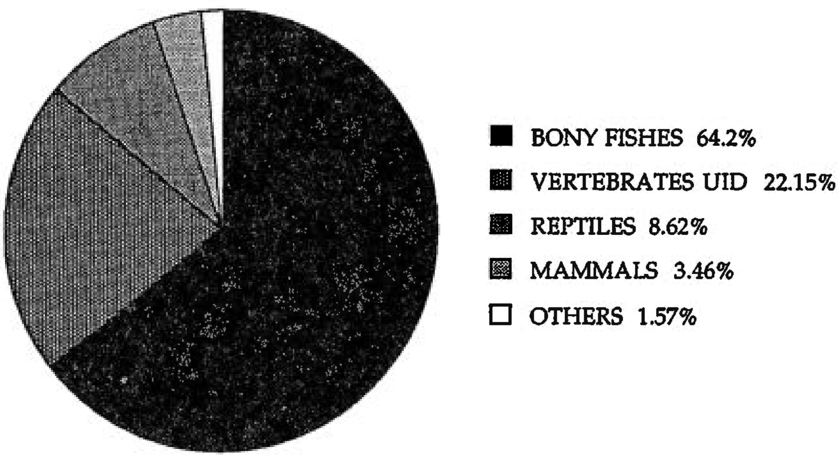


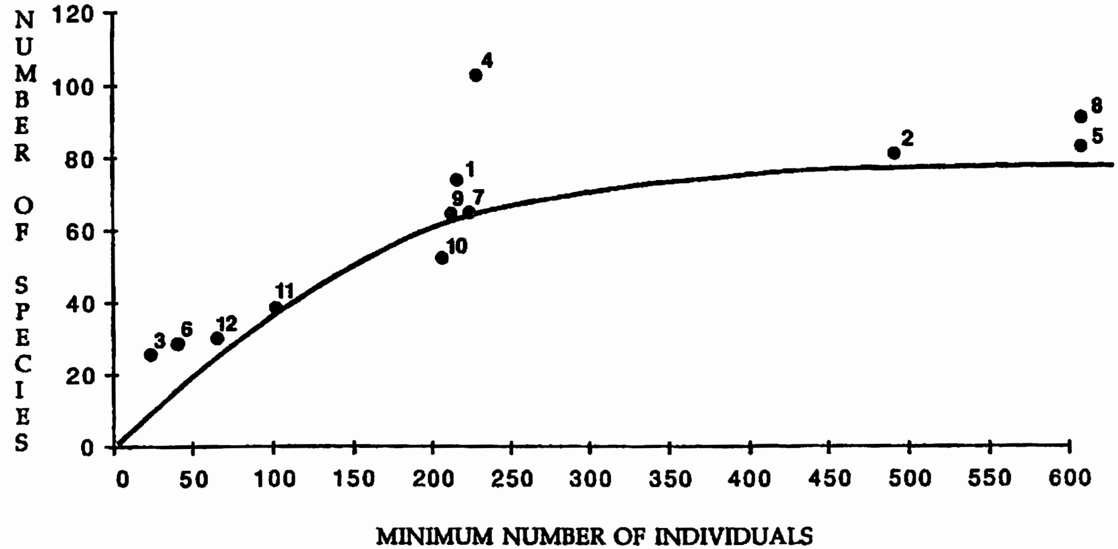

FIGURE 19
MINIMUM NUMBERS OF INDIVIDUALS AND EDIBLE MEAT WEIGHT SUMMARIES FOR FAUNAL CLASSES, MACROBLOCK, FEATURE 101, FLOTATION

The criteria for sample reliability have been determined to be 1,400 identifiable elements or an MNI of 200, based on zooarchaeological samples from sites within the circum-Caribbean coastal plain (Wing and Brown 1979:119). Samples of this size include the majority of the species that were used at a site; therefore, increasing the sample size results in the addition of few new species. For the Maisabel samples, these criteria are used as a rough measure of reliability. In addition to these reliability measures, it is possible to calculate sample adequacy on a site-by-site basis, by determining the point of diminishing returns (Wing and Brown 1979:119). This measure consists of plotting the relationship between number of species and MNI, thereby ascertaining the sample size at which no new species will be identified. For the Maisabel sample, this relationship is presented in Figure 20.

The Maisabel analysis indicates that samples containing between 50 and 60 species with MNI of over 200 are reliable. Exceptions to this pattern are three of the coarse-screened samples that contain species counts from 78 to 92 and have MNI estimates ranging from nearly 500 to over 2,000. The additional species identified in the coarse-screened samples are primarily marine bivalves that are underrepre-sented in the flotation samples. These data suggest that the volumes of the flotation samples were not large enough to include the full range of invertebrate species. Interestingly, previous studies have demonstrated that molluscan species representation is not adversely affected by coarse-screening; yet, the vertebrate species or their size ranges are frequently underrepresented in non-fine-screened samples (Wing and Quitmyer 1985). For the purposes of this study, the reliability criterion of an MNI of at least 200 individuals appears to include the species that were of primary importance.

The isolated flotation samples from Mounds 1 and 2, the samples from Feature 101, and the flotation samples from N32E32 are below this reliability criterion. Yet, based on number of fragments the sample from N32E32 approaches the level of reliability based on number of fragments and can thus be considered adequate. The poorly preserved faunal material from Feature 101, although low in both number of species and MNI, provides data on the species that were most commonly used during the Elenan Ostionoid occupation.

The single flotation samples from Mounds 1 and 2 were analyzed primarily to assess recovery biases associated with samples sieved with coarse gauge screen. These samples also provide insights for future Maisabel excavations on what volume of matrix will produce reliable samples. The isolated flotation samples from Mounds 1 and 2 were 3 and 8 l, respectively. In contrast, the 25-l flotation sample from Feature 104, N112W88, produced a total of 2,262 identifiable elements representing 229 individuals. Although a number of smaller volumetric




Mound 1
1 N96W13 column flotation
2 N98W13 60-70cm coarse
3 N98W13 60-70cm flotation
Mound 2
4 S38W18 column flotation
5 S36W18 coarse
6 S36W18 flotation

7 N112W88 20-60cm flotation
8 N112W88 30-40cm coarse
9 N112W88 Feature 104 flotation
10 N112W88 Feature 104 coarse

11 N32E32 20-40cm flotation
12 Macroblock Feature 101 flotation

FIGURE 20
RELATIONSHIP BETWEEN MNI AND NUMBER OF SPECIES

samples can be analytically combined to produce a sample of reliable size, such as was done with many of the Maisabel samples, it appears that a volumetric sample of at least 20 l of rich deposits (e.g., features) is needed for an adequate sample. In less rich areas, samples of greater size are needed. In other areas of the Caribbean, archaeological sites should be tested to determine the volume of matrix that is needed to produce reliable samples.

The samples selected for analysis and the diverse recovery methods employed resulted in substantial variation in both species composition and abundance. Intrasite variability in context function also had an influence on the composition and preservation of the faunal remains. Within a site, activity areas for meat extraction, preparation, and disposal will result in differential disposal and preservation patterns of the faunal remains. One method of determining the degree of preservation as well as possible processing or preparation activity areas is by tabulating the frequency of modified or altered bone. Appendix D (p. 157) presents information on burning, erosion, and human modifications (e.g., cuts, working).

Of the analyzed contexts, only Feature 101 appears to contain a high incidence of modified bone. The feature contains a large number of burned elements and the general preservation of the faunal material is poor. The poor preservation of the bone tends to support the hypothesis that the feature was a drainage ditch outside of a structure (Siegel and Bernstein 1987; Siegel 1989). The low frequencies of both shell and bone within the feature and the high incidence of burned bone suggest that refuse from hearths within the arc of the feature was occasionally discarded in the ditch but that the area was cleaned or, possibly, that continual wetting and drying reduced the preservation of the bone.

### *The Identified Fauna*

The results of previous analyses of faunal remains from Saladoid and Ostionoid sites in the Caribbean have provided valuable information on the process of island subsistence adaptation (Goodwin 1979, 1980, 1987; Wing and Scudder 1980; Narganes Storde 1982; Steadman et al. 1984; Watters et al. 1984; Jones 1985; Wing 1989). Based on previous models of settlement and subsistence for early ceramic occupations in the Lesser and Greater Antilles, it was possible to hypothesize that the probable subsistence adaptations of the early Saladoid occupants would indicate a strong reliance on terrestrial resources, particularly the hutia, a medium-sized rodent, and the land crabs *Cardisoma* and *Gecarcinus*. The later phases of Saladoid occupation and subsequent Ostionoid components should exhibit reduced reliance on terrestrial fauna and a concomitant increase in the utilization of maritime resources, particularly marine invertebrates.

In contrast to the inland riverine settlement patterns of early Saladoid sites in the Lesser Antilles, such as St. Kitts, Maisabel has early Saladoid components and is located directly on the coast. Not surprisingly, Maisabel's settlement location and zooarchaeological data are most similar to early ceramic age sites on the eastern coast of Puerto Rico, such as Hacienda Grande (Roe 1985; Wing 1990). Maisabel's location on the north central coastal plain provided the occupants with soils suitable for horticulture as well as access to a diversity of aquatic and terrestrial habitats. The faunal data indicate that during the early phases of occupation there was a well-established maritime economy in combination with terrestrial resource use. The present analysis is unique for Caribbean studies in that fine-screened samples of both vertebrate and invertebrate remains have been analyzed in a comparable fashion. The following discussion describes the identified fauna and their frequencies in the samples as well as where and by what techniques these resources might have been procured.

*Terrestrial Resources*

**Mammals**: The terrestrial resources are similar to those identified at other early ceramic sites. The now extinct rodent, Allen's hutia (*Isolobodon portoricensis*), was the most common in the samples. The hutia (*Plagiodontia*) and the spiny rat (Echimyidae) are also represented. Hutias could have been easily hunted in the vicinity of the site with such simple technology as small spears. The only other terrestrial mammals identified in the samples were two species of bats that are not considered food items. In addition, one of the excavation units on the northern end of Mound 2, not included in the present analysis, was noted to contain a metapodial of a small-sized dog.

The most common hutia at the site and the dog are believed to have been non-indigenous to Puerto Rico. The Pleistocene fossil record of hutias in the West Indies suggests that *Isolobodon portoricensis* was introduced by human agents from neighboring Hispaniola (Morgan and Woods 1986). In the case of the dog, archaeological evidence has been used to document its introduction and transportation to the West Indies (Olson 1982). Dogs may have been transported from the South American mainland for use as food or to assist in the hunting of other animals, or both.

**Birds:** The most common birds are dove species of the family Columbidae. Positive identification of dove species is generally determined based on interspecific size variations in different elements (e.g., Steadman et al. 1984:17-18). Unfortunately, the majority of the Maisabel dove specimens are fragments not amenable to measuring. However, it is possible to distinguish two genera in the samples: *Columba* and *Zenaida*.

The West Indian columbid species prefer habitats ranging from forested areas to locations of secondary shrub growth or partial clearings (Bond 1985). These species could have been easily captured near the site with a simple snare net technology or with trapping devices. Interestingly, one of the most common elements identified in the samples is the anterior manubrium of the sternum or the breastbone. The breast meat of these small birds appears to have been a preferred portion.

The only other terrestrial bird species identified are finches and cuckoos. If either of these were food items, they were a very minor component of the inhabitants diets.

**Reptiles:** Terrestrial reptilian species identified as food items include two forms of lizards, one of which is the iguana and the other is the lizard (*Diploglossus*). Also present are remains of the pygmy boa (*Epicrates* sp.). The terrestrial reptiles are represented by a surprisingly low number of specimens considering the modern natural population densities of reptilian species on Puerto Rico (Pregill 1981). If the site's inhabitants were exploiting primarily terrestrial resources in proportions equal to today's natural abundance, reptilian remains should be better represented in the samples.

**Crustace:**. Undoubtedly, the most important terrestrial resources in the early Saladoid deposits were the blue land crabs (*Cardisoma gunahumi*). In the contexts that contain land crab refuse, they provide up to 45% of the total estimated edible meat weight. Crab remains were densest in the areas of the site dating to the Hacienda Grande and early Cuevas phases. No crab remains were identified in samples from the macroblock (Feature 101) or from N32E32.

Land crabs might have been available in large quantities to the east of the site, in the extensive mangrove swamp associated with the Cibuco River. It is within this area that land crabs are harvested today. Prehistorically, land crabs could have been hunted in the vicinity of their burrows at night with the aid of torches, or large numbers of females could have been captured during their mass spawning migrations to salt water in the summer and fall months.

In order to assess previous theories concerning Saladoid subsistence change, particularly those models proposing that human overexploitation of the crabs prompted a dietary shift, a reconstruction of the population structure of the land crabs, harvested prehistorically, was conducted using the Maisabel specimens. Based on dimensional allometric scaling, I have reconstructed the size classes of the crab individuals that were collected (see Section 4).

Taking into consideration size and element pairing, the analyzed contexts contain a measurable sample of 119 *Cardisoma guanhumi* mandibles (Table 7). They are all derived from the earliest Saladoid occupation in Puerto Rico, the Hacienda Grande phase.

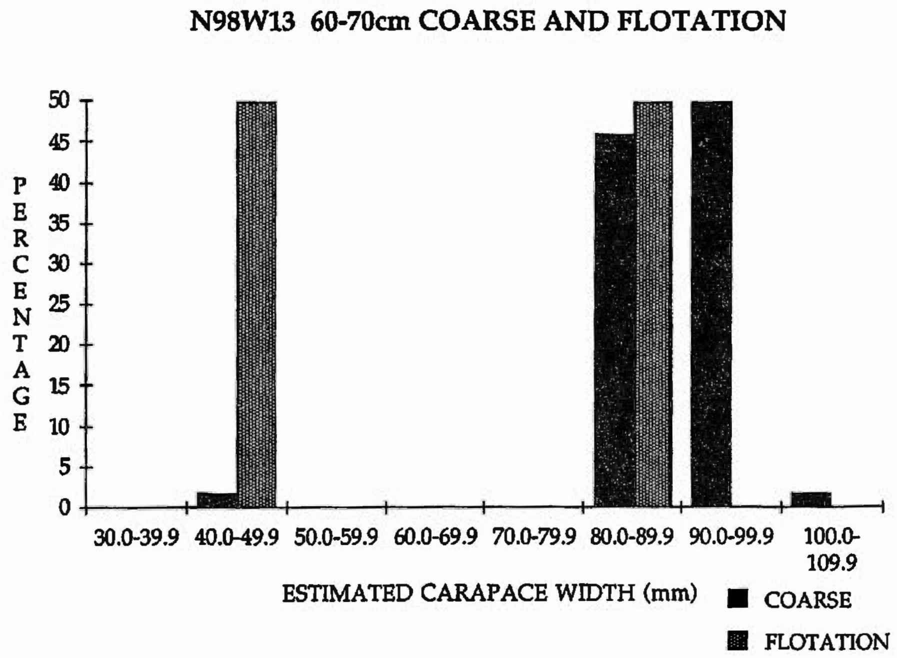
The samples are from mounds (N98W13 and S36W18) and an early Saladoid pit feature located in a unit on the western edge of the site (N112W88). The majority of the mandible specimens were recovered in contexts that were screened with 1/4" mesh. Only two of the flotation samples produced mandible specimens: Flot #61 (N98W13, 60-70 cm) and Flot #587 (N112W88, Feature 104, 80-90 cm). However, the mandibles recovered from the flotation sample for Feature 104 greatly expanded the size and weight ranges of the crabs represented archaeologically.

TABLE 7
FREQUENCIES AND SIZE RANGES OF
*CARDISOMA GUANHUMI* MANDIBLES

| | | | Mandible Length (mm) | | |
|---|---|---|---|---|---|
| Context | Side | N | Mean | Sd | Range |
| N98W13<br>60 - 70cm<br>Coarse Fraction | Rt | 52 | 11.5 | 11.5 | 4.7 - 13.2 |
| N98W13<br>60 - 70cm<br>Flotation Sample | Rt | 2 | 8.0 | 3.4 | 7.5 - 10.9 |
| S36W18<br>50 - 60cm<br>Coarse Fraction | Lf | 17 | 9.5 | .9 | 7.5 - 10.9 |
| N112W88<br>80 - 113cm<br>Feature 104<br>Coarse Fraction | Rt | 16 | 9.8 | .6 | 3.9 - 10.7 |
| N112W88<br>80 - 90cm<br>Feature 104<br>Flotation Sample | Rt | 32 | 5.6 | 2.1 | 3.9 - 10.7 |

The data on the estimated widths and weights of land crabs from the various contexts are presented, by class, in Figures 21-23. These reconstructions indicate that a large number of the harvested crabs were within the size and weight ranges of 70-80 mm and 185-285 g, respectively. The one exception to this trend comes from the flotation sample for Feature 104 (Flot #587, 26 l). Both estimates from this context indicate that small crabs (i.e., 40-50 mm and 85-135 g) were also harvested. Significantly, these small mandibles were recovered only in the flotation samples. The coarse-screened material from this feature (N112W88, 80-113 cm) indicates that only much larger crabs were consumed.

In terms of assessing human impact on the crab population, it is important to note that the prehistoric crabs were substantially larger than modern land crabs in the same geographical area. Also, the sample of crab mandibles from Maisabel suggests that humans were indiscriminately selecting both juveniles and adult specimens, even during the early phase of occupation. Overexploitation can eventually result in a reduction in the average size of the crabs; however, the crabs recover rather rapidly from such pressure, either through the surviving individuals or through recolonization of an area (Alan Pinder, personal communication 1986 with Peter Siegel). The archaeological data do not indicate that the harvested land crabs were becoming increasingly smaller through time. However, the individuals represented archaeologically are larger than modern specimens collected in the same area, therefore indicating that human exploitation might affect the population structure. Further implications of the crab data are discussed in the following section.



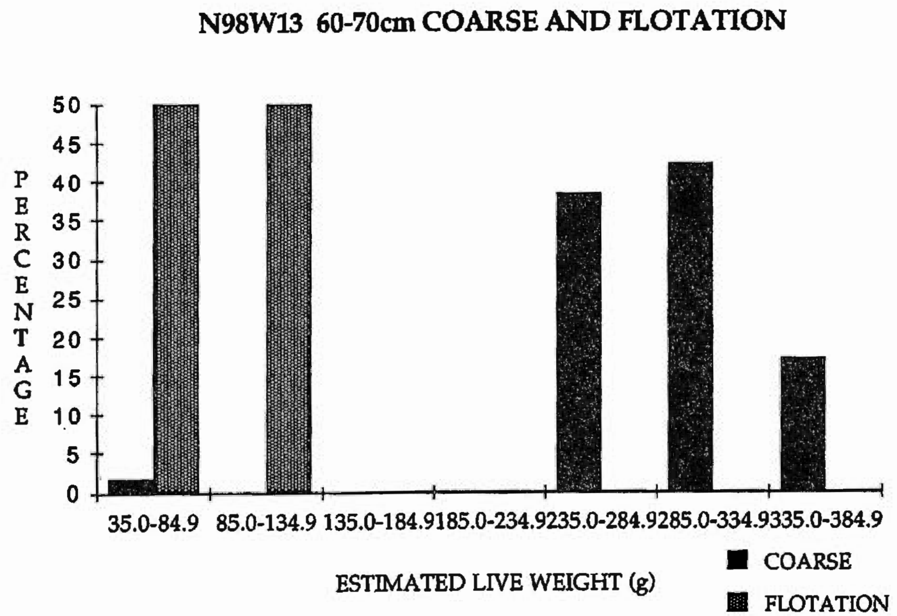
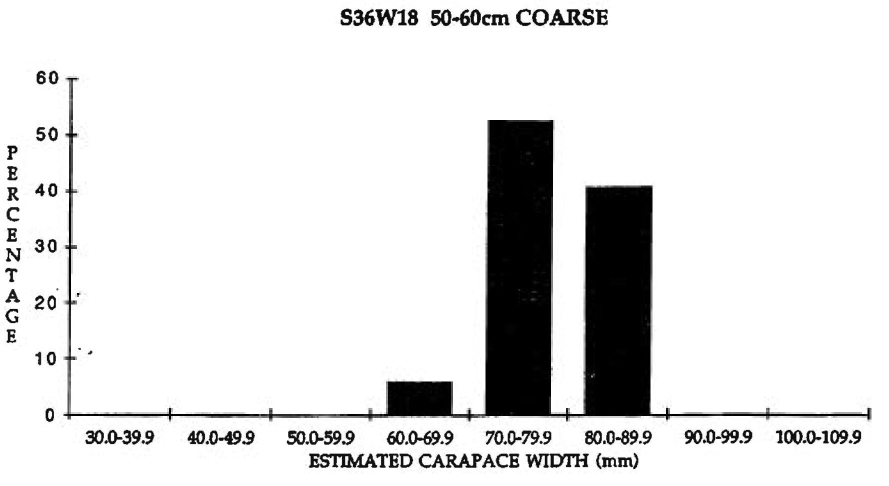




FIGURE 21

LAND CRAB CARAPACE WIDTH AND WEIGHT ESTIMATES, N98W13



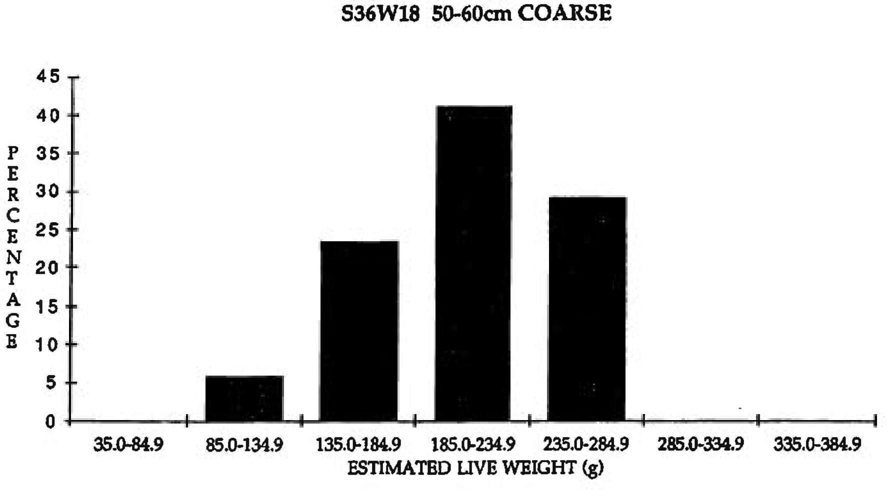
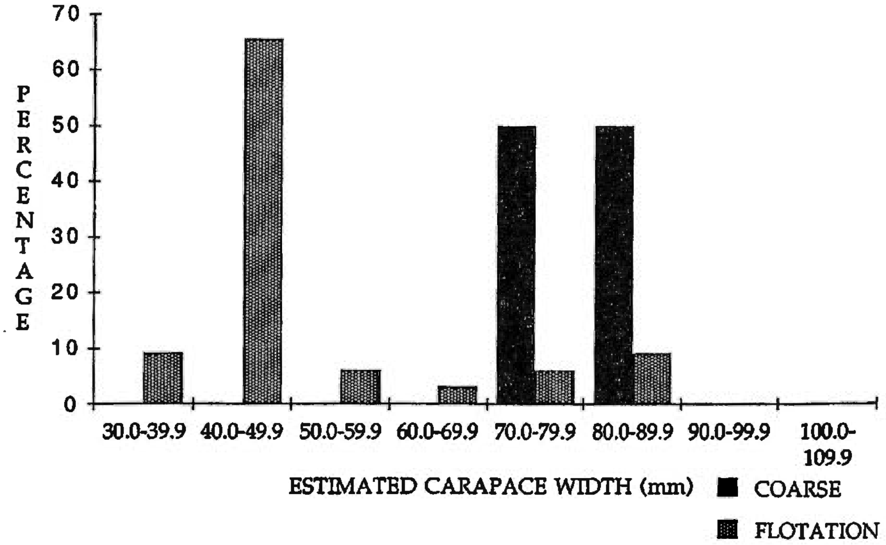




FIGURE 22

LAND CRAB CARAPACE WIDTH AND WEIGHT ESTIMATES, S36W18

N112W88 FEATURE 104 COARSE AND FLOTATION




N112W88 FEATURE 104 COARSE AND FLOTATION

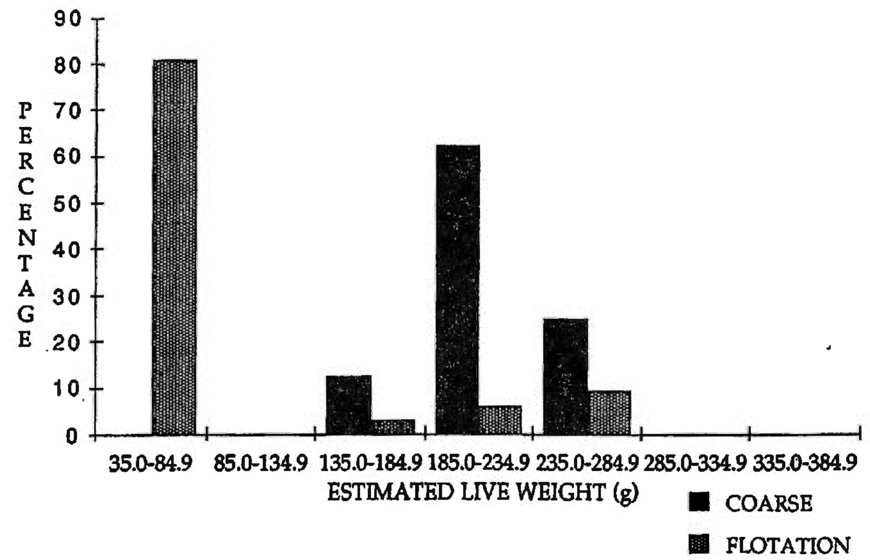



FIGURE 23
LAND CRAB CARAPACE WIDTH AND WEIGHT ESTIMATES,
N112W88, FEATURE 104

**Terrestrial Gastropods:**. Thirteen species of terrestrial gastropods are present in the samples; however, only the *Caracolus* spp. is considered to represent food refuse. The flotation samples produced a large number of very small land snails, which obviously are only incidental inclusions in the midden. Counts of these specimens are provided; however, they are not used in calculating percentages of abundance. The only exception was the larger *Caracolus* spp., which has been identified previously at other Puerto Rican sites, and is assumed to represent food refuse (Pantel 1980). All measures of abundance are provided except for estimates of edible meat weight.

At the present time, the origins and dispersals of land snails in the Caribbean are poorly understood. There is apparently little or no Caribbean fossil record of the origin of the species contained in the Maisabel samples. It is also not known what role, if any, humans played on the inadvertent introduction of land snails into the region. Researchers of Polynesian prehistory have argued that human movement of horticultural products resulted in the spread of anthropophilic land snails into the Polynesian islands (Kirch 1983:27). It is not known if a similar process of dispersal occurred within the Caribbean Basin, although it is known that early ceramic age populations transported a large number of cultigens into the islands that presumably could have contained small land snails.

*Aquatic Resources*

**Mammals:**. The only aquatic mammal represented in the samples is the manatee (*Trichechus manatus*). One scapula fragment was recovered from a coarse-screened context on the south side of Mound 2, S36W18. Manatees could have been hunted in either the oceanic waters with harpoons or spears or in the neritic bay and river waters that they frequently enter. Marine mammals appear to have been an infrequent source of protein for the Maisabel inhabitants.

**Birds:**. Several species of aquatic or shore birds were identified in the samples. These include herons (Ardeidae), the great egret (*Egretta alba*), and members of the duck, geese, or swan family (Anatidae). These birds would have been common along the coast, especially along the estuary at the mouth of the river. Despite the relatively high diversity of bird species that would have been available in the area, these animals do not appear to have been a focus of subsistence exploitation.

**Reptiles:** The aquatic reptiles identified include both marine and freshwater species. Sea turtles, Atlantic loggerhead (*Caretta caretta*), and

Green turtles (Chelonidae), were recovered in several contexts. These animals may have been hunted in the offshore waters. More likely, sea turtles were captured while they were feeding in the turtle grass beds within shallower waters or while they were nesting on the beaches. Aggregates of feeding marine turtles would have been common in the shallow bays, especially in Puerto Nuevo Bay. Females of the species would have been available during the spring and summer months of the year when they come ashore to lay their eggs on the beaches (Carr 1952).

A turtle species that is more common in the samples is the freshwater slider or pond turtle (*Trachemys* spp.). This species would have been very common in the mangrove sloughs of the river. These turtles bask on logs and along the river banks and are also active on land areas throughout the year (Pregill 1981:23). Pond turtles could have been captured in the river waters or on land.

The remains of at least one species of aquatic snake (*Alsophis* spp.) was identified. If snakes were used as food, they were not a major subsistence resource. Their presence in the samples does reinforce the overall importance of riverine resources in the diet.

**Fishes**: The fishes are represented by the greatest species diversity of the faunal classes and of the aquatic resources. Fishes also contribute the greatest percentage of estimated edible meat weight in 11 of the analyzed contexts.

In order to determine the size ranges of the fish individuals represented archaeologically, the anterior widths of all measurable atli, trunk, and precaudal vertebrae were recorded. Appendix E (p. 161) presents information on the species examined, their size ranges, and the average individual weights and weight ranges of the species with measurable elements. In Appendix E, Figures E1-E8 (pp. 177-180) depict the vertebral size ranges of the fishes represented in the various contexts.

Variations in habitat structure, size ranges of the fish individuals, and natural population densities necessitated the use of a range of procurement strategies and technologies. Reconstructions of prehistoric Caribbean fishing practices generally have relied on three lines of evidence to infer the methods used by island inhabitants: (1) assessments of ethnohistorical accounts of Taíno and Lucayan fishing technologies and practices (e.g., Lóven 1935; Rouse 1963; Keegan 1985), (2) species composition and size ranges of the species represented in zooarchaeological assemblages (Wing and Reitz 1982), and (3) modern experimental studies of fish yields using primitive technologies (Keegan 1982,

1986) and behavioral ecology (e.g., Randall 1967). For the Maisabel assemblage, all of these lines of evidence are used in reconstructing the probable subsistence technologies and strategies. The discussion follows the habitats in which the resources were procured, beginning with the riverine ecosystem. Table 8 summarizes the habitats of the major

Table 8
Habitats of the Predominant Fish Families.

| Family | Habitat |
|---|---|
| Clupeidae (herrings, sardines) | seasonally in neritic waters |
| Belonidae (needlefishes) | shallow waters, surface |
| Holocentridae (squirrelfishes) | shallow reef and inshore |
| Centropomidae (snooks) | mangrove sloughs |
| *Serranidae (sea bass) | shallow to deep water reefs |
| *Carangidae (jacks) | shallow to deep water reefs |
| *Lutjanidae (snappers) | shallow to deep water reefs |
| Gerreidae (mojarras) | neritic waters |
| Haemulidae (grunts) | shallow reefs, tidal grass flats |
| Sciaenidae (drum) | mangrove slough |
| Labridae (wrasses) | shallow reefs |
| Scaridae (parrotfishes) | shallow to deep reefs, tidal flats |
| Mugilidae (mullet) | mangrove sloughs |
| Eleotridae (sleepers) | freshwater and mangrove sloughs |
| Scombridae (tuna, mackerals) | pelagic, inshore for feeding |
| Balistidae (triggerfishes) | shallow to deep reefs |

* Enter shallow grass flats primarily to feed.

fish families represented in the samples. Information on the habitats in which the fish individuals were probably procured is presented in Table 9.

The exploitation of riverine freshwater species is indicated by the presence of sleepers, particularly the bigmouth sleeper (*Gobiomorus dormitor*) and other members of the family Eleotridae. The bigmouth sleeper is the only exclusively freshwater form identified in the assemblage. The sleepers are primarily bottom dwellers that would have been

Table 9
Minimum Number of Fish Individuals by Habitat

| Context | Location | Levels (cm) | Percentage Minimum No. of Individuals Inshore | Reef | Oceanic |
|---|---|---|---|---|---|
| N96W13 | Mound 1 | 0 -160 | 35.5 | 59.7 | 4.8 |
| N98W13 | | 60 -70 | 38.5 | 57.7 | 3.8 |
| | | 60 -70 | 25.0 | 75.0 | 0 |
| S36W18 | Mound 2 | 0 -120 | 49.4 | 47.2 | 3.4 |
| | | 50 -60 | 26.1 | 69.2 | 4.6 |
| | | 50 -60 | 44.4 | 55.6 | 0 |
| N112W88 | General Levels | 20 -60 | 43.7 | 49.3 | 7.0 |
| | | 30 -40 | 25.0 | 73.3 | 1.7 |
| | Feature 104 | 80 -90 | 55.4 | 33.9 | 10.7 |
| | | 80 -113 | 38.1 | 57.1 | 4.8 |
| N32E32 | General Levels | 20 -40 | 44.3 | 50.8 | 4.9 |
| N43W8 N43W10 N42W14 N42W18 | Feature 101 Macroblock | pedestal | 40.0 | 57.5 | 2.5 |

common in the mangrove slough areas associated with the river. These species are represented primarily by small individuals in the fine-screened samples (see Appendix E).

The riverine habitat was also exploited to obtain juvenile individuals of snappers (*Lutjanus* spp.), jacks (*Caranx* spp.), and grunts (*Haemulon* and *Anisotremus* spp.). As juveniles, these species would have inhabited the protected river and estuary waters. Upon maturing, they would have migrated to the submerged limestone deposits or areas of minor coral growth further from shore.

Other species of the estuary were also exploited. The herbivorous species of mullet (*Mugil* spp.) and snook (*Centropomus* spp.) are permanent residents in brackish mangrove sloughs (Randall 1967:692) as are the drum family species of *Bairdiella* and the Atlantic croaker (*Micropogonias undulatus*). The estuary also supported a large number of species that attain a small body size, for example, mojarras

(*Diapterus* spp. and *Gerres* spp.) and surface-dwelling needlefish (*Strongylura* spp.).

The sizes of the majority of these individuals and the features of the estuary (e.g., river flow, channel substratum) suggest that the site's inhabitants employed either seines or stationary nets at points along the lower course of the river. During the drier months of the year, when the volume of the Cibuco River was lower, stationary gill nets easily could have been placed near the river's mouth. It is also during the drier summer months that salt water intrusion into the Cibuco is greatest (Torres-González and Díaz 1984), therefore marine species could have been captured further upriver.

The faunal assemblage indicates that the neritic waters beyond the estuary were intensively exploited. The flotation samples contain the remains of large numbers of sardines (Harengula spp.) and shad, herring, or other sardine specimens (Clupeidae). The clupeid species were apparently utilized throughout the occupation of the site. Although their remains are very common, in terms of NISP and MNI, estimates of edible meat weight indicate that these forms were a very consistent, yet not overly abundant, source of protein. Significantly, these species are very poorly represented in the coarse-screened samples.

Sardines and shad or herring probably were available in clear shallow waters (Randall 1983:22). Frequently, when large schools enter shallow waters, shore birds, particularly pelicans, are noted to feed on them (Bond 1985). It is probable that feeding pelicans were a signal to the Maisabel inhabitants that these resources had entered the neritic waters. Interestingly, east of Maisabel and directly north of the Cibuco River there is a steep rocky promontory that today contains a large pelican rookery. The shallow sandy bottom of the Boca del Cibuco could have been exploited productively for clupeids with fine-mesh seine nets.

The neritic waters were also exploited for a number of tropical marine reef species. Adult carnivores such as groupers (*Epinephalus* spp.), snappers (*Lutjanus* spp.), moray eels (Muraenidae), surface dwelling houndfishes (*Tylosaurus* spp.), and reef predators, such as jacks (*Caranx* spp.), are present in the excavated deposits. Also represented are a number of non-piscivorous reef carnivores, including squirrelfishes (*Holocentrus* spp.), triggerfishes (*Balistes* spp.), grunts (*Haemulon* spp. and *Anisotremus* spp.), permits (*Trachinotus* spp.), and wrasses (*Bodianus* spp. and *Halichoeres* spp.).

Reef herbivores (algae consumers) and omnivores are present, common in the inshore waters with coral or submerged limestone. The most abundant of these are the parrotfishes (*Sparisoma* spp. and *Scarus* spp.) and the herbivorous black durgon (*Melichthyes niger*). Less well represented are surgeonfishes (*Acanthurus* spp.), damselfishes (Pomacentridae), and gobies (Gobiidae).

The complex of reef fishes identified at Maisabel is similar to that of other Caribbean sites, with the exception of the additional identification of greater numbers of small gobies, wrasses, and squirrelfishes. In attempting to reconstruct the technologies used to procure these species, researchers have suggested that basketry traps were likely employed based on the feeding habits of the species most frequently identified and the substratum of the coral reef or submerged limestone littoral surfaces (e.g., Keegan 1982, 1986; Wing and Reitz 1982). Experimental studies of basketry trap yields conducted by Keegan (1986) indicate that the greatest returns were from traps set along the crepuscular migration routes of the primary reef carnivores. Particularly high returns were in traps set near the interface of the tidal flat with the reef flats. During the day, the tidal flat sea grasses are inhabited primarily by herbivorous species; however, at night both reef omnivores and carnivores enter the tidal flats to feed (Randall 1967; Ehrlich 1975).

The Maisabel inhabitants probably set traps along the interface of the submerged limestone and the turtle grass beds within the semi-protected bays. Traps set along the large eolianite cays in Puerto Nuevo Bay would likely have yielded such non-piscivorous species as the triggerfishes, which feed on invertebrates attached to the cays. It would have been more difficult and less efficient to place traps outside of the bay areas because wave surges and currents have been noted to lead to the rapid destruction and loss of traps (Davenport 1960; Keegan 1982). These stationary traps could have been harvested periodically, while other fishing and gathering activities took place in the interim.

The size ranges and diversity of reef species suggest that the traps were closely woven. The use of traps tends to result in the capture of specimens that are relatively uniform in size (Wing and Reitz 1982; Wing and Scudder 1983). The size of both the trap weave and its entrance define the potential size limits of the fish individuals. Once individuals are within the trap, they attract both conspecific individuals and predatory species (Munro *et al.* 1971). The Maisabel samples suggest that the trap weave was tight enough to prevent the escape of the smaller reef species; yet the size of the trap entrance also excluded very large predators. In Appendix E, Figures E1-E8 demonstrate that the majority of the fishes are within a restricted size range.

The exploitation of oceanic waters is suggested by the identification of at least three genera of tuna (*Scomberomorus*, *Euthynnus*, and *Thunnus*), species of flying fishes (Hemiramphidae and Exocoetidae), and sharks (Carcharhinidae). Tuna and shark remains are fairly common at other Caribbean sites (e.g., Wing and Scudder 1980); however, flying fishes apparently have not been identified previously at Antillean sites (Wing and Reitz 1982:22). Tunas and sharks could have been captured in shallower waters while they were feeding. Although the flying fishes are primarily surface dwelling oceanic species, some inshore species range over shallow water reefs (Randall 1967:684). These data are inconclusive evidence that the Maisabel inhabitants were skilled at the exploitation of the open waters for subsistence purposes. However, based on the assemblage, it is also impossible to conclude that the oceanic waters were not occasionally utilized.

The recovery of large numbers of small-sized fishes in the flotation samples demonstrate the need for fine-screened flotation in future Caribbean excavations. The Maisabel samples indicate the importance of these resources in the diet and provide strong evidence for the use of fine-mesh nets or seines in shallow inshore waters. Subsequent Caribbean studies that employ flotation techniques should provide additional information on the diversity and size ranges of the marine fishes that were exploited.

**Gastropods**: The marine gastropods constitute a large portion of the assemblage in terms of NISP and MNI; however, they provide less edible meat weight than the combined species of fishes. Of the 43 species that can be considered food items, the majority are forms that primarily inhabit the supralittoral splash zone. Table 10 summarizes habitat information for the major gastropod families.

The species of major dietary importance include the limpets (*Fissurella* spp.), Nerites (*Nerita* spp. and *Neritina virginea*), the West Indian top-shell (*Cittarium pica*), and periwinkles (*Littorina* spp.). Large aggregates of these individuals are common on exposed rock surfaces in the intertidal splash zone (Abbott 1974).

A number of the common intertidal species are represented by small specimens (e.g., the periwinkles and ceriths); however, estimates of edible meat weight have been calculated. Although their contribution to the diet was very minor, it can be proposed that they were gathered when other larger, economically more important gastropods and chitons were collected. Large numbers of small gastropods could have been boiled, both to extract the meat and as a simple method of preparation. Recent simulations of breakage patterns of nerites suggest that boiling produced the typical nerite refuse observed in Bahamian middens (Keegan 1985:134).

Other marine gastropods include epifaunal species that would have been common in the turtle grass beds such as conch (*Strombus* spp.) and olive snails (*Olivella* spp. and *Oliva* spp.). At least three species of conch are present in the samples, the queen conch (*Strombus gigas*), the West Indian fighting conch (*Strombus pugilus*), and the hawk wing (*Strombus raninus*).

The shells of conchs and olive snails were valued for secondary utilitarian purposes. *Strombus* remains were used for a number of tools and *Oliva* shells were frequently modified into beads or bead rattles.

TABLE 10
HABITATS OF THE MAJOR GASTROPOD FAMILIES

| Family | Habitat |
|---|---|
| Fissurellidae (limpets) | intertidal rocky areas |
| Trochidae (top-shells) | littoral and supralittoral rocks |
| Turbanidae (turbans) | littoral and supralittoral rocks |
| Neritidae (nerites) | supralittoral rocky shores |
| Littorinidae (periwinkles) | supralittoral rocky areas |
| Strombidae (conches) | turtle grass beds (shallow to deep) |
| Cypraeidae (cypreas) | intertidal waters |
| Marginellidae (olive snails) | turtle grass beds, shallow waters |

Beads and shell tools from these species are common in the Maisabel assemblage.

In terms of edible gastropod meat weight, the conchs and the West Indian top-shells were apparently the most important constituents of the diet. The use of these two species appears to have been consistent through the occupation. Interestingly, marine gastropods are a major component of the assemblage in the early phases of occupation. In contrast to other Antillean early ceramic sites (e.g., Goodwin 1979, 1987), Maisabel does not exhibit an increase in marine shellfish exploitation through time.

**Chitons**: At least two species of chitons are present in the samples. Although identification of the chitons beyond the class level was not conducted, the genera Chiton and Acanthopluera are most likely to be present. Chitons would have been available in the intertidal splash zone along with many of the marine gastropods. Chiton remains are abundant in several of the contexts. These specimens probably were boiled as a method of preparation also.

**Bivalves**: Several families of bivalves are represented in the samples, yet none are very abundant. Table 11 is a summary of the major bivalve genera and the habitats in which they are found. These species are underrepresented in the flotation samples; therefore, conclusions concerning bivalve exploitation are drawn mainly from the coarse-screened samples. The most abundant species are the Tiger Lucina (*Codakia orbicularis*), jewel boxes (*Chama* spp.), sea scallops (*Pecten* spp.), and tellins (*Tellina* spp.). With the exception of the jewel boxes, all of these forms are inshore species that were probably available within the turtle grass beds. Other minor bivalves are the arcs (*Arca* spp. and *Anadara* spp.), cockles (*Laevicardium* spp.), donax (*Donax* spp.), and the West Indian pointed venus (*Anomalocardium brasiliana*).

The diversity of species represented and their percentages of edible meat weight, indicate that bivalves were not a significant component of the diet. The low occurrence of bivalves in the samples is explainable by two factors. First, the high energy coast has little area suitable for infaunal bivalve habitation. Although the bay settings are relatively restricted, wave surge may have reduced the area habitable for soft-bottom-dwelling bivalve species. The samples do contain a small number of species that attach themselves to a substratum, including the crested oyster (*Ostrea* spp.) and some of the arcs (*Arca* spp.). These forms would have been more common in the submerged limestone areas near Maisabel; but they would have been more difficult to procure. Second, a recent study of the nutritional composition of molluscan species indicates that bivalves are slightly inferior to gastropods in terms of protein (Goodwin 1987:77). In this case, the Maisabel inhabitants may have selected the more visible and common gastropods over the more elusive bivalves.

TABLE 11
PREFERRED HABITATS OF THE MAJOR BIVALVE GENERA.

| Genera | Habitat |
|---|---|
| Anadara | offshore areas and muddy areas |
| Arca | attached to rocky substratum by byssus |
| Pecten | semi-infaunal and in grass beds |
| Lima | common under rocks in shallow water |
| Ostrea | attached to substratum in shallow water |
| Codakia | shallow water grass beds |
| Chama | rocky areas |
| Trachycardium | shallow water habitats |
| Laevicardium | shallow water habitats |
| Mactrellona | shallow water habitats |
| Tellina | sandy, shallow water |
| Donax | very shallow, sandy habitats |
| Chione | shallow water habitats |

## VI. *The Maisabel subsistence economy and implications forother early Saladoid and Ostinoid Occupations*

In contrast to previous models of Saladoid subsistence, the Maisabel assemblage indicates that the site's inhabitants were skilled at the exploitation of a range of maritime habitats. The faunal data also indicate that terrestrial resources were used in varying quantities throughout the occupation of the site. However, in none of the samples are terrestrial resources the major focus of exploitation in terms of either number of species represented or MNI (Table 12).

A subsistence feature that the Maisabel assemblage shares with other contemporaneous sites is a characteristic decline in land crab use between the early phase of Saladoid occupation and the later Ostionoid time period. The reconstruction of crab sizes through dimensional allometric scaling indicates that a large range of different sized individuals were harvested prehistorically. Human collection pressure of both large and very small specimens appears to have reduced the number of crabs that were available for harvesting. As the terrestrial crabs declined in availability, the Maisabel inhabitants intensified their well-developed maritime subsistence economy.

The development of a diverse maritime economy during the early occupation of the site may relate to two features of Saladoid settlement on the north coast of Puerto Rico. First, the aquatic habitats within the vicinity of the site provided a greater number of subsistence exploitation options than were apparently available at comparable sites in the Lesser Antilles. The faunal data indicate that all of the aquatic zones, with the possible exception of pelagic waters, were intensively exploited. The greater use of aquatic fauna may have been due to the availability of new habitats and resources. Alternatively, these peoples may have developed greater skill in the exploitation of the aquatic biomes as they migrated northward through the islands. By the time Puerto Rico was settled, the colonists may have possessed a broader knowledge of aquatic resources and methods of procurement. Either explanation indicates that subsistence changes reflect the intensification of an existing system.

The settlement and subsistence data for the preceding Archaic period hunter-gatherer-shellfishers provide evidence that terrestrial resource exploitation was not profitable in the absence of horticultural production. Exploitation of coastal resources, primarily shellfish, fulfilled the subsistence and protein needs of these inhabitants. The non-diversified subsistence base of the Archaic populations probably resulted in the rapid exhaustion of resources available for procurement in the Lesser Antilles. With the lack of expertise in a variety of fishing methods and the lack of horticultural products in the diet, a population experiencing a slow rate of growth, or even a stable population, could have easily overexploited

Table 12
Number of Species and MNI of Edible Terrestrial and Aquatic Fauna

| Context | Location | Levels | No. of Terrestrial Species | Terrestrial Species MNI | No. of Aquatic Species | Aquatic Species MNI |
|---|---|---|---|---|---|---|
| N96W13 | Mound 1 | 0 -160 | 7 | 17 | 56 | 128 |
| N98W13 | " | 60 -70 | 6 | 133 | 73 | 357 |
| | | 60 - 70* | 3 | 6 | 19 | 23 |
| S38W18 | Mound 2 | 0 - 120 | 7 | 14 | 71 | 125 |
| | | 50 - 60 | 6 | 65 | 71 | 861 |
| | | 50 - 60* | 3 | 3 | 27 | 31 |
| N112W88 | General Levels | 30 - 40 | 6 | 13 | 54 | 181 |
| | | 20 - 60* | 4 | 5 | 50 | 222 |
| | Feature 104 | 80 - 90 | 3 | 21 | 45 | 198 |
| | | 80 -113* | 3 | 45 | 54 | 181 |
| N32E32 | | 20 - 40 | 4 | 4 | 34 | 92 |
| N43W8 N43W10 N42W14 N42W18 | Feature 101 | pedestal | 3 | 3 | 28 | 52 |

*flotation samples

marine shellfish populations. Once the shellfish resources were depleted, either intra-island or inter-island population expansion was required for survival (Davis 1974, 1982; Goodwin 1978).

In contrast to the limited subsistence practices of the Archaic populations, early ceramic peoples were skilled horticulturists, fisherfolk, and shellfish collectors. Carbohydrates were provided by tropical cultigens, possibly from both the starchy tuber manioc and maize. If maize was not a part of the diet, protein would have been supplied by faunal resources, of which fish and marine shellfish were most important. Manioc cultivation and exploitation of animal resources constituted a subsistence system. This system required habitats that were suitable for cultivation and required access to animal resources for necessary protein.

Once a new island was settled, the population would have needed to find areas suitable for horticultural production and to identify areas where potential faunal resources were available. During the initial settlement and reconnaissance of an island, manioc or maize plants would have been established and faunal resources in the vicinity of the cultigens probably would have been initially selected. As the population expanded and additional methods of procurement were developed, new food items would have been added to the diet.

For the early ceramic occupations in the Lesser Antilles, the faunal resources in the vicinity of the cultigens were terrestrial species. Although inland river terrace soils may have provided higher plant yields, the terrestrial faunal resources in these areas were easily impacted by human predation. As the terrestrial resources declined in availability, new sources of protein were added to the diet. In this case, marine resource exploitation was incorporated into the subsistence system. The maritime economy continued to develop and, in the case of St. Kitts, there was an accompanying shift to the occupation of progressively poorer horticultural soil closer to the coastal resources (Goodwin 1980). Therefore, initial settlement location was selected on the basis of availability of suitable soils; however, this locational preference was later modified by decreases in the abundance of animal resources.

The data from St. Kitts demonstrate the interaction between the subsistence system and the ecological variability of an area. Knowledge of resource fragility and environmental productivity were incorporated into the system and presumably transferred to subsequent populations. As populations migrated through the islands, they gained new information concerning the subsistence possibilities of the Caribbean islands.

By the time Puerto Rico was settled and Maisabel was inhabited, the Saladoid peoples likely would have perfected a greater repertoire of subsistence strategies. In addition, the geographical setting of Maisabel provided access to a number of marine biomes that could have been exploited upon initial settlement. Terrestrial resources were used during the early occupation; however, the decline in availability of these resources, especially the land crabs, resulted in the intensification of the maritime economy. A shift in settlement location was unnecessary because cultivation was initially established on the coastal plain. In this regard, the faunal assemblage does not indicate that marine fauna were being overexploited by the inhabitants in either time period. Additional research in this area may provide information on factors leading to the eventual abandonment of the site during the latter portion of the Ostionoid period.

## VII. Conclusions and future research

The faunal data from Maisabel provide another segment of information on Saladoid and Ostionoid subsistence patterns within the Caribbean Basin. The Maisabel data were examined to test the applicability of subsistence models directed at explaining regional patterns of change in resource and habitat use. Through analysis of large undisturbed samples that were processed with either fine-mesh or coarse-screens, it was possible to derive information relevant to questions concerning synchronic patterns of ecological adaptation and species utilization as well as diachronic changes in resource use and abundance.

This study has revealed that subsistence is best understood as a system of interrelated parts. Food production and food collecting behavior are conducted within the constraints of the ecological area, the technologies available to exploit that environment, and knowledge concerning environmental productivity and sustenance requirements. Changes in one aspect of the system will affect other parts of the system. In the case of the Caribbean, single variables such as population pressure or environmental change should not be overemphasized as the factors that most strongly influence subsistence choices.

The physical setting of Maisabel on the north coast of Puerto Rico allowed the inhabitants access to a wide range of habitats, including the Cibuco River system, an extensive mangrove swamp, neritic marine waters, shallow reef structures, a semi-protected marine bay, and pelagic open waters. Terrestrial habitats included the wide coastal plain and the extensive marsh system to the east of the site. Soils within the area of the site are fine-grained sands that would have supported horticultural production. Successful exploitation of these habitats by the site's occupants required a knowledge of both the productivity of these habitats and technology for their exploitation.

The relative contributions of the vertebrate and invertebrate species to the diet were determined through the use of a variety of analytical methods. It is assumed that all of the faunal remains recovered, with the exception of those species that are parasitic forms, were food items. Once identification and quantification were completed, measurements of selected fish and crab elements were made in order to provide size estimates of the individuals that were harvested prehistorically. Modifications to the faunal remains were infrequent; however, they do indicate areas of differential preservation within the site.

The faunal data indicate that during early settlement, subsistence efforts were concentrated on collection of marine fishes and gastropods. Terrestrial crabs were the only significant non-aquatic resource present in the samples. The major sources of dietary protein were the species of marine fishes. Other important sources of protein were the marine gastropods, and in contexts where they were identified, land crabs. Procurement strategies necessary for harvesting the aquatic fishes probably included traps, seines, and stationary nets for riverine resources.

A reduction in land crab exploitation during the later phases of occupation is best explained as the result of human-induced changes in the population structure of the species. Size estimates of the land crabs represented archaeologically indicate that the site's inhabitants exploited both very large and very small individuals. The selection of a wide size range of individuals may have affected the reproductive viability of the species. As the numbers of land crabs available decreased through time, the maritime economy was intensified to fulfill nutritional needs. In contrast to what other researchers have suggested, neither environmental change nor population pressure appear to have been responsible for the observed dietary change.

The Maisabel samples demonstrate that resource and habitat use during the Saladoid and Elenan Ostionoid time periods on the north central coast of Puerto Rico vary from Lesser Antillean sites dating to the same time periods. By the time Puerto Rico was colonized, the inhabitants apparently were more skilled at the exploitation of resources within the near-shore waters. In this regard, the diverse ecological zones located near the site provided access to a greater range of aquatic habitats than were available in the Lesser Antilles.

This study demonstrates that there is substantial variation in subsistence adaptations within single time periods in different geographical areas of the Caribbean. The region does not consist of a single homogeneous ecological zone. Prehistorically, there existed a tremendous amount of variation within the islands and between land masses. This variation would be represented in habitats available for exploitation, including marsh systems, mangrove swamps, riverine habitats, and shallow offshore aquatic zones. Furthermore, the soils available for cultivation would have varied between the islands. The igneous formations that comprise the Lesser Antilles may have been responsible for poorer quality and more shallow soils than those that formed on the larger islands of the Greater Antilles.

Researchers modeling general adaptive strategies must consider this variability, as well as the historical background of the colonizing peoples in order to accurately assign causality for archaeologically observed subsistence changes. The colonization of the Lesser Antilles by Saladoid populations from northeastern South America indicates that these populations were well-skilled in water navigation and were undoubtedly aware of the diversity of aquatic resources that were available. The emphasis archaeologists have placed on the nature and implications of the terrestrial components of early ceramic age sites may be too simplistic.

Many of the models examined in this study have attempted to explain subsistence change through analysis of primarily one terrestrial resource, the land crab. Few researchers have attempted to understand the broader implications of terrestrial settlement and its relationship to other aspects of food production. Rather than asking why did the use of this resource decline over time, researchers need to ask why was this resource selected for exploitation over seemingly more abundant marine resources during the initial settlement of some islands.

One means by which this question could be addressed is to consider the role of horticulture in the early colonization and settlement of the islands. Was the hypothesized terrestrial emphasis related to a larger complex of subsistence activities, which included the establishment of horticultural resources? The initial colonizers may have attempted to recreate settlement and subsistence systems most similar to those in northern South America. However, the paucity of terrestrial resources in the Lesser Antilles may have necessitated a reorientation to a maritime economy. Future studies may reveal that the terrestrial and inland riverine systems of northern South America were more productive than similar habitats in the Lesser Antilles. Furthermore, it might be profitable to construct hypotheses based on subsistence patterns observed in the Saladoid sites of northern South America, which can then be tested using Antillean data. This contrastive approach may reveal the individual adaptive responses that the Saladoid populations experienced, due to both the environmental variability in the islands and their knowledge of how to exploit these resources.

In reference to Maisabel, further research is needed on the subsistence patterns during the Ostionoid time period. For instance, following intensification of the maritime economy, were marine resources subject to overexploitation? If so, did overexploitation require incorporation of new food items into the diet or eventual abandonment of the site and migration to another segment of the coast or to the interior?

Additional inferences concerning subsistence adaptations of the Maisabel inhabitants will be possible following a stable isotope analysis of the bone collagen of 34 human skeletons recovered from the site. This will provide further information on the Ostionoid component of the site and augment the zooarchaeological data presented in this report. The isotope analysis also will attempt to place the faunal component of the assemblage into a larger dietary context. With these additional data, it should be feasible to determine the relative contribution of horticultural products to the overall diet at various times in the past. With these multiple sets of information, we can expect eventually to construct a more realistic and precise model of Saladoid and Ostionoid subsistence strategies, than what one domain of the archaeological record can provide.

The data generated by the analysis of the Maisabel faunal assemblage are among the most comprehensive for the Caribbean. Future research designed to recover the full range of vertebrate and invertebrate species used by prehistoric inhabitants, throughout the islands, is necessary to provide the empirical basis for testing hypotheses and developing sound theories of human adaptation.

***Abstract***

*This research is concerned with reconstructing the vertebrate and invertebrate components of the subsistence economy of the inhabitants of the early ceramic, or Saladoid and Elenan Ostionoid site, Maisabel, located on the north coast of Puerto Rico. By means of the analysis of zooarchaeological remains from Maisabel, I have been able to document the pattern of Saladoid and Elenan Ostionoid subsistence and ecological adaptation in this geographical area. The data from Maisabel have also been used to generate a broader understanding of the processes of prehistoric Antillean subsistence adaptations and transformations by means of comparisons with other faunal assemblages and models of subsistence.*

***Resumen***

*Este trabajo está dedicado a la reconstrucción de los restos arqueológicos de vertebrados e invertebrados que formaron parte de la economía de subsistencia de los habitantes del sitio cerámico temprano (Saladoide y Elenan Ostinoide) de Maisabel, situado en la costa norte de Puerto Rico. A través del análisis de los restos zooarqueológicos de Maisabel, la autora documenta los patrones de modos de subsistencia y de adaptación ecológica de los Saladoides y Elenan Ostinoides en esta región geográfica. Además, los datos obtenidos en Maisabel han sido utilizados para generar un entendimiento más amplio sobre el proceso de las adaptaciones y transformaciones de la subsistencia prehistórica en las Antillas a través de modelos comparativos de fauna y manutención en otras áreas arqueológicas.*

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## APPENDIX "A"

## Volumetric and temporal information for flotation samples

TABLE A-1
VOLUMETRIC AND TEMPORAL INFORMATION FOR FLOTATION SAMPLES

| Provenience | Level (cm) | Flotation Sample# | Volume (liters) | Temporal Assignment |
|---|---|---|---|---|
| N96W13 | 0-20 | 55 | 3 | Hacienda Grande |
| | 20-30 | 68 | 3 | |
| | 30-40 | 62 | 3 | |
| | 40-50 | 55 | 3.5 | |
| | 50-60 | 77 | 4 | |
| | 60-70 | 80 | 4 | |
| | 70-80 | 91 | 5 | |
| | 80-90 | 88 | 5 | |
| | 90-100 | 95 | 3 | |
| | 100-110 | 70 | 3 | |
| | 110-120 | 92 | 3 | |
| | 120-130 | 84 | 4 | |
| | 130-140 | 76 | 3 | |
| | 140-150 | 60 | 2 | |
| | 150-160 | 75 | 2 | |
| | | | 47.5 | |
| N98W13 | 60-70 | 61 | 3 | Hacienda Grande |
| S38W18 Column | 0-20 | 300 | 8 | LateHacienda Grande to Early Cuevas |
| | 20-30 | 311 | 10 | |
| | 30-40 | 321 | 9 | |
| | 40-50 | 336 | 11 | |
| | 50-60 | 346 | 11 | |
| | 60-70 | 351 | 9 | |
| | 70-80 | 358 | 8 | |
| | 80-90 | 364 | 9 | |
| | 90-100 | 368 | 9 | |
| | 100-110 | 378 | 10 | |
| | 110-120 | 384 | 7 | |
| | | | 101 | |
| S36W18 | 50-60 | 334 | 8 | Hacienda Grande to Early Cuevas |
| N112W88 | 20-30 | 556 | 11 | Hacienda Grande |
| | 30-40 | 561 | 9 | |
| | 40-50 | 565 | 11 | |
| | 50-60 | 574 | 11 | |
| | | | 42 | |
| N112W88 | 80-113 Feature104 | 587 | 26 | Hacienda Grande |
| N32E32 | 20-30 | 347 | 10 | Transitional Cuevas to Early Ostionoid |
| | 30-40 | 353 | 10 | |
| | | | 20 | |
| N43W8 N43W10 N42W14 N42W18 | Feature101 | 770 | 10 | |

## APPENDIX "B"

## Modern land crab and chiton data used to generate allometric values

TABLE B-1
WEIGHTS AND MEASUREMENTS OF MODERN *Cardisoma guanhumi* USED TO GENERATE ALLOMETRIC VALUES USED IN THIS STUDY

| Specimen Field # | Live Weight (g) | Shell Weight (g) | Mandible(lf) Height (mm) | Carapace Width (mm)* |
|---|---|---|---|---|
| 214 | 90 | 11.58 | 6.6 | 57.4 |
| 190 | 90 | 8.25 | 7.1 | |
| 210 | 94 | 20.24 | 7.2 | 62.0 |
| 207 | 94 | 11.55 | 6.7 | |
| 208 | 98 | 10.25 | 6.3 | 57.0 |
| 209 | 99 | 12.25 | 6.3 | 56.8 |
| 216 | 104 | 14.18 | 6.9 | 60.5 |
| 187 | 105 | 16.95 (rt) | 7.5 | 63.4 |
| 204 | 106 | 19.74 | 7.1 | 60.8 |
| 183 | 110 | 21.49 | 7.8 | 61.4 |
| 206 | 115 | 13.51 | 7.0 | |
| 215 | 120 | 14.46 | 7.5 | 62.8 |
| 191 | 120 | 14.88 | 6.9 | 60.5 |
| 212 | 125 | 12.01 | 6.7 | 55.7 |
| 217 | 130 | 16.29 | 6.8 | 60.8 |
| 193 | 139 | 18.53 | 7.6 | 67.8 |
| 213 | 140 | 16.06 | 7.4 | |
| 185 | 140 | 24.31 | 7.7 | 66.3 |
| 188 | 142 | 18.34 | 7.0 | 65.3 |
| 189 | 147 | 23.52 | 7.5 | 64.5 |
| 184 | 152 | 20.22 | 8.0 | 67.3 |
| 186 | 152 | 27.92 (rt) | 8.6 | |
| 205 | 162 | 21.53 | 8.0 | 71.0 |
| 192 | 163 | 25.42 | 8.1 | |
| 211 | 179 | 23.57 | 8.0 | 69.7 |

* Measurements taken on dried specimens

TABLE B-2
WEIGHTS OF MODERN CHITON USED TO
GENERATE ALLOMETRIC VALUES USED IN THIS STUDY

| Specimen | Live Weight (g) | Shell Weight (g) | Edible Meat Wt. (g) | Species |
|---|---|---|---|---|
| Z 5751 | 12.3 | 5.76 | 3.10 | *Chiton squamosa* |
| Z 5752 | 10.8 | 4.49 | 2.00 | *Acanthopluera granulata* |
| Z 5753 | 10.7 | 4.32 | 2.80 | " |
| Z 5754 | 7.1 | 2.71 | 1.70 | " |
| Z 5755 | 9.8 | 4.31 | 2.10 | " |
| Z 5756 | 15.8 | 6.50 | 3.50 | " |
| Z 5757 | 8.3 | 3.76 | 1.75 | " |
| Z 5758 | 9.2 | 3.72 | 2.10 | " |
| Z 5759 | 13.3 | 5.04 | 3.05 | " |
| Z 5760 | 8.4 | 3.28 | 1.80 | " |
| Z 5761 | 7.9 | 3.33 | 1.20 | " |
| Z 5762 | 7.3 | 2.71 | 1.50 | " |
| Z 5763 | 10.6 | 4.64 | 2.60 | " |
| Z 5764 | 16.8 | 7.27 | 3.80 | " |
| Z 5765 | 20.3 | 8.46 | 5.20 | " |

# Appendix "C"

## Identified fauna and measures of abundance for the analyzed contexts

Table C-1. Faunal remains from N96W13 0-160 cm flotation samples

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Isolobodon portoricensis* | Allen's Hutia | 1 | 0.07 | 1 | 0.66 | .1 | 0.01 | 4.0 | 0.14 |
| Rodentia | Unidentified Rodent | 2 | 0.14 | 1 | 0.66 | .1 | 0.01 | 4.0 | 0.14 |
| Mammalia uid, small | Small Mammal | 1 | 0.07 | 1 | 0.66 | .01 | 0.00 | .6 | 0.02 |
| Mammalia uid | Unidentified Mammal | 2 | 0.14 | - | 0.00 | .1 | 0.01 | 4.0 | 0.14 |
| **TOTAL MAMMALIA** | **TOTAL MAMMALS** | **6** | **0.42** | **3** | **1.99** | **.31** | **0.03** | **12.6** | **0.44** |
| *Columba* spp. | Dove | 4 | 0.28 | 1 | 0.66 | .9 | 0.09 | 15.9 | 0.56 |
| cf. Columbia sp. | Dove | 4 | 0.28 | - | 0.00 | .3 | 0.03 | 6.3 | 0.22 |
| Columbidae | Doves and Pigeons | 1 | 0.07 | 1 | 0.66 | 1.3 | 0.12 | 21.7 | 0.76 |
| cf. Columbidae | Doves and Pigeons | 1 | 0.07 | - | 0.00 | .2 | 0.02 | 4.5 | 0.16 |
| Passeriformes | Song Birds | 4 | 0.28 | 4 | 2.65 | .9 | 0.09 | 15.9 | 0.56 |
| Emberizidae | Finches | 1 | 0.07 | 1 | 0.66 | .04 | 0.00 | 1.2 | 0.04 |
| Aves uid | Unidentified Birds | 96 | 6.75 | - | 0.00 | 3.3 | 0.31 | 47.4 | 1.66 |
| **TOTAL AVES** | **TOTAL BIRDS** | **111** | **7.80** | **7** | **4.64** | **6.94** | **0.66** | **112.9** | **3.96** |
| *Trachemys* sp | Slider | 1 | 0.07 | 1 | 0.66 | .1 | 0.01 | 13.2 | 0.46 |
| Testudines | Turtles | 1 | 0.07 | - | 0.00 | .1 | 0.01 | 13.2 | 0.46 |
| *Anolis* sp. | Anole | 1 | 0.07 | 1 | 0.66 | <.01 | 0.00 | - | 0.00 |
| Iguanidae | Iguanas, Anoles, Lizards | 2 | 0.14 | 1 | 0.66 | .01 | 0.00 | - | 0.00 |
| Anguidae | Lizard | 2 | 0.14 | 1 | 0.66 | <.01 | 0.00 | - | 0.00 |
| Lacertilia | Lizard | 2 | 0.14 | - | 0.00 | <.01 | 0.00 | - | 0.00 |
| *Alsophis* sp. | Snake | 1 | 0.07 | 1 | 0.66 | <.01 | 0.00 | - | 0.00 |
| Serpentes | Snake | 4 | 0.28 | 2 | 1.32 | .1 | 0.01 | 1.3 | 0.05 |
| Reptilia uid | Unidentified Reptile | 21 | 1.48 | - | 0.00 | .2 | 0.02 | - | 0.00 |
| **TOTAL REPTILIA** | **TOTAL REPTILES** | **35** | **2.46** | **7** | **4.64** | **.31** | **0.03** | **27.7** | **0.97** |

Table C-1 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Rana* sp. | Frog | 1 | 0.07 | 1 | 0.66 | <.01 | 0.00 | - | 0.00 |
| **TOTAL AMPHIBIA** | **TOTAL AMPHIBIANS** | **1** | **0.07** | **1** | **0.66** | **-** | **0.00** | **-** | **0.00** |
| *Harengula* spp. | Sardine | 2 | 0.14 | 2 | 1.32 | <0.01 | 0.00 | -- | 0.00 |
| Clupeidae cf. Opisthonema | Herring | 6 | 0.42 | 2 | 1.32 | .02 | 0.00 | .6 | 0.02 |
| Clupeidae | Herring, Shad, Sardine | 83 | 5.83 | - | 0.00 | .4 | 0.04 | 9.6 | 0.34 |
| Hemiramphidae | Halfbeak | 2 | 0.14 | 1 | 0.66 | .1 | 0.01 | 2.7 | 0.09 |
| *Strongylura* sp. | Needlefish | 1 | 0.07 | 1 | 0.66 | .01 | 0.00 | .5 | 0.02 |
| *Tylosaurus* sp. | Houndfish | 1 | 0.07 | 1 | 0.66 | 1.0 | 0.09 | 21.9 | 0.77 |
| Belonidae | Needlefish | 1 | 0.07 | 1 | 0.66 | .2 | 0.02 | 5.1 | 0.18 |
| *Holocentrus* sp. | Squirrelfish | 1 | 0.07 | 1 | 0.66 | .04 | 0.00 | 1.2 | 0.04 |
| *Centropomus parallelus* | Snook | 1 | 0.07 | 1 | 0.66 | 1.3 | 0.12 | 27.7 | 0.97 |
| *Centropomus* cf. *pectinatus* | Snook | 3 | 0.21 | 2 | 1.32 | .5 | 0.05 | 11.7 | 0.41 |
| *Centropomus* spp. | Snook | 6 | 0.42 | 2 | 1.32 | 1.1 | 0.10 | 23.8 | 0.84 |
| *Epinephalus fulvus* | Coney | 8 | 0.56 | 3 | 1.99 | .7 | 0.07 | 15.9 | 0.56 |
| *Epinephalus* cf. *fulvus* | Red Hind | 1 | 0.07 | - | 0.00 | .1 | 0.01 | 2.7 | 0.09 |
| *Epinephalus* spp. | Grouper | 2 | 0.14 | - | 0.00 | .2 | 0.02 | 5.1 | 0.18 |
| Serranidae | Sea Bass | 2 | 0.14 | 1 | 0.66 | .5 | 0.05 | 11.7 | 0.41 |
| *Caranx caballus* | Blue Runner | 1 | 0.07 | 1 | 0.66 | .02 | 0.00 | .6 | 0.02 |
| *Caranx* spp. | Jack | 15 | 1.05 | 3 | 1.99 | 1.0 | 0.09 | 21.9 | 0.77 |
| *Trachinotus* spp. | Pompano | 1 | 0.07 | 1 | 0.66 | .1 | 0.01 | 2.7 | 0.09 |
| Carangidae | Jacks | 8 | 0.56 | - | 0.00 | .5 | 0.05 | 11.7 | 0.41 |
| *Lutjanus* cf. *buccanella* | Blackfin Snapper | 1 | 0.07 | 1 | 0.66 | .1 | 0.01 | 2.7 | 0.09 |
| *Lutjanus jocu* | Dog Snapper | 1 | 0.07 | 1 | 0.66 | .01 | 0.00 | .3 | 0.01 |

Table C-1 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Lutjanus vivanus* | Silk Snapper | 1 | 0.07 | 1 | 0.66 | .03 | 0.00 | .9 | 0.03 |
| *Lutjanus* spp. | Snapper | 6 | 0.42 | 2 | 1.32 | .6 | 0.06 | 13.8 | 0.48 |
| *Ocyurus chrysurus* | Yellowtail Snapper | 2 | 0.14 | 1 | 0.66 | 1.0 | 0.09 | 21.9 | 0.77 |
| Lutjanidae | Snappers | 6 | 0.42 | - | 0.00 | .9 | 0.09 | 19.9 | 0.70 |
| Gerreidae | Yelowfin Mojarra | 1 | 0.07 | 1 | 0.66 | .03 | 0.00 | .9 | 0.03 |
| cf. Gerreidae | Mojarras | 3 | 0.21 | - | 0.00 | .2 | 0.02 | 5.1 | 0.18 |
| *Anisotremus surinamensis* | Black Margate | 1 | 0.07 | 1 | 0.66 | .1 | 0.01 | 2.7 | 0.09 |
| *Haemulon plumieri* | White Grunt | 1 | 0.07 | 1 | 0.66 | .1 | 0.01 | 2.7 | 0.09 |
| *Haemulon* cf. *sciurus* | Blue Stripped Grunt | 2 | 0.14 | 1 | 0.66 | .1 | 0.01 | 2.7 | 0.09 |
| *Haemulon* spp. | Grunts | 15 | 1.05 | 2 | 1.32 | 1.2 | 0.11 | 25.8 | 0.91 |
| cf. *Haemulon* sp. | Grunt | 1 | 0.07 | - | 0.00 | .01 | 0.00 | .3 | 0.01 |
| Haemulidae | Grunts | 2 | 0.14 | - | 0.00 | .1 | 0.01 | 2.7 | 0.09 |
| *Bairdiella ronchus* | Roncho Basto | 1 | 0.07 | 2 | 1.32 | .4 | 0.04 | 9.6 | 0.34 |
| *Bairdiella* sp. | Drum | 1 | 0.07 | - | 0.00 | .1 | 0.01 | 2.7 | 0.09 |
| Sciaenidae | Drums | 1 | 0.07 | 1 | 0.66 | .2 | 0.02 | 5.1 | 0.18 |
| *Bodianus rufus* | Spanish Hogfish | 1 | 0.07 | 1 | 0.66 | .3 | 0.03 | 7.4 | 0.26 |
| *Bodianus* spp | Hogfish | 2 | 0.14 | 1 | 0.66 | .3 | 0.03 | 7.4 | 0.26 |
| *Halichoeres* spp. | Wrasse | 8 | 0.56 | 4 | 2.65 | .2 | 0.02 | 5.1 | 0.18 |
| Labridae | Wrasses | 2 | 0.14 | - | 0.00 | .1 | 0.01 | 2.7 | 0.09 |
| *Sparisoma* spp. | Parrotfish | 8 | 0.56 | 3 | 1.99 | .5 | 0.05 | 11.7 | 0.41 |
| Scaridae | Parrotfishes | 3 | 0.21 | - | 0.00 | .7 | 0.07 | 15.9 | 0.56 |
| Mugil spp. | Mullet | 4 | 0.28 | 2 | 1.32 | .2 | 0.02 | 5.1 | 0.18 |
| *Gobiomorus dormitor* | Bigmouth Sleeper | 8 | 0.56 | 3 | 1.99 | .3 | 0.03 | 7.4 | 0.26 |
| *Acanthurus* spp. | Surgeonfish | 1 | 0.07 | 1 | 0.66 | .1 | 0.01 | 2.7 | 0.09 |
| cf. *Acanthurus* spp. | Surgeonfish | 2 | 0.14 | 1 | 0.66 | .04 | 0.00 | 1.2 | 0.04 |

Table C-1 continued

| Species | Common Name | Number of Fragments # | Number of Fragments % | Minimum Number of Individuals # | Minimum Number of Individuals % | Bone/Shell Weight g | Bone/Shell Weight % | Minimum Edible Meat Weight g | Minimum Edible Meat Weight % |
|---|---|---|---|---|---|---|---|---|---|
| cf. *Euthynnus* sp. | Tuna | 1 | 0.07 | 1 | 0.66 | 1.4 | 0.13 | 29.6 | 1.04 |
| Scomberidae | Mackerals | 1 | 0.07 | 1 | 0.66 | .6 | 0.06 | 13.8 | 0.48 |
| *Balistes vetula* | Queen Triggerfish | 1 | 0.07 | 1 | 0.66 | .2 | 0.02 | 5.1 | 0.18 |
| *Balistes* spp. | Triggerfish | 8 | 0.56 | 2 | 1.32 | 2.7 | 0.26 | 53.5 | 1.88 |
| Balistidae | Leatherjackets | 670 | 47.08 | - | 0.00 | 4.7 | 0.44 | 88.1 | 3.09 |
| *Lactophrys* sp. | Trunkfish | 1 | 0.07 | 1 | 0.66 | .02 | 0.00 | .6 | 0.02 |
| cf. Ostraciidae | Trunk fishes | 1 | 0.07 | - | 0.00 | <.01 | 0.00 | -- | 0.00 |
| *Diodon* spp. | Porcupinefish | 1 | 0.07 | 1 | 0.66 | .04 | 0.00 | 1.2 | 0.04 |
| Diodontidae | Porcupinefishes | 2 | 0.14 | 1 | 0.66 | .1 | 0.01 | 2.7 | 0.09 |
| Osteichthyes uid | Unidentified Bony Fishes | * | 0.00 | - | 0.00 | 57.0 | 5.40 | 832.3 | 29.22 |
| **TOTAL OSTEICHTHYES** | **TOTAL BONY FISHES** | **916** | **64.37** | **62** | **41.06** | **82.47** | **7.81** | **1390.4** | **48.82** |
| Vertebrata uid | Unidentified Vertebrates | * | 0.00 | - | 0.00 | 32.8 | 3.11 | 506.2 | 17.77 |
| **TOTAL VERTEBRATES** | **TOTAL VERTEBRATES** | **1069** | **75.12** | **80** | **52.98** | **122.83** | **11.63** | **2049.8** | **71.97** |
| *Cardisoma guanhumi* | Blue Land Crab | 38 | 2.67 | 6 | 3.97 | 53.6 | 5.07 | 206.7 | 7.26 |
| Gecarcinidae | Land Crab | 43 | 3.02 | - | 0.00 | 12.7 | 1.20 | 64.0 | 2.25 |
| Brachyura | Unidentified Crab | * | 0.00 | - | 0.00 | 463.6 | 43.89 | 334.6 | 11.75 |
| **TOTAL CRUSTACEA** | **TOTAL MARINE ARTHROPODS** | **81** | **5.69** | **6** | **3.97** | **529.9** | **50.16** | **605.3** | **21.25** |
| *Fissurella barbadensis* | Barbados Keyhole Limpet | 1 | 0.07 | 1 | 0.66 | .5 | 0.05 | .4 | 0.01 |
| *F. nodosa* | Knobby Keyhole Limpet | 3 | 0.21 | 3 | 1.99 | 4.7 | 0.44 | 2.9 | 0.10 |
| *Fissurellidae* | Keyhole Limpets | 28 | 1.97 | - | 0.00 | 3.8 | 0.36 | 2.4 | 0.08 |
| *Acmaea antillarium* | Antillean Limpet | 1 | 0.07 | 1 | 0.66 | .02 | 0.00 | .02 | 0.00 |
| Acmaeidae | Limpet | 1 | 0.07 | 1 | 0.66 | .01 | 0.00 | .01 | 0.00 |

Table C-1 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Cittarium pica* | West Indian Top Shell | 48 | 3.37 | 4 | 2.65 | 210.1 | 19.89 | 94.8 | 3.33 |
| *Turbo castena* | Chestnut Turban | 2 | 0.14 | 2 | 1.32 | .7 | 0.07 | .5 | 0.02 |
| *Astrea tuber* | Green Star-shell | 2 | 0.14 | 2 | 1.32 | 1.8 | 0.17 | 1.2 | 0.04 |
| *Astrea* sp. | Star-shell | 1 | 0.07 | - | 0.00 | .1 | 0.01 | .08 | 0.00 |
| Turbanidae | Turbans | 5 | 0.35 | - | 0.00 | 3.5 | 0.33 | 2.2 | 0.08 |
| *Nerita peloronta* | Bleeding Tooth Nerite | 2 | 0.14 | 2 | 1.32 | .4 | 0.04 | .3 | 0.01 |
| *Nerita* cf. *peloronta* | Bleeding Tooth Nerite | 1 | 0.07 | - | 0.00 | .2 | 0.02 | .2 | 0.01 |
| *N. tessellata* | Tessellate Nerite | 1 | 0.07 | 1 | 0.66 | .3 | 0.03 | .2 | 0.01 |
| *N. versicolor* | Four-toothed Nerite | 3 | 0.21 | 3 | 1.99 | .5 | 0.05 | .4 | 0.01 |
| *Nerita* spp. | Nerite | 8 | 0.56 | - | 0.00 | .9 | 0.09 | .7 | 0.02 |
| *Neritina virginea* | Virgin Nerite | 22 | 1.55 | 13 | 8.61 | 5.2 | 0.49 | 3.1 | 0.11 |
| *Neritina* spp. | Nerite | 19 | 1.34 | - | 0.00 | 3.9 | 0.37 | 2.4 | 0.08 |
| Neritidea | Nerites | 2 | 0.14 | - | 0.00 | .3 | 0.03 | .2 | 0.01 |
| *Littorina angustior* | Angust Periwinkle | 3 | 0.21 | 3 | 1.99 | .3 | 0.03 | .2 | 0.01 |
| *L. lineolata* | Lineolate Periwinkle | 2 | 0.14 | 32 | 1.32 | .2 | 0.02 | .2 | 0.01 |
| *L. zicwac* | Zebra Periwinkle | 7 | 0.49 | 7 | 4.64 | .8 | 0.08 | .6 | 0.02 |
| *Tectarius muricatus* | Beaded Periwinkle | 2 | 0.14 | 2 | 1.32 | .2 | 0.02 | .2 | 0.01 |
| Littorinidae | Periwinkles | 2 | 0.14 | - | 0.00 | .1 | 0.01 | .1 | 0.00 |
| *Cerithium eburneum* | Ivory Cerith | 1 | 0.07 | 1 | 0.66 | .3 | 0.03 | .2 | 0.01 |
| cf. *Petaloconchus* sp. | Work Shell | 1 | 0.07 | 1 | 0.66 | - | 0.00 | - | 0.00 |
| *Diastoma* sp. | Bitium | 1 | 0.07 | 1 | 0.66 | - | 0.00 | - | 0.00 |
| *Strombus* spp. | Conch | 3 | 0.21 | 2 | 1.32 | 77.6 | 7.35 | 37.9 | 1.33 |
| *Thais rustica* | Rustic Rock-shell | 1 | 0.07 | 1 | 0.66 | .3 | 0.03 | .2 | 0.01 |
| *Nassarius vibex* | Variable Nassa | 1 | 0.07 | 1 | 0.66 | .2 | 0.02 | .2 | 0.01 |
| *Melampus* sp. | Melampus | 1 | 0.07 | 1 | 0.66 | .1 | 0.01 | .1 | 0.00 |

Table C-1 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| Gastropoda uid marine | Uid Marine Gastrophods | * | 0.00 | - | 0.00 | 38.4 | 3.64 | 19.8 | 0.70 |
| **TOTAL GASTROPODA MARINE** | **TOTAL MARINE GASTROPODS** | **177** | **12.44** | **57** | **37.75** | **355.63** | **33.67** | **171.91** | **6.04** |
| *Bulimulus* spp. (1) | | (94) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Opeas pumilum* | | (280) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Opeas* spp. | | (18) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Gastrocopta pellucida* | | (23) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Leptineria* sp. | | (1) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Lamellaxis micra* | | (1) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| Sagidae | | (15) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Guppya* sp. | | (1) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Subulinea octons* | | (1) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Megalomastoma croecum* | | (5) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| **TOTAL GASTROPODA TERRESTIAL** | **TOTAL LAND SNAILS** | **(439)** | **0.00** | **-** | **0.00** | **-** | **0.00** | **-** | **0.00** |
| Chiton s.l. | Coat-of-Mail Shells | 81 | 5.69 | 3 | 1.99 | 6.7 | 0.63 | 3.7 | 0.13 |
| **TOTAL AMPHINEURA** | **TOTAL COAT-OF-MAIL SHELLS** | **81** | **5.69** | **3** | **1.99** | **6.7** | **0.63** | **3.7** | **0.13** |
| *Codakia orbiculatis* | Tiger Lucina | 2 | 0.14 | 1 | 0.66 | 1.2 | 0.11 | 1.2 | 0.04 |
| *Chama* spp. | Jewel Box | 2 | 0.14 | 1 | 0.66 | .2 | 0.02 | .3 | 0.01 |
| *Donax* sp. | Donax | 1 | 0.07 | 1 | 0.66 | .2 | 0.02 | .3 | 0.01 |
| Bivalvia uid | Unidentified Bivalves | * | 0.00 | - | 0.00 | 12.0 | 1.14 | 5.7 | 0.20 |
| **TOTAL BIVALVIA** | **TOTAL BIVALVES** | **5** | **0.35** | **3** | **1.99** | **13.6** | **1.29** | **7.5** | **0.26** |

Table C-1 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| Mollusca uid | Unidentified Mollusk | * | 0.00 | - | 0.00 | 27.7 | 2.62 | 10 | 0.35 |
| **TOTAL MOLLUSCA** | **TOTAL MOLLUSK** | **263** | **18.48** | **63** | **41.72** | **403.63** | **38.21** | **193.11** | **6.78** |
| Echinoidea | Sea Urchins | 9 | 0.63 | 1 | 0.66 | - | 0.00 | - | 0.00 |
| Cidaridae | Sea Urchins | 1 | 0.07 | 1 | 0.66 | - | 0.00 | - | 0.00 |
| **TOTAL ECHINOIDEA** | **TOTAL SEA URCHINS** | **10** | **0.70** | **2** | **1.32** | **-** | **0.00** | **-** | **0.00** |
| **TOTAL INVERTEBRATA** | **TOTAL INVERTEBRATES** | **354** | **24.88** | **71** | **47.02** | **933.53** | **88.37** | **798.41** | **28.03** |
| **SAMPLE TOTAL** | **VERTEBRATES AND INVERTEBRATES** | **1423** | **100.00** | **151** | **100.00** | **1056.4** | **100.00** | **2848.2** | **100.00** |

Table C-2. Faunal remains from N96W13 60-70 cm, coarse fraction.

| Species | Common Name | Number of Fragments # | Number of Fragments % | Minimum Number of Individuals # | Minimum Number of Individuals % | Bone/Shell Weight g | Bone/Shell Weight % | Minimum Edible Meat Weight g | Minimum Edible Meat Weight % |
|---|---|---|---|---|---|---|---|---|---|
| *Isolobodon portoricensis* | Allen's Hutia | 3 | 0.10 | 1 | 0.20 | 1.9 | 0.02 | 43.2 | 0.39 |
| cf. *I. portoricensis* | Allen's Hutia | 1 | 0.03 | - | 0.00 | .2 | 0.00 | 6.9 | 0.06 |
| Rodentia | Unidentified Rodent | 7 | 0.23 | - | 0.00 | 1.3 | 0.02 | 31.8 | 0.28 |
| Mammalia uid, small | Small Mammal | 2 | 0.07 | - | 0.00 | .8 | 0.01 | 21.4 | 0.19 |
| Mammalia uid, large | Large Mammal | 1 | 0.03 | 1 | 0.20 | 10.4 | 0.13 | 171.3 | 1.53 |
| Mammalia uid | Unidentified Mammal | 5 | 0.17 | - | 0.00 | 2.0 | 0.03 | 45.1 | 0.40 |
| **TOTAL MAMMALIA** | **TOTAL MAMMAL** | **19** | **0.64** | **2** | **0.40** | **16.6** | **0.21** | **319.7** | **2.85** |
| *Columba* spp. | Dove | 96 | 3.22 | 10 | 2.02 | 15.6 | 0.20 | 174.7 | 1.56 |
| Columbidae | Doves and Pigeons | 28 | 0.94 | - | 0.00 | 3.8 | 0.05 | 53.3 | 0.48 |
| Aves uid | Unidentified Birds | 115 | 3.86 | - | 0.00 | 9.5 | 0.12 | 115.2 | 1.03 |
| **TOTAL AVES** | **TOTAL BIRDS** | **239** | **8.01** | **10** | **2.02** | **28.9** | **0.37** | **343.2** | **3.06** |
| *Trachemys* sp. | Slider | 3 | 0.10 | 1 | 0.20 | 1.9 | 0.02 | 62.8 | 0.56 |
| *Caretta caretta* | Atlantic Loggerhead | 10 | 0.34 | 1 | 0.20 | 163.4 | 2.10 | 665.4 | 5.94 |
| Chelonidae | Sea Turtles | 3 | 0.10 | 1 | 0.20 | 14.5 | 0.19 | 184.3 | 1.65 |
| Testudines | Turtles | 7 | 0.23 | - | 0.00 | 5.8 | 0.07 | 113.4 | 1.01 |
| *Amevia* spp. | Runner | 2 | 0.07 | 1 | 0.20 | .3 | 0.00 | - | 0.00 |
| Anguidae | Lizard | 1 | 0.03 | 1 | 0.20 | .01 | 0.00 | - | 0.00 |
| *Epicrates* sp. | Pigmy Boa | 1 | 0.03 | 1 | 0.20 | .3 | 0.00 | 3.7 | 0.03 |
| Serpentes | Snake | 1 | 0.03 | - | 0.00 | .1 | 0.00 | 1.3 | 0.01 |
| **TOTAL REPTILIA** | **TOTAL REPTILE** | **28** | **0.94** | **6** | **1.21** | **186.31** | **2.39** | **1030.9** | **9.20** |
| *Elops saurus* | Ladyfish | 1 | 0.03 | 1 | 0.20 | .1 | 0.00 | 2.7 | 0.02 |
| *Albula vulpes* | Bonefish | 2 | 0.07 | 1 | 0.20 | .2 | 0.00 | 5.1 | 0.05 |
| *Harengula* sp. | Sardine | 1 | 0.03 | 1 | 0.20 | .01 | 0.00 | .3 | 0.00 |

Table C-2 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| Clupeidae | Herring, Shad, Sardine | 2 | 0.07 | 1 | 0.20 | .01 | 0.00 | .3 | 0.00 |
| cf. Belonidae | Needlefish | 4 | 0.13 | 3 | 0.61 | .3 | 0.00 | 7.4 | 0.07 |
| *Holocentrus* spp. | Squirrelfish | 3 | 0.10 | 1 | 0.20 | .3 | 0.00 | 7.4 | 0.07 |
| Holocentridae. | Squirrelfish | 2 | 0.07 | 1 | 0.20 | .1 | 0.00 | 2.7 | 0.02 |
| *Centropomus undecimalis* | Snook | 4 | 0.13 | 2 | 0.40 | 3.6 | 0.05 | 69.3 | 0.62 |
| *Centropomus* spp. | Snook | 37 | 1.24 | 3 | 0.61 | 19.2 | 0.25 | 312.6 | 2.79 |
| cf. Centropomidae | Snook | 3 | 0.10 | - | 0.00 | 1.1 | 0.01 | 23.8 | 0.21 |
| *Epinephalus fulvus* | Coney | 10 | 0.34 | 2 | 0.40 | 5.1 | 0.07 | 94.8 | 0.85 |
| *Epinephalus guttatus* | Red Hind | 1 | 0.03 | 1 | 0.20 | 4.4 | 0.06 | 83.0 | 0.74 |
| *Epinephalus* spp. | Grouper | 18 | 0.60 | - | 0.00 | 7.4 | 0.09 | 132.5 | 1.18 |
| Serranidae | Sea Bass | 14 | 0.47 | - | 0.00 | 7.9 | 0.10 | 140.6 | 1.26 |
| *Caranx* sp. | Jack | 1 | 0.03 | 1 | 0.20 | .4 | 0.01 | 9.6 | 0.09 |
| Carangidae | Jacks | 22 | 0.74 | - | 0.00 | 3.9 | 0.05 | 74.5 | 0.67 |
| *Lutjanus* spp. | Snapper | 10 | 0.34 | 2 | 0.40 | 5.1 | 0.07 | 94.8 | 0.85 |
| Lutjanidae | Snappers | 2 | 0.07 | - | 0.00 | .7 | 0.01 | 15.9 | 0.14 |
| *Diapterus* sp. | Mojarra | 1 | 0.03 | 1 | 0.20 | .2 | 0.00 | 5.1 | 0.05 |
| Gerres sp. | Yellowfin Mojarra | 1 | 0.03 | 1 | 0.20 | .1 | 0.00 | 2.7 | 0.02 |
| Gerreidae | Mojarras | 1 | 0.03 | - | 0.00 | .2 | 0.00 | 5.1 | 0.05 |
| *Haemulon* spp. | Grunt | 23 | 0.77 | 3 | 0.61 | 4.2 | 0.05 | 79.6 | 0.71 |
| Haemulidae | Grunts | 7 | 0.23 | - | 0.00 | .6 | 0.01 | 13.8 | 0.12 |
| cf. Haemulidae | Grunts | 2 | 0.07 | - | 0.00 | .8 | 0.01 | 17.9 | 0.16 |
| Sciaenidae | Drums | 3 | 0.10 | - | 0.00 | .3 | 0.00 | 7.4 | 0.07 |
| *Bodianus rufus* | Spanish Hogfish | 1 | 0.03 | 1 | 0.20 | .2 | 0.00 | 5.1 | 0.05 |
| *Bodianus* cf. *rufus* | Spanish Hogfish | 5 | 0.17 | 1 | 0.20 | 1.0 | 0.01 | 21.9 | 0.20 |
| *Bodianus* spp. | Hogfish | 11 | 0.37 | 2 | 0.40 | 5.5 | 0.07 | 101.5 | 0.91 |
| *Halichoeres* spp. | Wrasse | 5 | 0.17 | 1 | 0.20 | 2.0 | 0.03 | 40.8 | 0.36 |

Table C-2 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| Labridae | Wrasses | 2 | 0.07 | - | 0.00 | .3 | 0.00 | 7.4 | 0.07 |
| *Scarus* spp. | Parrotfish | 2 | 0.07 | 1 | 0.20 | .5 | 0.01 | 11.7 | 0.10 |
| *Sparisoma* spp. | Parrotfish | 10 | 0.34 | 3 | 0.61 | 5.0 | 0.06 | 93.1 | 0.83 |
| Scaridae | Parrotfishes | 1 | 0.03 | - | 0.00 | .1 | 0.00 | 2.7 | 0.02 |
| *Mugil* spp. | Mullet | 8 | 0.27 | 4 | 0.81 | 1.1 | 0.01 | 23.8 | 0.21 |
| *Gobiomorus dormitor* | Bigmouth Sleeper | 4 | 0.13 | 2 | 0.40 | .9 | 0.01 | 19.9 | 0.18 |
| *Euthynnus alletteratus* | Little Tunny | 3 | 0.10 | 2 | 0.40 | 1.7 | 0.02 | 35.3 | 0.32 |
| Scombridae | Mackerals | 12 | 0.40 | - | 0.00 | 8.4 | 0.11 | 148.5 | 1.33 |
| *Balistes* spp. | Triggerfish | 24 | 0.80 | 4 | 0.81 | 18.3 | 0.23 | 299.4 | 2.67 |
| *Melichthyes niger* | Black Durgon | 40 | 1.34 | 4 | 0.81 | 11.0 | 0.14 | 189.3 | 1.69 |
| Balistidae | Leatherjackets | 27 | 0.91 | - | 0.00 | 6.8 | 0.09 | 122.8 | 1.10 |
| *Chilomycterus* sp. | Burrfishes | 1 | 0.03 | 1 | 0.20 | 2.9 | 0.04 | 57.0 | 0.51 |
| Diodontidae | Porcupinefishes | 1 | 0.03 | 1 | 0.20 | .2 | 0.00 | 5.1 | 0.05 |
| Osteichthyes uid | Unidentified Bony Fishes | * | 0.00 | - | 0.00 | 245.1 | 3.14 | 3093.2 | 27.62 |
| **TOTAL OSTEICHTHYES** | **TOTAL BONY FISHES** | **332** | **11.13** | **52** | **10.51** | **377.22** | **4.84** | **5487.4** | **48.99** |
| Vertebrata uid | Unidentified Vertebrates | * | 0.00 | - | 0.00 | 57.3 | 0.74 | 836.3 | 7.47 |
| **TOTAL VERTEBRATA** | **TOTAL VERTEBRATES** | **618** | **20.72** | **70** | **14.14** | **666.33** | **8.55** | **8017.5** | **71.58** |
| *Cardisoma guanhumi* | Blue Land Crab | 1434 | 48.09 | 120 | 24.24 | 1964.8 | 25.21 | 1083.7 | 9.68 |
| Gecarcinidae | Land Crab | 66 | 2.21 | - | 0.00 | 33.5 | 0.43 | 99.9 | 0.89 |
| Brachyura | Unidentified Crab | * | 0.00 | - | 0.00 | 1751.0 | 22.46 | 616.7 | 5.51 |
| **TOTAL CRUSTACEA** | **TOTAL MARINE ARTHROPODS** | **1500** | **50.30** | **120** | **24.24** | **3749.3** | **48.10** | **1800.3** | **16.07** |
| *Diodora* sp. | Keyhole Limpet | 1 | 0.03 | 1 | 0.20 | .4 | 0.01 | .3 | 0.00 |

Table C-2 continued

| Species | Common Name | Number of Fragments # | Number of Fragments % | Minimum Number of Individuals # | Minimum Number of Individuals % | Bone/Shell Weight g | Bone/Shell Weight % | Minimum Edible Meat Weight g | Minimum Edible Meat Weight % |
|---|---|---|---|---|---|---|---|---|---|
| *Fissurella fascicularis* | Wobbly Keyhole Limpet | 1 | 0.03 | 1 | 0.20 | .9 | 0.01 | .6 | 0.01 |
| *Fissurella nodosa* | Knobby Keyhole Limpet | 10 | 0.34 | 10 | 2.02 | 12.3 | 0.16 | 7.0 | 0.06 |
| Fissurellidae | Keyhole Limpets | 18 | 0.60 | - | 0.00 | 5.6 | 0.07 | 3.4 | 0.03 |
| *Acmaea* spp. | Limpet | 18 | 0.60 | 17 | 3.43 | 7.7 | 0.10 | 4.5 | 0.04 |
| Trochidae | Margarites | 1 | 0.03 | 1 | 0.20 | .4 | 0.01 | .3 | 0.00 |
| *Cittarium pica* | West Indian Top Shell | 356 | 11.94 | 42 | 8.48 | 1510.2 | 19.37 | 581.7 | 5.19 |
| *Astrea* spp. | Star-shell | 2 | 0.07 | 2 | 0.40 | .7 | 0.01 | .5 | 0.00 |
| cf. *Astraea* sp. | Star-Shell | 1 | 0.03 | - | 0.00 | .2 | 0.00 | .2 | 0.00 |
| *Turbo castanea* | Chestnut Turban | 8 | 0.27 | 8 | 1.62 | 2.9 | 0.04 | 1.8 | 0.02 |
| Turbanidae | Turbans | 4 | 0.13 | - | 0.00 | 1.3 | 0.02 | .9 | 0.01 |
| *Nerita peloronta* | Bleeding Tooth Nerite | 68 | 2.28 | 17 | 3.43 | 38.6 | 0.50 | 19.9 | 0.18 |
| *N. tessellata* | Tessellate Nerite | 10 | 0.34 | 7 | 1.41 | 2.7 | 0.03 | 1.7 | 0.02 |
| *N. versicolor* | Four-toothed Nerite | 20 | 0.67 | 15 | 3.03 | 17.3 | 0.22 | 9.5 | 0.08 |
| *Nerita* spp. | Nerite | 3 | 0.10 | - | 0.00 | 1.3 | 0.02 | .9 | 0.01 |
| *Neritina virginea* | Virgin Nerite | 92 | 3.09 | 91 | 18.38 | 28.6 | 0.37 | 15.1 | 0.13 |
| *Neritina* spp. | Nerite | 15 | 0.50 | 2 | 0.40 | 4.6 | 0.06 | 2.8 | 0.02 |
| Neritidae | Nerites | 15 | 0.50 | - | 0.00 | 4.1 | 0.05 | 2.5 | 0.02 |
| *Littorina lineolata* | Lineolate Periwinkle | 3 | 0.10 | 3 | 0.61 | .5 | 0.01 | .4 | 0.00 |
| *L. ziczac* | Zebra Periwinkle | 13 | 0.44 | 13 | 2.63 | 1.9 | 0.02 | 1.2 | 0.01 |
| *Littorina* sp. | Periwinkle | 1 | 0.03 | - | 0.00 | .2 | 0.00 | .2 | 0.00 |
| *Nodolittorina tuberculata* | Common Prickly-winkle | 4 | 0.13 | 5 | 1.01 | 1.4 | 0.02 | 1.9 | 0.01 |
| *Tectarius muricatus* | Beaded Periwinkle | 6 | 0.20 | 6 | 1.21 | 1.6 | 0.02 | 1.1 | 0.01 |
| *Echinius nodulosus* | False Periwinkle | 1 | 0.03 | 1 | 0.20 | .2 | 0.00 | .2 | 0.00 |
| *Littorinidae* | Periwinkles | 1 | 0.03 | - | 0.00 | .1 | 0.00 | .1 | 0.00 |
| *Cerithium algicola* | Ivory Cerith | 2 | 0.07 | 2 | 0.40 | 1.1 | 0.01 | .7 | 0.01 |
| *Cerithium eburneum* | Ivory Cerith | 1 | 0.03 | 1 | 0.20 | .4 | 0.01 | .3 | 0.00 |

Table C-2 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| Chiton s.l. | Coat-of-Mail Shells | 57 | 1.91 | 10 | 2.02 | 25.2 | 0.32 | 15.6 | 0.14 |
| **TOTAL CHITON** | **TOTAL COAT-OF-MAIL SHELLS** | **57** | **1.91** | **10** | **2.02** | **25.2** | **0.32** | **15.6** | **0.14** |
| *Pecten* spp. | Scallop | 3 | 0.10 | 1 | 0.20 | 1.3 | 0.02 | 1.2 | 0.01 |
| *Codakia orbiculatis* | Tiger Lucina | 19 | 0.64 | 5 | 1.01 | 78.2 | 1.00 | 20.3 | 0.18 |
| *Lucina pectinata* | Thick Lucine | 4 | 0.13 | 3 | 0.61 | 9.3 | 0.12 | 4.8 | 0.04 |
| *Chama congregata* | Little Corrugated Jewel Box | 13 | 0.44 | 5 | 1.01 | 4.1 | 0.05 | 2.7 | 0.02 |
| Cardiidae | Cockle | 1 | 0.03 | 1 | 0.20 | .7 | 0.01 | .8 | 0.01 |
| *Mactrellona alata* | Caribbean Winged Mactra | 6 | 0.20 | 2 | 0.40 | 7.0 | 0.09 | 3.9 | 0.03 |
| cf. Mactridae | Surf Clam | 1 | 0.03 | 1 | 0.20 | 1.1 | 0.01 | 1.1 | 0.01 |
| *Tellina listeri* | Speckled Tellin | 1 | 0.03 | 1 | 0.20 | 1.3 | 0.02 | 1.2 | 0.01 |
| *Tagelus plebius* | Stout Tagelus | 1 | 0.03 | 1 | 0.20 | 2.7 | 0.03 | 2.1 | 0.02 |
| cf. *Periglypta listeri* | Princess Venus | 2 | 0.07 | 1 | 0.20 | 1.1 | 0.01 | 1.1 | 0.01 |
| *Chione cancellata* | Cross-barred Venus | 1 | 0.03 | 1 | 0.20 | 2.0 | 0.03 | 1.7 | 0.02 |
| *Anomalocardium brasiliana* | West Indian Pointed Venus | 1 | 0.03 | 1 | 0.20 | .9 | 0.01 | 1.0 | 0.01 |
| Bivalvia uid | Unidentified Bivalves | * | 0.00 | - | 0.00 | 39.1 | 0.50 | 12.7 | 0.11 |
| **TOTAL BIVALVIA** | **TOTAL BIVALVES** | **53** | **1.78** | **23** | **4.65** | **148.8** | **1.91** | **54.6** | **0.49** |
| Mollusca uid | Unidentified Mollusk | * | 0.00 | - | 0.00 | 81.1 | 1.04 | 39.5 | 0.35 |
| **TOTAL MOLLUSCA** | **TOTAL MOLLUSKS** | **863** | **28.94** | **304** | **61.41** | **3379.2** | **43.35** | **1382.4** | **12.34** |
| Echinoidea | Sea Urchins | 1 | 0.03 | 1 | 0.20 | - | 0.00 | - | 0.00 |
| **TOTAL INVERTEBRATA** | **TOTAL INVERTEBRATES** | **2364** | **79.28** | **425** | **85.86** | **7128.5** | **91.45** | **3182.7** | **28.42** |
| **SAMPLE TOTAL** | **VERTEBRATES AND INVERTEBRATES** | **2982** | **100.00** | **495** | **100.00** | **7794.8** | **100.00** | **11200.2** | **100.00** |

Table C-3. Faunal rmains from N98W13, 60-70 cm, flotation.

| Species | Common Name | Number of Fragments # | Number of Fragments % | Minimum Number of Individuals # | Minimum Number of Individuals % | Bone/Shell Weight g | Bone/Shell Weight % | Minimum Edible Meat Weight g | Minimum Edible Meat Weight % |
|---|---|---|---|---|---|---|---|---|---|
| Rodentia | Rodent | 1 | 0.48 | 1 | 3.33 | .05 | 0.05 | 2.3 | 0.47 |
| Mammalia uid | Unidentified Mammal | 1 | 0.48 | - | 0.00 | .5 | 0.50 | 14.7 | 2.99 |
| **TOTAL MAMMALIA** | **TOTAL MAMMAL** | **2** | **0.96** | **1** | **3.33** | **.55** | **0.55** | **17.0** | **3.46** |
| Columbidae | Doves and Pigeons | 2 | 0.96 | 2 | 6.67 | .2 | 0.20 | 4.5 | 0.92 |
| Aves uid | Unidentified Birds | 16 | 7.69 | - | 0.00 | .3 | 0.30 | 6.3 | 1.28 |
| **TOTAL AVES** | **TOTAL BIRDS** | **18** | **8.65** | **2** | **6.67** | **.5** | **0.50** | **10.8** | **2.20** |
| Lacertilia | Lizard | 2 | 0.96 | 1 | 3.33 | <.01 | 0.00 | - | 0.00 |
| **TOTAL REPTILIA** | **TOTAL REPTILE** | **2** | **0.96** | **1** | **3.33** | **-** | **0.00** | **-** | **0.00** |
| Clupeidae | Herring, Shad, Sardine | 14 | 6.73 | 1 | 3.33 | .05 | 0.05 | 1.5 | 0.31 |
| *Tylosaurus* sp. | Houndfish | 1 | 0.48 | 1 | 3.33 | .2 | 0.20 | 5.1 | 1.04 |
| *Epinephalus fulvus* | Coney | 1 | 0.48 | 1 | 3.33 | .1 | 0.10 | 2.7 | 0.55 |
| *Epinephalus* sp. | Grouper | 1 | 0.48 | 1 | 3.33 | .05 | 0.05 | 1.5 | 0.31 |
| Carangidae | Jacks | 7 | 3.37 | 1 | 3.33 | .1 | 0.10 | 2.7 | 0.55 |
| *Lutjanus griseus* | Gray Snapper | 1 | 0.48 | 1 | 3.33 | .5 | 0.50 | 11.7 | 2.38 |
| Lutjanidae | Snappers | 2 | 0.96 | 1 | 3.33 | .01 | 0.01 | .3 | 0.06 |
| *Diapterus* spp. | Mojarra | 2 | 0.96 | 1 | 3.33 | .1 | 0.10 | 2.7 | 0.55 |
| *Haemulon* spp. | Grunt | 4 | 1.92 | 1 | 3.33 | .4 | 0.40 | 9.6 | 1.95 |
| *Bodianus* sp. | Hogfish | 1 | 0.48 | 1 | 3.33 | .2 | 0.20 | 5.1 | 1.04 |
| *Halichoeres* sp. | Wrasse | 1 | 0.48 | 1 | 3.33 | .01 | 0.01 | .3 | 0.06 |
| *Melichthyes niger* | Black Durgon | 1 | 0.48 | 1 | 3.33 | .1 | 0.10 | 2.7 | 0.55 |
| Balistidae | Leatherjackets | 124 | 59.62 | - | 0.00 | 1.0 | 1.00 | 21.8 | 4.44 |
| Osteichthyes uid | Unidentified Bony Fishes | * | 0.00 | - | 0.00 | 7.7 | 7.68 | 137.3 | 27.94 |
| **TOTAL OSTEICHTHYES** | **TOTAL BONY FISHES** | **160** | **76.92** | **12** | **40.00** | **10.52** | **10.49** | **205.0** | **41.71** |

Table C-3 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| Vertebrata uid | Unidentified Vertebrates | * | 0.00 | * | 0.00 | 1.1 | 1.10 | 23.8 | 4.84 |
| **TOTAL VERTEBRATES** | **TOTAL VERTEBRATES** | **182** | **87.50** | **16** | **53.33** | **12.67** | **12.63** | **256.6** | **52.21** |
| Portunidae | Swimming Crab | 1 | 0.48 | 1 | 3.33 | .1 | 0.10 | - | 0.00 |
| *Cardisoma guinhumi* | Blue Land Crab | 6 | 2.88 | 3 | 10.00 | 4.7 | 4.69 | 67.5 | 13.73 |
| Gecarcinidae | Land Crab | 3 | 1.44 | - | 0.00 | .5 | 0.50 | 14.5 | 2.95 |
| Brachyura | Unidentified Crab | * | 0.00 | - | 0.00 | 68.2 | 68.00 | 138.5 | 28.18 |
| **TOTAL CRUSTACEA** | **TOTAL MARINE ARTHROPODS** | **10** | **4.81** | **4** | **13.33** | **73.5** | **73.28** | **220.5** | **44.87** |
| *Cittarium pica* | West Indian Top Shell | 2 | 0.96 | 1 | 3.33 | 2.6 | 2.59 | 1.7 | 0.35 |
| *Nerita peloronta* | Bleeding Tooth Nerite | 2 | 0.96 | 1 | 3.33 | .5 | 0.50 | 5.7 | 1.16 |
| *N. versicolor* | Four-toothed Nerite | 1 | 0.48 | 1 | 3.33 | 1.4 | 1.40 | .9 | 0.18 |
| *Nerita* sp. | Nerite | 1 | 0.48 | 1 | 3.33 | .3 | 0.30 | .2 | 0.04 |
| Neritina spp. | Nerite | 2 | 0.96 | 1 | 3.33 | .1 | 0.10 | .1 | 0.02 |
| *Littorina lineolata* | Lineolate Periwinkle | 1 | 0.48 | 1 | 3.33 | .2 | 0.20 | .1 | 0.02 |
| *Littorina* spp. | Periwinkle | 3 | 1.44 | 1 | 3.33 | .02 | 0.02 | .02 | 0.00 |
| *Oliva sayana* | Lettered Olive | 1 | 0.48 | 1 | 3.33 | 5.7 | 5.68 | 3.4 | 0.69 |
| Gastropoda uid marine | Uid Marine Snails | * | 0.00 | * | 0.00 | 1.4 | 1.40 | .9 | 0.18 |
| **TOTAL GASTROPODA MARINE** | **TOTAL MARINE SNAILS** | **13** | **6.25** | **8** | **26.67** | **12.22** | **12.18** | **13.02** | **2.65** |
| *Bulimulus* spp. (1) | | (7) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Opeas pumilum* | | (21) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Gastroocopta pellucida* | | (1) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| Sagidae | | (2) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| **TOTAL GASTROPODA TERRESTRIAL** | **TOTAL LAND SNAILS** | **(31)** | **0.00** | **-** | **0.00** | **-** | **0.00** | **-** | **0.00** |

Table C-3 continued

| Species | Common Name | Number of Fragments # | % | Minimum Number of Individuals # | % | Bone/Shell Weight g | % | Minimum Edible Meat Weight g | % |
|---|---|---|---|---|---|---|---|---|---|
| Bivalvia uid | Unidentified Bivalves | * | 0.00 | 1 | 3.33 | .01 | 0.01 | - | 0.00 |
| **TOTAL BIVALVIA** | **TOTAL BIVALVES** | ***** | **0.00** | **1** | **3.33** | **.01** | **0.01** | **-** | **0.00** |
| Mollusca uid | Unidentified Mollusks | * | 0.00 | * | 0.00 | 1.9 | 1.89 | 1.3 | 0.26 |
| **TOTAL MOLLUSCA** | **TOTAL MOLLUSK** | **13** | **6.25** | **9** | **30.00** | **14.13** | **14.09** | **14.32** | **2.91** |
| Echinoidea | Sea Urchins | 3 | 1.44 | 1 | 3.33 | - | 0.00 | - | 0.00 |
| **TOTAL INVERTEBRATA** | **TOTAL INVERTEBRATES** | **26** | **12.50** | **14** | **46.67** | **87.63** | **87.37** | **234.82** | **47.78** |
| **SAMPLE TOTAL** | **VERTEBRATES AND INVERTEBRATES** | **208** | **100.00** | **30** | **100.00** | **100.3** | **100.00** | **491.4** | **100.00** |

Table C-4. Faunal remains from S38W18 0-120 cm flotation samples.

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Isolobodon portoricensis* | Allen's Hutia | 6 | 0.17 | 1 | 0.43 | 2.1 | 0.31 | 46.9 | 1.04 |
| *Plagiodontia* sp. | Hutia | 1 | 0.03 | 1 | 0.43 | .0 | 0.04 | 9.7 | 0.21 |
| Capromyidae | Hutia | 1 | 0.03 | 1 | 0.43 | .3 | 0.04 | 9.7 | 0.21 |
| Rodentia | Unidentified Rodent | 11 | 0.31 | - | 0.00 | .6 | 0.09 | 16.9 | 0.37 |
| **TOTAL MAMMALIA** | **TOTAL MAMMAL** | **19** | **0.54** | **3** | **1.28** | **3.3** | **0.49** | **83.2** | **1.84** |
| Anatidae | Ducks, Geese, Swans | 1 | 0.03 | 1 | 0.43 | .8 | 0.12 | 14.4 | 0.32 |
| *Columba* spp. | Dove | 5 | 0.14 | 3 | 1.28 | .6 | 0.09 | 11.3 | 0.25 |
| Columbidae | Doves and Pigeons | 8 | 0.23 | 2 | 0.85 | 1.0 | 0.15 | 18.8 | 0.42 |
| Passeriformes | Song birds | 2 | 0.06 | 2 | 0.85 | .02 | 0.00 | .7 | 0.02 |
| Aves uid | Unidentified Birds | 131 | 3.71 | - | 0.00 | 5.1 | 0.76 | 68.3 | 1.51 |
| **TOTAL AVES** | **TOTAL BIRDS** | **147** | **4.16** | **8** | **3.40** | **7.52** | **1.12** | **113.5** | **2.51** |
| *Trachemys* spp. | Pond Slider | 2 | 0.06 | 1 | 0.43 | 1.5 | 0.22 | 55.4 | 1.22 |
| Testudines | Turtles | 6 | 0.17 | - | 0.00 | 1.2 | 0.18 | 49.2 | 1.09 |
| *Iguana iguana* | Iguana | 1 | 0.03 | 1 | 0.43 | <.01 | 0.00 | - | 0.00 |
| *Anolis* spp. | Anole | 2 | 0.06 | 2 | 0.85 | <.01 | 0.00 | - | 0.00 |
| Iguanidae | Iguanas, Anoles, Lizards | 1 | 0.03 | 1 | 0.43 | <.01 | 0.00 | - | 0.00 |
| *Amevia* sp. | Runner | 1 | 0.03 | 1 | 0.43 | .3 | 0.04 | - | 0.00 |
| cf. *Diploglossus* sp. | Lizard | 1 | 0.03 | 1 | 0.43 | .1 | 0.01 | - | 0.00 |
| *Alsophis* spp. | Snake | 2 | 0.06 | 1 | 0.43 | .1 | 0.01 | 1.3 | 0.03 |
| Colubridae | Snake | 1 | 0.03 | 1 | 0.43 | .1 | 0.01 | 1.3 | 0.03 |
| Serpentes | Snake | 6 | 0.17 | - | 0.00 | .01 | 0.00 | .1 | 0.00 |
| Reptilia uid | Unidentified Reptiles | 8 | 0.23 | - | 0.00 | .04 | 0.01 | - | 0.00 |
| **TOTAL REPTILIA** | **TOTAL REPTILES** | **31** | **0.88** | **9** | **3.83** | **.65** | **0.10** | **107.3** | **2.37** |

Table C-4 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Bufo* sp. | Toad | 1 | 0.03 | 1 | 0.43 | <.01 | 0.00 | - | 0.00 |
| Anura | Frog | 1 | 0.03 | - | 0.00 | .01 | 0.00 | - | 0.00 |
| **TOTAL AMPHIBIA** | **TOTAL AMPHIBIAN** | **2** | **0.06** | **1** | **0.43** | **.01** | **0.00** | **-** | **0.00** |
| *Anguilla rostrata* | American Eel | 3 | 0.08 | 1 | 0.43 | .1 | 0.01 | 2.7 | 0.06 |
| Anguilliformes | Eels and Morays | 1 | 0.03 | - | 0.00 | .1 | 0.01 | 2.7 | 0.06 |
| *Harengula* sp. | Sardine | 40 | 1.13 | 23 | 9.79 | .1 | 0.01 | 2.7 | 0.06 |
| Clupeidae | Herring, Shad, Sardine | 931 | 26.34 | - | 0.00 | 3.1 | 0.46 | 60.6 | 1.34 |
| *Hemiramphus* spp. | Halfbeak | 7 | 0.20 | 2 | 0.85 | .1 | 0.01 | 2.7 | 0.06 |
| Exocoetidae | Flying Fish | 5 | 0.14 | - | 0.00 | .1 | 0.01 | 2.7 | 0.06 |
| *Strongylura* spp. | Needlefish | 35 | 0.99 | 4 | 1.70 | .5 | 0.07 | 11.7 | 0.26 |
| *Tylosaurus* spp. | Houndfish | 2 | 0.06 | 2 | 0.85 | .5 | 0.07 | 11.7 | 0.26 |
| *Holocentrus* cf. *rufus* | Longspine Squirrelfish | 1 | 0.03 | 1 | 0.43 | 1.5 | 0.22 | 31.5 | 0.70 |
| *Holocentrus* spp. | Squirrelfish | 4 | 0.11 | - | 0.00 | .4 | 0.06 | 9.6 | 0.21 |
| Holocentridae. | Squirrelfish | 3 | 0.08 | - | 0.00 | .1 | 0.01 | 2.7 | 0.06 |
| *Centropomus* spp. | Snook | 5 | 0.14 | 1 | 0.43 | 1.8 | 0.27 | 37.1 | 0.82 |
| *Epinephalus fulvus* | Coney | 25 | 0.71 | 2 | 0.85 | 1.5 | 0.22 | 31.5 | 0.70 |
| *Epinephalus* spp. | Grouper | 17 | 0.48 | 2 | 0.85 | .8 | 0.12 | 17.9 | 0.40 |
| cf. *Epinephalus* spp. | Grouper | 2 | 0.06 | - | 0.00 | .1 | 0.01 | 2.7 | 0.06 |
| Serranidae | Sea Bass | 14 | 0.40 | - | 0.00 | 1.1 | 0.16 | 23.8 | 0.53 |
| *Caranx crysos* | Blue Runner | 2 | 0.06 | 1 | 0.43 | .04 | 0.01 | 1.2 | 0.03 |
| *C.* cf. *latus* | Horse-eye Jack | 2 | 0.06 | 1 | 0.43 | <.01 | 0.00 | - | 0.00 |
| *Caranx* sp. | Jack | 70 | 1.98 | 2 | 0.85 | 3.7 | 0.55 | 71.0 | 1.57 |
| cf. *Selene* sp. | Moonfish | 1 | 0.03 | 1 | 0.43 | .04 | 0.01 | 1.2 | 0.03 |
| *Trachinotus* spp. | Pompano | 3 | 0.08 | 1 | 0.43 | .7 | 0.10 | 15.9 | 0.35 |
| Carangidae | Jacks | 39 | 1.10 | - | 0.00 | .9 | 0.13 | 19.9 | 0.44 |

Table C-4. Faunal remains from S38W18 0-120 cm flotation samples.

| Species | Common Name | Number of Fragments # | Number of Fragments % | Minimum Number of Individuals # | Minimum Number of Individuals % | Bone/Shell Weight g | Bone/Shell Weight % | Minimum Edible Meat Weight g | Minimum Edible Meat Weight % |
|---|---|---|---|---|---|---|---|---|---|
| *Isolobodon portoricensis* | Allen's Hutia | 6 | 0.17 | 1 | 0.43 | 2.1 | 0.31 | 46.9 | 1.04 |
| *Plagiodontia* sp. | Hutia | 1 | 0.03 | 1 | 0.43 | .0 | 0.04 | 9.7 | 0.21 |
| Capromyidae | Hutia | 1 | 0.03 | 1 | 0.43 | .3 | 0.04 | 9.7 | 0.21 |
| Rodentia | Unidentified Rodent | 11 | 0.31 | - | 0.00 | .6 | 0.09 | 16.9 | 0.37 |
| **TOTAL MAMMALIA** | **TOTAL MAMMAL** | **19** | **0.54** | **3** | **1.28** | **3.3** | **0.49** | **83.2** | **1.84** |
| Anatidae | Ducks, Geese, Swans | 1 | 0.03 | 1 | 0.43 | .8 | 0.12 | 14.4 | 0.32 |
| *Columba* spp. | Dove | 5 | 0.14 | 3 | 1.28 | .6 | 0.09 | 11.3 | 0.25 |
| Columbidae | Doves and Pigeons | 8 | 0.23 | 2 | 0.85 | 1.0 | 0.15 | 18.8 | 0.42 |
| Passeriformes | Song birds | 2 | 0.06 | 2 | 0.85 | .02 | 0.00 | .7 | 0.02 |
| Aves uid | Unidentified Birds | 131 | 3.71 | - | 0.00 | 5.1 | 0.76 | 68.3 | 1.51 |
| **TOTAL AVES** | **TOTAL BIRDS** | **147** | **4.16** | **8** | **3.40** | **7.52** | **1.12** | **113.5** | **2.51** |
| *Trachemys* spp. | Pond Slider | 2 | 0.06 | 1 | 0.43 | 1.5 | 0.22 | 55.4 | 1.22 |
| Testudines | Turtles | 6 | 0.17 | - | 0.00 | 1.2 | 0.18 | 49.2 | 1.09 |
| *Iguana iguana* | Iguana | 1 | 0.03 | 1 | 0.43 | <.01 | 0.00 | - | 0.00 |
| *Anolis* spp. | Anole | 2 | 0.06 | 2 | 0.85 | <.01 | 0.00 | - | 0.00 |
| Iguanidae | Iguanas, Anoles, Lizards | 1 | 0.03 | 1 | 0.43 | <.01 | 0.00 | - | 0.00 |
| *Amevia* sp. | Runner | 1 | 0.03 | 1 | 0.43 | .3 | 0.04 | - | 0.00 |
| cf. *Diploglossus* sp. | Lizard | 1 | 0.03 | 1 | 0.43 | .1 | 0.01 | - | 0.00 |
| *Alsophis* spp. | Snake | 2 | 0.06 | 1 | 0.43 | .1 | 0.01 | 1.3 | 0.03 |
| Colubridae | Snake | 1 | 0.03 | 1 | 0.43 | .1 | 0.01 | 1.3 | 0.03 |
| Serpentes | Snake | 6 | 0.17 | - | 0.00 | .01 | 0.00 | .1 | 0.00 |
| Reptilia uid | Unidentified Reptiles | 8 | 0.23 | - | 0.00 | .04 | 0.01 | - | 0.00 |
| **TOTAL REPTILIA** | **TOTAL REPTILES** | **31** | **0.88** | **9** | **3.83** | **.65** | **0.10** | **107.3** | **2.37** |

Table C-4 continued

| Species | Common Name | Number of Fragments # | Number of Fragments % | Minimum Number of Individuals # | Minimum Number of Individuals % | Bone/Shell Weight g | Bone/Shell Weight % | Minimum Edible Meat Weight g | Minimum Edible Meat Weight % |
|---|---|---|---|---|---|---|---|---|---|
| *Bufo* sp. | Toad | 1 | 0.03 | 1 | 0.43 | <.01 | 0.00 | - | 0.00 |
| Anura | Frog | 1 | 0.03 | - | 0.00 | .01 | 0.00 | - | 0.00 |
| **TOTAL AMPHIBIA** | **TOTAL AMPHIBIAN** | **2** | **0.06** | **1** | **0.43** | **.01** | **0.00** | **-** | **0.00** |
| *Anguilla rostrata* | American Eel | 3 | 0.08 | 1 | 0.43 | .1 | 0.01 | 2.7 | 0.06 |
| Anguilliformes | Eels and Morays | 1 | 0.03 | - | 0.00 | .1 | 0.01 | 2.7 | 0.06 |
| *Harengula* sp. | Sardine | 40 | 1.13 | 23 | 9.79 | .1 | 0.01 | 2.7 | 0.06 |
| Clupeidae | Herring, Shad, Sardine | 931 | 26.34 | - | 0.00 | 3.1 | 0.46 | 60.6 | 1.34 |
| *Hemiramphus* spp. | Halfbeak | 7 | 0.20 | 2 | 0.85 | .1 | 0.01 | 2.7 | 0.06 |
| Exocoetidae | Flying Fish | 5 | 0.14 | - | 0.00 | .1 | 0.01 | 2.7 | 0.06 |
| *Strongylura* spp. | Needlefish | 35 | 0.99 | 4 | 1.70 | .5 | 0.07 | 11.7 | 0.26 |
| *Tylosaurus* spp. | Houndfish | 2 | 0.06 | 2 | 0.85 | .5 | 0.07 | 11.7 | 0.26 |
| *Holocentrus* cf. *rufus* | Longspine Squirrelfish | 1 | 0.03 | 1 | 0.43 | 1.5 | 0.22 | 31.5 | 0.70 |
| *Holocentrus* spp. | Squirrelfish | 4 | 0.11 | - | 0.00 | .4 | 0.06 | 9.6 | 0.21 |
| Holocentridae. | Squirrelfish | 3 | 0.08 | - | 0.00 | .1 | 0.01 | 2.7 | 0.06 |
| *Centropomus* spp. | Snook | 5 | 0.14 | 1 | 0.43 | 1.8 | 0.27 | 37.1 | 0.82 |
| *Epinephalus fulvus* | Coney | 25 | 0.71 | 2 | 0.85 | 1.5 | 0.22 | 31.5 | 0.70 |
| *Epinephalus* spp. | Grouper | 17 | 0.48 | 2 | 0.85 | .8 | 0.12 | 17.9 | 0.40 |
| cf. *Epinephalus* spp. | Grouper | 2 | 0.06 | - | 0.00 | .1 | 0.01 | 2.7 | 0.06 |
| Serranidae | Sea Bass | 14 | 0.40 | - | 0.00 | 1.1 | 0.16 | 23.8 | 0.53 |
| *Caranx crysos* | Blue Runner | 2 | 0.06 | 1 | 0.43 | .04 | 0.01 | 1.2 | 0.03 |
| *C.* cf. *latus* | Horse-eye Jack | 2 | 0.06 | 1 | 0.43 | <.01 | 0.00 | - | 0.00 |
| *Caranx* sp. | Jack | 70 | 1.98 | 2 | 0.85 | 3.7 | 0.55 | 71.0 | 1.57 |
| cf. *Selene* sp. | Moonfish | 1 | 0.03 | 1 | 0.43 | .04 | 0.01 | 1.2 | 0.03 |
| *Trachinotus* spp. | Pompano | 3 | 0.08 | 1 | 0.43 | .7 | 0.10 | 15.9 | 0.35 |
| Carangidae | Jacks | 39 | 1.10 | - | 0.00 | .9 | 0.13 | 19.9 | 0.44 |

Table C-4 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Lutjanus* cf. *campechanus* | Red Snapper | 1 | 0.03 | 1 | 0.43 | .05 | 0.01 | 1.5 | 0.03 |
| *Lutjanus jocu* | Dog Snapper | 4 | 0.11 | 1 | 0.43 | .2 | 0.03 | 5.1 | 0.11 |
| *Lutjanus* spp. | Snapper | 12 | 0.34 | - | 0.00 | 1.9 | 0.28 | 39.0 | 0.86 |
| *Ocyurus chrysurus* | Yellowtail Snapper | 1 | 0.03 | 1 | 0.43 | .04 | 0.01 | 1.2 | 0.03 |
| Lutjanidae | Snappers | 11 | 0.31 | - | 0.00 | 1.3 | 0.19 | 27.7 | 0.61 |
| *Diapterus* sp. | Mojarra | 3 | 0.08 | 3 | 1.28 | .04 | 0.01 | 1.2 | 0.03 |
| Gerreidae | Mojarras | 2 | 0.06 | 2 | 0.85 | .04 | 0.01 | 1.2 | 0.03 |
| *Anisotremus surinamensis* | Black Margate | 1 | 0.03 | 1 | 0.43 | .1 | 0.01 | 2.7 | 0.06 |
| *A. virginicus* | Porkfish | 2 | 0.06 | 1 | 0.43 | .3 | 0.04 | 7.4 | 0.16 |
| *Anisotremus* spp. | Grunt | 4 | 0.11 | - | 0.00 | .3 | 0.04 | 7.4 | 0.16 |
| *Haemulon plumieri* | White Grunt | 7 | 0.20 | 2 | 0.85 | .6 | 0.09 | 13.8 | 0.30 |
| *Haemulon* spp. | Grunt | 38 | 1.07 | 2 | 0.85 | 2.2 | 0.33 | 44.5 | 0.98 |
| cf. *Orthopristis chrysoptera* | Pigfish | 1 | 0.03 | 1 | 0.43 | .02 | 0.00 | .7 | 0.02 |
| Haemulidae | Grunts | 4 | 0.11 | - | 0.00 | .3 | 0.04 | 7.4 | 0.16 |
| Sparidae | Porgies | 3 | 0.08 | 1 | 0.43 | .05 | 0.01 | 1.5 | 0.03 |
| *Bairdiella ronchus* | Roncho Basto | 1 | 0.03 | 1 | 0.43 | .1 | 0.01 | 2.7 | 0.06 |
| Pomacanthidae | Anglefishes | 1 | 0.03 | 1 | 0.43 | .1 | 0.01 | 2.7 | 0.06 |
| *Abudefduf* cf. *saxatilis* | Sergeant Major | 1 | 0.03 | 1 | 0.43 | .03 | 0.00 | .9 | 0.02 |
| *Bodianus rufus* | Spanish Hogfish | 2 | 0.06 | 1 | 0.43 | .4 | 0.06 | 9.6 | 0.21 |
| *Bodianus* spp. | Hogfish | 2 | 0.06 | 1 | 0.43 | .5 | 0.07 | 11.7 | 0.26 |
| *Halichoeres bivittatus* | Slippery Dick | 1 | 0.03 | 1 | 0.43 | .04 | 0.01 | 1.2 | 0.03 |
| *H.* cf. *bivittatus* | Slippery Dick | 1 | 0.03 | - | 0.00 | .01 | 0.00 | .3 | 0.01 |
| *H.* cf. *radiatus* | Puddingwife | 1 | 0.03 | 1 | 0.43 | .2 | 0.03 | 5.1 | 0.11 |
| *Halichoeres* spp. | Wrasse | 2 | 0.06 | - | 0.00 | .7 | 0.10 | 15.8 | 0.35 |
| Labridae | Wrasses | 1 | 0.03 | 1 | 0.43 | <.01 | 0.00 | - | 0.00 |
| *Scarus* sp. | Parrotfish | 1 | 0.03 | 1 | 0.43 | .4 | 0.06 | 9.6 | 0.21 |

Table C-4 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Sparisoma rubripinne* | Redfin Parrotfish | 1 | 0.03 | 1 | 0.43 | .1 | 0.01 | 2.7 | 0.06 |
| *Sparisoma* spp. | Parrotfish | 13 | 0.37 | 2 | 0.85 | 1.9 | 0.28 | 39.0 | 0.86 |
| cf. *Sparisoma* spp. | Parrotfish | 5 | 0.14 | - | 0.00 | .2 | 0.03 | 5.1 | 0.11 |
| *Mugil* spp. | Mullet | 10 | 0.28 | 4 | 1.70 | 1.0 | 0.15 | 21.9 | 0.48 |
| cf. Sphyraenidae | Barracuda | 1 | 0.03 | 1 | 0.43 | .02 | 0.00 | .7 | 0.02 |
| *Gobiomorus dormitor* | Bigmouth Sleeper | 26 | 0.74 | 3 | 1.28 | 2.0 | 0.30 | 40.8 | 0.90 |
| *Gobiomorus* spp. | Sleeper | 3 | 0.08 | - | 0.00 | .3 | 0.04 | 7.4 | 0.16 |
| Eleotridae | Sleepers | 2 | 0.06 | - | 0.00 | .03 | 0.00 | .9 | 0.02 |
| *Gobionellus* spp. | Goby | 3 | 0.08 | 1 | 0.03 | .02 | 0.00 | .7 | 0.02 |
| *Acanthrurus coeruleus* | Blue Tang | 1 | 0.03 | 1 | 0.43 | .01 | 0.00 | .3 | 0.01 |
| *Acanthrurus* sp. | Surgeonfish | 1 | 0.03 | - | 0.00 | .1 | 0.01 | 2.7 | 0.06 |
| cf. *Acanthrurus* sp. | Surgeonfish | 1 | 0.03 | - | 0.00 | .01 | 0.00 | .3 | 0.01 |
| *Scomberomorus* spp. | Mackeral | 3 | 0.08 | 1 | 0.43 | 2.2 | 0.33 | 44.5 | 0.98 |
| *Thunnus* sp. | Tuna | 1 | 0.03 | 1 | 0.43 | .2 | 0.03 | 5.1 | 0.11 |
| cf. *Thunnus* spp. | Tuna | 2 | 0.06 | - | 0.00 | 1.6 | 0.24 | 33.4 | 0.74 |
| Scombridae | Mackerals | 3 | 0.08 | - | 0.00 | 2.7 | 0.40 | 53.5 | 1.18 |
| *Balistes* cf. *vetula* | Queen Triggerfish | 1 | 0.03 | 1 | 0.43 | .4 | 0.06 | 9.6 | 0.21 |
| *Balistes* spp. | Triggerfish | 9 | 0.25 | 2 | 0.85 | 1.6 | 0.24 | 33.4 | 0.74 |
| *Melichthyes niger* | Black Durgon | 13 | 0.37 | 1 | 0.43 | 1.6 | 0.24 | 33.4 | 0.74 |
| Balistidae | Leatherjackets | 1301 | 36.80 | - | 0.00 | 9.7 | 1.44 | 169.1 | 3.73 |
| *Diodon* spp. | Porcupinefish | 2 | 0.06 | 1 | 0.43 | .5 | 0.07 | 11.7 | 0.26 |
| Diodontidae | Porcupinefishes | 1 | 0.03 | - | 0.00 | <.01 | 0.00 | - | 0.00 |
| Osteichthyes uid | Unidentified Bony Fishes | * | 0.00 | - | 0.00 | 128.8 | 19.4 | 1733.5 | 38.28 |
| **TOTAL OSTEICHTHYES** | **TOTAL BONY FISHES** | **2723** | **77.03** | **89** | **37.87** | **182.19** | **27.08** | **2835.1** | **62.61** |

Table C-4 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| Vertebrata uid | Unidentified Vertebrates | * | 0.00 | - | 0.00 | 71.6 | 10.64 | 1021.9 | 22.57 |
| **TOTAL VERTEBRATA** | **TOTAL VERTEBRATES** | **2922** | **82.66** | **110** | **46.81** | **265.27** | **39.43** | **4161** | **91.89** |
| *Cardisoma guanhumi* | Blue Land Crab | 5 | 0.14 | 1 | 0.43 | 1.4 | 0.21 | 23.2 | 0.51 |
| Brachyura | Unidentified Crab | * | 0.00 | - | 0.00 | 190.4 | 28.30 | 222.2 | 4.91 |
| **TOTAL CRUSTACEA** | **TOTAL MARINE ARTHROPODS** | **5** | **0.14** | **1** | **0.43** | **191.8** | **28.51** | **245.4** | **5.42** |
| *Fissurella nodosa* | Knobby Keyhole Limpet | 48 | 1.36 | 18 | 7.66 | 23.8 | 3.54 | 12.8 | 0.28 |
| *F. rosea* | Rosy Keyhole Limpet | 1 | 0.03 | 1 | 0.43 | .1 | 0.01 | .08 | 0.00 |
| *Fissurella* sp. | Keyhole Limpet | 1 | 0.03 | - | 0.00 | 1.3 | 0.19 | .9 | 0.02 |
| Fissurellidae | Keyhole Limpets | 5 | 0.14 | - | 0.00 | 1.3 | 0.19 | .9 | 0.02 |
| *Acmaea antillarium* | Antillean Limpet | 1 | 0.03 | 1 | 0.43 | .05 | 0.01 | .04 | 0.00 |
| cf. *Acmaea* sp. | Limpet | 1 | 0.03 | - | 0.00 | .02 | 0.00 | .02 | 0.00 |
| Trochidae | Margarites | 1 | 0.03 | 1 | 0.43 | .01 | 0.00 | -- | 0.00 |
| *Cittarium pica* | West Indian Top Shell | 90 | 2.55 | 3 | 1.28 | 52.6 | 7.82 | 26.5 | 0.59 |
| *Nerita fulgurans* | Antillean Nerite | 2 | 0.06 | 2 | 0.85 | 1.2 | 0.18 | .8 | 0.02 |
| *N. peloronta* | Bleeding Tooth Nerite | 2 | 0.06 | 2 | 0.85 | 1.2 | 0.18 | .8 | 0.02 |
| *N. tessellata* | Tessellate Nerite | 10 | 0.28 | 10 | 4.26 | 2.0 | 0.30 | 1.3 | 0.03 |
| *N. versicolor* | Four-toothed Nerite | 16 | 0.45 | 16 | 6.81 | 7.0 | 1.04 | 4.1 | 0.09 |
| *Nerita* spp. | Nerite | 17 | 0.48 | - | 0.00 | 3.3 | 0.49 | 2.1 | 0.05 |
| *Neritina virginea* | Virgin Nerite | 17 | 0.48 | 15 | 6.38 | 4.7 | 0.70 | 2.9 | 0.06 |
| cf. *Neritina* sp. | Nerite | 1 | 0.03 | - | 0.00 | .1 | 0.01 | .1 | 0.00 |
| *Pupura pupa* | Zebra Nerite | 2 | 0.06 | 2 | 0.85 | .1 | 0.01 | .1 | 0.00 |
| Neritidea | Nerites | 43 | 1.22 | - | 0.00 | 2.6 | 0.39 | 1.7 | 0.04 |
| *Littorina angustior* | August Periwinkle | 1 | 0.03 | 1 | 0.43 | .2 | 0.03 | .2 | 0.00 |
| *L. lineolata* | Lineolate Periwinkle | 3 | 0.08 | 3 | 1.28 | .5 | 0.07 | .4 | 0.01 |

Table C-4 continued

| Species | Common Name | Number of Fragments # | Number of Fragments % | Minimum Number of Individuals # | Minimum Number of Individuals % | Bone/Shell Weight g | Bone/Shell Weight % | Minimum Edible Meat Weight g | Minimum Edible Meat Weight % |
|---|---|---|---|---|---|---|---|---|---|
| *L. meleagris* | White-spotted Periwinkle | 1 | 0.03 | 1 | 0.43 | <.01 | 0.00 | -- | 0.00 |
| *L. ziczac* | Zebra Periwinkle | 3 | 0.08 | 3 | 1.28 | .4 | 0.06 | .3 | 0.01 |
| *Littorina* sp. | Periwinkle | 1 | 0.03 | - | 0.00 | .2 | 0.03 | .2 | 0.00 |
| *Nodolittorina tuberculata* | Common Prickly-winkle | 5 | 0.14 | 5 | 2.13 | .7 | .10 | .5 | 0.01 |
| *Tectarius muricatus* | Beaded Periwinkle | 7 | 0.20 | 7 | 2.98 | .8 | 0.12 | .6 | 0.01 |
| Littorinidae | Periwinkles | 2 | 0.06 | - | 0.00 | .02 | 0.00 | -- | 0.00 |
| *Zebina browniana* | Smooth Risso | 1 | 0.03 | 1 | 0.43 | -- | 0.00 | -- | 0.00 |
| *Cerithium eburneum* | Ivory Cerith | 5 | 0.14 | 5 | 2.13 | 2.2 | 0.33 | 1.4 | 0.03 |
| *Cerithium* sp. | Cerith | 1 | 0.03 | - | 0.00 | .1 | 0.01 | .1 | 0.00 |
| Cerithidae | Cerith | 1 | 0.03 | - | 0.00 | .2 | 0.03 | .2 | 0.00 |
| *Crepidula* sp. | Slipper-shell | 1 | 0.03 | 1 | 0.43 | .1 | 0.01 | .1 | 0.00 |
| *Strombus* spp. | Conch | 24 | 0.68 | 1 | 0.43 | 18.9 | 2.81 | 10.3 | 0.23 |
| *Polinices* sp. | Moon Snail | 2 | 0.06 | 2 | 0.85 | 1.9 | 0.28 | 1.2 | 0.03 |
| *Mitrella ocellata* | White-spotted Dove-shell | 1 | 0.03 | 1 | 0.43 | .1 | 0.01 | .1 | 0.00 |
| cf. Columbellidae | Dove-shell | 1 | 0.03 | - | 0.00 | .2 | 0.03 | .2 | 0.00 |
| *Oliva* sp. | Olive | 1 | 0.03 | 1 | 0.43 | 2.4 | 0.36 | 1.5 | 0.03 |
| *Engoniophos unicinctus* | ——— | 2 | 0.06 | 2 | 0.85 | .4 | 0.06 | .3 | 0.01 |
| cf. *Melampus* sp | Melampus | 1 | 0.03 | 1 | 0.43 | .1 | 0.01 | .1 | 0.00 |
| Gastropoda uid marine | Uid Marine Gastrophods | * | 0.00 | - | 0.00 | 37.9 | 5.63 | 19.6 | 0.43 |
| **TOTAL GASTROPODA MARINE** | **TOTAL MARINE GASTROPODS** | **322** | **9.11** | **106** | **45.11** | **168.7** | **25.07** | **92.44** | **2.04** |
| *Bulimulus* spp. (1) | | (304) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Leptineria* spp. | | (11) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Opeas pumilum* | | (771) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |

Table C-4 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Opeas* spp. | | (139) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Gastrocopta pellucida* | | (139) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| Sagidae | | (80) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Megalomastoma croecum* | | (1) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| cf. Cyclophoridae | | (2) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| **TOTAL GASTROPODA TERR.** | **TOTAL LAND SNAILS** | **(1147)** | **0.00** | **-** | **0.00** | **-** | **0.00** | **-** | **0.00** |
| Chiton s.l. | Coat-of-Mail Shells | 278 | 7.68 | 12 | 5.11 | 32.9 | 4.89 | 20.8 | 0.46 |
| **TOTAL CHITON** | **TOTAL COAT-OF-MAIL SHELLS** | **278** | **7.68** | **12** | **5.11** | **32.9** | **4.89** | **20.8** | **0.46** |
| Arcidae | Arks | 1 | 0.03 | 1 | 0.43 | .4 | 0.06 | .6 | 0.01 |
| Pectinidae | Scallops | 1 | 0.03 | 1 | 0.43 | .7 | 0.10 | .8 | 0.02 |
| *Chama* spp. | Jewel Box | 3 | 0.08 | 1 | 0.43 | .8 | 0.12 | .9 | 0.02 |
| *Donax denticulatus* | Fat Donax | 1 | 0.03 | 1 | 0.43 | .4 | 0.06 | .6 | 0.01 |
| *Pitar* sp. | Venus | 1 | 0.03 | 1 | 0.43 | .2 | 0.03 | .3 | 0.01 |
| Bivalvia uid | Unidentified Bivalves | * | 0.00 | - | 0.00 | 11.6 | 1.72 | 5.5 | 0.12 |
| **TOTAL BIVALVIA** | **TOTAL BIVALVES** | **7** | **0.20** | **5** | **2.13** | **14.1** | **2.10** | **8.7** | **0.19** |
| Mollusca uid | Unidentified Mollusk | * | 0.00 | - | 0.00 | .04 | 0.01 | .04 | 0.00 |
| **TOTAL MOLLUSCA** | **TOTAL MOLLUSKS** | **607** | **17.17** | **123** | **52.34** | **215.74** | **32.07** | **121.98** | **2.69** |
| Echinoidea | Sea Urchins | 1 | 0.03 | 1 | 0.43 | - | 0.00 | - | 0.00 |
| **TOTAL INVERTEBRATA** | **TOTAL INVERTEBRATES** | **613** | **17.34** | **125** | **53.19** | **407.54** | **60.57** | **367.38** | **8.11** |
| **SAMPLE TOTAL** | **VERTEBRATES AND INVERTEBRATES** | **3535** | **100.00** | **235** | **100.00** | **672.8** | **100.00** | **4528.4** | **100.00** |

Table C-5. Faunal remains from S38W18 50-60 cm, coarse fraction.

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Isolobodon portoricensis* | Allen's Hutia | 60 | 1.31 | 4 | 0.43 | 31.1 | 0.73 | 416.0 | 3.89 |
| *Trichechus manatus* | Manatee | 1 | 0.02 | 1 | 0.11 | 82.0 | 1.93 | 912.4 | 8.53 |
| Mammalia uid | Unidentified Mammal | 6 | 0.13 | - | 0.00 | 1.4 | 0.03 | 33.8 | 0.32 |
| **TOTAL MAMMALIA** | **TOTAL MAMMAL** | **67** | **1.47** | **5** | **0.54** | **114.5** | **2.70** | **1362.2** | **12.72** |
| Anatidae | Ducks, Geese, Swans | 1 | 0.02 | 1 | 0.11 | .3 | 0.01 | 6.3 | 0.06 |
| *Columba* spp. | Dove | 57 | 1.25 | 14 | 1.51 | 9.5 | 0.22 | 115.2 | 1.08 |
| *Egretta alba* | Great Egret | 7 | 0.15 | 1 | 0.11 | 6.6 | 0.16 | 84.8 | 0.79 |
| Fringillidae | Grosbeaks, Finches, Buntings | 1 | 0.02 | 1 | 0.11 | .03 | 0.00 | .9 | 0.01 |
| Aves uid | Unidentified Birds | 114 | 2.50 | - | 0.00 | 15.0 | 0.35 | 169.0 | 1.58 |
| **TOTAL AVES** | **TOTAL BIRDS** | **180** | **3.94** | **17** | **1.83** | **31.43** | **.74** | **376.2** | **3.52** |
| *Trachemys* spp. | Slider | 16 | 0.35 | 1 | 0.11 | 32.0 | 0.75 | 280.4 | 2.62 |
| Chelonidae | Sea Turtles | 2 | 0.04 | 1 | 0.11 | 26.5 | 0.62 | 253.7 | 2.37 |
| Testudines | Turtles | 74 | 1.62 | - | 0.00 | 21.6 | 0.51 | 227.6 | 2.13 |
| *Amevia* spp. | Runner | 2 | 0.04 | 1 | 0.11 | .2 | 0.00 | -- | 0.00 |
| *Alsophis* spp. | Snake | 29 | 0.63 | 2 | 0.22 | 2.2 | 0.05 | 24.1 | 0.23 |
| *Epicrates* spp. | Pigmy Boa | 3 | 0.07 | 1 | 0.11 | .8 | 0.02 | 9.3 | 0.09 |
| Reptilia uid | Unidentified Reptiles | 6 | 0.13 | - | 0.00 | 1.4 | 0.03 | -- | 0.00 |
| **TOTAL REPTILIA** | **TOTAL REPTILES** | **132** | **2.89** | **6** | **0.65** | **84.7** | **2.00** | **795.7** | **7.44** |
| Carcharhinidae | Requiem Sharks | 4 | 0.09 | 1 | 0.11 | .7 | 0.02 | 5.3 | 0.05 |
| **TOTAL CHONDRICHTHYES** | **TOTAL CARTILAGINOUS FISHES** | **4** | **0.09** | **1** | **0.11** | **.7** | **0.02** | **5.3** | **0.05** |
| *Harengula* sp. | Sardine | 1 | 0.02 | 1 | 0.11 | <.01 | 0.00 | -- | 0.00 |
| Clupeidae | Herring, Shad, Sardine | 3 | 0.07 | - | 0.00 | .01 | 0.00 | .3 | 0.00 |

Table C-5 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Tylosaurus* spp. | Houndfish | 39 | 0.85 | 3 | 0.32 | 4.9 | 0.12 | 91.5 | 0.86 |
| Belonidae | Needlefish | 8 | 0.18 | - | 0.00 | .9 | 0.02 | 19.9 | 0.19 |
| *Holocentrus adscensionis* | Longspine Squirrelfish | 4 | 0.09 | 1 | 0.11 | .7 | 0.02 | 15.9 | 0.15 |
| *Holocentrus* spp. | Squirrelfish | 6 | 0.13 | - | 0.00 | .8 | 0.02 | 17.9 | 0.17 |
| *Centropomus undecimalis* | Snook | 3 | 0.07 | 1 | 0.11 | 1.7 | 0.04 | 35.3 | 0.33 |
| *Centropomus* spp. | Snook | 22 | 0.48 | 4 | 0.43 | 9.9 | 0.23 | 172.2 | 1.61 |
| *Epinephalus fulvus* | Coney | 77 | 1.69 | 7 | 0.75 | 10.5 | 0.25 | 181.6 | 1.70 |
| *Epinephalus guttatus* | Red Hind | 2 | 0.04 | 1 | 0.11 | .7 | 0.02 | 15.9 | 0.15 |
| *Epinephalus* spp. | Grouper | 30 | 0.66 | 1 | 0.11 | 4.5 | 0.11 | 84.7 | 0.79 |
| Serranidae | Sea Bass | 2 | 0.04 | 1 | 0.11 | 3.8 | 0.09 | 72.7 | 0.68 |
| *Caranx* spp. | Jack | 82 | 1.80 | 3 | 0.32 | 7.8 | 0.18 | 138.9 | 1.30 |
| *Lutjanus apodus* | Schoolmaster | 3 | 0.07 | 2 | 0.22 | 1.0 | 0.02 | 21.9 | 0.20 |
| *Lutjanus* spp. | Snapper | 45 | 0.99 | 2 | 0.22 | 8.3 | 0.20 | 146.9 | 1.37 |
| Lutjanidae | Snappers | 2 | 0.04 | 2 | 0.22 | .3 | 0.01 | 7.4 | 0.07 |
| *Diapterus* cf. *plumieri* | Stripped Mojarra | 6 | 0.13 | 3 | 0.32 | 1.8 | 0.04 | 37.1 | 0.35 |
| *Haemulon* spp. | Grunt | 68 | 1.49 | 8 | 0.86 | 9.5 | 0.22 | 165.9 | 1.55 |
| Haemulidae | Grunts | 13 | 0.28 | - | 0.00 | 1.8 | 0.04 | 37.1 | 0.35 |
| *Calamus* sp. | Porgies | 1 | 0.02 | 1 | 0.11 | .1 | 0.00 | 2.7 | 0.03 |
| Sciaenidae | Drum | 1 | 0.02 | 1 | 0.11 | .4 | 0.01 | 9.6 | 0.09 |
| *Bodianus rufus* | Spanish Hogfish | 9 | 0.20 | 3 | 0.32 | 1.4 | 0.03 | 29.6 | 0.28 |
| *Halichoeres bivittatus* | Slippery Dick | 6 | 0.13 | 3 | 0.32 | 2.1 | 0.05 | 42.7 | 0.40 |
| Labridae | Wrasses | 7 | 0.15 | - | 0.00 | 1.5 | 0.04 | 31.5 | 0.29 |
| *Sparisoma rubripinne* | Redfin Parrotfish | 6 | 0.13 | 2 | 0.22 | 3.8 | 0.09 | 74.7 | 0.70 |
| *Sparisoma viride* | Spotlight Parrotfish | 5 | 0.11 | 2 | 0.22 | 4.5 | 0.11 | 84.7 | 0.79 |
| Sparisoma spp. | Parrotfish | 17 | 0.37 | - | 0.00 | 4.1 | 0.10 | 77.9 | 0.73 |

Table C-5 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| Scaridae. | Parrotfish | 5 | 0.11 | - | 0.00 | 2.1 | 0.05 | 42.7 | 0.40 |
| *Mugil* spp. | Mullet | 3 | 0.07 | 1 | 0.11 | .2 | 0.00 | 5.1 | 0.05 |
| *Gobiomorus dormitor* | Bigmouth Sleeper | 41 | 0.90 | 3 | 0.32 | 6.9 | 0.16 | 124.4 | 1.16 |
| *Euthynnus alletteratus* | Little Tunny | 39 | 0.85 | 2 | 0.22 | 19.8 | 0.47 | 321.4 | 3.01 |
| Scombridae | Mackerals | 18 | 0.39 | 1 | 0.11 | 8.9 | 0.21 | 156.5 | 1.46 |
| *Balistes* cf. *vetula* | Queen Triggerfish | 7 | 0.15 | 2 | 0.22 | 3.6 | 0.08 | 69.3 | 0.65 |
| *Melichthyes niger* | Black Durgon | 60 | 1.31 | 3 | 0.32 | 16.6 | 0.39 | 274.2 | 2.56 |
| Balistidae | Leatherjackets | 130 | 2.85 | - | 0.00 | 23.0 | 0.54 | 367.7 | 3.44 |
| *Chilomycterus* spp. | Burrfish | 6 | 0.13 | 1 | 0.11 | 2.2 | 0.05 | 44.5 | 0.42 |
| Diodontidae | Porcupinefishes | 3 | 0.07 | - | 0.00 | .3 | 0.01 | 7.4 | 0.07 |
| Osteichthyes uid | Unidentified Bony Fishes | * | 0.00 | - | 0.00 | 196.9 | 4.64 | 2539.9 | 23.75 |
| **TOTAL OSTEICHTHYES** | **TOTAL BONY FISHES** | **780** | **17.08** | **65** | **6.99** | **367.31** | **8.65** | **5569.6** | **52.09** |
| Vertebrata uid | Unidentified Vertebrates | * | 0.00 | - | 0.00 | 34.7 | 0.82 | 523.5 | 4.90 |
| **TOTAL VERTEBRATA** | **TOTAL VERTEBRATES** | **1163** | **25.47** | **94** | **10.11** | **680.64** | **16.03** | **8640.9** | **80.81** |
| *Balanus* spp. | Barnacle | 3 | 0.07 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Cardisoma guanhumi* | Blue Land Crab | 238 | 5.21 | 43 | 4.62 | 173.5 | 4.09 | 354.9 | 3.32 |
| Gecarcinidae | Land Crab | 12 | 0.26 | 3 | 0.32 | 13.2 | 0.31 | 65.1 | 0.61 |
| Brachyura | Unidentified Crab | * | 0.00 | - | 0.00 | 518.4 | 12.21 | 352.3 | 3.29 |
| **TOTAL CRUSTACEA** | **TOTAL MARINE ARTHROPODS** | **253** | **5.54** | **46** | **4.95** | **705.1** | **16.61** | **772.3** | **7.22** |
| *Diodora* sp. | Keyhole Limpet | 1 | 0.02 | 1 | 0.11 | .1 | 0.00 | .1 | 0.00 |
| *Lucapina* sp. | Fleshy Limpet | 1 | 0.02 | 1 | 0.11 | .1 | 0.00 | .1 | 0.00 |

Table C-5 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Fissurella nodosa* | Knobby Keyhole Limpet | 122 | 2.67 | 122 | 13.12 | 163.9 | 3.86 | 75.4 | 0.71 |
| Fissurellidae | Keyhole Limpets | 191 | 4.18 | - | 0.00 | 57.9 | 1.36 | 28.9 | 0.27 |
| *Acmaea* sp. | Limpet | 1 | 0.02 | 1 | 0.11 | .3 | 0.01 | .2 | 0.00 |
| *Cittarium pica* | West Indian Top Shell | 572 | 12.52 | 38 | 4.09 | 803.1 | 18.92 | 325.4 | 3.04 |
| *Gaza* spp. | Gaza | 4 | 0.09 | 4 | 0.43 | 1.2 | 0.03 | .8 | 0.01 |
| *Astraea tuber* | Green Star-shell | 6 | 0.13 | 3 | 0.32 | 5.9 | 0.14 | 3.5 | 0.03 |
| *Astraea* spp. | Star-shell | 3 | 0.07 | - | 0.00 | 1.9 | 0.04 | 1.2 | 0.01 |
| *Turbo castena* | Chestnut Turban | 4 | 0.09 | 4 | 0.43 | .7 | 0.02 | .5 | 0.00 |
| Turbinidae | Turbans | 2 | 0.04 | - | 0.00 | 1.3 | 0.03 | .9 | 0.01 |
| *Nerita peloronta* | Bleeding Tooth Nerite | 42 | 0.92 | 25 | 2.69 | 23.6 | 0.56 | 12.7 | 0.12 |
| *N. tessellata* | Tessellate Nerite | 97 | 2.12 | 65 | 6.99 | 41.9 | 0.99 | 21.5 | 0.20 |
| *N. versicolor* | Four-toothed Nerite | 116 | 2.54 | 97 | 10.43 | 57.1 | 1.34 | 28.6 | 0.27 |
| *Nerita* spp. | Nerite | 301 | 6.59 | - | 0.00 | 63.2 | 1.49 | 31.4 | 0.29 |
| *Neritina virginea* | Virgin Nerite | 53 | 1.16 | 53 | 5.70 | 22.5 | 0.53 | 12.1 | 0.11 |
| *Neritina* spp. | Nerite | 24 | 0.53 | - | 0.00 | 4.3 | 0.10 | 2.6 | 0.02 |
| Neritidae | Nerites | 1 | 0.02 | - | 0.00 | .04 | 0.00 | .03 | 0.00 |
| *Littorina angustior* | August Periwinkle | 45 | 0.99 | 45 | 4.84 | 8.0 | 0.19 | 4.7 | 0.04 |
| *L. ziczac* | Zebra Periwinkle | 52 | 1.14 | 52 | 5.59 | 9.8 | 0.23 | 5.6 | 0.05 |
| *Nodolittorina tuberculata* | Common Prickly-winkle | 70 | 1.53 | 70 | 7.53 | 14.5 | 0.34 | 8.1 | 0.08 |
| *Echinius nodolosus* | False Periwinkle | 1 | 0.02 | 1 | 0.11 | .4 | 0.01 | .3 | 0.00 |
| *Planaxis nucleus* | Black Atlantic Planaxis | 1 | 0.02 | 1 | 0.11 | .2 | 0.00 | .2 | 0.00 |
| *Modulus modulus* | Atlantic Modulus | 4 | 0.09 | 4 | 0.43 | .9 | 0.02 | .6 | 0.01 |
| *Cerithium algicola* | Ivory Cerith | 7 | 0.15 | 7 | 0.75 | 2.5 | 0.06 | 1.6 | 0.01 |
| *C. eburneum* | Ivory Cerith | 9 | 0.20 | 9 | 0.97 | 1.7 | 0.04 | 1.1 | 0.01 |
| *C. litteratum* | Stocky Cerith | 1 | 0.02 | 1 | 0.11 | .9 | 0.02 | .6 | 0.01 |

Table C-5 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Strombus gigas* | Pink Conch | 31 | 0.68 | 8 | 0.86 | 148.4 | 3.50 | 68.8 | 0.64 |
| *Strombus* spp. | Conch | 334 | 7.31 | 7 | 0.75 | 582.4 | 13.72 | 242.1 | 2.26 |
| *Polinices* sp. | Moon Shell | 5 | 0.11 | 5 | 0.54 | 1.3 | 0.03 | .9 | 0.01 |
| *Cymatium* sp. | Triton | 1 | 0.02 | 1 | 0.11 | .5 | 0.01 | .4 | 0.00 |
| *Thais rustica* | Rustic Rock-shell | 6 | 0.13 | 6 | 0.65 | 1.3 | 0.03 | .9 | 0.01 |
| *Thais* cf. *rustica* | Rustic Rock-shell | 1 | 0.02 | 1 | 0.11 | 1.8 | 0.04 | 1.2 | 0.01 |
| *Columbella mercatoria* | Comon Dove-shell | 10 | 0.22 | 9 | 0.97 | 2.0 | 0.05 | 1.3 | 0.01 |
| *Nitidella* spp. | Dove-shell | 2 | 0.04 | 2 | 0.22 | .3 | 0.01 | .2 | 0.00 |
| *Engoniophos* cf. *unicinctus* | ——— | 10 | 0.22 | 10 | 1.08 | 2.3 | 0.05 | -- | 0.00 |
| *Oliva* cf. *sayana* | Lettered Olive | 1 | 0.02 | 1 | 0.11 | 1.1 | 0.03 | .7 | 0.01 |
| *Oliva* spp. | Olive | 3 | 0.07 | 3 | 0.32 | 7.4 | 0.17 | 4.4 | 0.04 |
| *Marginella* spp. | Marginella | 2 | 0.04 | 2 | 0.22 | 3.1 | 0.07 | 2.0 | 0.02 |
| *Conus regius* | Crown Cone | 2 | 0.04 | 2 | 0.22 | 12.8 | 0.30 | 7.2 | 0.07 |
| *Conus* spp. | Cone | 3 | 0.07 | 2 | 0.22 | .7 | 0.02 | .5 | 0.00 |
| Gastropoda uid marine | Uid Marine Gastrophods | * | 0.00 | - | 0.00 | 79.6 | 1.87 | 38.8 | 0.36 |
| **TOTAL GASTROPODA MARINE** | **TOTAL MARINE GASTROPODS** | **2142** | **46.90** | **663** | **71.29** | **2132.94** | **50.24** | **938.13** | **8.77** |
| *Bulimulus* spp. (1) | | (536) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Opeas pumilum* | | (6) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| Sagidae | | (6) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Megalomastoma croecum* | | (48) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Caracolus* spp. | | 6 | 0.13 | 2 | 0.22 | 4.5 | 0.11 | - | 0.00 |
| **TOTAL GASTROPODA TERR.** | **TOTAL LAND SNAILS** | **6** | **0.13** | **2** | **0.22** | **4.5** | **0.11** | **-** | **0.00** |

Table C-5 continued

| Species | Common Name | Number of Fragments # | Number of Fragments % | Minimum Number of Individuals # | Minimum Number of Individuals % | Bone/Shell Weight g | Bone/Shell Weight % | Minimum Edible Meat Weight g | Minimum Edible Meat Weight % |
|---|---|---|---|---|---|---|---|---|---|
| Chiton s.l. | Coat-of-Mail Shells | 736 | 16.12 | 78 | 8.39 | 211.4 | 4.98 | 155.3 | 1.45 |
| **TOTAL CHITON** | **TOTAL COAT-OF-MAIL SHELLS** | **736** | **16.12** | **78** | **8.39** | **211.4** | **4.98** | **155.3** | **1.45** |
| *Arca zebra* | Turkey Wing | 1 | 0.02 | 1 | 0.11 | 4.6 | 0.11 | 3.0 | 0.03 |
| *Anadara notabilis* | Eared Ark | 3 | 0.07 | 2 | 0.22 | 15.9 | 0.37 | 6.9 | 0.06 |
| *A. ovalis* | Blood Ark | 7 | 0.15 | 5 | 0.54 | 2.0 | 0.05 | 1.7 | 0.02 |
| *Anadara* spp. | Ark | 20 | 0.44 | - | 0.00 | 8.4 | 0.20 | 4.4 | 0.04 |
| *Pecten ziczac* | Zigzag Scallop | 1 | 0.02 | 1 | 0.11 | 4.0 | 0.09 | 2.7 | 0.03 |
| *Lima scabra* | Rough Lima | 2 | 0.04 | 2 | 0.22 | 2.9 | 0.07 | 2.2 | 0.02 |
| *L.* cf. *scabra* | Rough Lima | 1 | 0.02 | 1 | 0.11 | .3 | 0.01 | .5 | 0.00 |
| *Ostrea* cf. *equestris* | Credted Oyster | 4 | 0.09 | 1 | 0.11 | 6.0 | 0.14 | 3.5 | 0.03 |
| *Codakia orbicularis* | Tiger Lucina | 91 | 1.99 | 7 | 0.75 | 182.3 | 4.29 | 36.1 | 0.34 |
| *Lucina pectinata* | Thick Lucine | 1 | 0.02 | 1 | 0.11 | 6.5 | 0.15 | 3.7 | 0.03 |
| *Chama congregata* | Little Corrugated Jewel Box | 94 | 2.06 | 13 | 1.40 | 21.2 | 0.50 | 8.3 | 0.08 |
| *Laevicardium* sp. | Cockle | 1 | 0.02 | 1 | 0.11 | .4 | 0.01 | .6 | 0.01 |
| *Mactrellona alata* | Caribbean Winged Mactra | 6 | 0.13 | 1 | 0.11 | 5.7 | 0.13 | 3.4 | 0.03 |
| *Tellina fausta* | Faust's Tellin | 14 | 0.31 | 1 | 0.11 | 28.8 | 0.68 | 10.3 | 0.10 |
| *Tellina listeri* | Speckled Tellin | 2 | 0.04 | 2 | 0.22 | 9.2 | 0.22 | 4.7 | 0.04 |
| *Donax* sp. | Donax | 1 | 0.02 | 1 | 0.11 | .4 | 0.01 | .6 | 0.01 |
| *Chione cancellata* | Cross-barred Venus | 1 | 0.02 | 1 | 0.11 | .3 | 0.01 | .5 | 0.00 |
| *Anomalocardium brasiliana* | West Indian Pointed Venus | 4 | 0.09 | 2 | 0.22 | 2.8 | 0.07 | 2.1 | 0.02 |
| *Pitar dione* | Royal Comb Venus | 7 | 0.15 | 2 | 0.22 | 4.7 | 0.11 | 3.0 | 0.03 |
| *Pitar* sp. | Venus | 1 | 0.02 | 1 | 0.11 | 10.6 | 0.25 | 5.2 | 0.05 |
| Bivalvia uid | Unidentified Bivalves | * | 0.00 | - | 0.00 | 53.6 | 1.26 | 15.7 | 0.15 |
| **TOTAL BIVALVIA** | **TOTAL BIVALVES** | **262** | **5.74** | **46** | **4.95** | **370.6** | **8.73** | **119.1** | **1.11** |

Table C-5 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| Mollusca uid | Unidentified Mollusk | * | 0.00 | - | 0.00 | 140.3 | 3.30 | 65.4 | 0.61 |
| **TOTAL MOLLUSCA** | **TOTAL MOLLUSKS** | **3149** | **68.95** | **789** | **84.84** | **2859.74** | **67.36** | **1227.93** | **11.95** |
| Echinoidea | Sea Urchins | 2 | 0.04 | 1 | 0.11 | - | 0.00 | - | 0.00 |
| **TOTAL INVERTEBRATA** | **TOTAL INVERTEBRATES** | **3404** | **74.53** | **836** | **89.89** | **3564.84** | **83.97** | **2051.7** | **19.19** |
| **SAMPLE TOTAL** | **VERTEBRATES AND INVERTEBRATES** | **4567** | **100.00** | **930** | **100.00** | **4245.5** | **100.00** | **10692.6** | **100.00** |

Table C-6. Faunal remains from S38W18 50-60 cm, flotation.

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Isolobodon portoricensis* | Allen's Hutia | 1 | 0.20 | 1 | 2.50 | .7 | 0.82 | 19.2 | 2.60 |
| **TOTAL MAMMALIA** | **TOTAL MAMMAL** | **1** | **0.20** | **1** | **2.50** | **.7** | **0.82** | **19.2** | **2.60** |
| Aves uid | Unidentified Birds | 17 | 3.33 | 1 | 2.50 | .6 | 0.70 | 11.3 | 1.53 |
| **TOTAL AVES** | **TOTAL BIRDS** | **17** | **3.33** | **1** | **2.50** | **.6** | **0.70** | **11.3** | **1.53** |
| *Caretta caretta* | Atlantic Loggerhead | 1 | 0.20 | 1 | 2.50 | 1.6 | 1.86 | 57.3 | 7.76 |
| Testudines | Turtles | 2 | 0.39 | - | 0.00 | .4 | 0.47 | 27.5 | 3.72 |
| Reptilia uid | Unidentified Reptiles | 4 | 0.78 | - | 0.00 | .01 | 0.01 | - | 0.00 |
| **TOTAL REPTILIA** | **TOTAL REPTILES** | **7** | **1.37** | **1** | **2.50** | **2.01** | **2.34** | **84.8** | **11.48** |
| *Harengula* spp. | Sardine | 8 | 1.57 | 4 | 10.00 | .03 | 0.03 | .9 | 0.12 |
| Clupeidae | Herring, Shad, Sardine | 144 | 28.18 | - | 0.00 | .4 | 0.47 | 9.6 | 1.30 |
| *Holocentrus* sp. | Squirrelfish | 1 | 0.20 | 1 | 2.50 | .2 | 0.23 | 5.1 | 0.69 |
| *Epinephalus fulvus* | Coney | 3 | 0.59 | 1 | 2.50 | .5 | 0.58 | 11.7 | 1.58 |
| Serranidae | Sea Bass | 1 | 0.20 | - | 0.00 | .01 | 0.01 | .3 | 0.04 |
| *Caranx* spp. | Jack | 8 | 1.57 | 1 | 2.50 | .3 | 0.35 | 7.4 | 1.00 |
| Carangidae | Jacks | 5 | 0.98 | - | 0.00 | .04 | 0.05 | 1.2 | 0.16 |
| *Haemulon* spp. | Grunt | 3 | 0.59 | 1 | 2.50 | .3 | 0.35 | 7.4 | 1.00 |
| *Bairdiella* cf. *ronchus* | Roncho gusto | 1 | 0.20 | 1 | 2.50 | .01 | 0.01 | .3 | 0.04 |
| *Halichoeres bivittatus* | Slippery Dick | 2 | 0.39 | 1 | 2.50 | .01 | 0.01 | .3 | 0.04 |
| Labridae | Wrasses | 4 | 0.78 | 1 | 2.50 | .3 | 0.35 | 7.4 | 1.00 |
| *Sparisoma* sp. | Parrotfish | 1 | 0.20 | 1 | 2.50 | .2 | 0.23 | 5.1 | 0.69 |
| *Mugil* sp. | Mullet | 1 | 0.20 | 1 | 2.50 | .03 | 0.03 | .9 | 0.12 |
| *Gobiomorus dormitor* | Bigmouth Sleeper | 2 | 0.39 | 1 | 2.50 | .6 | 0.70 | 13.8 | 1.87 |
| Eleotridae | Sleepers | 1 | 0.20 | 1 | 2.50 | .02 | 0.02 | .7 | 0.09 |

Table C-6 continued

| Species | Common Name | Number of Fragments |  | Minimum Number of Individuals |  | Bone/Shell Weight |  | Minimum Edible Meat Weight |  |
|---|---|---|---|---|---|---|---|---|---|
|  |  | # | % | # | % | g | % | g | % |
| *Melichthyes niger* | Black Durgon | 3 | 0.59 | 2 | 5.00 | .2 | 0.23 | 5.1 | 0.69 |
| Balistidae | Leatherjackets | 227 | 44.42 | - | 0.00 | 1.5 | 1.75 | 31.5 | 4.26 |
| Diodontidae | Porcupinefishes | 2 | 0.39 | 1 | 2.50 | .1 | 0.12 | 2.7 | 0.37 |
| Osteichthyes uid | Unidentified Bony Fishes | * | 0.00 | - | 0.00 | 13.6 | 15.84 | 229.2 | 31.03 |
| TOTAL OSTEICHTHYES | TOTAL BONY FISHES | 417 | 81.60 | 18 | 45.00 | 18.35 | 21.37 | 340.6 | 46.11 |
| Vertebrata uid | Unidentified Vertebrates | * | 0.00 | - | 0.00 | 10.3 | 12.00 | 178.5 | 24.16 |
| **TOTAL VERTEBRATA** | **TOTAL VERTEBRATES** | **442** | **86.50** | **21** | **52.50** | **31.96** | **37.22** | **634.4** | **85.88** |
| Brachyura | Unidentified Crab | * | 0.00 | 1 | 2.50 | 23.6 | 27.49 | 85 | 11.51 |
| **TOTAL CRUSTACEA** | **TOTAL MARINE ARTHROPODS** | * | **0.00** | **1** | **2.50** | **23.6** | **27.49** | **85** | **11.51** |
| Fissurellidae | Keyhole Limpets | 7 | 1.37 | 1 | 2.50 | 1.6 | 1.86 | 1.1 | 0.15 |
| Acmaeidae | Limpets | 1 | 0.20 | 1 | 2.50 | <.01 | 0.00 | - | 0.00 |
| *Cittarium pica* | West Indian Top Shell | 12 | 2.35 | 1 | 2.50 | 2.4 | 2.80 | 1.5 | 0.20 |
| *Nerita fulgurans* | Antillean Nerite | 2 | 0.39 | 1 | 2.50 | .5 | 0.58 | .4 | 0.05 |
| *N. peloronta* | Bleeding Tooth Nerite | 2 | 0.39 | 2 | 5.00 | 2.7 | 3.14 | 1.7 | 0.23 |
| *N. versicolor* | Four-toothed Nerite | 1 | 0.20 | 1 | 2.50 | .9 | 1.05 | .6 | 0.08 |
| Neritidae | Nerites | 13 | 2.54 | - | 0.00 | 1.8 | 2.10 | 1.2 | 0.16 |
| *Littorina angustior* | August Periwinkle | 1 | 0.20 | 1 | 2.50 | .2 | 0.23 | .2 | 0.03 |
| *L. lineolata* | Lineolate Periwinkle | 2 | 0.39 | 2 | 5.00 | .4 | 0.47 | .3 | 0.04 |
| Littorinidae | Periwinkles | 1 | 0.20 | 1 | 2.50 | <.01 | 0.00 | - | 0.00 |
| *Cerithium litteratum* | Stocky Cerith | 1 | 0.20 | 1 | 2.50 | .2 | 0.23 | .2 | 0.03 |
| *Strombus* spp. | Conch | 2 | 0.39 | 1 | 2.50 | 5.7 | 6.64 | 3.4 | 0.46 |
| Gastropoda uid marine | Uid Marine Gastrophods | * | 0.00 | - | 0.00 | 2.7 | 3.14 | 1.7 | 0.23 |
| **TOTAL GASTROPODA MARINE** | **TOTAL MARINE GASTROPODS** | **45** | **8.81** | **13** | **32.50** | **19.1** | **22.25** | **12.3** | **1.67** |

Table C-6 continued

| Species | Common Name | Number of Fragments # | % | Minimum Number of Individuals # | % | Bone/Shell Weight g | % | Minimum Edible Meat Weight g | % |
|---|---|---|---|---|---|---|---|---|---|
| *Bulimulus* spp. (1) | | (78) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Leptineria* spp. | | (6) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Opeas pumilum* | | (226) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Gastrocopta pellucida* | | (3) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| Sagidae | | (9) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Megalomastoma croecum* | | (1) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| **TOTAL GASTROPODA TERR.** | **TOTAL LAND SNAILS** | **(323)** | **0.00** | **-** | **0.00** | **-** | **0.00** | **-** | **0.00** |
| Chiton s.l. | Coat-of-Mail Shells | 22 | 4.31 | 3 | 7.50 | 2.4 | 2.80 | 1.2 | 0.16 |
| **TOTAL AMPHINEURA** | **TOTAL COAT-OF-MAIL SHELLS** | **22** | **4.31** | **3** | **7.50** | **2.4** | **2.80** | **1.2** | **0.16** |
| Chamidae | Jewel Boxes | 1 | 0.20 | 1 | 2.50 | .2 | 0.23 | .3 | 0.04 |
| Bivalvia uid | Unidentified Bivalves | * | 0.00 | - | 0.00 | 1.6 | 1.86 | 1.4 | 0.19 |
| **TOTAL BIVALVIA** | **TOTAL BIVALVES** | **1** | **0.20** | **1** | **2.50** | **1.8** | **2.10** | **1.7** | **0.23** |
| Mollusca uid | Unidentified Mollusks | * | 0.00 | * | 0.00 | 7.0 | 8.15 | 4.1 | 0.56 |
| **TOTAL MOLLUSCA** | **TOTAL MOLLUSKS** | **68** | **13.31** | **17** | **42.50** | **30.3** | **35.29** | **19.3** | **2.61** |
| **Echinoidea** | **Sea Urchins** | **1** | **0.20** | **1** | **2.50** | **-** | **0.00** | **-** | **0.00** |
| **TOTAL INVERTEBRATA** | **TOTAL INVERTEBRATES** | **69** | **13.50** | **19** | **47.50** | **53.9** | **62.78** | **104.3** | **14.12** |
| **SAMPLE TOTAL** | **VERTEBRATES AND INVERTEBRATES** | **511** | **100.00** | **40** | **100.00** | **85.9** | **100.00** | **738.7** | **100.00** |

Table C-7. Faunal remains from N112W88, 20-60 cm flotation.

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| Capromyidae | Hutia | 2 | 0.09 | 1 | 0.43 | .5 | 0.10 | 14.7 | 0.83 |
| *Ebtesicus fuscus* | Big Brown Bat | 1 | 0.05 | 1 | 0.43 | -- | 0.00 | -- | 0.00 |
| Mammalia uid, small | Small Mammal | 1 | 0.05 | - | 0.00 | .1 | 0.02 | 4 | 0.23 |
| **TOTAL MAMMALIA** | **TOTAL MAMMAL** | **4** | **0.19** | **2** | **0.87** | **.6** | **0.12** | **18.7** | **1.06** |
| Columbidae | Doves and Pigeons | 4 | 0.19 | 1 | 0.43 | .6 | 0.12 | 11.3 | 0.64 |
| Aves uid | Unidentified Birds | 50 | 2.32 | - | 0.00 | 2.4 | 0.47 | 36.2 | 2.04 |
| **TOTAL AVES** | **TOTAL BIRDS** | **54** | **2.51** | **1** | **0.43** | **3.0** | **0.59** | **47.5** | **2.68** |
| Testudines | Turtles | 7 | 0.32 | 1 | 0.43 | 1.7 | 0.33 | 59.2 | 3.34 |
| Anguidae | Lizard | 52 | 2.41 | 1 | 0.43 | .1 | 0.02 | -- | 0.00 |
| Lacertilia | Lizard | 1 | 0.05 | - | 0.00 | <.01 | 0.00 | -- | 0.00 |
| *Epicrates* spp. | Pigmy Boa | 2 | 0.09 | 1 | 0.43 | .1 | 0.02 | 1.3 | 0.07 |
| *Alsophis* sp. | Snake | 1 | 0.05 | 1 | 0.43 | .02 | 0.00 | .3 | 0.07 |
| Serpentes | Snake | 2 | 0.09 | - | 0.00 | .04 | 0.01 | .6 | 0.03 |
| Reptilia uid | Unidentified Reptile | 8 | 0.37 | - | 0.00 | .04 | 0.01 | -- | 0.00 |
| **TOTAL REPTILIA** | **TOTAL REPTILE** | **66** | **3.06** | **3** | **1.30** | **.3** | **0.06** | **61.4** | **3.47** |
| *Harengula* spp. | Sardine | 29 | 1.35 | 16 | 6.93 | .1 | 0.02 | 2.7 | 0.15 |
| Clupeidae | Herring, Shad, Sardine | 438 | 20.33 | - | 0.00 | 2.0 | 0.39 | 40.8 | 2.30 |
| *Hemiramphus* spp. | Halfbeak | 5 | 0.23 | 1 | 0.43 | .1 | 0.02 | 2.7 | 0.15 |
| Exocoetidae | Flying Fish | 11 | 0.51 | 3 | 1.30 | .1 | 0.02 | 2.7 | 0.15 |
| *Strongylura* spp. | Needlefish | 7 | 0.32 | 3 | 1.30 | .2 | 0.04 | 5.1 | 0.29 |
| *Tylosaurus* spp. | Houndfish | 5 | 0.23 | 2 | 0.87 | .6 | 0.12 | 13.8 | 0.78 |
| *Holocentrus ascensionis* | Squirrelfish | 1 | 0.05 | 1 | 0.43 | .1 | 0.02 | 2.7 | 0.15 |
| *Holocentrus* spp. | Squirrelfish | 5 | 0.23 | 1 | 0.43 | .2 | 0.04 | 5.1 | 0.29 |

Table C-7 continued

| Species | Common Name | Number of Fragments # | Number of Fragments % | Minimum Number of Individuals # | Minimum Number of Individuals % | Bone/Shell Weight g | Bone/Shell Weight % | Minimum Edible Meat Weight g | Minimum Edible Meat Weight % |
|---|---|---|---|---|---|---|---|---|---|
| *Epinephalus fulvus* | Coney | 30 | 1.39 | 5 | 2.16 | 2.0 | 0.39 | 40.8 | 2.30 |
| *Epinephasus* spp. | Grouper | 7 | 0.32 | 2 | 0.87 | .6 | 0.12 | 13.9 | 0.78 |
| Serranidae | Sea Bass | 7 | 0.32 | - | 0.00 | .3 | 0.06 | 7.4 | 0.42 |
| *Caranx* spp. | Jack | 21 | 0.97 | 2 | 0.87 | 1.0 | 0.20 | 21.9 | 1.24 |
| *Trachinotus* ap. | Pompano | 1 | 0.05 | 1 | 0.43 | .1 | 0.02 | 2.7 | 0.15 |
| Carangidae | Jacks | 11 | 0.51 | - | 0.00 | .04 | 0.01 | 1.2 | 0.07 |
| *Lutjanus* cf. *buccanella* | Blackfin Snapper | 1 | 0.05 | 1 | 0.43 | .3 | 0.06 | 7.4 | 0.42 |
| *Lutjanus* spp. | Snapper | 5 | 0.23 | 2 | 0.87 | .5 | 0.10 | 11.7 | 0.66 |
| *Ocyrus chrysurus* | Yellowtail Snapper | 1 | 0.05 | 1 | 0.43 | .05 | 0.01 | 1.5 | 0.08 |
| Lutjanidae | Snappers | 1 | 0.05 | - | 0.00 | .1 | 0.02 | 2.7 | 0.15 |
| *Diapterus* spp. | Mojarra | 2 | 0.09 | 1 | 0.43 | .2 | 0.04 | 5.1 | 0.29 |
| *Eucinostomus* spp. | Mojarra | 2 | 0.09 | 2 | 0.87 | .04 | 0.01 | 1.2 | 0.07 |
| *Anisotremus* sp. | Grunt | 1 | 0.05 | 1 | 0.43 | .03 | 0.01 | .9 | 0.05 |
| *Haemulon* spp. | Grunt | 19 | 0.88 | 3 | 1.30 | 1.2 | 0.24 | 25.8 | 1.46 |
| Haemulidae | Grunts | 5 | 0.23 | - | 0.00 | .4 | 0.08 | 9.6 | 0.54 |
| *Bairdiella rochus* | Rocho Basto | 4 | 0.19 | 3 | 1.30 | .04 | 0.01 | 1.2 | 0.07 |
| cf. Pomacanthidae | Angelfishes | 2 | 0.09 | 2 | 0.87 | .02 | 0.00 | .7 | 0.04 |
| *Bodianus rufus* | Spanish Hogfish | 1 | 0.05 | 1 | 0.43 | .1 | 0.02 | 2.7 | 0.15 |
| *Halichoeres bivittatus* | Slippery Dick | 2 | 0.09 | 2 | 0.87 | .2 | 0.04 | 5.1 | 0.29 |
| *Halichoeres* spp. | Wrasse | 4 | 0.19 | 2 | 0.87 | .4 | 0.08 | 9.6 | 0.54 |
| Labridae | Wrasses | 7 | 0.32 | - | 0.00 | .5 | 0.10 | 11.7 | 0.66 |
| *Sparisoma* spp. | Parrotfish | 6 | 0.28 | 2 | 0.87 | .4 | 0.088 | 9.6 | 0.54 |
| Scaridae | Parrotfishes | 18 | 0.84 | - | 0.00 | .3 | 0.06 | 7.4 | 0.42 |
| *Mugil sp.* | Mullet | 1 | 0.05 | 1 | 0.43 | .05 | 0.01 | 1.5 | 0.08 |
| *Gobiomorus dormitor* | Bigmouth Sleeper | 1 | 0.05 | 1 | 0.43 | .04 | 0.01 | 1.2 | 0.07 |
| *Gobiomorus* spp. | Sleeper | 6 | 0.28 | 2 | 0.87 | .4 | 0.08 | 9.6 | 0.54 |

Table C-7 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Gobionellus* spp. | Goby | 2 | 0.09 | 2 | 0.87 | .03 | 0.01 | .9 | 0.05 |
| Gobiidae | Gobies | 18 | 0.84 | - | 0.00 | .1 | 0.02 | 2.7 | 0.15 |
| *Scomberomorus* sp. | Mackeral | 1 | 0.05 | 1 | 0.43 | .3 | 0.06 | 7.4 | 0.42 |
| Scombridae | Mackeral | 1 | 0.05 | - | 0.00 | .1 | 0.02 | 2.7 | 0.15 |
| *Balistes* spp. | Triggerfish | 6 | 0.28 | 1 | 0.43 | 1.0 | 0.20 | 21.9 | 1.24 |
| *Melichthyes niger* | Black Durgon | 7 | 0.32 | 2 | 0.87 | .9 | 0.18 | 19.9 | 1.12 |
| Balistidae | Leatherjackets | 444 | 20.61 | - | 0.00 | 4.6 | 0.91 | 86.4 | 4.88 |
| Diodontidae | Porcupinefishes | 3 | 0.14 | 1 | 0.43 | .1 | 0.02 | 2.7 | 0.15 |
| Osteichthyes uid | Unidentified Bony Fishes | * | 0.00 | - | 0.00 | 62.3 | 12.26 | 901.6 | 50.90 |
| **TOTAL OSTEICHTHYES** | **TOTAL BONY FISHES** | **1149** | **53.34** | **71** | **30.74** | **82.14** | **16.16** | **1335.9** | **75.42** |
| Vertebrata uid | Unidentified Vertebrates | * | 0.00 | - | 0.00 | 21 | 4.13 | 25.3 | 1.43 |
| **TOTAL VERTEBRATA** | **TOTAL VERTEBRATES** | **1273** | **59.10** | **77** | **33.33** | **107.04** | **21.06** | **1488.8** | **84.06** |
| *Cardisoma guanhumi* | Blue Land Crab | 8 | 0.37 | 2 | 0.87 | 3.5 | 0.69 | 35.3 | 1.99 |
| Brachyura | Unidentified Crab | * | 0.00 | - | 0.00 | 4.0 | 0.79 | 37.6 | 2.12 |
| **TOTAL CRUSTACEA** | **TOTAL MARINE ATHROPODS** | **8** | **0.37** | **2** | **0.87** | **3.9** | **0.77** | **72.9** | **4.12** |
| *Diodora* spp. | Keyhole Limpet | 2 | 0.09 | 2 | 0.87 | 1.1 | 0.22 | .7 | 0.04 |
| *Fissurella nodosa* | Knobby Keyhole Limpet | 13 | 0.60 | 13 | 5.63 | 12.8 | 2.52 | 7.2 | 0.41 |
| Fissurellidae | Keyhole Limpets | 55 | 2.55 | - | 0.00 | 7.0 | 1.38 | 4.1 | 0.23 |
| Acmaeidae | Limpet | 2 | 0.09 | 2 | 0.87 | .02 | 0.00 | .02 | 0.00 |
| *Cittarium pica* | Wst Indian Top Shell | 96 | 4.46 | 4 | 1.73 | 49.8 | 9.80 | 25.2 | 1.42 |
| Trochidae | Margarites | 2 | 0.09 | 1 | 0.43 | .9 | 0.18 | .6 | 0.03 |
| Astraenidae | Star-Shell | 3 | 0.14 | 2 | 0.87 | 1.9 | 0.37 | 1.2 | 0.07 |
| Trubinidae | Turbans | 1 | 0.05 | 1 | 0.43 | .1 | 0.02 | .1 | 0.01 |

Table C-7 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| *Nerita fulgurans* | Antillean Nerite | 5 | 0.23 | 2 | 0.87 | 1.6 | 0.31 | 1.1 | 0.06 |
| *N. peloronta* | Bleeding Tooth Nerite | 8 | 0.37 | 6 | 2.60 | 1.6 | 0.31 | 1.1 | 0.06 |
| *N. tessellata* | Tessellate Nerite | 5 | 0.23 | 5 | 2.16 | 1.9 | 0.37 | 1.2 | 0.07 |
| *Nerita* spp. | Nerite | 35 | 1.62 | - | 0.00 | 3.5 | 0.69 | 2.2 | 0.12 |
| *Neritina virginea* | Virgin Nerite | 106 | 4.92 | 68 | 29.44 | 26.8 | 5.27 | 14.2 | 0.80 |
| *Neritina* spp. | Nerite | 49 | 2.27 | - | 0.00 | 1.8 | 0.35 | 1.2 | 0.07 |
| Neritidae | Nerites | 2 | 0.09 | - | 0.00 | .1 | 0.02 | .1 | 0.01 |
| *Littorina angustior* | Angust Periwinkle | 3 | 0.14 | 3 | 1.30 | .3 | 0.06 | .2 | 0.01 |
| *L. lineolata* | Lineolate Perwinkle | 5 | 0.23 | 5 | 2.16 | .3 | 0.06 | .2 | 0.01 |
| *Littorina* sp. | Periwinkle | 1 | 0.05 | 1 | 0.43 | .01 | 0.00 | - | 0.00 |
| *Nodolittorina tuberculata* | Common Prickly-winkle | 1 | 0.05 | 1 | 0.43 | .1 | 0.02 | .1 | 0.01 |
| *Tectarius muricatus* | Beaded Periwinkle | 3 | 0.14 | 2 | 0.87 | .3 | 0.06 | .2 | 0.01 |
| Vermetidae | Worm-shell | 3 | 0.14 | 1 | 0.43 | .1 | 0.02 | - | 0.00 |
| *Cerithium eburneum* | Ivory Cerith | 3 | 0.14 | 3 | 1.30 | .8 | 0.16 | .6 | 0.03 |
| Cerithidae | Cerith | 1 | 0.05 | 1 | 0.43 | .1 | 0.02 | .1 | 0.01 |
| *Stombus gigas* | Pick Conch | 3 | 0.14 | 3 | 1.30 | 116.7 | 22.96 | 55.2 | 3.12 |
| *Strombus* spp. | Conch | 48 | 2.23 | - | 0.00 | 58.9 | 11.59 | 29.4 | 1.66 |
| *Pupura patula* | Wide-mouthed Purpura | 1 | 0.05 | 1 | 0.43 | .8 | 0.16 | .6 | 0.03 |
| *Thais rustica* | Rustic Rock-shell | 1 | 0.05 | 1 | 0.43 | .3 | 0.06 | .2 | 0.01 |
| Gastropoda uid marine | Uid Marine Snails | * | 0.00 | - | 0.00 | 17.9 | 3.52 | 9.8 | 0.55 |
| **TOTAL GASTROPODA MARINE** | **TOTAL MARINE SNAILS** | **457** | **21.22** | **128** | **55.41** | **307.53** | **60.52** | **156.82** | **8.85** |
| *Bulimulus* spp. (1) | | (280) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Bulimulus* spp. (2) | | (1) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Opeus pumilum* | | (1055) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Leptineria* spp. | | (3) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |

Table C-7 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Gastrocopta pellucida* | | (194) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| Sagidae | | (22) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Megalomastoma croecum* | | (12) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Succinea* spp. | | (1) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| **TOTAL GASTROPODA TERRESTRIAL** | **TOTAL LAND SNAILS** | **(1568)** | **0.00** | **-** | **0.00** | **-** | **0.00** | **-** | **0.00** |
| Chiton s.1. | Coat-of-Mail Shells | 387 | 17.97 | 19 | 8.23 | 37.9 | 7.46 | 24.3 | 1.37 |
| **TOTAL AMPHINEURA** | **TOTAL COAT OF MAIL SHELLS** | **387** | **17.97** | **19** | **8.23** | **37.9** | **7.46** | **24.3** | **1.37** |
| Arcidae | Arks | 1 | 0.05 | 1 | 0.43 | .4 | 0.08 | .6 | 0.03 |
| *Chama* spp. | Jewel Box | 2 | 0.09 | 1 | 0.43 | .8 | 0.16 | .9 | 0.05 |
| Chamidae | Jewel Boxes | 12 | 0.56 | - | 0.00 | 1.0 | 0.20 | 1.0 | 0.06 |
| *Mactrellona alata* | Caribbean Winged Mactra | 1 | 0.05 | 1 | 0.43 | .3 | 0.06 | .5 | 0.03 |
| Bivalvia uid | Unidentified Bivalves | * | 0.00 | - | 0.00 | 8.8 | 1.73 | 4.6 | 0.26 |
| **TOTAL BIVALVIA** | **TOTAL BIVALVES** | **16** | **0.74** | **3** | **1.30** | **11.3** | **2.22** | **7.6** | **0.43** |
| Mollusca uid | Unidentified Mollusk | * | 0.00 | - | 0.00 | 40.5 | 7.97 | 20.8 | 1.17 |
| **TOTAL MOLLUSCA** | **TOTAL MOLLUSKS** | **860** | **39.93** | **150** | **64.94** | **397.23** | **78.17** | **209.52** | **11.83** |
| Echinoidea | Sea Urchins | 13 | 0.60 | 2 | 0.87 | -- | 0.00 | -- | 0.00 |
| **TOTAL INVERTEBRATA** | **TOTAL INVERTEBRATES** | **881** | **40.90** | **154** | **66.67** | **401.13** | **78.94** | **282.42** | **15.94** |
| **SAMPLE TOTAL** | **VERTEBRATES AND INVERTEBRATES** | **2154** | **100.00** | **231** | **100.00** | **508.2** | **100.00** | **1771.2** | **100.00** |

Table C-8. Faunal remains from N112W88, 30-40 cm, coarse fraction.

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| Rodentia | Rodent | 2 | 0.04 | 1 | 0.04 | .8 | 0.02 | 21.4 | 0.41 |
| *Homo sapiens sapiens* | Human | 2 | 0.04 | 1 | 0.04 | -- | 0.00 | -- | 0.00 |
| Mammalia uid | Unidentified Mammal | 1 | 0.02 | - | 0.00 | .1 | 0.00 | 4.0 | 0.08 |
| **TOTAL MAMMALIA** | **TOTAL MAMMAL** | **5** | **0.10** | **2** | **0.09** | **.9** | **0.02** | **25.4** | **-.48** |
| Ardeidae | Herons | 1 | 0.02 | 1 | 0.04 | .4 | 0.01 | 8.1 | 0.15 |
| *Columba* spp. | Dove | 4 | 0.08 | 3 | 0.13 | .6 | 0.02 | 11.3 | 0.22 |
| Columbidae | Doves and Pigeons | 17 | 0.33 | 1 | 0.04 | 2.4 | 0.06 | 36.3 | 0.69 |
| *Crotophaga ani* | Smooth-billed Ani | 1 | 0.02 | 1 | 0.04 | .2 | 0.01 | 4.5 | 0.09 |
| Emberizidae | Finches | 1 | 0.02 | 1 | 0.04 | .03 | 0.00 | .9 | 0.02 |
| Aves uid | Unidentified Birds | 53 | 1.04 | - | 0.00 | 4.5 | 0.12 | 61.5 | 1.17 |
| **TOTAL AVES** | **TOTAL BIRDS** | **77** | **1.50** | **6** | **0.27** | **8.13** | **0.22** | **122.6** | **2.33** |
| *Trachemys* spp. | Slider | 5 | 0.10 | 1 | 0.04 | 13.1 | 0.35 | 174.6 | 3.32 |
| Testudines | Turtles | 71 | 1.39 | - | 0.00 | 27.2 | 0.73 | 257.7 | 4.90 |
| *Amevia* spp. | Runner | 1 | 0.02 | 1 | 0.04 | .1 | 0.00 | -- | 0.00 |
| Reptilia uid | Unidentified Reptile | 2 | 0.04 | - | 0.00 | .2 | 0.01 | -- | 0.00 |
| **TOTAL REPTILIA** | **TOTAL REPTILE** | **79** | **1.54** | **2** | **0.09** | **40.6** | **1.10** | **432.3** | **8.23** |
| Carcharhinidae | Requeim Sharks | 3 | 0.06 | 1 | 0.04 | 1 | 0.03 | 8.7 | 0.17 |
| **TOTAL CHONDRICHTHYES** | **TOTAL CARTILAGINOUS FISHES** | **3** | **0.06** | **1** | **0.04** | **1** | **0.03** | **8.7** | **0.17** |
| *Elops saurus* | Ladyfish | 1 | 0.02 | 1 | 0.04 | .1 | 0.00 | 2.7 | 0.05 |
| Clupeidae | Herring, Shad Sardine | 1 | 0.02 | 1 | 0.04 | <.01 | 0.00 | -- | 0.00 |
| *Tylosaurus* spp. | Houndfish | 46 | .90 | 2 | 0.09 | 5.4 | 0.15 | 99.8 | 1.90 |
| Belonidae | Needlefish | 13 | 0.25 | - | 0.00 | 1.5 | 0.04 | 31.5 | 0.60 |
| *Holocentrus* spp. | Squirrelfish | 11 | 0.21 | 2 | 0.09 | 1.7 | 0.05 | 35.3 | 0.67 |

Table C-8 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Centropomus* spp. | Snook | 9 | 0.18 | 3 | 0.13 | 1.8 | 0.05 | 37.1 | 0.71 |
| *Epinephalus adcensionis* | Rock Hind | 1 | 0.02 | 1 | 0.04 | .2 | 0.01 | 5.1 | 0.10 |
| *Epinephalus fulvus* | Coney | 19 | 0.37 | 3 | 0.13 | 2.6 | 0.07 | 51.7 | 0.98 |
| *Epinephalus* spp. | Grouper | 22 | 0.43 | - | 0.00 | 2.2 | 0.06 | 44.5 | 0.85 |
| *Caranx* cf. *latus* | Horse-eye Jack | 2 | 0.04 | 1 | 0.04 | .4 | 0.01 | 9.6 | 0.18 |
| *Caranx* spp. | Jack | 21 | 0.41 | 1 | 0.04 | 1.7 | 0.05 | 35.3 | 0.67 |
| *Trachinotus* sp. | Pompano | 1 | 0.02 | 1 | 0.04 | .2 | 0.01 | 5.1 | 0.10 |
| *Lutjanus* spp. | Snapper | 8 | 0.16 | 3 | 0.13 | 1.9 | 0.05 | 39.0 | 0.74 |
| *Diapterus* spp. | Mojarra | 15 | 0.29 | 2 | 0.09 | 1.7 | 0.05 | 35.3 | 0.67 |
| *Anisotremus* sp. | Grunt | 1 | 0.02 | 1 | 0.04 | .2 | 0.01 | 5.1 | 0.10 |
| *Haemulon* spp. | Grunt | 46 | 0.90 | 6 | 0.27 | 5.9 | 0.16 | 108.1 | 2.06 |
| *Bairdiella ronchus* | Roncho Basto | 1 | 0.02 | 1 | 0.04 | .2 | 0.01 | 5.1 | 0.10 |
| *Micropogonias* spp. | Croaker | 3 | 0.06 | 1 | 0.04 | 1.1 | 0.03 | 23.8 | 0.45 |
| Chaetodontidae | Butterfly Fish | 2 | 0.04 | 1 | 0.04 | .2 | 0.01 | 5.1 | 0.10 |
| *Bodianus* spp. | Hogfish | 2 | 0.04 | 2 | 0.09 | .5 | 0.01 | 11.7 | 0.22 |
| *Halichoeres* spp. | Wrasse | 4 | 0.08 | 3 | 0.13 | 1.3 | 0.04 | 27.7 | 0.53 |
| Labridae | Wrasses | 20 | 0.39 | - | 0.00 | 3.0 | 0.08 | 58.8 | 1.12 |
| *Scarus* sp. | Parrotfish | 1 | 0.02 | 1 | 0.04 | .4 | 0.01 | 9.6 | 0.18 |
| *Sparisoma* viride | Spotlight Parrotfish | 1 | 0.02 | 1 | 0.04 | 1.1 | 0.03 | 23.8 | 0.45 |
| *Sparisoma* spp. | Parrotfish | 41 | 0.80 | 10 | 0.45 | 11.4 | 0.31 | 195.5 | 3.72 |
| Scaridae | Parrotfish | 10 | 0.20 | - | 0.00 | 1.6 | 0.04 | 33.4 | 0.64 |
| *Mugil* spp. | Mullet | 5 | 0.10 | 2 | 0.09 | .7 | 0.02 | 15.9 | 0.30 |
| *Gobiomorus dormitor* | Bigmouth Sleeper | 23 | 0.45 | 2 | 0.09 | 4.1 | 0.11 | 77.9 | 1.48 |
| *Acanthurus* spp. | Surgeonfish | 2 | 0.04 | 1 | 0.04 | .2 | 0.01 | 5.1 | 0.10 |
| *Euthynnus* spp. | Tuna | 2 | 0.04 | 1 | 0.04 | 2.2 | 0.06 | 44.5 | 0.85 |
| Scombridae | Mackerals | 5 | 0.10 | - | 0.00 | 1.9 | 0.05 | 39.0 | 0.74 |

Table C-8 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Balistes* spp. | Triggerfish | 20 | 0.39 | 2 | 0.09 | 3.9 | 0.11 | 74.5 | 1.42 |
| *Melichthyes niger* | Black Durgon | 22 | 0.43 | 4 | 0.18 | 3.5 | 0.09 | 67.6 | 1.29 |
| Balistidae | Leatherjackets | 44 | 0.86 | - | 0.00 | 8.1 | 0.22 | 143.8 | 2.74 |
| Osteichthyes uid | Unidentified Bony Fishes | * | 0.00 | - | 0.00 | 112.9 | 3.05 | 1539.7 | 29.30 |
| **TOTAL OSTEICHTHYES** | **TOTAL BONY FISHES** | **425** | **8.30** | **60** | **2.68** | **185.8** | **5.02** | **2947.7** | **56.09** |
| Vertebrata uid | Unidentified Vertebrates | * | 0.00 | * | 0.00 | 19.6 | 0.53 | 10.7 | 0.20 |
| **TOTAL VERTEBRATA** | **TOTAL VERTEBRATES** | **589** | **11.51** | **71** | **3.17** | **256.03** | **6.91** | **3547.7** | **67.50** |
| *Cardisoma guanhumi* | Blue Land Crab | 4 | 0.08 | 1 | 0.04 | 1.0 | 0.03 | 19.39 | 0.38 |
| Gecarcinidae | Land Crab | 7 | 0.14 | - | 0.00 | 1.6 | 0.04 | 24.7 | 0.47 |
| Brachyura | Unidentified Crab | * | 0.00 | - | 0.00 | 21.2 | 0.57 | 80.9 | 1.54 |
| **TOTAL CRUSTACEA** | **TOTAL MARINE ARTHROPODS** | **11** | **0.21** | **1** | **0.04** | **23.8** | **0.64** | **125.5** | **2.39** |
| *Fissurella barbadensis* | Barbados Keyhole Limpet | 15 | 0.29 | 15 | 0.67 | 21.3 | 0.58 | 11.5 | 0.22 |
| *F. nodosa* | Knobby Keyhole Limpet | 143 | 2.79 | 143 | 6.39 | 158.2 | 4.27 | 73.0 | 1.39 |
| *F. rosea* | Rosy Keyhole Limpet | 6 | 0.12 | 6 | 0.27 | 3.6 | 0.10 | 2.3 | 0.04 |
| Fissurella spp. | Keyhole Limpet | 177 | 3.46 | 9 | 0.40 | 59.6 | 1.61 | 29.7 | 0.57 |
| *Acmaea* cf. *antillarium* | Antillean Limpet | 1 | 0.02 | 1 | 0.04 | .1 | 0.00 | .1 | 0.00 |
| *A.* cf. *leucopleura* | Black-ribbed Limpet | 4 | 0.08 | 4 | 0.18 | -- | 0.00 | -- | 0.00 |
| Acmaeidae | Limpet | 1 | 0.02 | 1 | 0.04 | .2 | 0.01 | .2 | 0.00 |
| *Callistoma* sp. | Top-shell | 1 | 0.02 | 1 | 0.04 | .1 | 0.00 | .1 | 0.00 |
| *Cittarium pica* | West Indian Top Shell | 667 | 13.03 | 55 | 2.46 | 703.7 | 19.00 | 288.1 | 5.48 |
| *Astraea* spp. | Star-shell | 16 | 0.31 | 2 | 0.09 | 15.3 | 0.41 | 8.5 | 0.16 |
| *Turbo castanea* | Chestnut Turban | 13 | 0.25 | 13 | 0.58 | 3.9 | 0.11 | 2.4 | 0.05 |
| Turbanidae | Turbans | 4 | 0.08 | 4 | 0.18 | 4.3 | 0.12 | 2.7 | 0.05 |

Table C-8 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Nerita fulgurans* | Antillean Nerite | 2 | 0.04 | 2 | 0.09 | .5 | 0.01 | .4 | 0.01 |
| *N. peloronta* | Bleeding Tooth Nerite | 22 | 0.43 | 12 | 0.54 | 17.3 | 0.47 | 9.5 | 0.18 |
| *N. tessellata* | Tesselllate Nerite | 109 | 2.13 | 109 | 4.87 | 49.8 | 1.34 | 25.2 | 0.48 |
| *N. versicolor* | Four-toothed Nerite | 147 | 2.87 | 145 | 6.48 | 22.2 | 0.60 | 12.0 | 0.23 |
| *Nerita* spp. | Nerite | 239 | 4.67 | - | 0.00 | 33.1 | 0.89 | 17.3 | 0.33 |
| *Neritina virginea* | Virgin Nerite | 1152 | 22.51 | 1101 | 49.22 | 426.8 | 11.53 | 181.9 | 3.46 |
| *Littorina angustior* | August Periwinkle | 4 | 0.08 | 4 | 0.18 | .6 | 0.02 | .4 | 0.01 |
| *L. lineolata* | Lineolate Periwinkle | 37 | 0.72 | 37 | 1.65 | 5.9 | 0.16 | 3.5 | 0.07 |
| *L. ziczac* | Zebra Periwinkle | 24 | 0.47 | 24 | 1.07 | 4.5 | 0.12 | 2.8 | 0.05 |
| *Nodolittorina tuberculata* | Coommon Prickly-winkle | 60 | 1.17 | 60 | 2.68 | 10.6 | 0.29 | 6.1 | 0.12 |
| *Tectarius muricatus* | Beaded Periwinkle | 40 | 0.78 | 28 | 1.25 | 11.5 | 0.31 | 6.5 | 0.12 |
| Vermetidae | Worm-shell | 1 | 0.02 | 1 | 0.04 | -- | 0.00 | -- | 0.00 |
| *Modulus modulus* | Atlantic Modulus | 1 | 0.02 | 1 | 0.04 | -- | 0.00 | -- | 0.00 |
| *Certhium algicola* | Ivory Cerith | 27 | 0.53 | 27 | 1.21 | 6.3 | 0.17 | 3.8 | 0.07 |
| *Certhium eburneum* | Ivory Cerith | 5 | 0.10 | 5 | 0.22 | 1.4 | 0.04 | .9 | 0.02 |
| *Strombus gigas* | Pink Chonch | 32 | 0.63 | 14 | 0.63 | 385.4 | 10.41 | 165.6 | 3.15 |
| *S. raninus* | Hawk-wing Chonch | 1 | 0.02 | 1 | 0.04 | 2.2 | 0.06 | 1.4 | 0.03 |
| *Strombus* spp. | Conch | 263 | 5.14 | 3 | 0.13 | 395.1 | 10.67 | 169.4 | 3.22 |
| cf. *Strombus* sp. | Conch | 1 | 0.02 | 1 | 0.04 | 19.9 | 0.54 | 10.8 | 0.21 |
| Cypraeidae | Cowrie | 1 | 0.02 | 1 | 0.04 | .8 | 0.02 | .6 | 0.01 |
| *Polinices* spp. | Moon-shell | 2 | 0.04 | 2 | 0.09 | .6 | 0.02 | .4 | 0.01 |
| *Natica* sp. | Natica | 1 | 0.02 | 1 | 0.04 | -- | 0.00 | -- | 0.00 |
| *Cypraecassis* spp. | Cowerie-helment | 5 | 0.10 | 4 | 0.18 | 12.9 | 0.35 | 7.3 | 0.14 |
| *Cassis* spp. | Helment | 2 | 0.04 | 1 | 0.04 | 47.5 | 1.28 | 24.1 | 0.46 |
| *Cymatium* sp. | Triton | 1 | 0.02 | 1 | 0.04 | 3.1 | 0.08 | 2.0 | 0.04 |
| *Pupura patula* | Wide-mouthed Purpura | 6 | 0.12 | 6 | 0.27 | 7.4 | 0.20 | 4.4 | 0.08 |

Table C-8 continued

| Species | Common Name | Number of Fragments # | Number of Fragments % | Minimum Number of Individuals # | Minimum Number of Individuals % | Bone/Shell Weight g | Bone/Shell Weight % | Minimum Edible Meat Weight g | Minimum Edible Meat Weight % |
|---|---|---|---|---|---|---|---|---|---|
| *Thais rustica* | Rustic Rockk-shell | 16 | 0.31 | 16 | 0.72 | 8.6 | 0.23 | 5.0 | 0.10 |
| *Columbella mercatoria* | Common Dove-shell | 8 | 0.16 | 8 | 0.36 | 1.8 | 0.05 | 1.2 | 0.02 |
| *Nitidella laevigata* | Smooth Dove-shell | 2 | 0.04 | 2 | 0.09 | .2 | 0.01 | .2 | 0.00 |
| *Pisania tincta* | Dwarf Triton | 1 | 0.02 | 1 | 0.04 | -- | 0.00 | -- | 0.00 |
| *Engoniophos unicinctus* | ———— | 5 | 0.10 | 5 | 0.22 | -- | 0.00 | -- | 0.00 |
| *Nassarius albus* | Variable Nassa | 3 | 0.06 | 3 | 0.13 | -- | 0.00 | -- | 0.00 |
| *Leucozonia occellata* | White-spotted Latirus | 1 | 0.02 | 1 | 0.04 | -- | 0.00 | -- | 0.00 |
| *Oliva* spp. | Olive | 8 | 0.16 | 8 | 0.36 | 29.8 | 0.80 | 15.7 | 0.30 |
| *Olivella* spp. | Dwarf Olive | 7 | 0.14 | 7 | 0.31 | 2.5 | 0.07 | 1.6 | 0.03 |
| *Bulla striata* | Common Atlantic Bubble | 2 | 0.04 | 2 | 0.09 | .9 | 0.02 | .6 | 0.01 |
| Gastropoda uid marine | Uid Marine Gastropods | * | 0.00 | - | 0.00 | 321.0 | 8.67 | 139.9 | 2.66 |
| **TOTAL GASTROPODA MARINE** | **TOTAL MARINE GASTROPODS** | **3286** | **64.20** | **1898** | **84.85** | **2800.5** | **75.62** | **1239.1** | **23.58** |
| *Bulimulus* spp. (1) | | (85) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Drymaeus* spp. | | (3) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Opeas pumilum* | | (1) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Megalomastoma croecum* | | (96) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Polydontes* cf. *lima* | | (22) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| Sagidae | | (5) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Caracolus* spp. | | 8 | 0.16 | 5 | 0.22 | 18.9 | 0.51 | - | 0.00 |
| **TOTAL GASTROPODA TERRESTRIAL** | **TOTAL LAND SNAILS** | **8** | **0.16** | **5** | **0.22** | **18.9** | **0.51** | **-** | **0.00** |
| Chiton s.l. | Coat-of-mail Shells | 1054 | 20.59 | 224 | 10.01 | 290.5 | 7.84 | 218.9 | 4.17 |
| **TOTAL AMPHINEURA** | **TOTAL COAT-OF-MAIL SHELLS** | **1054** | **20.59** | **224** | **10.01** | **290.5** | **7.84** | **218.9** | **4.17** |

Table C-8 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Anadara notabilis* | Eared Ark | 1 | 0.02 | 1 | 0.04 | 2.5 | 0.07 | 1.9 | 0.04 |
| *A. ovalis* | Blood Ark | 1 | 0.02 | 1 | 0.04 | .6 | 0.02 | .7 | 0.01 |
| *Anadara* sp. | Ark | 1 | 0.02 | 1 | 0.04 | 1.4 | 0.04 | 1.3 | 0.02 |
| Arcidae | Arks | 11 | 0.21 | - | 0.00 | 4.3 | 0.12 | 2.8 | 0.05 |
| Pectinidae | Scallops | 5 | 0.10 | 1 | 0.04 | 3.5 | 0.09 | 2.4 | 0.05 |
| *Codakia orbicularis* | Tiger Lucina | 66 | 1.29 | 4 | 0.18 | 73.0 | 1.97 | 19.4 | 0.37 |
| Lucinidae | Lucine | 1 | 0.02 | - | 0.00 | .1 | 0.00 | .2 | 0.00 |
| *Chama* spp. | Jewel Box | 40 | 0.78 | 13 | 0.58 | 12.8 | 0.35 | 5.9 | 0.11 |
| *Trachycardium magnum* | Magnum Cockle | 1 | 0.02 | 1 | 0.04 | .5 | 0.01 | .6 | 0.01 |
| *Laevicardium laevigatum* | Common Egg Cockle | 8 | 0.16 | 1 | 0.04 | 18.9 | 0.51 | 7.7 | 0.15 |
| *Mactrellona alata* | Caribbean Winged Mactra | 8 | 0.16 | 1 | 0.04 | 7.6 | 0.21 | 4.2 | 0.08 |
| *Tellina fausta* | Faust's Tellin | 6 | 0.12 | 1 | 0.04 | 18.4 | 0.50 | 7.6 | 0.14 |
| *Tellina* spp. | Tellin | 18 | 0.35 | 11 | 0.49 | 2.0 | 0.05 | 1.7 | 0.03 |
| *Chione cancellata* | Cross-barred Venus | 1 | 0.02 | 1 | 0.04 | 1.2 | 0.03 | 1.2 | 0.02 |
| *Anomalocardium brasiliana* | West Indian Pointed Venus | 2 | 0.04 | 1 | 0.04 | 4.3 | 0.12 | 2.8 | 0.05 |
| Bivalvia uid | Unidentified Bivalves | * | 0.00 | - | 0.00 | 66.1 | 1.78 | 18.1 | 0.34 |
| **TOTAL BIVALVIA** | **TOTAL BIVALVES** | **170** | **3.32** | **38** | **1.70** | **217.2** | **5.87** | **78.5** | **1.49** |
| Mollusca uid | Unidentified Mollusks | * | 0.00 | - | 0.00 | 95.9 | 2.59 | 46.0 | 0.88 |
| **TOTAL MOLLUSCA** | **TOTAL MOLLUSK** | **4518** | **88.28** | **2165** | **96.78** | **3423.4** | **92.44** | **1582.5** | **30.11** |
| **TOTAL INVERTEBRATA** | **TOTAL INVERTEBRATES** | **4529** | **88.49** | **2166** | **96.83** | **3447.2** | **93.09** | **1708.0** | **32.50** |
| **SAMPLE TOTAL** | **VERTEBRATES AND INVERTEBRATES** | **5118** | **100.00** | **2237** | **100.00** | **3703.2** | **100.00** | **5255.7** | **100.00** |

Table C-9. Faunal remains from N112W88, Feature 104, flotation samples.

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| Mammalia uid, small | Small Mammal | 3 | 0.13 | 1 | 0.44 | .2 | 0.02 | 7 | 0.26 |
| **TOTAL MAMMALIA** | **TOTAL MAMMAL** | **3** | **0.13** | **1** | **0.44** | **.2** | **0.02** | **7** | **0.26** |
| Columbidae | Doves and Pigeons | 4 | 0.18 | 1 | 0.44 | .4 | 0.03 | 8.1 | 0.30 |
| Aves uid | Unidentified Birds | 68 | 3.01 | - | 0.00 | 4.2 | 0.33 | 58.0 | 2.17 |
| **TOTAL AVES** | **TOTAL BIRDS** | **72** | **3.18** | **1** | **0.44** | **4.6** | **0.36** | **66.6** | **2.49** |
| Testudines | Turtles | 8 | 0.35 | 1 | 0.44 | 3.7 | 0.29 | 89.4 | 3.34 |
| Anguidae | Lizard | 8 | 0.35 | 1 | 0.44 | -- | 0.00 | -- | 0.00 |
| Lacertilia | Lizard | 12 | 0.53 | 2 | 0.87 | .1 | 0.01 | -- | 0.00 |
| *Alsophis* sp. | Snake | 3 | 0.13 | 1 | 0.44 | .1 | 0.01 | 1.3 | 0.05 |
| **TOTAL REPTILIA** | **TOTAL REPTILE** | **31** | **1.37** | **5** | **2.18** | **3.9** | **0.30** | **90.7** | **3.39** |
| Carcharhinus sp. | Requeim Sharks | 1 | 0.04 | 1 | 0.44 | .1 | 0.01 | .4 | 0.01 |
| **TOTAL CHONDRICHTHYES** | **TOTAL CARTILAGINOUS FISHES** | **1** | **0.04** | **1** | **0.44** | **.1** | **0.01** | **.4** | **0.01** |
| *Harengula* spp. | Sardine | 30 | 1.33 | 20 | 8.73 | .2 | 0.02 | 5.1 | 0.19 |
| Clupeidae | Herring, Shad, Sardine | 604 | 26.70 | - | 0.00 | 2.2 | 0.17 | 44.5 | 1.66 |
| Exocoetidae | Flying Fish | 16 | 0.71 | 2 | 0.87 | .2 | 0.02 | 5.1 | 0.19 |
| *Strongylura* spp. | Needlefish | 9 | 0.40 | 2 | 0.87 | .1 | 0.01 | 2.7 | 0.10 |
| *Tylosaurus* sp. | Houndfish | 1 | 0.04 | 1 | 0.44 | .1 | 0.01 | 2.7 | 0.10 |
| Belonidae | Needlefish | 2 | 0.09 | - | 0.00 | .1 | 0.01 | 2.7 | 0.10 |
| *Holocentrus* spp. | Squirrelfish | 2 | 0.09 | 1 | 0.44 | .1 | 0.01 | 2.7 | 0.10 |
| *Epinephalus* spp. | Grouper | 18 | 0.80 | 2 | 0.87 | 1.1 | 0.09 | 23.8 | 0.89 |
| *Caranx* spp. | Jack | 21 | 0.93 | 2 | 0.87 | .5 | 0.04 | 11.7 | 0.44 |
| Carangidae | Jacks | 15 | 0.66 | - | 0.00 | .4 | 0.03 | 9.6 | 0.36 |

Table C-9 continued

| Species | Common Name | Number of Fragments # | Number of Fragments % | Minimum Number of Individuals # | Minimum Number of Individuals % | Bone/Shell Weight g | Bone/Shell Weight % | Minimum Edible Meat Weight g | Minimum Edible Meat Weight % |
|---|---|---|---|---|---|---|---|---|---|
| *Lutjanus* spp. | Snapper | 2 | 0.09 | 1 | 0.44 | .1 | 0.01 | 2.7 | 0.10 |
| cf. *Lutjanus* spp. | Snapper | 2 | 0.09 | 1 | 0.44 | 3.0 | 0.23 | 58.8 | 2.20 |
| *Diapterus* sp. | Mojarra | 1 | 0.04 | 1 | 0.44 | .02 | 0.00 | .6 | 0.02 |
| *Anisotremus virginicus* | Porkfish | 1 | 0.04 | 1 | 0.44 | .03 | 0.00 | .9 | 0.03 |
| *Haemulon* spp. | Grunt | 7 | 0.31 | 2 | 0.87 | .3 | 0.02 | 7.4 | 0.28 |
| *Bodianus* spp | Hogfish | 3 | 0.13 | 1 | 0.44 | .4 | 0.03 | 9.6 | 0.36 |
| *Halichoeres* spp. | Wrasse | 6 | 0.27 | 3 | 1.31 | .04 | 0.00 | 1.2 | 0.04 |
| Labridae | Wrasses | 2 | 0.09 | - | 0.00 | .01 | 0.00 | .3 | 0.01 |
| *Sparisoma* spp. | Parrotfish | 3 | 0.13 | 1 | 0.44 | 1.0 | 0.08 | 21.9 | 0.82 |
| Scaridae | Parrotfishes | 15 | 0.66 | - | 0.00 | .1 | 0.01 | 2.7 | 0.10 |
| *Mugil* spp. | Mullet | 3 | 0.13 | 3 | 1.31 | .5 | 0.04 | 11.7 | 0.44 |
| cf. *Eleotris* sp. | Sleeper | 1 | 0.04 | 1 | 0.44 | <.01 | 0.00 | -- | 0.00 |
| *Gobiomorus dormitor* | Bigmouth Sleeper | 43 | 1.90 | 3 | 1.31 | 2.5 | 0.19 | 49.9 | 1.86 |
| *Euthynnus alletteratus* | Little Tunny | 3 | 0.13 | 1 | 0.44 | .7 | 0.05 | 15.9 | 0.59 |
| *Euthynnus* spp. | Tuna | 2 | 0.09 | 2 | 0.87 | .9 | 0.07 | 19.9 | 0.74 |
| Scomberidae | Mackerals | 1 | 0.04 | 1 | 0.44 | .1 | 0.01 | 2.7 | 0.10 |
| *Balistes* cf. *vetula* | Queen Triggerfish | 1 | 0.04 | 1 | 0.44 | 1.3 | 0.10 | 27.7 | 1.03 |
| *Melichthyes niger* | Black Durgon | 3 | 0.13 | 2 | 0.87 | .5 | 0.04 | 11.7 | 0.44 |
| Balistidae | Leatherjackets | 386 | 17.06 | - | 0.00 | 3.2 | 0.25 | 62.3 | 2.33 |
| *Diodon* spp. | Porcupinefish | 2 | 0.09 | 1 | 0.44 | .8 | 0.06 | 17.9 | 0.67 |
| Osteichthyes uid | Unidentified Bony Fishes | * | 0.00 | - | 0.00 | 61.6 | 4.79 | 892.5 | 33.35 |
| **TOTAL OSTEICHTHYES** | **TOTAL BONY FISHES** | **1205** | **53.27** | **56** | **24.45** | **82.1** | **6.38** | **1328.9** | **49.65** |
| Vertebrata uid | Unidentified Vertebrates | * | 0.00 | - | 0.00 | 15.1 | 1.17 | 251.8 | 9.41 |
| **TOTAL VERTEBRATA** | **TOTAL VERTEBRATES** | **1312** | **58.00** | **64** | **27.95** | **106.0** | **8.24** | **1745.4** | **65.21** |

Table C-9 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Cardisoma guanhumi* | Blue Land Crab | 178 | 7.87 | 43 | 18.78 | 79.8 | 6.20 | 248.3 | 9.28 |
| Gecarcinidae | Land Crab | 37 | 1.64 | - | 0.00 | 10.4 | 0.81 | 58.3 | 2.18 |
| Brachyura | Unidentified Crab | * | 0.00 | - | 0.00 | 339.6 | 26.39 | 290.0 | 10.83 |
| **TOTAL CRUSTACEA** | **TOTAL MARINE ARTHROPODS** | **215** | **9.50** | **43** | **18.78** | **429.8** | **33.40** | **596.6** | **22.29** |
| *Diodora* sp. | Keyhole Limpet | 1 | 0.04 | 1 | 0.44 | .2 | 0.02 | .1 | 0.00 |
| *Fissurella nodosa* | Knobby Keyhole Limpet | 16 | 0.71 | 16 | 6.99 | 29.0 | 2.25 | 15.3 | 0.57 |
| *Fissurella* spp. | Keyhole Limpet | 15 | 0.66 | - | 0.00 | 3.6 | 0.28 | 2.2 | 0.08 |
| Fissurellidae | Keyhole Limpets | 5 | 0.22 | - | 0.00 | 1.2 | 0.09 | .8 | 0.03 |
| *Acmaea* spp. | Limpet | 1 | 0.04 | 1 | 0.44 | .1 | 0.01 | .1 | 0.00 |
| *Callistoma* sp. | Top-shell | 1 | 0.04 | 1 | 0.44 | .1 | 0.01 | .1 | 0.00 |
| *Cittarium pica* | West Indian Top Shell | 63 | 2.79 | 4 | 1.75 | 141.4 | 10.99 | 65.8 | 2.46 |
| *Tegula* sp. | Tegula | 1 | 0.04 | 1 | 0.44 | .2 | 0.02 | .2 | 0.01 |
| *Turbo castena* | Chestnut Turban | 1 | 0.04 | 1 | 0.44 | .3 | 0.02 | .3 | 0.01 |
| *Turbo* sp. | Turban | 1 | 0.04 | - | 0.00 | .05 | 0.00 | .04 | 0.00 |
| Turbanidae | Turbans | 1 | 0.04 | - | 0.00 | .2 | 0.02 | .2 | 0.01 |
| *Nerita fulgurans* | Antillean Nerite | 3 | 0.13 | 3 | 1.31 | 1.2 | 0.09 | .8 | 0.03 |
| *Nerita peloronta* | Bleeding Tooth Nerite | 8 | 0.35 | 8 | 3.49 | .5 | 0.04 | .4 | 0.01 |
| *N. tessellate* | Tessellate Nerite | 4 | 0.18 | 4 | 1.75 | 1.8 | 0.14 | 1.2 | 0.04 |
| *N. versicolor* | Four-toothed Nerite | 4 | 0.18 | 4 | 1.75 | 2.9 | 0.23 | 1.8 | 0.07 |
| *Nerita* spp. | Nerite | 39 | 1.72 | - | 0.00 | 2.6 | 0.20 | 1.7 | 0.06 |
| *Neritina virginea* | Virgin Nerite | 13 | 0.57 | 8 | 3.49 | 1.8 | 0.14 | 1.2 | 0.04 |
| Neritidae | Nerites | 28 | 1.24 | 2 | 0.87 | 2.0 | 0.16 | 1.3 | 0.05 |
| *Littorina lineolata* | Lineolate Periwinkle | 3 | 0.13 | 3 | 1.31 | .3 | 0.02 | .3 | 0.01 |

Table C-9 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *L. ziczac* | Zebra Periwinkle | 9 | 0.40 | 8 | 3.49 | 1.0 | 0.08 | .7 | 0.03 |
| *Tectarius muricatus* | Beaded Periwinkle | 4 | 0.18 | 4 | 1.75 | .4 | 0.03 | .3 | 0.01 |
| *Modulus modulus* | Common Atlantic Modulus | 1 | 0.04 | 1 | 0.44 | <.01 | 0.00 | -- | 0.00 |
| *Cerithium algicola* | Ivory Cerith | 1 | 0.04 | 1 | 0.44 | -- | 0.00 | -- | 0.00 |
| *Strombus gigas* | Pink Conch | 12 | 0.53 | 3 | 1.31 | 101.7 | 7.90 | 48.6 | 1.82 |
| *Strombus* spp. | Conch | 25 | 1.11 | 4 | 1.75 | 173.9 | 13.51 | 79.6 | 2.97 |
| *Cypraea zebra* | Measled Cowrie | 1 | 0.04 | 1 | 0.44 | 22.5 | 1.75 | 12.1 | 0.45 |
| *Cassis* sp. | Helment Shell | 1 | 0.04 | 1 | 0.44 | 5.1 | 0.40 | 3.1 | 0.12 |
| *Thais rustica* | Rustic Rock-shell | 1 | 0.04 | 1 | 0.44 | .3 | 0.02 | .3 | 0.01 |
| *Columbella mercatoria* | Common Dove-shell | 2 | 0.09 | 2 | 0.87 | .7 | 0.05 | .5 | 0.02 |
| *Engoniophos* cf. *unicinctus* | ———— | 1 | 0.04 | 1 | 0.44 | -- | 0.00 | -- | 0.00 |
| *Oliva* spp. | Olive | 2 | 0.09 | 2 | 0.87 | 9.6 | 0.75 | 5.5 | 0.21 |
| Marginellidae | Olive Shell | 1 | 0.04 | 1 | 0.44 | .4 | 0.03 | .3 | 0.01 |
| Gastropoda uid marine | Uid Marine Gastrophods | * | 0.00 | - | 0.00 | 32.9 | 2.56 | 17.2 | 0.64 |
| **TOTAL GASTROPODA MARINE** | **TOTAL MARINE GASTROPODS** | **269** | **11.89** | **87** | **37.99** | **537.95** | **41.80** | **262.04** | **9.79** |
| *Bulimulus* spp. (1) | | (258) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Bulimulus* spp. (2) | | (2) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| Bulimulidae | | (9) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Opeas pumilum* | | (792) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Gastrocopta pellucida* | | (148) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Megalomastoma croecum* | | (11) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| Sagidae | | (11) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| **TOTAL** GASTROPODA TERRESTRIAL | **TOTAL** LAND SNAILS | (1231) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |

Table C-9 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| Chiton s.l. | Coat-of-Mail Shells | 318 | 14.06 | 27 | 11.79 | 55 | 4.27 | 36.3 | 1.36 |
| TOTAL AMPHINEURA | TOTAL COAT-OF-MAIL SHELLS | 318 | 14.06 | 27 | 11.79 | 55 | 4.27 | 36.3 | 1.36 |
| *Anadara* sp. | Ark | 1 | 0.04 | 1 | 0.44 | .1 | 0.01 | .2 | 0.01 |
| Arcidae | Arks | 1 | 0.04 | 1 | 0.44 | .4 | 0.03 | .6 | 0.02 |
| *Codakia orbicularis* | Tiger Lucina | 9 | 0.40 | 1 | 0.44 | 17.9 | 1.39 | 7.5 | 0.28 |
| *Chama* spp. | Jewel Box | 30 | 1.33 | 2 | 0.87 | 1.9 | 0.15 | 1.6 | 0.06 |
| Chamidae | Jewel Boxes | 87 | 3.85 | - | 0.00 | 2.9 | 0.23 | 2.1 | 0.08 |
| *Tellina fausta* | Faust's Tellin | 1 | 0.04 | 1 | 0.44 | 14.0 | 1.09 | 6.3 | 0.24 |
| *Mactrellona alata* | Caribbean Winged Mactra | 3 | 0.13 | 1 | 0.44 | 2.2 | 0.17 | 1.8 | 0.07 |
| Bivalvia uid | Unidentified Bivalves | * | 0.00 | - | 0.00 | 2.9 | 0.23 | 2.2 | 0.08 |
| **TOTAL BIVALVIA** | **TOTAL BIVALVES** | **132** | **5.84** | **7** | **3.06** | **132.0** | **10.26** | **22.3** | **0.83** |
| Mollusca uid | Unidentified Mollusk | * | 0.00 | - | 0.00 | 26.1 | 2.03 | 13.9 | 0.52 |
| **TOTAL MOLLUSKA** | **TOTAL MOLLUSK** | **719** | **31.79** | **121** | **52.84** | **751.05** | **58.36** | **334.54** | **12.50** |
| Echinoidea | Sea Urchins | 16 | 0.71 | 1 | 0.44 | - | 0.00 | - | 0.00 |
| **TOTAL INVERTEBRATA** | **TOTAL INVERTEBRATES** | **950** | **42.00** | **165** | **72.05** | **1180.85** | **91.76** | **931.14** | **34.79** |
| **SAMPLE TOTAL** | **VERTEBRATES AND INVERTEBRATES** | **2262** | **100.00** | **229** | **100.00** | **1286.8** | **100.00** | **2676.5** | **100.00** |

Table C-10. Faunal remains from N112W88, Feature 104, coarse fraction.

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| Rodentia | Unidentified Rodent | 2 | 0.22 | 1 | 0.46 | .7 | 0.06 | 19.2 | 0.89 |
| **TOTAL MAMMALIA** | **TOTAL MAMMAL** | **2** | **0.22** | **1** | **0.46** | **.7** | **0.06** | **19.2** | **0.89** |
| *Columba* spp. | Dove | 3 | 0.32 | 1 | 0.46 | .6 | 0.05 | 11.3 | 0.52 |
| Aves uid | Unidentified Birds | 1 | 0.11 | - | 0.00 | .1 | 0.01 | 2.5 | 0.12 |
| **TOTAL AVES** | **TOTAL BIRDS** | **4** | **0.43** | **1** | **0.46** | **.7** | **0.06** | **13.8** | **0.64** |
| Testudines | Turtles | 11 | 1.18 | 1 | 0.46 | 17.3 | 1.57 | 202.4 | 9.36 |
| **TOTAL REPTILIA** | **TOTAL REPTILE** | **11** | **1.18** | **1** | **0.46** | **17.3** | **1.57** | **202.4** | **9.36** |
| *Carcharhinus* sp. | Requeim Sharks | 1 | 0.11 | 1 | 0.46 | .2 | 0.02 | .9 | 0.04 |
| **TOTAL CHONDRICHTHYES** | **TOTAL CARTILAGINOUS FISHES** | **1** | **0.11** | **1** | **0.46** | **.2** | **0.02** | **.9** | **0.04** |
| Clupeidae | Herring, Shad, Sardine | 2 | 0.22 | 1 | 0.46 | .01 | 0.00 | .4 | 0.02 |
| *Tylosaurus* sp. | Houndfish | 1 | 0.11 | 1 | 0.46 | .1 | 0.01 | 2.7 | 0.12 |
| Holocentridae. | Squirrelfish | 1 | 0.11 | 1 | 0.46 | .1 | 0.01 | 2.7 | 0.12 |
| *Centropomus* spp. | Snook | 2 | 0.22 | 2 | 0.91 | .4 | 0.04 | 9.6 | 0.44 |
| *Epinephalus* spp. | Grouper | 8 | 0.86 | 1 | 0.46 | 1.1 | 0.10 | 23.8 | 1.10 |
| *Trachinotus* sp. | Pompano | 1 | 0.11 | 1 | 0.46 | .2 | 0.02 | 5.1 | 0.24 |
| *Lutjanus* spp. | Snapper | 9 | 0.97 | 3 | 1.37 | 13.3 | 1.21 | 224.6 | 10.39 |
| *Haemulon* spp. | Grunt | 7 | 0.75 | 1 | 0.46 | 1.6 | 0.15 | 33.4 | 1.54 |
| cf. Sciaenidae | Drum | 1 | 0.11 | 1 | 0.46 | .4 | 0.04 | 9.6 | 0.44 |
| *Bodianus* spp. | Hogfish | 2 | 0.22 | 1 | 0.46 | .7 | 0.06 | 15.9 | 0.74 |
| Labridae | Wrasses | 1 | 0.11 | - | 0.00 | .3 | 0.03 | 7.4 | 0.34 |

Table C-10 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Sparisoma viride* | Spotlight Parrotfish | 3 | 0.32 | 2 | 0.91 | 1.0 | 0.09 | 21.9 | 1.01 |
| *Sparisoma* spp. | Parrotfish | 4 | 0.43 | - | 0.00 | .5 | 0.05 | 11.7 | 0.54 |
| Scaridae | Parrotfish | 2 | 0.22 | - | 0.00 | .6 | 0.05 | 13.8 | 0.64 |
| *Mugil* sp. | Mullet | 1 | 0.11 | 1 | 0.46 | .1 | 0.01 | 2.7 | 0.12 |
| *Gobiomorus dormitor* | Bigmouth Sleeper | 7 | 0.75 | 2 | 0.91 | 1.9 | 0.17 | 39.0 | 1.80 |
| Eleotridae | Sleepers | 3 | 0.32 | - | 0.00 | .5 | 0.05 | 11.7 | 0.54 |
| Scomberidae | Mackerals | 1 | 0.11 | 1 | 0.46 | .6 | 0.05 | 13.8 | 0.64 |
| *Balistes* spp. | Triggerfish | 2 | 0.22 | 1 | 0.46 | 3.9 | 0.36 | 74.5 | 3.45 |
| Balistidae | Leatherjackets | 5 | 0.54 | - | 0.00 | 1.0 | 0.09 | 21.9 | 1.01 |
| cf. *Diodon* spp. | Porcupinefish | 3 | 0.32 | 1 | 0.46 | .8 | 0.07 | 17.9 | 0.83 |
| Osteichthyes uid | Unidentified Bony Fishes | * | 0.00 | - | 0.00 | 24.2 | 2.20 | 385.0 | 17.81 |
| **TOTAL OSTEICHTHYES** | **TOTAL BONY FISHES** | **66** | **7.10** | **21** | **9.59** | **53.31** | **4.85** | **949.1** | **43.90** |
| Vertebrata uid | Unidentified Vertebrates | * | 0.00 | - | 0.00 | 2.7 | 0.25 | 53.5 | 2.47 |
| **TOTAL VERTEBRATA** | **TOTAL VERTEBRATES** | **84** | **9.04** | **25** | **11.42** | **74.91** | **6.82** | **1238.9** | **57.31** |
| *Cardisoma guanhumi* | Blue Land Crab | 190 | 20.45 | 18 | 8.22 | 158.1 | 14.39 | 340.0 | 15.73 |
| Gecarcinidae | Land Crab | 75 | 8.07 | - | 0.00 | 44.5 | 4.05 | 113.9 | 5.27 |
| Brachyura | Unidentified Crab | * | 0.00 | - | 0.00 | 137.6 | 12.53 | 191.4 | 8.85 |
| **TOTAL CRUSTACEA** | **TOTAL MARINE ARTHROPODS** | **265** | **28.53** | **18** | **8.22** | **340.2** | **30.97** | **645.3** | **29.85** |
| *Fissurella nodosa* | Knobby Keyhole Limpet | 32 | 3.44 | 32 | 14.61 | 48.5 | 4.42 | 24.6 | 1.14 |
| *Fissurella* spp. | Keyhole Limpets | 15 | 1.61 | - | 0.00 | 6.9 | 0.63 | 4.1 | 0.19 |
| *Cittarium pica* | West Indian Top Shell | 96 | 10.33 | 9 | 4.11 | 137.9 | 12.55 | 58.3 | 2.70 |
| *Gaza superba* | Superb Gaza | 1 | 0.11 | 1 | 0.46 | .3 | 0.03 | .3 | 0.01 |
| *Nerita fulgurans* | Antillean Nerite | 1 | 0.11 | 1 | 0.46 | .3 | 0.03 | .3 | 0.01 |

Table C-10 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *N. tessellata* | Tessellate Nerite | 12 | 1.29 | 12 | 5.48 | 4.5 | 0.41 | 2.8 | 0.13 |
| *N. versicolor* | Four-toothed Nerite | 5 | 0.54 | 5 | 2.28 | 2.9 | 0.26 | 1.8 | 0.08 |
| *Nerita* spp. | Nerite | 27 | 2.91 | - | 0.00 | 5.9 | 0.54 | 3.5 | 0.16 |
| *Neritina virginea* | Virgin Nerite | 27 | 2.91 | 27 | 12.33 | 9.6 | 0.87 | 5.5 | 0.25 |
| *Neritina* spp. | Nerite | 1 | 0.11 | - | 0.00 | .8 | 0.07 | .6 | 0.03 |
| *Littorina angustior* | Angust Periwinkle | 3 | 0.32 | 3 | 1.37 | .5 | 0.05 | .4 | 0.02 |
| *L. lineolata* | Lineolate Periwinkle | 6 | 0.65 | 6 | 2.74 | 1.1 | 0.10 | .7 | 0.03 |
| *L. ziczac* | Zebra Periwinkle | 1 | 0.11 | 1 | 0.46 | .3 | 0.03 | .3 | 0.01 |
| *Nodolittorina tuberculata* | Common Prickly-winkle | 4 | 0.43 | 4 | 1.83 | .7 | 0.06 | .5 | 0.02 |
| *Tectarius muricatus* | Beaded Periwinkle | 7 | 0.75 | 5 | 2.28 | 1.9 | 0.17 | 1.2 | 0.06 |
| *Cerithium eburneum* | Ivory Cerith | 3 | 0.32 | 3 | 1.37 | .8 | 0.07 | .6 | 0.03 |
| *Strombus gigas* | Pink Conch | 5 | 0.54 | 3 | 1.37 | 86.1 | 7.84 | 41.7 | 1.93 |
| *Strombus* cf. *pugilis* | West Indian Fighting Conch | 2 | 0.22 | 2 | 0.91 | 14.8 | 1.35 | 8.2 | 0.38 |
| *S. raninus* | Hawk-wing Conch | 1 | 0.11 | 1 | 0.46 | 12.5 | 1.14 | 6.7 | 0.31 |
| *Strombus* spp. | Conch | 59 | 6.35 | 7 | 3.20 | 146.4 | 13.33 | 5.5 | 0.25 |
| *Pupura patula* | Wide-mouthed Purpura | 1 | 0.11 | 1 | 0.46 | 1.5 | 0.14 | 1.0 | 0.05 |
| *Cypraea* sp. | Cowerie | 1 | 0.11 | 1 | 0.46 | 5.0 | 0.46 | 3.0 | 0.14 |
| Cypraeidae | Cowerie | 1 | 0.11 | 1 | 0.46 | .3 | 0.03 | .3 | 0.01 |
| *Thais rustica* | Rustic Rock-shell | 2 | 0.22 | 2 | 0.91 | 1.0 | 0.09 | .7 | 0.03 |
| *Columbella mercatoria* | Common Dove-shell | 2 | 0.22 | 2 | 0.91 | .4 | 0.04 | .4 | 0.02 |
| Gastropoda uid marine | Uid Marine Gastrophods | * | 0.00 | - | 0.00 | 49.6 | 4.52 | 25.1 | 1.16 |
| **TOTAL GASTROPODA MARINE** | **TOTAL MARINE GASTROPODS** | **315** | **33.91** | **129** | **58.90** | **540.5** | **49.20** | **198.1** | **9.16** |
| *Bulimulus* spp. (1) | | (32) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| Sagidae | | (29) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |

Table C-10 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Megalomastoma croecum* | | (1) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| **TOTAL GASTROPODA TERRESTRIAL** | **TOTAL LAND SNAILS** | **(62)** | **0.00** | **-** | **0.00** | **-** | **0.00** | **-** | **0.00** |
| Chiton s.l. | Coat-of-mail Shells | 225 | 24.22 | 36 | 16.44 | 68.7 | 6.25 | 46.1 | 2.13 |
| **TOTAL AMPHINEURA** | **TOTAL COAT-OF-MAIL SHELLS** | **225** | **24.22** | **36** | **16.44** | **68.7** | **6.25** | **46.1** | **2.13** |
| Arcidae | Arks | 1 | 0.11 | 1 | 0.46 | .3 | 0.03 | .5 | 0.02 |
| *Pecten* spp. | Scallop | 1 | 0.11 | 1 | 0.46 | 1.1 | 0.10 | 1.1 | 0.05 |
| *Codakia orbiculatis* | Tiger Lucina | 22 | 2.37 | 2 | 0.91 | 43.3 | 3.94 | 13.6 | 0.63 |
| *Chama* spp. | Jewel Box | 6 | 0.65 | 2 | 0.91 | 1.4 | 0.13 | 1.3 | 0.06 |
| Chamidae | Jewel Boxs | 4 | 0.43 | - | 0.00 | .6 | 0.05 | .7 | 0.03 |
| *Laevicardium laevigatum* | Common Egg Cockle | 2 | 0.22 | 1 | 0.46 | 5.1 | 0.46 | 3.2 | 0.15 |
| *Trachycardium magnum* | Magnum Cockle | 1 | 0.11 | 1 | 0.46 | 1.2 | 0.11 | 1.2 | 0.06 |
| *Tellina fausta* | Faust's Tellin | 1 | 0.11 | 1 | 0.46 | 4.4 | 0.40 | 2.9 | 0.13 |
| *Tellina* sp. | Tellin | 1 | 0.11 | 1 | 0.46 | .2 | 0.02 | .3 | 0.01 |
| *Chione cancellata* | Cross-barred Venus | 1 | 0.11 | 1 | 0.46 | .8 | 0.07 | .9 | 0.04 |
| Bivalvia uid | Unidentified Bivalves | * | 0.00 | - | 0.00 | 13.0 | 1.18 | 6.0 | 0.28 |
| **TOTAL BIVALVIA** | **TOTAL BIVALVES** | **40** | **4.31** | **11** | **5.02** | **71.4** | **6.50** | **31.7** | **1.47** |
| Mollusca uid | Unidentified Mollusk | * | 0.00 | - | 0.00 | 2.8 | 0.25 | 1.8 | 0.08 |
| **TOTAL MOLLUSKA** | **TOTAL MOLLUSK** | **580** | **62.43** | **176** | **80.37** | **683.4** | **62.21** | **277.7** | **12.85** |
| **TOTAL INVERTEBRATA** | **TOTAL INVERTEBRATES** | **845** | **90.96** | **194** | **88.58** | **1023.6** | **93.18** | **923** | **42.69** |
| **SAMPLE TOTAL** | **VERTEBRATES AND INVERTEBRATES** | **929** | **100.00** | **219** | **100.00** | **1098.5** | **100.00** | **2161.9** | **100.00** |

Table C-11. Faunal remains from N32E32, 20-40, flotation samples.

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Isolobodon portoricensis* | Allen's Hutia | 5 | 0.42 | 1 | 0.97 | .7 | 0.04 | 19.2 | 1.07 |
| Echimyidae | Spiny Rat | 1 | 0.08 | 1 | 0.97 | .04 | 0.00 | 1.9 | 0.11 |
| Rodentia | Unidentified Rodent | 16 | 1.35 | - | 0.00 | 1.4 | 0.08 | 33.8 | 1.88 |
| Mammalia uid, small | Small Mammal | 1 | 0.08 | - | 0.00 | .1 | 0.01 | 4.0 | 0.22 |
| **TOTAL MAMMALIA** | **TOTAL MAMMAL** | **23** | **1.94** | **2** | **1.94** | **2.24** | **0.12** | **58.9** | **3.27** |
| *Zenaida* sp. | Dove | 1 | 0.08 | 1 | 0.97 | .03 | 0.00 | .9 | 0.05 |
| Emberizidae | Finches | 1 | 0.08 | 1 | 0.97 | <.01 | 0.00 | - | 0.00 |
| Aves uid | Unidentified Birds | 1 | 0.08 | 1 | 0.97 | .1 | 0.01 | 2.5 | 0.14 |
| **TOTAL AVES** | **TOTAL BIRDS** | **3** | **0.25** | **3** | **2.91** | **.13** | **0.01** | **3.4** | **0.19** |
| Testudines | Turtles | 36 | 3.04 | 1 | 0.97 | 5.8 | 0.31 | 113.4 | 6.30 |
| Anguidae | Lizard | 4 | 0.34 | 1 | 0.97 | - | 0.00 | - | 0.00 |
| Lacertilia | Lizard | 8 | 0.68 | 1 | 0.97 | - | 0.00 | - | 0.00 |
| Colubridae | Snake | 2 | 0.17 | 2 | 1.94 | .1 | 0.01 | 1.3 | 0.07 |
| cf. Colubridae | Snake | 1 | 0.08 | 1 | 0.97 | <.01 | 0.00 | - | 0.00 |
| **TOTAL REPTILIA** | **TOTAL REPTILE** | **51** | **4.31** | **6** | **5.83** | **5.9** | **0.32** | **114.7** | **6.37** |
| Lamniformes | Shark | 1 | 0.08 | 1 | 0.97 | .1 | 0.01 | .4 | 0.02 |
| **TOTAL CHONDRICHTHYES** | **TOTAL CARTILAGINOUS FISHES** | **1** | **0.08** | **1** | **0.97** | **.1** | **0.01** | **.4** | **0.02** |
| Muraenidae | Moray Eels | 2 | 0.17 | 1 | 0.97 | .05 | 0.00 | 1.5 | 0.08 |
| *Harengula* spp. | Sardine | 19 | 1.61 | 10 | 9.71 | .05 | 0.00 | 1.5 | 0.08 |
| Clupeidae | Herring, Shad, Sardine | 328 | 27.73 | - | 0.00 | 1.1 | 0.06 | 23.8 | 1.32 |
| Exocoetidae | Flying Fish | 6 | 0.51 | 2 | 1.94 | .2 | 0.01 | 5.1 | 0.28 |
| *Strongylura* spp. | Needlefish | 5 | 0.42 | 2 | 1.94 | .1 | 0.01 | 2.7 | 0.15 |

Table C-11 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Tylosaurus* spp. | Houndfish | 2 | 0.17 | 2 | 1.94 | .2 | 0.01 | 5.1 | 0.28 |
| Belonidae | Needlefish | 2 | 0.17 | - | 0.00 | .2 | 0.01 | 5.1 | 0.28 |
| *Epinephalus fulvus* | Coney | 1 | 0.08 | 1 | 0.97 | .1 | 0.01 | 2.7 | 0.15 |
| *Epinephalus* spp. | Grouper | 5 | 0.42 | 1 | 0.97 | .2 | 0.01 | 5.1 | 0.28 |
| Serranidae | Sea Bass | 2 | 0.17 | - | 0.00 | .1 | 0.01 | 2.7 | 0.15 |
| *Caranx* spp. | Jack | 5 | 0.42 | 2 | 1.94 | .2 | 0.01 | 5.1 | 0.28 |
| Carangidae | Jacks | 3 | 0.25 | - | 0.00 | .01 | 0.00 | .3 | 0.02 |
| *Lutjanus* spp. | Snapper | 2 | 0.17 | 2 | 1.94 | .1 | 0.01 | 2.7 | 0.15 |
| *Haemulon* sp. | Grunt | 1 | 0.08 | 1 | 0.97 | .05 | 0.00 | .2 | 0.01 |
| Haemulidae | Grunts | 1 | 0.08 | 1 | 0.97 | .03 | 0.00 | .9 | 0.05 |
| *Bodianus* spp. | Hogfish | 2 | 0.17 | 1 | 0.97 | .4 | 0.02 | 9.6 | 0.53 |
| *Halichoeres* spp. | Wrasse | 2 | 0.17 | 2 | 1.94 | .03 | 0.00 | .9 | 0.05 |
| Labridae | Wrasses | 3 | 0.25 | 1 | 0.97 | .02 | 0.00 | .6 | 0.03 |
| *Sparisoma* spp. | Parrotfish | 9 | 0.76 | 2 | 1.94 | 1.4 | 0.08 | 29.6 | 1.64 |
| Scaridae | Parrotfish | 53 | 4.48 | - | 0.00 | 2.1 | 0.11 | 42.7 | 2.37 |
| *Mugil* spp. | Mullet | 1 | 0.08 | 1 | 0.97 | .01 | 0.00 | .3 | 0.02 |
| *Gobiomorus dormitor* | Bigmouth Sleeper | 39 | 3.30 | 11 | 10.68 | .4 | 0.02 | 9.6 | 0.53 |
| Eleotridae | Sleepers | 26 | 2.20 | - | 0.00 | .2 | 0.01 | 5.1 | 0.28 |
| Gobiidae | Goby | 9 | 0.76 | 9 | 8.74 | .05 | 0.00 | .2 | 0.01 |
| *Acanthurus* spp. | Surgeonfish | 9 | 0.76 | 3 | 2.91 | .4 | 0.02 | 9.6 | 0.53 |
| *Scomberomorus* sp. | Mackeral | 1 | 0.08 | 1 | 0.97 | .1 | 0.01 | 2.7 | 0.15 |
| Scomberidae | Mackerals | 2 | 0.17 | 2 | 1.94 | .2 | 0.01 | 5.1 | 0.28 |
| Balistidae | Leatherjackets | 220 | 18.60 | 2 | 1.94 | 1.8 | 0.10 | 37.1 | 2.06 |
| *Lactophrys* sp. | Trunk Fish | 6 | 0.51 | 1 | 0.97 | .1 | 0.01 | 2.7 | 0.15 |

Table C-11 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| Osteichthyes uid | Unidentified Bony Fishes | * | 0.00 | - | 0.00 | 71.6 | 3.84 | 1021.9 | 56.75 |
| **TOTAL OSTEICHTHYES** | **TOTAL BONY FISHES** | **766** | **64.75** | **61** | **59.22** | **81.5** | **4.37** | **1242.2** | **68.99** |
| Vertebrata uid | Unidentified Vertebrates | * | 0.00 | - | 0.00 | 20.8 | 1.12 | 335.9 | 18.65 |
| **TOTAL VERTEBRATA** | **TOTAL VERTEBRATES** | **844** | **71.34** | **73** | **70.87** | **110.67** | **5.94** | **1755.5** | **97.50** |
| *Fissurella barbadensis* | Barbados Keyhole Limpet | 1 | 0.08 | 1 | 0.97 | 1.4 | 0.08 | .9 | 0.05 |
| Fissurellidae | Keyhole Limpets | 63 | 5.33 | - | 0.00 | 5.2 | 0.28 | 3.1 | 0.17 |
| *Cittarium pica* | West Indian Top Shell | 87 | 7.35 | 1 | 0.97 | 8.6 | 0.46 | 5.0 | 0.28 |
| *Turbo castena* | Chestnut Turban | 1 | 0.08 | 1 | 0.97 | .7 | 0.04 | .5 | 0.03 |
| *Nerita tessellata* | Tessellate Nerite | 2 | 0.17 | 2 | 1.94 | .8 | 0.04 | .6 | 0.03 |
| *Nerita* spp. | Nerite | 9 | 0.76 | - | 0.00 | .5 | 0.03 | .4 | 0.02 |
| *Neritina virginea* | Virgin Nerite | 15 | 1.27 | 15 | 14.56 | 4.6 | 0.25 | 2.8 | 0.16 |
| *Neritina* spp. | Nerite | 14 | 1.18 | - | 0.00 | .7 | 0.04 | .5 | 0.03 |
| Littorinidae | Periwinkles | 2 | 0.17 | 1 | 0.97 | .1 | 0.01 | .1 | 0.01 |
| *Strombus* sp. | Conch | 1 | 0.08 | 1 | 0.97 | 1.9 | 0.10 | 1.2 | 0.07 |
| Gastropoda uid marine | Uid Marine Gastrophods | * | 0.00 | - | 0.00 | 18.3 | 0.98 | 10.0 | 0.56 |
| **TOTAL GASTROPODA MARINE** | **TOTAL MARINE GASTROPODS** | **195** | **16.48** | **22** | **21.36** | **42.8** | **2.30** | **25.1** | **1.39** |
| *Bulimulus* spp. (1) | | (2) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Opeas pumilum* | | (3) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| Sagidae | | (3) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| *Megalomastoma croecum* | | (3) | 0.00 | - | 0.00 | - | 0.00 | - | 0.00 |
| **TOTAL GASTROPODA TERRESTRIAL** | **TOTAL LAND SNAILS** | **(11)** | **0.00** | **-** | **0.00** | **-** | **0.00** | **-** | **0.00** |

Table C-11 continued

| Species | Common Name | Number of Fragments # | Number of Fragments % | Minimum Number of Individuals # | Minimum Number of Individuals % | Bone/Shell Weight g | Bone/Shell Weight % | Minimum Edible Meat Weight g | Minimum Edible Meat Weight % |
|---|---|---|---|---|---|---|---|---|---|
| Chiton s.l. | Coat-of-Mail Shells | 130 | 10.99 | 3 | 2.91 | 4.3 | 0.23 | 2.3 | 0.13 |
| TOTAL AMPHINEURA | TOTAL COAT-OF-MAIL SHELLS | 130 | 10.99 | 3 | 2.91 | 4.3 | 0.23 | 2.3 | 0.13 |
| *Lucina pectinata* | Thick Lucine | 6 | 0.51 | 1 | 0.97 | 3.0 | 0.16 | 2.2 | 0.12 |
| *Lima* spp. | Lima | 2 | 0.17 | 1 | 0.97 | .03 | 0.00 | .1 | 0.01 |
| *Mactrellona alata* | Caribbean Winged Mactra | 2 | 0.17 | 1 | 0.97 | .4 | 0.02 | .6 | 0.03 |
| *Anomalocardium brasiliana* | West Indian Pointed Venus | 2 | 0.17 | 1 | 0.97 | 2.5 | 0.13 | 1.9 | 0.11 |
| Bivalvia uid | Unidentified Bivalves | * | 0.00 | - | 0.00 | 1.9 | 0.10 | 1.6 | 0.09 |
| **TOTAL BIVALVIA** | **TOTAL BIVALVES** | **12** | **1.01** | **4** | **3.88** | **7.83** | **0.42** | **6.4** | **0.36** |
| Mollusca uid | Unidentified Mollusk | * | 0.00 | - | 0.00 | 20.7 | 1.11 | 11.2 | 0.62 |
| **TOTAL MOLLUSCA** | **TOTAL MOLLUSK** | **337** | **28.49** | **29** | **28.16** | **75.63** | **4.06** | **45** | **2.50** |
| Echinoidea | Sea Urchins | 2 | 0.17 | 1 | 0.97 | - | 0.00 | - | 0.00 |
| **TOTAL INVERTEBRATA** | **TOTAL INVERTEBRATES** | **339** | **28.66** | **30** | **29.13** | **75.63** | **4.06** | **45** | **2.50** |
| **SAMPLE TOTAL** | **VERTEBRATES** AND INVERTEBRATES | **1183** | **100.00** | **103** | **100.00** | **1863** | **100.00** | **1800.6** | **100.00** |

Table C-12. Faunal remains from Feature 101, flotation samples.

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Molossus molossus* | Rat Bat | 1 | 0.19 | 1 | 1.56 | -- | 0.00 | -- | 0.00 |
| *Isolobodon portoricensis* | Allen's Hutia | 8 | 1.56 | 1 | 1.56 | 1.0 | 1.35 | 25.7 | 2.34 |
| Rodentia | Unidentified Rodent | 7 | 1.36 | - | 0.00 | .4 | 0.54 | 12.2 | 1.11 |
| *Homo sapiens sapiens* | Human | 1 | 0.19 | 1 | 1.56 | -- | 0.00 | -- | 0.00 |
| Mammalia uid, small | Small Mammal | 1 | 0.19 | 1 | 1.56 | <.01 | 0.00 | -- | 0.00 |
| **TOTAL MAMMALIA** | **TOTAL MAMMAL** | **18** | **3.51** | **4** | **6.25** | **1.4** | **1.89** | **37.9** | **3.46** |
| Columbidae | Doves and Pigeons | 1 | 0.19 | 1 | 1.56 | .03 | 0.04 | .9 | 0.08 |
| Aves uid | Unidentified Birds | 4 | 0.78 | 1 | 1.56 | .2 | 0.27 | 4.5 | 0.41 |
| **TOTAL AVES** | **TOTAL BIRDS** | **5** | **0.97** | **2** | **3.13** | **.23** | **0.31** | **5.4** | **0.49** |
| Testudines | Turtles | 24 | 4.68 | 2 | 3.13 | 4.1 | 5.52 | 94.3 | 8.60 |
| Anguidae | Lizard | 4 | 0.78 | - | 0.00 | -- | 0.00 | -- | 0.00 |
| Lacertilia | Lizard | 2 | 0.39 | - | 0.00 | -- | 0.00 | -- | 0.00 |
| Colubridae | Snake | 1 | 0.19 | 1 | 1.56 | .01 | 0.01 | .1 | 0.01 |
| Serpentes | Snake | 3 | 0.58 | 1 | 1.56 | .01 | 0.01 | .1 | 0.01 |
| Reptilia uid | Unidentified Reptile | 2 | 0.39 | - | 0.00 | .1 | 0.13 | - | 0.00 |
| **TOTAL REPTILIA** | **TOTAL REPTILE** | **36** | **7.02** | **5** | **7.81** | **4.22** | **5.68** | **94.5** | **8.62** |
| *Eleutherodactylus* sp. | Tree Frog | 1 | 0.19 | 1 | 1.56 | -- | 0.00 | -- | 0.00 |
| **TOTAL AMPHIBIA** | **TOTAL AMPHIBIANS** | **1** | **0.19** | **1** | **1.56** | **--** | **0.00** | **--** | **0.00** |
| *Galeocerdo* spp. | Tiger Shark | 2 | 0.39 | 1 | 1.56 | .04 | 0.05 | .1 | 0.01 |
| Lamniformes | Shark | 1 | 0.19 | 1 | 1.56 | .01 | 0.01 | .01 | 0.00 |
| Rajiformes | Rays, Skates | 1 | 0.19 | 1 | 1.56 | .03 | 0.04 | <.01 | 0.00 |
| **TOTAL CHONDRICHTHYES** | **TOTAL CARTILAGINOUS FISHES** | **4** | **0.78** | **3** | **4.69** | **.08** | **0.11** | **.11** | **0.01** |

Table C-12 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| *Harengula* spp. | Sardine | 11 | 2.14 | 7 | 10.94 | .03 | 0.04 | .9 | 0.08 |
| Clupeidae | Herring, Shad, Sardine | 185 | 36.06 | - | 0.00 | .7 | 0.94 | 15.9 | 1.45 |
| Belonidae | Needlefish | 2 | 0.39 | 1 | 1.56 | <.01 | 0.00 | -- | 0.00 |
| Exocoetidae | Flying Fish | 1 | 0.19 | 1 | 1.56 | .02 | 0.03 | .6 | 0.05 |
| *Epinephalus fulvus* | Coney | 3 | 0.58 | 3 | 4.69 | .2 | 0.27 | 5.1 | 0.47 |
| *Epinephalus* spp. | Grouper | 11 | 2.14 | 3 | 4.69 | 1.4 | 1.89 | 29.6 | 2.70 |
| Carangidae | Jacks | 1 | 0.19 | 1 | 1.56 | <.01 | 0.00 | -- | 0.00 |
| *Eucinostomus* sp. | Mojarra/Silver Jenny | 1 | 0.19 | 1 | 1.56 | .01 | 0.01 | .3 | 0.03 |
| Gerreidae | Mojarras | 2 | 0.39 | 2 | 3.13 | <.01 | 0.00 | -- | 0.00 |
| *Anisotremus* sp. | Grunt | 1 | 0.19 | 1 | 1.56 | 0.2 | 0.03 | .6 | 0.05 |
| *Haemulon* spp. | Grunt | 6 | 1.17 | 3 | 4.69 | .4 | 0.54 | 9.6 | 0.88 |
| Haemulidae | Grunts | 2 | 0.39 | - | 0.00 | .1 | 0.13 | 2.7 | 0.25 |
| *Bodianus* spp. | Hogfish | 1 | 0.19 | 1 | 1.56 | <.01 | 0.00 | -- | 0.00 |
| *Halichoeres* spp. | Wrasse | 1 | 0.19 | 1 | 1.56 | .04 | 0.05 | 1.2 | 0.11 |
| *Scarus* spp. | Parrotfish | 2 | 0.39 | 1 | 1.56 | .1 | 0.13 | 2.7 | 0.25 |
| *Sparisoma* spp. | Parrotfish | 6 | 1.17 | 2 | 3.13 | .8 | 1.08 | 17.9 | 1.63 |
| Scaridae | Parrotfishes | 33 | 6.43 | - | 0.00 | 1.1 | 1.48 | 23.8 | 2.17 |
| *Mugil* spp. | Mullet | 1 | 0.19 | 1 | 1.56 | .02 | 0.03 | .6 | 0.05 |
| *Gobiomorus dormitor* | Bigmouth Sleeper | 2 | 0.39 | 2 | 3.13 | .2 | 0.27 | 5.1 | 0.47 |
| Eleotridae | Sleepers | 32 | 6.24 | 2 | 3.13 | .4 | 0.54 | 9.6 | 0.88 |
| Gobiidae | Gobies | 10 | 1.95 | 2 | 3.13 | .02 | 0.03 | .6 | 0.05 |
| *Acanthurus* spp. | Surgeonfish | 7 | 1.36 | 3 | 4.69 | .5 | 0.67 | 11.7 | 1.07 |
| Balistidae | Leatherjackets | 90 | 17.54 | 1 | 1.56 | .8 | 1.08 | 17.9 | 1.63 |
| *Lactophrys* sp. | Trunk Fish | 5 | 0.97 | 1 | 1.56 | .1 | 0.13 | 2.7 | 0.25 |
| Osteichthyes uid | Unidentified Bony Fishes | * | 0.00 | - | 0.00 | 35.6 | 47.95 | 544.9 | 49.70 |
| **TOTAL OSTEICHTHYES** | **TOTAL BONY FISHES** | **416** | **81.09** | **40** | **62.50** | **42.56** | **57.32** | **704.0** | **64.21** |

Table C-12 continued

| Species | Common Name | Number of Fragments | | Minimum Number of Individuals | | Bone/Shell Weight | | Minimum Edible Meat Weight | |
|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | g | % | g | % |
| Vertebrata uid | Unidentified Vertebrates | * | 0.00 | - | 0.00 | 14.5 | 19.53 | 242.8 | 22.15 |
| **TOTAL VERTEBRATA** | **TOTAL VERTEBRATES** | **479** | **93.37** | **55** | **85.94** | **62.99** | **84.84** | **1084.7** | **98.93** |
| Fissurellidae | Keyhole Limpets | 7 | 1.36 | 2 | 3.13 | .8 | 1.08 | .6 | 0.05 |
| *Cittarium pica* | West Indian Top Shell | 2 | 0.39 | 1 | 1.56 | .5 | 0.67 | .4 | 0.04 |
| *Neritina virginea* | Virgin Nerite | 1 | 0.19 | 1 | 1.56 | .3 | 0.40 | .2 | 0.02 |
| Neritidea | Nerites | 6 | 1.17 | 1 | 1.56 | .2 | 0.27 | .2 | 0.02 |
| Littorinidae | Periwinkles | 1 | 0.19 | 1 | 1.56 | .01 | 0.01 | - | 0.00 |
| Vermetidae | Worm-shell | 2 | 0.39 | - | 0.00 | - | 0.00 | - | 0.00 |
| Gastropoda uid marine | Uid Marine Gastrophods | * | 0.00 | - | 0.00 | 2.5 | 3.37 | 5.7 | 0.52 |
| **TOTAL GASTROPODA MARINE** | **TOTAL MARINE GASTROPODS** | **19** | **3.70** | **6** | **9.38** | **4.31** | **5.80** | **7.1** | **0.65** |
| Chiton s.l. | Coat-of-Mail Shells | 13 | 2.53 | 1 | 1.56 | .5 | 0.67 | .2 | 0.02 |
| TOTAL AMPHINEURA | TOTAL COAT-OF-MAIL SHELLS | 13 | 2.53 | 1 | 1.56 | .5 | 0.67 | .2 | 0.02 |
| *Codakia orbicularis* | Tiger Lucina | 1 | 0.19 | 1 | 1.56 | .2 | 0.27 | .3 | 0.03 |
| *Anomalocardium brassiliana* | West Indian Pointed Venus | 1 | 0.19 | 1 | 1.56 | .3 | 0.40 | .5 | 0.05 |
| Bivalvia uid | Unidentified Bivalves | * | 0.00 | - | 0.00 | .05 | 0.07 | .1 | 0.01 |
| **TOTAL BIVALVIA** | **TOTAL BIVALVES** | **2** | **0.39** | **2** | **3.13** | **.55** | **0.74** | **.9** | **0.08** |
| Mollusca uid | Unidentified Mollusk | * | 0.00 | - | 0.00 | 5.9 | 7.95 | 3.5 | 0.32 |
| **TOTAL MOLLUSCA** | **TOTAL MOLLUSK** | **34** | **6.63** | **9** | **14.06** | **11.26** | **15.16** | **11.7** | **1.07** |
| **TOTAL INVERTEBRATA** | **TOTAL INVERTEBRATES** | **34** | **6.63** | **9** | **14.06** | **11.26** | **15.16** | **11.7** | **1.07** |
| **SAMPLE TOTAL** | **VERTEBRATES AND INVERTEBRATES** | **513** | **100.00** | **64** | **100.00** | **74.2** | **100.00** | **1096.4** | **100.00** |

# Appendix "D"

# Bone modifications

Table D-1
Bone Modifications

| Context | Taxa | Bk | Burning* WhP | Bk | Bk/Wh | Other |
|---|---|---|---|---|---|---|
| N96W13 Column | Aves | | | | 1 | |
| | *Harengula* sp. | 1 | | | | |
| | Clupeidae | | | | 1 | |
| | *Gobiomorus dormitor* | | 1 | 5 | | |
| | Balistidae | 33 | | | | |
| | Osteichthyes uid | 118 | 10 | 12 | | |
| | Vertebrata | 1 | | | | |
| | Fissurellidae | 1 | | | | |
| | Chiton s. l. | 1 | | | | |
| | **Total** | **155** | **11** | **17** | **2** | |
| N98W13 60-70cm Coarse | Aves | | 1 | | | |
| | *Centropomus* spp. | | | 2 | | |
| | Holocentridae | | | 1 | | |
| | *Melichthyes niger* | | | 1 | | |
| | Osteichthyes uid | 6 | 1 | | | |
| | *Cardisoma* spp. | 7 | | 13 | | |
| | Brachyura | 2 | | | | |
| | Mollusca | | | | | 3 bead |
| | **Total** | **15** | **2** | **17** | | **3** |
| N98W13 60-70cm Flotation | Clupeidae | | 1 | | | |
| | Balistidae | 12 | | | | |
| | **Total** | **12** | **1** | | | |
| S38W18 Column | Reptilia | 1 | | | | |
| | Clupeidae | 1 | | | | |
| | Carangidae | 2 | | | | |
| | cf. *Sparisoma* spp. | | | 1 | | |
| | *Gobiomorus dormitor* | 1 | | | | |
| | Balistidae | 1 | | | | |
| | Osteichthyes uid | 182 | 28 | 61 | 28 | |
| | Vertebrata | 36 | 1 | | 3 | |
| | *Oliva* sp. | | | | | 1 bead |
| | Chiton s. l. | | | | | |
| | **Total** | **257** | **33** | **63** | **31** | **1** |
| S36W18 50-60cm Coarse | Aves | 2 | | | | |
| | Testudines | 3 | 1 | 1 | | |
| | *Centropomus* sp. | 1 | | | | |
| | *Epinephalus fulvus* | 1 | | | | |
| | *Gobiomorus dormitor* | | 1 | | | |
| | Balistidae | 5 | | 1 | | |
| | Osteichthyes uid | 9 | 1 | 7 | 1 | |
| | Fissurellidae | 3 | | | | |

Table D-1 continued

| Context | Taxa | Bk | Burning* WhP | Bk | Bk/Wh | Other |
|---|---|---|---|---|---|---|
| | *Cittarium pica* | 3 | | | | |
| | *Strombus* spp. | 4 | | | | |
| | *Cypraea* sp. | | | | | 1 |
| | Chiton s. l. | 1 | | | | |
| | Bivalvia uid | | | | | 1 |
| | **Total** | **32** | **3** | **9** | **1** | **2** |
| S36W18 50-60cm Flotation | *Harengula* spp | 2 | | | | |
| | Clupeidae | 1 | | | | |
| | Balistidae | 20 | | | | |
| | Osteichthyes uid | 24 | 3 | 22 | | |
| | **Total** | **47** | **4** | **22** | | |
| N112W88 30-40cm Coarse | *Trachyemys* sp. | | | 3 | | |
| | Testudines | 5 | | 2 | 3 | |
| | *Epinephalus* sp. | 1 | | | | |
| | *Bodianus* sp. | | 1 | | | |
| | *Sparisoma* spp. | 1 | | | | |
| | Scaridae | 2 | | | | |
| | *Melichthyes niger* | 2 | | | | |
| | Balistidae | 2 | | | | |
| | Osteichthyes uid | 6 | 1 | 21 | | |
| | Vertebrata | 4 | | 2 | | |
| | Gecarcinidae | 1 | | | | |
| | Brachyura | 6 | | | | |
| | *Fissurella* sp. | 1 | | | | |
| | *Nodolittorina tuberculata* | 1 | | | | |
| | Chiton s. l. | 6 | | | | |
| | Mollusca | | | | | 2 |
| | **Total** | **38** | **2** | **28** | **3** | |
| N112W88 20-60cm Flotation | Aves | 1 | | | | |
| | Clupeidae | 3 | 1 | | | |
| | *Epinephalus fulvus* | | 1 | | | |
| | *Epinephalus* sp. | 1 | | | | |
| | Serranidae | 1 | | | | |
| | *Caranx* sp. | 1 | | | | |
| | *Eucinostomus* sp. | 1 | | | | |
| | *Haemulon* sp. | 1 | | | | |
| | Labridae | 1 | | | | |
| | *Gobiomorus* sp. | 1 | | | | |
| | Balistidae | 28 | | | | 1 |
| | Osteichthyes uid | 182 | 15 | 7 | 5 | |
| | *Gecarcinus* sp. | 1 | | | | |
| | Fissurellidae | 6 | | | | |
| | Vermetidae | 1 | | | | |
| | Sagidae | 1 | | | | |
| | Gastropoda uid | 12 | | | | |

Table D-1 continued

| Context | Taxa | Bk | Burning* WhP | Bk | Bk/Wh | Other |
|---|---|---|---|---|---|---|
| | Chiton s. l. | 14 | | | | |
| | Bivalvia uid | 1 | | 1 | | |
| | **Total** | **257** | **17** | **8** | **5** | **1** |
| N112W88 | Osteichthyes uid | 6 | 1 | | | |
| Feature 104 | Vertebrata | | 4 | | | |
| 80-113cm | Gecarcinidae | 2 | | | | |
| Coarse | Chiton s. l. | 1 | | | | |
| | **Total** | **9** | **5** | | | |
| N112W88 | Aves | 3 | | | | |
| Feature 104 | Clupeidae | 3 | | | | |
| 80-90cm | *Epinephalus* sp. | 1 | | | | |
| Flotation | Carangidae | 1 | | | | |
| | Balistidae | 15 | | | | |
| | Osteichthyes uid | 84 | 7 | 20 | 14 | |
| | Vertebrata | 71 | | | | |
| | *Fissurella* spp. | 3 | 1 | | | |
| | Chiton s. l. | 15 | | | | |
| | **Total** | **196** | **8** | **20** | **14** | |
| N32E32 | Testudines | | 1 | 4 | | |
| 20-40cm | Clupeidae | 6 | | | | |
| Flotation | Labridae | 1 | | | | |
| | Scaridae | 2 | | | | |
| | Gobiidae | 1 | | | | |
| | Balistidae | 11 | | 1 | | |
| | Osteichthyes uid | 77 | 5 | 13 | 1 | |
| | Vertebrata | 135 | 3 | | 5 | |
| | Chiton s. l. | | | | | |
| | **Total** | **233** | **9** | **18** | **6** | |
| N43W8 | Rodentia | 2 | 1 | | | |
| N43W10 | Testudines | 8 | 1 | | | |
| N42W14 | Clupeidae | 16 | | 1 | 1 | |
| N42W18 | *Haemulon* sp. | 1 | | | | |
| Feature 101 | *Epinephalus* sp. | 1 | | | | |
| Flotation | Scaridae | 9 | | | | |
| | *Gobiomorus dormitor* | 1 | | | | |
| | Eleotridae | 2 | 2 | | | |
| | Balistidae | 11 | | | | |
| | *Lactophrys* sp. | 1 | | | | |
| | Osteichthyes uid | 468 | 45 | 6 | | |
| | Vertebrata | 232 | 8 | 5 | 25 | |
| | Chiton s. l. | 2 | | | | |
| | **Total** | **754** | **57** | **12** | **26** | |

*Bk = Black  Wh = White
P Bk = Partially Black  Bk/Wh = Black White

# Appendix "E"

## Estimates and distributions of fishes based on atlas and vertebral measurements

Table E-1 Weight estimates of fishes based on the anterior widths of the atlas or vertical centrum, from N96W13, 0-160 cm, flotation samples.

| | | Atlas or Vertebral Centrum Diameter (mm) | | | | Estimated Weight of Fish (g) | |
|---|---|---|---|---|---|---|---|
| Species | Element | N | Mean | Sd | Range | Mean | Range |
| *Harengula* spp. | A | 2 | 2.25 | .15 | 2.1 - 2.4 | 40.3 | 33.7 - 47.5 |
| cf. *Opisthonema* sp | .A | 1 | 1.6 | - | - | 16.8 | - |
| Clupeidae | V | 36 | 1.6 | .3 | 1.4 - 2.2 | 16.8 | 11.9 - 38.0 |
| Exocoetidae | V | 1 | 2.5 | - | - | 52.8 | - |
| *Strongylura* spp. | V | 1 | 1.5 | - | - | 14.2 | - |
| Hemiramphidae | V | 2 | 1.7 | .2 | 1.5 - 1.7 | 19.6 | 14.2 - 19.6 |
| *Centromomus* cf. *pectinatus* | A | 1 | 3.9 | - | - | 165.6 | - |
| *Centromomus* spp. | V | 4 | 4.5 | .7 | 3.6 - 5.5 | 239.2 | 134.8 - 400.6 |
| *Epinephalus fulvus* | V | 1 | 4.2 | - | - | 200.3 | - |
| *Epinephalus* spp. | V | 2 | 3.3 | .3 | 3.0 - 3.6 | 107.8 | 84.4 - 134.8 |
| *Caranx* spp. | V | 2 | 2.5 | .2 | 2.3 - 2.7 | 52.8 | 42.6 - 64.3 |
| *Lutjanus* sp. | V | 1 | 3.6 | - | - | 134.8 | - |
| Lutjanidae | V | 2 | 5.5 | 2.6 | 2.9 - 8.2 | 400.6 | 77.3 - 1181.1 |
| Gerreidae | A | 1 | 2.3 | - | - | 42.6 | - |
| *Haemulon* spp. | V | 2 | 4.2 | .9 | 3.3 - 5.2 | 200.3 | 107.8 - 346.8 |
| *Mugil* spp. | V | 4 | 3.4 | .8 | 2.6 - 4.7 | 116.4 | 58.4 - 267.5 |
| *Gobiomorus dormitor* | A | 1 | 1.4 | - | - | 11.9 | - |
| *Gobiomorus dormitor* | V | 3 | 2.1 | .4 | 1.7 - 2.7 | 33.7 | 19.6 - 64.3 |
| Balistidae | A | 1 | 6.8 | - | - | 691.1 | - |
| Osteichthyes uid | A | 2 | 1.95 | .55 | 1.4 - 2.5 | 27.9 | 11.9 - 52.8 |
| Osteichthyes uid | V | 48 | 2.2 | 1.7 | .5 - 7.5 | 38.0 | .8 - 889.0 |

Table E-2. Weight estimates of fishes based on the anterior widths of the atlas or vertical centrum, from N98W13, 60-70 cm, coarse fraction.

| | | Atlas or Vertebral Centrum Diameter (mm) | | | | Estimated Weight of Fish (g) | |
|---|---|---|---|---|---|---|---|
| Species | Element | N | Mean | Sd | Range | Mean | Range |
| *Elops saurus* | V | 1 | 4.2 | - | - | 200.3 | - |
| cf. Belonidae | V | 4 | 4.3 | .9 | 2.9 - 5.4 | 212.8 | 77.3 - 382.4 |
| *Centropomus* spp. | V | 15 | 8.4 | 2.0 | 4.5 - 12.7 | 1189.6 | 239.2 - 3441.7 |
| Centropomidae | V | 2 | 4.2 | .3 | 3.9 - 4.6 | 200.3 | 165.6 - 253.1 |
| *Epinephalus* sp. | A | 1 | 6.0 | - | - | 510.0 | - |
| Serranidae | V | 7 | 7.8 | 5.2 | 3.3 - 18.6 | 983.3 | 107.8 - 9175.9 |
| Serranidae | A | 1 | 4.4 | - | - | 225.8 | - |
| Carangidae | V | 2 | 5.45 | .75 | 4.7 - 6.2 | 391.3 | 267.5 - 545.1 |
| *Lutjanus* sp | A | 1 | 6.3 | - | - | 567.9 | - |
| Lutjanidae | A | 1 | 6.4 | - | - | 591.4 | - |
| Lutjanidae | V | 1 | 6.3 | - | - | 567.3 | - |
| *Haemulon* sp. | A | 1 | 5.1 | - | - | 329.9 | - |
| *Haemulon* sp. | V | 1 | 4.5 | - | - | 239.2 | - |
| Haemulidae | V | 3 | 3.9 | .7 | 3.3 - 4.8 | 165.6 | 107.8 - 282.3 |
| *Bodianus* cf. *rufus* | V | 3 | 4.7 | .2 | 4.5 - 4.9 | 267.5 | 144.6 - 297.7 |
| *Sparisoma* sp. | A | 1 | 4.7 | - | - | 267.5 | - |
| *Mugil* spp. | V | 4 | 4.3 | .9 | 3.1 - 5.4 | 212.8 | 91.8 - 382.2 |
| *Gobiomorus dormitor* | V | 4 | 5.7 | .7 | 4.7 - 6.4 | 439.1 | 267.5 - 591.4 |
| Scombridae | V | 2 | 7.4 | .2 | 7.2 - 7.6 | 858.9 | 800.5 - 919.8 |
| *Balistes* spp. | V | 4 | 7.5 | 1.6 | 5.5 - 9.2 | 889.0 | 400.6 - 1502.1 |
| *Melichthyes niger* | V | 9 | 5.1 | 1.3 | 3.1 - 7.2 | 329.9 | 91.8 - 800.5 |
| Osteichthyes uid | A | 4 | 6.1 | .7 | 5.3 - 7.2 | 522.7 | 364.2 - 800.5 |
| Osteichthyes uid | V | 123 | 5.8 | 3.4 | 1.5 - 28.5 | 459.2 | 14.2 - 27475.9 |

Table E-3. Weight estimates of fishes based on the anterior widths of the atlas or vertical centrum, from N98W13, 60-70 cm, flotation sample.

| | | Atlas or Vertebral Centrum Diameter (mm) | | | | Estimated Weight of Fish (g) | |
|---|---|---|---|---|---|---|---|
| Species | Element | N | Mean | Sd | Range | Mean | Range |
| Clupeidae | V | 4 | 1.85 | .1 | 1.8 - 2.1 | 24.4 | 22.7 - 33.7 |
| *Tylosaurus* spp. | V | 1 | 6.3 | - | - | 567.9 | - |
| *Epinephalus fulvus* | V | 1 | 3.8 | - | - | 154.9 | - |
| *Epinephalus* sp. | V | 1 | 3.3 | - | - | 107.8 | - |
| *Haemulon* sp. | V | 1 | 4.5 | - | - | 239.2 | - |
| Osteichthyes uid | V | 4 | 3.0 | 2.2 | 1.6 - 6.9 | 84.4 | 16.8 - 717.5 |

Table E-4. Weight estimates of fishes based on the anterior widths of the atlas or vertebral centrum, from S38W18, 0-120 cm, flotation samples.

| | | Atlas or Vertebral Centrum Diameter (mm) | | | | Estimated Weight of Fish (g) | |
|---|---|---|---|---|---|---|---|
| Species | Element | N | Mean | Sd | Range | Mean | Range |
| *Aguilla rostrata* | V | 2 | 4.34 | .05 | 4.3 - 4.4 | 219.2 | 218.8 - 225.8 |
| Anguillliformes | V | 1 | 4.4 | - | - | 225.8 | - |
| *Harengula* spp. | A | 15 | 1.9 | .2 | 1.6 - 2.3 | 26.1 | 16.8 - 42.6 |
| *Harengula* spp. | Ax | 14 | 1.9 | .2 | 1.2 - 2.2 | 26.1 | 8.0 - 38.0 |
| Clupeuidae | V | 436 | 1.6 | .3 | .8 - 2.9 | 16.8 | 2.8 - 77.3 |
| Exocoetidae | V | 3 | 2.1 | .2 | 1.9 - 2.4 | 33.9 | 26.1 - 47.5 |
| *Strongulura* spp. | V | 31 | 1.9 | .6 | .7 - 3.3 | 26.1 | 2.0 - 107.8 |
| *Tylosaurus* spp. | V | 2 | 6.35 | 1.1 | 5.2 - 7.5 | 579.6 | 346.8 - 889.0 |
| *Hemiramphus* spp. | V | 7 | 1.6 | .3 | 1.3 - 2.1 | 16.8 | 9.8 - 33.7 |
| *Holocentrus* spp. | A | 4 | 2.0 | .5 | 1.2 - 2.4 | 29.8 | 8.0 - 47.5 |
| *Centropomus* spp. | V | 2 | 10.4 | .4 | 10.0 - 10.8 | 2059.6 | 1862.1 - 2269.3 |
| *Epinephalus fulvus* | A | 1 | 2.0 | - | - | 16.8 | - |
| *E. fulvus* | V | 4 | 3.3 | .5 | 2.8- 4.0 | 107.8 | 70.7 - 176.7 |
| *Epinephalus* sp | A | 1 | 2.4 | - | - | 47.5 | - |
| *Epinephalus* sp. | V | 1 | 2.7 | - | - | 64.3 | - |
| Serranidae | V | 4 | 3.0 | 1.1 | 1.2 - 4.2 | 84.4 | 8.0 - 200.3 |
| *Caranx crysos* | V | 1 | 3.0 | - | - | 84.4 | - |
| *Caranx* sp. | A | 1 | 2.9 | - | - | 77.3 | - |
| *Caranx* spp. | V | 2 | 2.4 | .4 | 2.0 - 2.8 | 47.5 | 29.8 - 70.7 |
| cf. *Selene* sp. | V | 1 | 3.9 | - | - | 165.6 | - |
| Carangidae | V | 1 | 2.7 | - | - | 64.3 | - |
| *Lutjanus jocu* | V | 1 | 3.6 | - | - | 134.8 | - |
| *Lutjanus* spp. | A | 2 | 2.8 | .1 | 2.7 - 2.9 | 70.7 | 64.4 - 77.3 |
| *Lutjanus* sp. | V | 1 | 6.2 | - | - | 545.1 | - |
| *Ocyrus chrysurus* | V | 1 | 2.8 | - | - | 70.7 | - |
| Lutjanidae | V | 2 | 2.5 | .1 | 2.4 - 2.6 | 52.8 | 47.5 - 58.4 |

Table E-4 continued.

| Species | Element | Atlas or Vertebral Centrum Diameter (mm) | | | | Estimated Weight of Fish (g) | |
|---|---|---|---|---|---|---|---|
| | | N | Mean | Sd | Range | Mean | Range |
| *Anisotremus* sp. | V | 1 | 4.0 | - | - | 176.7 | - |
| *Haemulon* spp. | A | 6 | 3.2 | 1.0 | 1.7 - 4.5 | 99.6 | 19.6 - 239.2 |
| Haemulidae | A | 1 | 2.4 | - | - | 47.5 | - |
| Haemulidae | V | 5 | 2.5 | .7 | 1.9 - 3.4 | 52.8 | 26.1 - 116.4 |
| *Diapterus* sp. | A | 1 | 1.6 | - | - | 16.8 | - |
| *Diapterus* sp. | V | 1 | 1.9 | - | - | 26.1 | - |
| Gerreidae | A | 2 | 2.4 | .2 | 2.2 - 2.6 | 47.5 | 38.0 - 58.4 |
| Sciaenidae | A | 1 | 5.6 | - | - | 419.6 | - |
| Labridae | V | 2 | 2.4 | .3 | 2.1 - 2.7 | 47.5 | 33.7 - 64.4 |
| *Sparisoma* spp. | A | 4 | 4.35 | 1.7 | 2.3 - 6.5 | 219.2 | 42.6 - 615.4 |
| *Scarus* sp. | V | 1 | 8.5 | - | - | 1226.3 | - |
| Scaridae | V | 1 | 5.2 | - | - | 346.8 | - |
| *Mugil* spp. | V | 8 | 3.4 | 2.3 | 1.5 - 8.9 | 116.4 | 14.2 - 1380.2 |
| *Gobiomorus dormitor* | V | 11 | 3.9 | 1.3 | 2.0 - 6.5 | 165.6 | 29.8 - 615.4 |
| *Gobiomorus* sp. | V | 1 | 4.5 | - | - | 239.2 | - |
| *Gobionellus* sp. | V | 1 | 1.1 | - | - | 6.4 | - |
| *Scomberomorus* spp. | V | 2 | 11.75 | .4 | 11.3 - 12.2 | 2818.4 | 2549.2 - 3104.2 |
| *Balistes* spp. | V | 2 | 7.3 | .7 | 6.6 - 8.0 | 829.3 | 640.3 - 1049.4 |
| Osteichthyes uid | A | 14 | 1.9 | .6 | 1.1 - 3.0 | 26.1 | 6.4 - 84.4 |
| Osteichthyes uid | V | 133 | 2.6 | 1.2 | .8 - 8.2 | 58.4 | 2.8 - 1118.1 |

Table E-5. Weight estimates of fishes based on the anterior widths of the atlas or vertebral centrum, from S36W18, 50-60 cm, coarse fraction.

| | | Atlas or Vertebral Centrum Diameter (mm) | | | | Estimated Weight of Fish (g) | |
|---|---|---|---|---|---|---|---|
| Species | Element | N | Mean | Sd | Range | Mean | Range |
| Carcharhinidae | V | 1 | 8.1 | - | - | 1083.4 | - |
| *Harengula* sp. | A | 1 | 2.1 | - | - | 33.7 | - |
| Clupeidae | V | 3 | 1.6 | .2 | 1.4 - 1.8 | 29.8 | 11.9 - 22.7 |
| *Tylosaurus* spp. | V | 21 | 5.7 | 3.0 | 3.8 - 9.0 | 84.4 | 154.9 - 1420.4 |
| *Holocentrus* spp | V | 4 | 4.5 | .5 | 4.0 - 5.3 | 239.2 | 176.7 - 364.2 |
| *Centropomus* sp. | A | 1 | 15.1 | - | - | 5369.9 | - |
| *Centropomus* spp. | V | 8 | 5.3 | 2.6 | 3.6 - 10.3 | 364.2 | 134.8 - 2009.0 |
| *Epinephalus fulvus* | V | 24 | 4.2 | .7 | 3.1 - 6.0 | 200.3 | 91.9 - 510.0 |
| *E. guttatus* | V | 2 | 4.0 | .4 | 3.6 - 4.5 | 176.7 | 134.8 - 239.2 |
| *Epinephalus* spp. | V | 11 | 4.3 | 1.1 | 3.1 - 7.5 | 212.8 | 91.8 - 889.0 |
| Serranidae | V | 2 | 14.6 | .2 | 14.4 - 14.8 | 4924.8 | 4753.3 - 5100.2 |
| *Caranx* spp. | V | 6 | 3.8 | 1.6 | 2.6 - 7.2 | 154.9 | 58.4 - 800.5 |
| *Lutjanus* spp. | V | 18 | 5.0 | .9 | 3.4 - 6.9 | 313.6 | 116.4 - 717.5 |
| Lutjanidae | A | 2 | 4.4 | .1 | 4.3 - 4.5 | 225.8 | 212.8 - 239.2 |
| *Diapterus* cf. *plumieri* | V | 1 | 6.7 | - | - | 665.3 | - |
| *Haemulon* spp. | A | 2 | 3.9 | - | - | 165.6 | - |
| *Haemulon* spp. | V | 2 | 4.65 | .05 | 4.6 - 4.7 | 260.2 | 253.1 - 267.5 |
| Haemulidae | V | 12 | 5.0 | .8 | 3.6 - 7.0 | 313.6 | 134.8 - 744.6 |
| Scieaenidae | V | 1 | 6.4 | - | - | 591.4 | - |
| *Bodianus rufus* | A | 3 | 5.2 | .3 | 4.8 - 5.5 | 346.8 | 282.3 - 400.6 |
| Labridae | V | 4 | 4.55 | .7 | 3.6 - 5.7 | 246.1 | 134.8 - 439.1 |
| *Sparisoma rubrinne* | A | 1 | 4.5 | - | - | 239.2 | - |
| *Mugil* spp. | V | 2 | 4.95 | .7 | 4.2 - 5.7 | 305.6 | 200.3 - 439.1 |
| *Gobiomorus dormitor* | V | 26 | 5.3 | 1.2 | 3.2 - 8.0 | 364.2 | 99.6 - 1049.4 |

Table E-5 continued.

| Species | Element | Atlas or Vertebral Centrum Diameter (mm) | | | | Estimated Weight of Fish (g) | |
|---|---|---|---|---|---|---|---|
| | | N | Mean | Sd | Range | Mean | Range |
| *Euthynnus alleteratus* | V | 8 | 10.5 | .6 | 9.8 - 11.7 | 2110.8 | 1767.9 - 2787.6 |
| *Balistes* cf. *vetula* | V | 3 | 5.9 | 2.3 | 3.9 - 9.1 | 479.8 | 165.6 - 1461.3 |
| *Melichthyes niger* | V | 20 | 4.9 | 1.0 | 3.8 - 8.0 | 297.7 | 154.9 - 1049.4 |
| Osteichthyes uid | A | 1 | 4.9 | - | - | 297.7 | - |
| Osteichthyes uid | V | 55 | 5.9 | 1.7 | 3.3 - 11.5 | 479.8 | 107.8 - 1862.1 |

Table E-6. Weight estimates of fishes based on the anterior widths of the atlas or vertebral centrum, from S36W18, 50-60 cm, flotation sample.

| | | Atlas or Vertebral Centrum Diameter (mm) | | | | Estimated Weight of Fish (g) | |
|---|---|---|---|---|---|---|---|
| Species | Element | N | Mean | Sd | Range | Mean | Range |
| *Harengula* spp. | A | 4 | 2.3 | .3 | 1.9 - 2.7 | 42.6 | 26.1 - 64.3 |
| Clupeuidae | V | 42 | 1.8 | .2 | 1.4 - 2.6 | 22.7 | 11.9 - 58.4 |
| *Epinephalus fulvus* | V | 1 | 3.7 | - | - | 144.6 | - |
| *Caranx* sp. | V | 1 | 3.5 | - | - | 125.4 | - |
| *Bairdiella ronchus* | V | 1 | 1.9 | - | - | 26.1 | - |
| Labridae | A | 1 | 5.0 | - | - | 313.6 | - |
| *Sparisoma* sp. | A | 1 | 4.7 | - | - | 267.5 | - |
| *Mugil* sp. | V | 1 | 3.4 | - | - | 116.4 | - |
| *Gobiomorus dormitor* | A | 1 | 6.3 | - | - | 567.9 | - |
| *Gobiomorus dormitor* | V | 1 | 6.7 | - | - | 665.3 | - |
| Balistidae | V | 2 | 5.0 | .5 | 4.5 - 5.5 | 313.6 | 239.2 - 400.6 |
| Osteichthyes uid | V | 18 | 2.9 | 1.2 | 1.6 - 6.5 | 77.3 | 16.8 - 615.4 |

Table E-7. Weight estimates of fishes based on the anterior widths of the atlas or vertebral centrum, from N112W88, 20-60 cm, flotation sample.

| | | Atlas or Vertebral Centrum Diameter (mm) | | | | Estimated Weight of Fish (g) | |
|---|---|---|---|---|---|---|---|
| Species | Element | N | Mean | Sd | Range | Mean | Range |
| *Harengula* spp. | A | 4 | 1.8 | .1 | 1.7 - 1.9 | 22.7 | 19.6 - 26.1 |
| *Harengula* spp | Ax | 10 | 2.3 | .3 | 1.8 - 2.8 | 42.6 | 22.7 - 70.7 |
| Clupeidae | V | 163 | 1.8 | .2 | 1.3 - 3.0 | 22.7 | 9.8 - 84.4 |
| Exocoetidae | V | 11 | 2.0 | .3 | 1.6 - 2.6 | 29.8 | 16.8 - 58.4 |
| *Hemiramphus* spp. | V | 4 | 1.9 | .6 | 1.9 - 2.5 | 26.1 | 26.1 - 52.8 |
| *Strongylura* spp. | V | 7 | 2.9 | 1.0 | 1.7 - 4.3 | 77.3 | 19.6 - 212.8 |
| *Tylosaurus* spp. | V | 3 | 5.1 | .8 | 4.4 - 6.3 | 329.9 | 225.8 - 567.9 |
| *Epinephalus fulvus* | A | 5 | 3.6 | .6 | 2.9 - 4.5 | 134.8 | 77.3 - 239.2 |
| *E. fulvus* | V | 4 | 3.2 | 1.1 | 2.2 - 5.0 | 99.6 | 38.0 - 313.6 |
| *Epinephalus* spp. | V | 2 | 3.55 | .0 | 3.5 - 3.6 | 130.0 | 125.4 - 134.8 |
| Serranidae | V | 5 | 3.2 | .5 | 2.8 - 4.1 | 99.6 | 70.7 - 188.3 |
| *Caranx* spp. | V | 2 | 3.45 | .45 | 3.0 - 3.9 | 120.8 | 84.4 - 165.6 |
| *Lutjanus* cf. *buccanella* | V | 1 | 6.6 | - | - | 640.0 | - |
| *Lutjanus* spp. | V | 3 | 3.2 | .5 | 2.6 - 3.8 | 99.6 | 58.4 - 154.9 |
| *Ocyurus chrysurus* | A | 1 | 3.2 | - | - | 99.6 | - |
| Lutjanidae | V | 2 | 3.05 | .15 | 2.9 - 3.2 | 88.0 | 77.3 - 99.6 |
| *Eucinostomus* spp. | A | 2 | 2.2 | .35 | 1.9 - 2.6 | 40.3 | 26.1 - 58.4 |
| *Anisotremus* sp. | A | 1 | 2.7 | - | - | 64.3 | - |
| *Haemulon* spp. | V | 6 | 4.2 | 1.1 | 2.7 - 5.9 | 200.3 | 64.3 - 479.8 |
| Haemulidae | A | 3 | 2.9 | .2 | 2.7 - 3.1 | 77.3 | 64.3 - 91.8 |
| Haemulidae | V | 1 | 3.7 | - | - | 144.6 | - |
| *Bairdiella ronchus* | A | 3 | 2.1 | .4 | 1.5 - 2.6 | 33.7 | 14.2 - 58.4 |
| Labridae | A | 1 | 1.1 | - | - | 6.4 | - |
| *Sparisoma* spp. | A | 2 | 3.45 | .15 | 3.3 - 3.6 | 120.8 | 107.8 - 134.8 |
| *Sparisoma* sp. | V | 1 | 2.9 | - | - | 77.3 | - |
| *Mugil* spp. | V | 1 | 4.2 | - | - | 200.3 | - |

Table E-7 continued.

| Species | Element | Atlas or Vertebral Centrum Diameter (mm) | | | | Estimated Weight of Fish (g) | |
|---|---|---|---|---|---|---|---|
| | | N | Mean | Sd | Range | Mean | Range |
| *Gobiomorus* sp | V | 4 | 3.8 | 1.8 | 2.2 - 6.8 | 154.9 | 38.0 - 691.1 |
| *Gobionellus* sp | V | 2 | 2.0 | .4 | 1.6 - 2.4 | 29.8 | 16.8 - 47.5 |
| Gobiidae | V | 16 | 1.7 | .2 | 1.2 - 2.1 | 19.6 | 8.0 - 33.7 |
| *Scomberomorus* spp. | V | 1 | 9.2 | - | - | 1502.9 | - |
| *Balistes* spp. | V | 2 | 6.45 | .05 | 6.4 - 6.5 | 603.3 | 591.4 - 615.4 |
| *Melichthyes niger* | A | 3 | 5.3 | .9 | 4.4 - 6.6 | 364.2 | 225.8 - 640.0 |
| Osteichthyes uid | A | 7 | 2.3 | .8 | 1.3 - 3.7 | 42.6 | 9.8 - 144.6 |
| Osteichthyes uid | V | 89 | 2.3 | 1.0 | 1.2 - 6.6 | 42.6 | 8.0 - 640.0 |

Table E-8. Weight estimates of fishes based on the anterior widths of the atlas or vertebral centrum, from N112W88, 30-40 cm coarse fraction.

| | | Atlas or Vertebral Centrum Diameter (mm) | | | | Estimated Weight of Fish (g) | |
|---|---|---|---|---|---|---|---|
| Species | Element | N | Mean | Sd | Range | Mean | Range |
| Carcharhinidae | V | 2 | 11.05 | .9 | 10.11 - 12.1 | 2406.8 | 1910.3 - 2975.1 |
| *Tylosaurus* sp. | A | 1 | 5.0 | - | - | 313.6 | - |
| *Tylosaurus* spp. | V | 22 | 5.4 | .7 | 4.4 - 7.2 | 382.2 | 225.8 - 800.5 |
| Belonidae | V | 5 | 5.0 | .3 | 4.1 - 5.0 | 313.6 | 188.3 - 313.6 |
| *Holocentrus* sp. | V | 1 | 4.5 | - | - | 239.2 | - |
| *Centropomus* spp. | V | 7 | 6.1 | 2.7 | 4.0 - 12.3 | 522.7 | 176.7 - 317.0 |
| *Epinephalus adcensionis* | A | 1 | 4.9 | - | - | 297.7 | - |
| *E. fulvus* | A | 2 | 3.95 | .05 | 3.9 - 4.0 | 171.1 | 165.6 - 176.7 |
| *Epinephalus* spp. | V | 10 | 4.1 | .6 | 3.3 - 5.4 | 188.3 | 107.8 - 382.2 |
| *Caranx cf. latus* | A | 1 | 3.8 | - | - | 154.9 | - |
| *Caranx* spp. | V | 2 | 4.45 | .85 | 3.6 - 5.3 | 232.4 | 134.8 - 364.2 |
| *Lutjanus* spp. | V | 6 | 5.8 | 2.9 | 3.9 - 10.1 | 459.2 | 165.6 - 1910.3 |
| *Diapterus* spp. | A | 2 | 4.9 | .1 | 4.8 - 5.0 | 297.7 | 282.3 - 313.6 |
| *Diapterus* spp. | V | 5 | 4.0 | 1.1 | 2.3 - 5.2 | 176.7 | 42.6 - 346.8 |
| *Haemulon* spp. | A | 5 | 4.6 | .2 | 4.4 - 5.1 | 253.1 | 225.8 - 329.9 |
| *Haemulon* spp. | V | 12 | 4.5 | 1.5 | 3.7 - 6.9 | 239.2 | 144.6 - 717.5 |
| *Micropogonias* sp. | A | 1 | 4.7 | - | - | 267.5 | - |
| Chaetodontidae | V | 2 | 4.74 | .45 | 4.3 - 5.2 | 274.8 | 212.8 - 346.8 |
| Labridae | V | 5 | 4.8 | .5 | 4.0 - 5.3 | 282.3 | 176.7 - 364.2 |
| *Sparisoma* spp. | A | 3 | 4.5 | .4 | 3.9 - 5.0 | 239.2 | 165.6 - 313.6 |
| *Sparisoma* spp. | V | 4 | 3.8 | 2.3 | 3.6 - 7.2 | 154.9 | 134.8 - 800.5 |
| *Gobiomorus dormitor* | V | 11 | 5.2 | .8 | 3.4 - 6.6 | 346.8 | 116.4 - 640.1 |
| *Acanthurus* sp. | V | 1 | 4.6 | - | - | 253.1 | - |
| *Euthynnus* sp. | v | 1 | 13.2 | - | - | 3800.8 | - |
| *Balistes* spp. | V | 4 | 5.9 | .4 | 5.4 - 6.5 | 479.8 | 382.2 - 615.4 |
| *Melichthyes niger* | V | 5 | 5.0 | .9 | 4.0 - 6.5 | 313.6 | 176.7 - 615.4 |
| Osteichthyes uid | V | 19 | 5.4 | 1.5 | 3.3 - 9.5 | 382.2 | 107.8 - 1632.1 |

Table E-9. Weight estimates of fishes based on the anterior widths of the atlas or vertebral centrum, from N112W88, Feature 104, 80-90 cm, flotation sample.

| | | Atlas or Vertebral Centrum Diameter (mm) | | | | Estimated Weight of Fish (g) | |
|---|---|---|---|---|---|---|---|
| Species | Element | N | Mean | Sd | Range | Mean | Range |
| *Harengula* spp. | A | 9 | 2.0 | .2 | 1.2 - 2.4 | 29.8 | 19.6 - 47.5 |
| *Harengula* spp. | Ax | 20 | 2.0 | .3 | 1.6 - 2.4 | 29.8 | 16.8 - 47.5 |
| Clupeidae | V | 184 | 1.8 | .2 | 1.3 - 2.6 | 22.7 | 9.8 - 58.4 |
| Exocoetidae | V | 5 | 2.1 | .4 | 1.4 - 2.5 | 33.7 | 11.9 - 52.8 |
| *Strongylura* spp. | V | 9 | 2.3 | .5 | 1.5 - 3.3 | 42.6 | 14.2 - 107.8 |
| *Tylosaurus* sp. | V | 1 | 4.0 | - | - | 176.7 | - |
| *Epinephalus* spp. | V | 9 | 3.6 | 1.0 | 2.1 - 5.2 | 134.8 | 33.7 - 346.8 |
| *Caranx* spp. | V | 5 | 2.7 | .6 | 1.7 - 3.4 | 64.3 | 19.6 - 116.4 |
| *Lutjanus* spp. | V | 1 | 4.7 | - | - | 267.5 | - |
| *Diapterus* sp. | A | 1 | 2.6 | - | - | 58.4 | - |
| *Anisotremus virginicus* | A | 1 | 2.7 | - | - | 64.3 | - |
| *Haemulon* spp. | V | 2 | 3.4 | .3 | 3.1 - 3.7 | 116.4 | 91.8 - 144.6 |
| *Bodianus* sp. | V | 1 | 5.2 | - | - | 346.8 | - |
| *Halichoeres* sp. | A | 1 | 1.9 | - | - | 26.1 | - |
| *Mugil* spp. | V | 2 | 6.2 | 1.6 | 4.6 - 7.8 | 545.1 | 253.1 - 983.3 |
| *Gobiomorus dormitor* | V | 20 | 2.2 | .8 | 1.0 - 4.2 | 38.0 | 5.0 - 200.3 |
| *Euthynnus* sp. | V | 1 | 11.8 | - | - | 2849.3 | - |
| *Melichthyes niger* | V | 1 | 5.2 | - | - | 545.1 | - |
| Osteichthyes uid | A | 8 | 1.8 | .5 | 1.2 - 2.9 | 22.7 | 8.0 - 77.3 |
| Osteichthyes uid | V | 54 | 2.2 | .9 | 1.0 - 5.5 | 38.0 | 5.0 - 400.6 |

Table E-10. Weight estimates of fishes based on the anterior widths of the atlas or vertebral centrum, from N112W88, Feature 104, 80 -113 cm, coarse fraction.

| | | Atlas or Vertebral Centrum Diameter (mm) | | | | Estimated Weight of Fish (g) | |
|---|---|---|---|---|---|---|---|
| Species | Element | N | Mean | Sd | Range | Mean | Range |
| *Tylosaurus* sp. | V | 1 | 5.0 | - | - | 313.6 | - |
| *Centropomus* sp. | V | 1 | 4.8 | - | - | 282.3 | - |
| *Epinephalus* spp. | V | 3 | 4.4 | .4 | 4.0 - 4.9 | 225.8 | 176.7 - 297.7 |
| *Lutjanus* spp. | V | 2 | 8.8 | .25 | 8.6 - 9.1 | 1340.7 | 1263.7 - 1461.3 |
| *Haemulon* sp. | A | 1 | 6.1 | - | - | 522.7 | - |
| *Mugil* sp. | V | 1 | 4.9 | - | - | 297.7 | - |
| Balistidae | V | 1 | 4.0 | - | - | 176.7 | - |
| Osteichthyes uid | V | 10 | 5.3 | .7 | 4.1 - 6.8 | 364.4 | 188.3 - 691.1 |

Table E-11. Weight estimates of fishes based on the anterior widths of the atlas or vertebral centrum, from N32E32, 20-40 cm, flotation samples.

| | | Atlas or Vertebral Centrum Diameter (mm) | | | | Estimated Weight of Fish (g) | |
|---|---|---|---|---|---|---|---|
| Species | Element | N | Mean | Sd | Range | Mean | Range |
| Lamniformes | V | 1 | 5.8 | - | - | 459.2 | - |
| *Harengula* spp. | A | 2 | 2.0 | .3 | 1.7 - 2.3 | 28.9 | 19.6 - 42.6 |
| *Harengula* spp. | Ax | 8 | 1.9 | .1 | 1.8 - 2.1 | 26.1 | 22.7 - 33.7 |
| Clupeidae | V | 74 | 1.8 | .2 | 1.5 - 2.4 | 22.7 | 14.2 - 47.5 |
| Exocoetidae | V | 5 | 2.0 | .4 | 1.3 - 2.4 | 29.8 | 9.8 - 47.5 |
| *Strongylura* spp. | V | 5 | 2.8 | .7 | 2.0 - 3.9 | 70.7 | 29.8 - 165.6 |
| *Tylosaurus* spp. | V | 2 | 5.35 | .85 | 4.5 - 6.2 | 373.1 | 239.2 - 545.1 |
| *Holocentrus* spp. | V | 1 | 3.0 | - | - | 84.4 | - |
| *Epinephalus* sp. | V | 1 | 3.1 | - | - | 91.8 | - |
| *Caranx* sp. | A | 1 | 4.8 | - | - | 282.3 | - |
| Haemulidae | V | 1 | 3.0 | - | - | 84.4 | - |
| Labridae | V | 1 | 1.5 | - | - | 14.2 | - |
| *Sparisoma* sp. | A | 1 | 1.5 | - | - | 14.2 | - |
| *Gobiomorus dormitor* | A | 9 | 1.8 | .5 | 1.1 - 2.6 | 22.7 | 6.4 - 58.4 |
| *Gobiomorus dormitor* | V | 29 | 1.9 | .6 | 1.2 - 3.6 | 26.1 | 8.0 - 134.8 |
| Eleotridae | V | 18 | 1.4 | .2 | 1.1 - 1.9 | 11.9 | 6.4 - 26.1 |
| Gobiidae | A | 9 | 1.3 | .3 | .9 - 1.8 | 9.8 | 3.8 - 22.7 |
| *Acanthurus* spp. | A | 3 | 2.9 | .7 | 2.4 - 3.2 | 77.3 | 47.5 - 99.6 |
| *Acanthurus* spp. | V | 2 | 3.2 | .7 | 2.5 - 3.9 | 99.6 | 52.8 - 165.6 |
| Scombridae | V | 1 | 7.9 | - | - | 1016.0 | - |
| Osteichthyes uid | A | 4 | 1.7 | .2 | 1.5 - 1.9 | 19.6 | 14.2 - 26.1 |
| Osteichthyes uid | V | 72 | 1.85 | 1.2 | .9 - 10.2 | 24.3 | 3.8 - 1959.3 |

Table E-12. Weight estimates of fishes based on the anterior widths of the atlas or vertebral centrum, from Feature 101, flotation samples.

| Species | Element | Atlas or Vertebral Centrum Diameter (mm) | | | | Estimated Weight of Fish (g) | |
|---|---|---|---|---|---|---|---|
| | | N | Mean | Sd | Range | Mean | Range |
| Lamniformes | V | 1 | 2.2 | - | - | 38.0 | - |
| Rajiformes | V | 1 | 3.7 | - | - | 144.6 | - |
| *Harengula* spp. | A | 4 | 2.2 | .1 | 2.1 - 2.3 | 38.0 | 33.7 - 42.6 |
| *Harengula* spp. | Ax | 7 | 2.0 | .3 | 1.5 - 2.3 | 28.9 | 14.2 - 42.6 |
| Clupeidae | A | 1 | 1.7 | - | - | 19.6 | - |
| Clupeidae | V | 40 | 1.9 | .2 | 1.5 - 2.5 | 26.1 | 14.2 - 52.8 |
| Exoceitidae | V | 1 | 3.2 | - | - | 99.6 | - |
| Belonidae | V | 2 | 1.6 | .1 | 1.5 - 1.7 | 16.8 | 14.2 - 19.6 |
| *Epinephalus fulvus* | A | 3 | 3.3 | .3 | 2.9 - 3.6 | 107.8 | 77.3 - 134.8 |
| *Epinephalus* spp. | V | 5 | 3.4 | .5 | 2.5 - 3.9 | 116.4 | 52.8 - 165.6 |
| *Epinephalus* spp. | A | 2 | 2.95 | .15 | 2.8 - 3.1 | 80.8 | 70.7 - 91.8 |
| *Eucinostomus* sp. | A | 1 | 1.6 | - | - | 16.8 | - |
| Gerreidae | A | 2 | 1.35 | .25 | 1.1 - 1.6 | 10.8 | 6.4 - 16.8 |
| *Anisotremus* sp. | A | 1 | 2.7 | - | - | 64.3 | - |
| *Haemulon* spp. | V | 2 | 3.3 | .7 | 2.6 - 4.0 | 107.8 | 58.4 - 176.7 |
| Scaridae | V | 1 | 3.8 | - | - | 154.9 | - |
| *Mugil* spp. | V | 1 | 3.2 | - | - | 99.6 | - |
| *Gobiomorus dormitor* | v | 2 | 4.5 | 2.1 | 2.4 - 6.6 | 239.2 | 47.5 - 640.0 |
| Eleotridae | V | 18 | 1.9 | .5 | 1.2 - 3.2 | 26.1 | 8.0 - 99.6 |
| Gobiidae | A | 4 | 1.3 | .4 | 1.0 - 2.0 | 9.8 | 5.0 - 29.8 |
| Gobiidae | V | 6 | 1.4 | .2 | 1.0 - 1.7 | 11.9 | 5.0 - 19.6 |
| *Acanthurus* sp. | A | 2 | 1.9 | .2 | 1.7 - 2.1 | 26.1 | 19.6 - 33.7 |
| Osteichthyes uid | A | 1 | 2.7 | - | - | 64.3 | - |
| Osteichthyes uid | V | 50 | 1.9 | 1.0 | .9 - 5.5 | 26.1 | 3.8 - 400.6 |

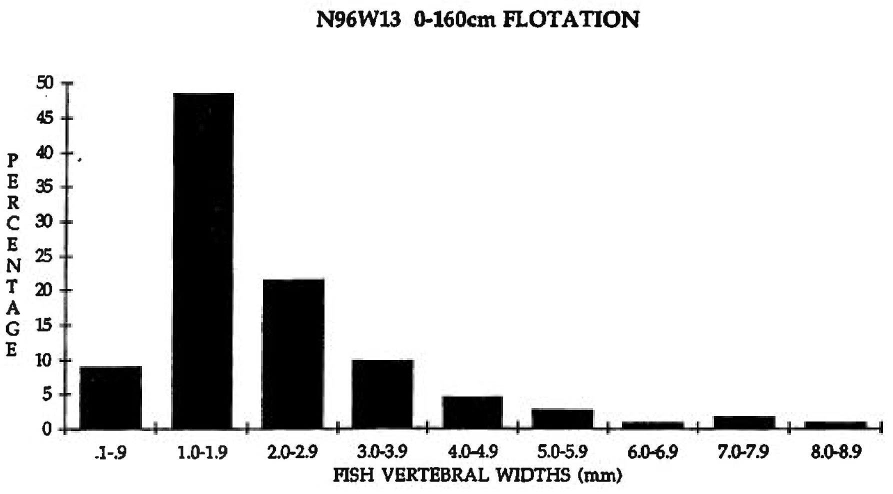


FIGURE E-1
SIZE RANGES OF FISH VERTEBRAE, N96W13 COLUMN

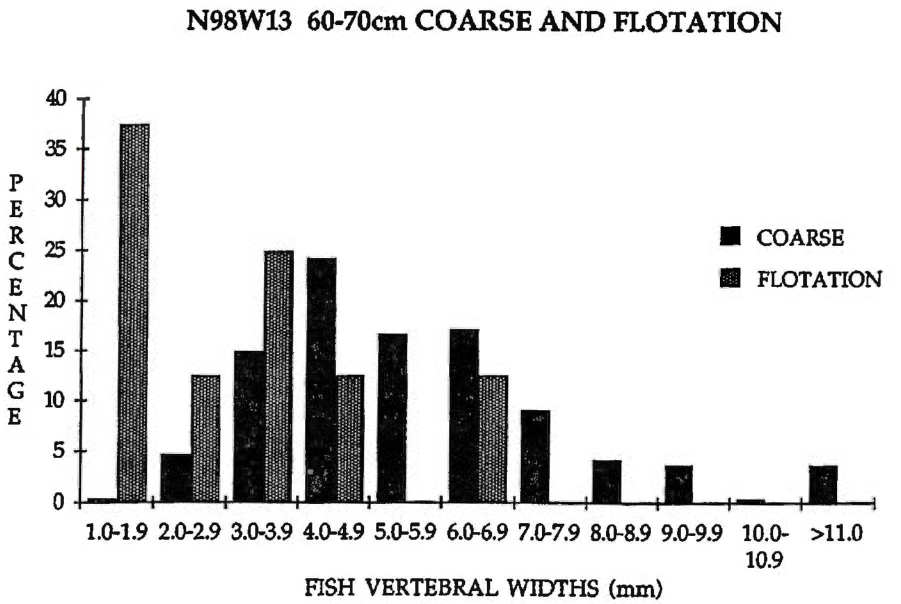


FIGURE E-2
SIZE RANGES OF FISH VERTEBRAE, N98W13, COARSE AND FLOTATION

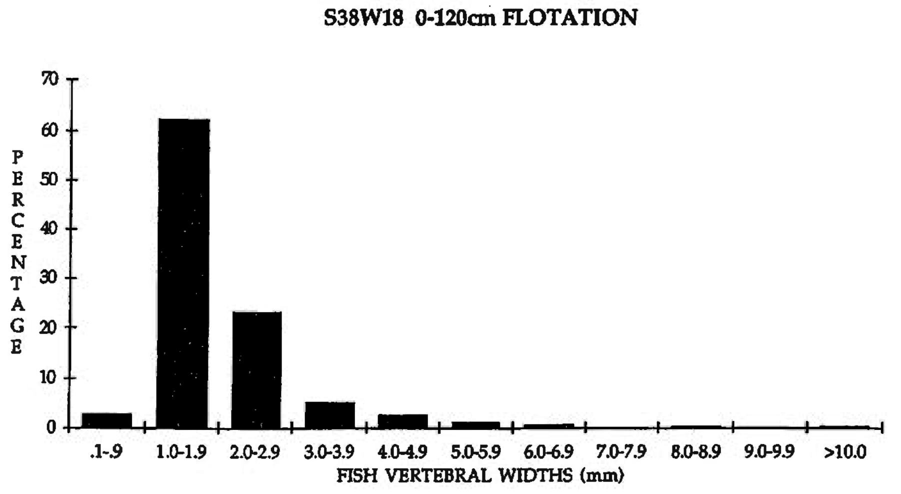


FIGURE E-3
SIZE RANGES OF FISH VERTEBRAE, S38W18 COLUMN

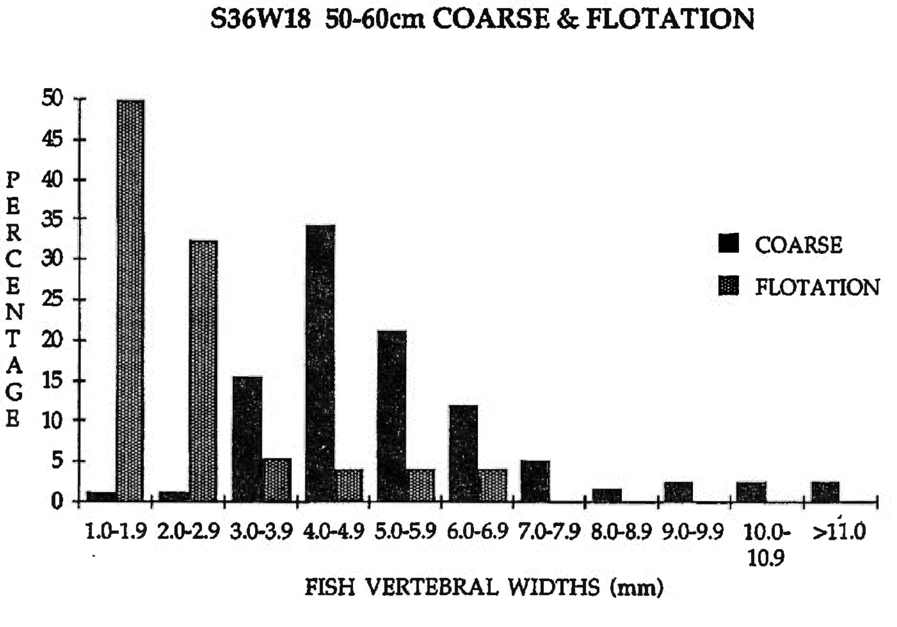


FIGURE E-4
SIZE RANGES OF FISH VERTEBRAE, S36W18, COARSE AND FLOTATION

## N112W88 COARSE AND FLOTATION

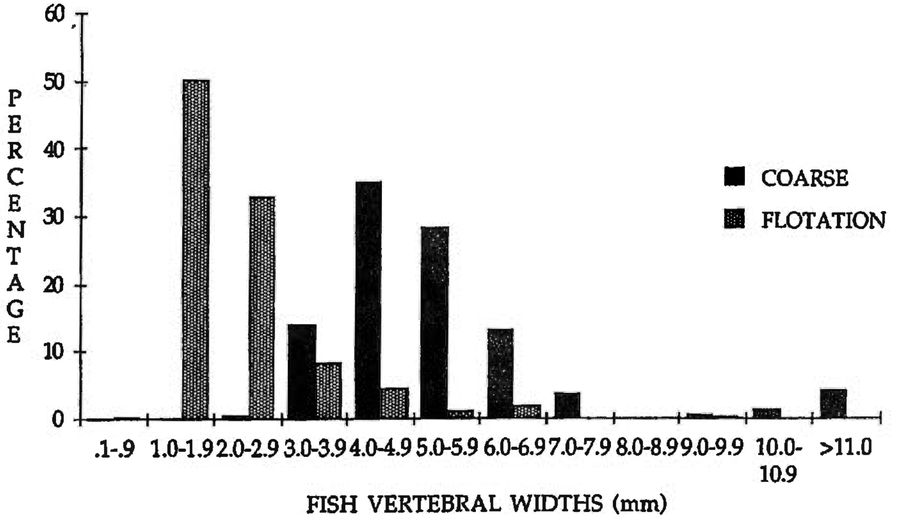


FIGURE E-5
SIZE RANGES OF FISH VERTEBRAE, N112W88, COARSE AND FLOTATION

## N112W88 FEATURE 104 COARSE AND FLOTATION

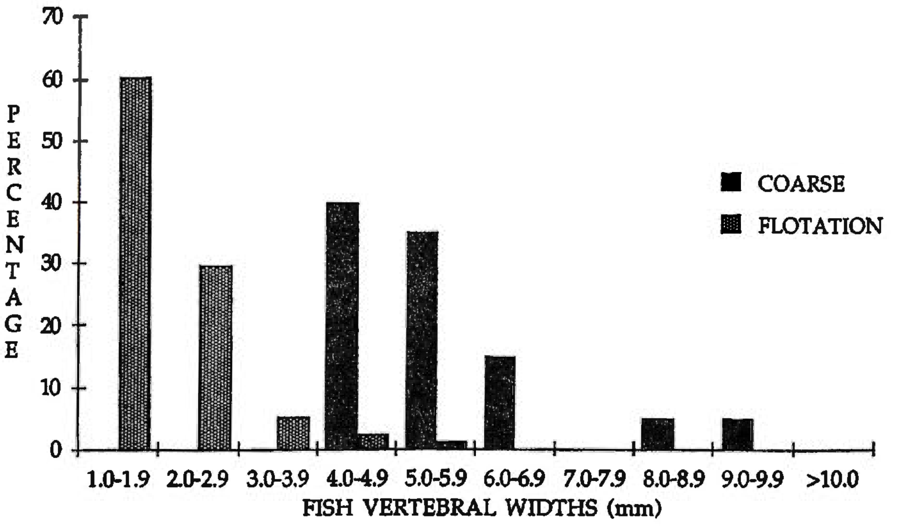


FIGURE E-6
SIZE RANGES OF FISH VERTEBRAE, N112W88, FEATURE 101
COARSE AND FLOTATION

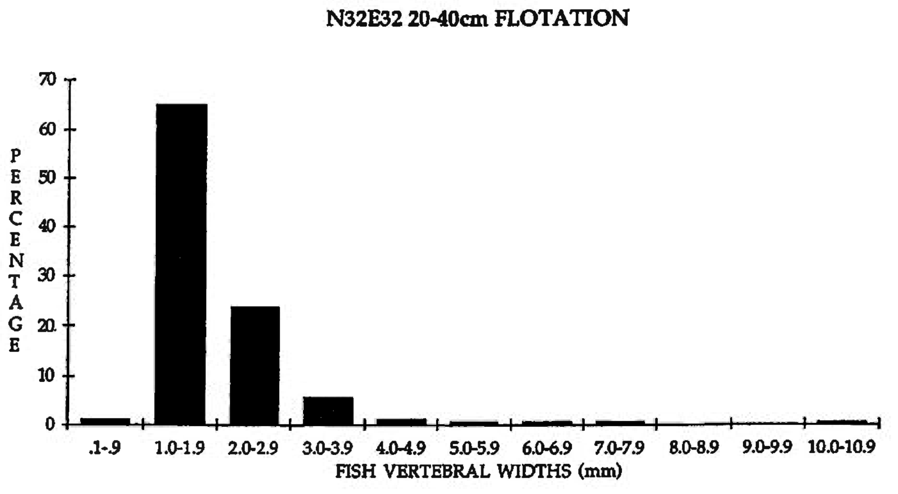


FIGURE E-7
SIZE RANGES OF FISH VERTEBRAE, N32E32 FLOTATION

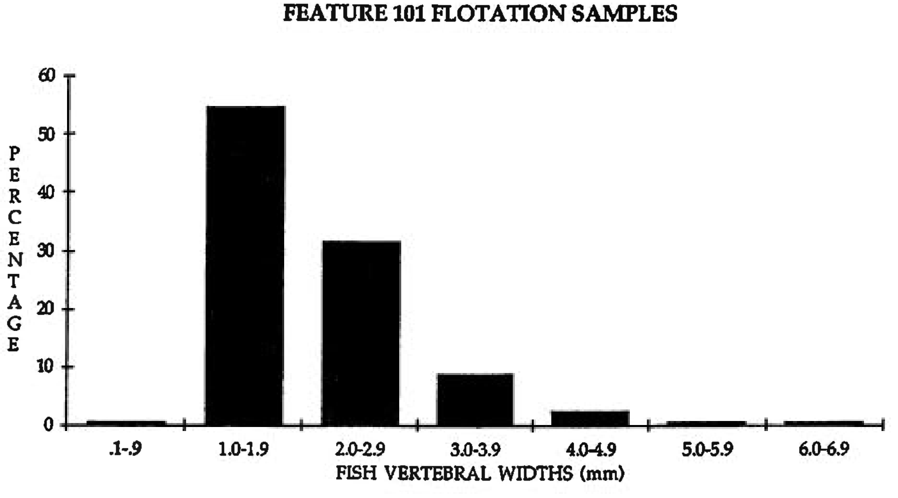


FIGURE E-8
SIZE RANGES OF FISH VERTEBRAE, MACROBLOCK,
FEATURE 101 FLOTATION