An Intensive Archeological Survey of Amoco Realty Property in Berkeley County, South Carolina with a Test of Two Subsistence-Settlement Hypotheses for the Prehistoric Period

Mark J. Brooks
James D. Scurry

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An Intensive Archeological Survey of Amoco Realty Property in Berkeley County, South Carolina with a Test of Two Subsistence-Settlement Hypotheses for the Prehistoric Period

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AN INTENSIVE ARCHEOLOGICAL SURVEY OF AMOCO REALTY PROPERTY IN BERKELEY COUNTY, SOUTH CAROLINA WITH A TEST OF TWO SUBSISTENCE-SETTLEMENT HYPOTHESES FOR THE PREHISTORIC PERIOD

by

Mark J. Brooks and James D. Scurry
Research Manuscript Series No. 147

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Prepared by the
INSTITUTE OF ARCHEOLOGY AND ANTHROPOLOGY
UNIVERSITY OF SOUTH CAROLINA
December, 1978
# TABLE OF CONTENTS

| LIST OF FIGURES                           | iii  |
| LIST OF TABLES                           | iv   |
| ACKNOWLEDGEMENTS                         | v    |
| MANAGEMENT SURVEY                        | vi   |
| INTRODUCTION                             | 1    |
| ARCHEOLOGICAL BACKGROUND                 | 3    |
| ENVIRONMENTAL SETTING                    | 4    |
| SURVEY METHODS                           | 12   |
| Introduction                             | 12   |
| Phase I                                  | 12   |
| Phase II                                 | 13   |
| Phase III                                | 19   |
| Evaluation of Methods                    | 20   |
| ARCHEOLOGICAL DATA                       | 23   |
| Introduction                             | 23   |
| Previously Recorded Sites from the Amoco Project Area | 23   |
| Sites Recorded During the Present Survey | 29   |
| BACKGROUND FOR SIGNIFICANCE ASSESSMENT: PRESENTATION OF HYPOTHESES | 43   |
| Introduction                             | 43   |
| Discussion                               | 43   |
| Chronological Controls                   | 46   |
| Explicit Hypotheses                      | 47   |
| TESTING AND EVALUATION OF HYPOTHESES     | 50   |
| SIGNIFICANCE ASSESSMENT OF ARCHEOLOGICAL SITES LOCATED DURING THE ARCHEOLOGICAL PROJECT | 64   |
| CONCLUSIONS AND RECOMMENDATIONS          | 68   |
| REFERENCES                               | 75   |
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>FIGURE</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIGURE 1:</td>
<td>Site Locations</td>
<td>ix</td>
</tr>
<tr>
<td>FIGURE 2:</td>
<td>Locations of the Sampling Quads.</td>
<td>x</td>
</tr>
<tr>
<td>FIGURE 3:</td>
<td>Widmer's Lower Coastal Plain Map Showing Location of Project Area</td>
<td>2</td>
</tr>
<tr>
<td>FIGURE 4:</td>
<td>Presence of Oak and Hickory in Mixed Hardwood Association.</td>
<td>5</td>
</tr>
<tr>
<td>FIGURE 5:</td>
<td>Loblolly-shortleaf Pine Association.</td>
<td>5</td>
</tr>
<tr>
<td>FIGURE 6:</td>
<td>Replacement of Pines by Mixed Hardwood</td>
<td>6</td>
</tr>
<tr>
<td>FIGURE 7:</td>
<td>Bottomland Associated Hardwoods.</td>
<td>6</td>
</tr>
<tr>
<td>FIGURE 8:</td>
<td>Tidal Marsh Association with Grove Creek and Cooper River.</td>
<td>8</td>
</tr>
<tr>
<td>FIGURE 9:</td>
<td>Freshwater Marsh Associated with Small Rank 1 Drainage</td>
<td>8</td>
</tr>
<tr>
<td>FIGURE 10:</td>
<td>Site 38BK334-Test Pit 1--View Looking West</td>
<td>40</td>
</tr>
<tr>
<td>FIGURE 11:</td>
<td>Site 38BK336-Test Pit 1--View Looking North</td>
<td>40</td>
</tr>
</tbody>
</table>
LIST OF TABLES

<table>
<thead>
<tr>
<th>TABLE</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>TABLE 1:</td>
<td>Sites and Management Recommendations</td>
<td>vii</td>
</tr>
<tr>
<td>TABLE 2:</td>
<td>Amoco Archeological Project Soil Data.</td>
<td>14</td>
</tr>
<tr>
<td>TABLE 3:</td>
<td>Soil Strata Proportions in Relation to the Number of Quadrats.</td>
<td>17</td>
</tr>
<tr>
<td>TABLE 4:</td>
<td>Artifacts from Prehistoric and Historic Sites.</td>
<td>24</td>
</tr>
<tr>
<td>TABLE 5:</td>
<td>Berkeley County Site Sample.</td>
<td>45</td>
</tr>
<tr>
<td>TABLE 6:</td>
<td>Soil Drainage and Site Elevations.</td>
<td>51</td>
</tr>
<tr>
<td>TABLE 7:</td>
<td>Artifact diversity and Density Values by Prehistoric Site</td>
<td>52</td>
</tr>
</tbody>
</table>
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We would like to thank Dr. Robert Kratsas and Dr. Stephen Elbert of the Amoco Chemicals Corporation for their interest in our research and their cooperation and assistance throughout the project. We would also like to thank Mr. Robert Smalls for providing valuable information on the environment of the project area and for his assistance in pulling our 4-wheel drive vehicle from a ditch. Very special thanks are extended to Dr. Donald Colquhoun of the Department of Geology, University of South Carolina and Dr. Walter Newman of the Department of Geology, Queens College of New York, who took the sediment cores and will be providing analysis of the cores as well as radiocarbon dates from peats and cypress stumps from the Cooper River and Grove Creek. Finally, we would like to thank Mr. Charles E. Glover of the Soil Conservation Service, Berkeley County District office in Moncks Corner for providing unpublished soil data on the project area.

Various members of the Institute staff contributed both technical and advisory services. Dr. Robert L. Stephenson, State Archeologist, made many useful comments and suggestions throughout the project. Dr. Paul Brockington, Environmental Impact Archeologist at the Institute and principal investigator on this project, provided overall supervision, handled administrative matters, and edited the report manuscript. Photographic assistance was provided by Gordon Brown, Institute photographer. Darby Erd, Institute Illustrator, prepared the figures. The report was edited by Susan Jackson, Editorial Assistant and Sandra Lee typed the manuscript.
The Amoco archeological survey was conducted at the request of the Amoco Realty Corporation from May 22 to June 9, 1978 by Mark Brooks and James D. Scurry of the Institute of Archeology and Anthropology staff. Eric C. Poplin and John Norris, also of the Institute staff, assisted during the second week of the survey. A field inspection by Paul Brockington was made during the last week of the fieldwork. The survey area consisted of a 1949.19 acre tract of land known locally as the Boswell tract or the Dundarrach Plantation, located adjacent to the Amoco Chemicals facilities in Berkeley County, South Carolina. The purpose of the survey was to locate and to evaluate the archeological resources which may be affected by industrial development scheduled for the area and to make recommendations pertaining to the preservation or conservation of those resources. A second, research-oriented objective of the survey was to test specific subsistence-settlement hypotheses which had been developed for the lower Coastal Plain of South Carolina.

It was impossible to survey completely all of the project area due to the dense vegetation and resulting lack of ground surface visibility. Therefore, a random sampling procedure was devised, utilizing 200 meter square quadrats. The sample was stratified by dividing soils within the project area into categories ranging from poorly drained to well drained.

An 11.57% sample of the total number of quadrats was tested by systematically placing 25 one-half meter square excavations in each sample quadrat. Also, an on-foot visual survey was conducted along the roads, powerline corridors, and firebreaks located within the project area, since these areas offer the only extensive exposed ground surface.

A total of 29 archeological sites have been recorded for the survey tract. Table 1 presents a listing of these sites and a summary of recommendations for their future management. Sites 38BK197-201 were located by Dr. Elaine Herold. They have been described and evaluated by her and will not be further discussed here. One site (38BK156), located by Hartley and Stephenson (1975), is included in the survey tract, as are three sites (38BK272-274) found in a powerline right-of-way by Karen Wood (1977). These four sites will be described and analyzed here along with the 20 sites discovered during the survey. Five sites found during the survey (38BK327, 330-333) are located just outside the survey tract boundaries on property owned by Georgia-Pacific Corporation. These five sites, found in road beds during travel to and from portions of the survey tract, are described here, but detailed evaluations and recommendations for them are not made.

Management recommendations are made for 19 sites within the survey tract. If possible, the best option from an archeological perspective would be preservation of all 19 sites. The primary importance of the archeological sites discovered lies in their ability to provide information important to scientific studies of prehistory and history. No further work is recommended at 14 of the sites because they are generally so small.
and already disturbed to the point that they have minimal or no research potential.

**TABLE 1**

**SITES AND MANAGEMENT RECOMMENDATIONS**

<table>
<thead>
<tr>
<th>Site</th>
<th>Recorded By</th>
<th>Cultural Period</th>
<th>Future Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>38BK156</td>
<td>Hartley and Stephenson (1975)</td>
<td>Prehistoric-Cape Fear</td>
<td>none</td>
</tr>
<tr>
<td>38BK272</td>
<td>Wood (1977)</td>
<td>Late 18th-Early 19th century</td>
<td>none</td>
</tr>
<tr>
<td>38BK273</td>
<td>Wood (1977)</td>
<td>Historic/Probable Woodland</td>
<td>none</td>
</tr>
<tr>
<td>38BK274</td>
<td>Wood (1977)</td>
<td>Prehistoric-Deptford</td>
<td>none</td>
</tr>
<tr>
<td>38BK315</td>
<td>Brooks and Scurry</td>
<td>Prehistoric-Late Archaic/Probable Woodland</td>
<td>none</td>
</tr>
<tr>
<td>38BK315</td>
<td>Brooks and Scurry</td>
<td>Prehistoric-Late Archaic/Probable Woodland</td>
<td>none</td>
</tr>
<tr>
<td>38BK316</td>
<td>Brooks and Scurry</td>
<td>Prehistoric-Probable Woodland</td>
<td>none</td>
</tr>
<tr>
<td>38BK317</td>
<td>Brooks and Scurry</td>
<td>Undetermined Prehistoric</td>
<td>none</td>
</tr>
<tr>
<td>38BK318</td>
<td>Brooks and Scurry</td>
<td>Late 18th-Early 19th century</td>
<td>none</td>
</tr>
<tr>
<td>38BK319</td>
<td>Brooks and Scurry</td>
<td>Historic/Probable Woodland</td>
<td>none</td>
</tr>
<tr>
<td>38BK323</td>
<td>Brooks and Scurry</td>
<td>Prehistoric-Probable Woodland</td>
<td>none</td>
</tr>
<tr>
<td>38BK324</td>
<td>Brooks and Scurry</td>
<td>Probable Stalling's Island, Probable Woodland</td>
<td>none</td>
</tr>
<tr>
<td>38BK325</td>
<td>Brooks and Scurry</td>
<td>Probable Stalling's Island/Late Archaic, Deptford, Cape Fear</td>
<td>none</td>
</tr>
<tr>
<td>38BK326</td>
<td>Brooks and Scurry</td>
<td>Late 18th-Early 19th century</td>
<td>none</td>
</tr>
<tr>
<td>38BK327</td>
<td>Brooks and Scurry</td>
<td>Probable Stalling's Island, Probable Woodland</td>
<td>none</td>
</tr>
<tr>
<td>38BK330</td>
<td>Brooks and Scurry</td>
<td>Late Archaic, Thom's Creek,</td>
<td>none</td>
</tr>
<tr>
<td>Site</td>
<td>Recorded</td>
<td>Cultural Period</td>
<td>Future Work</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------</td>
<td>------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>38BK331</td>
<td>Brooks and Scurry</td>
<td>Early Archaic, Thom's Creek, Deptford, Cape Fear</td>
<td>On Georgia Pacific Property - no recommendations</td>
</tr>
<tr>
<td>38BK332</td>
<td>Brooks and Scurry</td>
<td>Undetermined Prehistoric</td>
<td>On Georgia Pacific Property - no recommendations</td>
</tr>
<tr>
<td>38BK333</td>
<td>Brooks and Scurry</td>
<td>Probable Stalling's Island, Thom's Creek, Cape Fear</td>
<td>On Georgia Pacific Property - no recommendations</td>
</tr>
<tr>
<td>38BK334</td>
<td>Brooks and Scurry</td>
<td>Stallings Island, Probable Woodland</td>
<td>Intensive subsurface testing</td>
</tr>
<tr>
<td>38BK335</td>
<td>Brooks and Scurry</td>
<td>Late 18th-Early 19th century</td>
<td>Intensive subsurface testing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Historic/Probable Colono-Indian</td>
<td>no specific recommendations, but should be included in a comprehensive study of historic utilization of the area</td>
</tr>
<tr>
<td>38BK336</td>
<td>Brooks and Scurry</td>
<td>Probable Deptford, Cape Fear</td>
<td>none</td>
</tr>
<tr>
<td>38BK337</td>
<td>Brooks and Scurry</td>
<td>Late 18th-Early 19th century</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Historic/Probable Colono-Indian</td>
<td>none</td>
</tr>
<tr>
<td>38BK338</td>
<td>Brooks and Scurry</td>
<td>Thom's Creek</td>
<td>none</td>
</tr>
<tr>
<td>38BK343</td>
<td>Brooks and Scurry</td>
<td>Probable Woodland</td>
<td>none</td>
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</table>

Small scale test excavations are recommended for two sites if they cannot be avoided and preserved. These sites (38BK334 and 38BK336) are moderate to high density artifact scatters with buried, intact deposits, and a high probability of containing undisturbed features. These two sites thus have quite good potential for containing significant information. The recommended test excavations, if necessary, should take a crew of 4 about 2 weeks. The locations of these and other sites are shown in Figure 1.

Analysis of site location information showed that certain limited areas of the survey tract have much greater potential for containing sites than other areas. The high potential areas are defined by the occurrence of well-drained soils as shown in Figure 2. The survey sampling program...
SOIL SAMPLING STRATA:
1-5 POORLY TO SOMEWHAT POORLY DRAINED
6 MODERATELY WELL DRAINED
7 WELL DRAINED
8 MARSH, NOT INCLUDED IN SAMPLE

FIGURE 2: Locations of the Sampling Quads
was designed to show the relationship between soil variables and site locations and character. This experiment indicated that sites of all periods were much more likely to be found in the relatively restricted areas of well-drained soils. We therefore urge caution when developing these areas. Avoidance and preservation is preferable; if this is not possible, intensive survey of construction areas before disturbance and/or the presence of an archeologist during first phase clearing and grading are recommended.

Five sites with 18th century components were located in the survey tract, including one found by Wood (1978). Two of these, 38BK272 and 38BK318, have been recommended for no further work. Three others, 38BK326, 38BK335, and 38BK337, appear to have intact deposits and high enough artifact density such that they have potential for providing information significant to historical studies. It is beyond the scope of this study project, however, to make detailed evaluations and recommendations for these three sites. They should be included in a comprehensive study plan as developed by Herold, Knick, and Liss (1978) for all historical resources of the project area.

In summary, 24 archeological sites have been recorded for the project area. Five of these have been described and evaluated by Herold, Knick and Liss (1978). Three additional historic sites were found during the present study and should be included in Herold's comprehensive management plan. Of the remaining 16 sites, two (38BK334 and 38BK336) are recommended for intensive subsurface testing if preservation cannot be accomplished and 14 are recommended for no further consideration. Additionally, high probability areas for the occurrence of undiscovered sites have been identified. These are shown in Figure 2 as the areas with moderately well drained and well drained soils and should be avoided if possible. If avoidance is not possible, detailed inspection of these areas is recommended, either before or during construction.
INTRODUCTION

An intensive archeological survey of the Dundarrach Plantation (also known as the Boswell Tract) was conducted by the Institute of Archeology and Anthropology, University of South Carolina, from May 17 through June 9, 1978. This property is owned by the Amoco Realty Corporation. The survey was requested and funded by that corporation for the purpose of locating and assessing the archeological resources contained within the project area so that recommendations could be made for the management of these resources in view of the scheduled industrial development of the property. Within this framework, the survey was oriented toward the collection of specific kinds of archeological and environmental data to test a series of explicitly formulated hypotheses pertaining to changing patterns of prehistoric use of the environment.

Dr. Elaine B. Herold, of the Charleston Museum, was responsible, under separate contract with the Amoco Realty Corporation, for investigations of sites of the Historic Period. The results of her work are reported separately (Herold, Knick and Liss 1978) and are not a part of this report.

The project area contains 1,949 acres within the inter-riverine zone of the interior Lower Coastal Plain, approximately 13 miles north of Charleston, in Berkeley County, South Carolina. The tract is roughly rectangular, bordered on the south by the Amoco Chemical Plant property and on the north by Georgia Pacific property. Clements Ferry Road forms the eastern border. The Cooper River, and its associated marsh, forms the western boundary. Little Johnson Swamp, a low marshy bottomland area with dense hardwood ground cover, is located in the northeast corner of the project area. Little Johnson Creek flows from the swamp and empties into Grove Creek in the approximate center of the project area. Grove Creek, a tributary of the Cooper River, flows through the project area, meandering through the Cooper River marsh and into the river (Fig. 3).

Prior to the present survey, nine sites had been recorded in the project area. Five of these were historic period sites recorded by Dr. Herold (Herold, Knick and Liss 1978). One of these five sites (38BK197) was also examined during the present survey and will be considered briefly in this report. The other four sites were discovered by Hartly and Stephenson (1975) and Wood (1977). Three of these sites are of the prehistoric periods and one is of the historic period with prehistoric material present.
FIGURE 3. Widmer's Lower Coastal Plain map showing location of project area.
The interior Lower Coastal Plain of South Carolina is generally a poorly known archeological zone, although the area of the East Cooper River is perhaps the best known section of that zone due to the extensive work done for the Amoco Chemicals Corporation and related projects. Related research has been done on the Georgia and North Carolina coasts that provides some help in understanding the prehistory of the South Carolina coast. Of specific importance is the work of Dr. Jerald Milanich, of the University of Florida, in the Lower Coast Plain of Georgia. Milanich (1972, 1973) has set forth some cultural hypotheses that he has extended to the similar areas of South Carolina. He considers the interior portions of the Lower Coastal Plain to have been basically devoid of aboriginal occupation during certain seasons of the year and that only the estuarine zone was capable of supporting year-round aboriginal occupation. He further suggests that the sites in the interior sections of the Lower Coastal Plain from about 2500 B.C. to A.D. 700 represent seasonal movement of people into the interior riverine zone from the estuarine zone during the fall and early winter to collect nuts and hunt deer.

Recent research in the East Cooper River vicinity (Asreen 1974, 1975; Hartley and Stephenson 1975; House and Goodyear 1975; Widmer 1976a, 1976b; Green and Brooks n.d.) suggests that Milanich's proposed patterns are not applicable, at least to the South Carolina Coastal Plain. This suggestion is based upon the considerable number and variety of sites in the East Cooper River area. Widmer (1976a, 1976b) presents strong arguments based upon archeological and environmental data that, at least in the East Cooper River area, the subsistence resource variability and productivity were such that aboriginal populations could be, and probably were, supported year-round during this time period.

Widmer (1976b: 46-48) also suggested an adaptive model to apply to this situation. Brooks (in Green and Brooks n.d.), using available environmental and archeological site data from Berkeley County, has elaborated on this subsistence-settlement model for culture change in the interior Lower Coastal Plain. This model suggests that much of this area did, indeed, support year-round occupation, but that the utilization of this environment varied through time with environmental changes. These changes are presumed to have been brought about by a changing oak-hickory forest structure and a generally rising, though fluctuating sea level during the Holocene Period. These presumed sea level changes would have altered the distribution and productivity of the major subsistence resources occurring in the riverine and inter-riverine physiographic zones. If this is the case, then changes in patterns of human subsistence and settlement would be expected to result from adaptations to the changes in subsistence resources. These adaptations, however, may have been strongly conditioned by a general trend toward larger populations. This, together with an overall reduction in land area (brought about by the presumed general sea-level rise) would tend to reduce the size of the band territories. This, in turn, would lead to a more sedentary and a more labor-intensive economy (Binford 1968).
ENVIRONMENTAL SETTING

Although the loblolly-shortleaf pine forest is currently dominant in most of the East Cooper River area, it is probable that this is due to a long history of logging and planned forest management, which has resulted in a nearly total replacement of a southern mixed hardwood forest climax (Quarterman and Keever 1962). Chapman (1905) noted that the loblolly-shortleaf pine composition tended to be associated with flat, moist lands, swamp edges, and well drained bottomlands. Most of the East Cooper River area is characterized by these physiographic features (Dames and Moore 1975). Longleaf pine, on the other hand, prefers higher, lighter, better drained soils and is, therefore, more restricted in distribution than loblolly. The numerous hardwood stands found throughout the East Cooper River area (USDA Forest Service 1971; Dames and Moore 1975, 1976) on tracts that are better drained than those containing hardwood swamp associations would appear to represent the original Southern mixed hardwood climax forest (Quarterman and Keever 1962). The hardwood swamp associations, comprised principally of cypress and gum, are found in the hydric regions of the East Cooper River area in creek bottoms and poorly drained areas (Dames and Moore 1975, 1976).

These generalized forest associations characteristic of the East Cooper River area were also noted in the project area. The longleaf pines and mesic adapted mixed hardwoods are most strongly associated with the well to moderately well drained soils occurring at the higher elevations along the norther border of the project area and above Grove Creek and Little Johnson Creek/Swamp. Our field observations were in strong agreement with Quarterman and Keever (1962) in that various species of oak and hickory were significantly represented in these mesic adapted, mixed hardwood associations. This is illustrated in Figure 4. Mesic adapted vegetation such as oak and hickory prefer the higher, well to moderately well drained soils situated on broad, flat to gently sloping terrain. Soils in areas such as this lose relatively little precipitation to run-off, but by the same token, their permeability does not allow the soil to become saturated (Oosting 1942; Quarterman and Keever 1962; Camp, et al. 1975).

Also in agreement, was the strong correlation between loblolly-shortleaf pine and soils associated with flat, moist lands, swamp edges, and well drained bottomlands (Fig. 5). Given the ability of these species to adapt to a broad range of edaphic conditions, and their encouragement by historic and modern land management practices, it is not surprising that loblolly-shortleaf pine was observed to occur also on the higher, better drained soils in the project area. Nevertheless, as Quarterman and Keever (1962) demonstrate, the more shade-tolerant, mesic adapted, species of the Southern mixed hardwood climax forest would tend to replace the pines in these mesic areas, given time and no additional interference by man. Figure 6 illustrates this, as indicated by an understory of mixed hardwoods.
FIGURE 4. Presence of oak and hickory in mixed hardwood association.

FIGURE 5. Loblolly-shortleaf pine association.
FIGURE 6. Replacement of pines by mixed hardwood.

FIGURE 7. Bottomland associated hardwoods.
Cypress, gum and other swamp associated hardwoods occur primarily on the hydric soils of Little Johnson swamp and the low bottomland areas along Little Johnson Creek and Grove Creek. In addition, a number of small drainages that do not appear on the U.S.G.S. maps empty into Grove and Johnson Creeks. The low bottomland areas associated with these drainages, as well as a number of low depressions in the southeastern portion of the project area, also contain these swamp associated hardwoods (Fig. 7).

From the preceding discussion, it should be apparent that there is a strong correlation between soil types and the vegetation they can support. This correlation was heavily drawn upon in designing our survey strategy for recovering data necessary for testing hypotheses concerning the prehistoric utilization of the inter-riverine zone. It should be kept in mind that edaphic conditions and associated vegetational patterns may not have been constant throughout the Holocene. Although it is expected that the higher elevations have remained relatively stable, environmentally, throughout this period, a general trend in sea level rise, which would directly inundate some areas and raise the water table through eustatic pressure in others, would tend to alter well to moderately well drained soils at the lower elevations in such a manner that mesic adapted vegetation would be replaced by hydric adapted species. This was demonstrated during the subsurface testing phase of the survey, in that some of the soils at the lower elevations would have been fairly well drained (deep, fine sand to fine sandy clay soils), but they are currently saturated as a result of a high water table at or near the surface.

With this factor in mind, and assuming that the inter-riverine zone was exploited primarily during the fall and early winter for acorns, hickory nuts, and deer, then we would expect most prehistoric sites in this zone to occur at the higher elevations, in association with well to moderately well drained soils that have remained relatively stable throughout the Holocene, and are capable of supporting high densities of mesic adapted oak and hickory species. Further, the higher productivity localities for these resources within the environmentally stable upland areas should remain relatively constant through time, such that we would expect these localities to have been more heavily or intensively utilized, often producing multicomponent sites.

In addition to the wooded zones, two types of marsh are found within the project area. The tidal marsh is associated with Grove Creek and extends out to the Cooper River (Fig. 8). Much smaller freshwater marshes are associated with many of the small drainages within the project area (Fig. 9). The extent and distribution of these two biotic zones in the project area, and the adjacent Cooper River Valley in general, fluctuated through time due to sea level fluctuations and the variability of freshwater discharge (Dr. Donald Colquhoun, personal communications). As suggested earlier, this is thought to have exerted considerable influence on the distribution and productivity of various tidal and fresh water resources over time.
FIGURE 8. Tidal marsh associated with Grove Creek and Cooper River.

FIGURE 9. Freshwater marsh associated with Grove Creek and Cooper River.
Based on the previous discussion, it is apparent that a number of contrasting biotic zones are and were present within and adjacent to the project area. The occurrence of these zones in relatively close proximity to each other relates directly to the productivity and diversity of potential food resources available for exploitation by prehistoric populations.

Smith (1975) notes that the interfaces between different biotic zones are favorable habitats for certain species of upland game, especially white-tailed deer, whose highest population densities occur where many small areas of varying vegetation are located. In support of this, as many as twelve deer were sighted during a single day in the project area, most of which occurred at the interface between the secondary growth vegetation along the transmission lines and the adjacent forested areas. A wildlife habitat study of the nearby Francis Marion National Forest indicates a diversified habitat conducive to deer maintenance, with plentiful browse provided by tit, bay, blueberry, wild grape, yellow jasmine, red maple, honeysuckle, dogwood, and smilax (USDA Forest Service 1971). Hickory, oak, beech, and dogwood provide mast for deer. In addition to providing a seasonally varied deer diet, this setting is also favorable for turkey, woodcock, wood duck, dove, squirrel, bobcat, raccoon, oppossum, and bear (Dames and Moore 1975). Although archeological and ethnohistoric data indicate that these faunal species were utilized by prehistoric human populations in the southeastern United States, white-tailed deer were the preferred upland game (Caldwell 1958; Lewis and Lewis 1961; Morse 1967; Parmalee 1969; DeJarnette, Kurjack and Cambran 1962; Fowler 1959; Smith 1975; Swanton 1946; Canouts 1971; Hudson 1972).

Plant resources for human exploitation would also have been abundantly available in the project area. Acorns and hickory nuts would be available in the fall and early winter. These items were extremely important in prehistoric economies in the southeastern United States (Caldwell 1958; Larson 1970; Swanton 1946; Hilton 1959; Ashe 1959; Lawson 1952). Palmetto berries, flesh of the sabal palm, and various fruits such as wild cherry, plums, and persimmons, are other potentially exploitable species known to have been utilized by southeastern aboriginal populations (Larson 1970).

A wide variety of potential subsistence resources occurs in the Cooper River and its associated tidal and freshwater marshes in the vicinity of the project area. Seasonally available resources are present primarily from winter through summer and include such species as migratory waterfowl (various species of ducks, geese, and teal), anadromous fish (i.e., striped bass, blueback herring, American shad, hickory shad, alewife, sturgeon, American eels), and various plant resources, i.e., wild rice, arrowhead, etc. (Dames and Moore 1975; Interstate Commerce Commission 1977; Federal Power Commission 1977). All of these riverine zone resources are known to have been important subsistence items to prehistoric populations in the coastal areas of the Southeastern United States (Swanton 1946; Lawson 1952; Larson 1970). Subsistence resources available year-round in this zone include alligators, turtles, and various fish species such as freshwater species of the sunfish family, the coastal shiner, mullet, and flounder. An abundance of mullet, turtles,
alligators and wood ducks were observed during the survey in the Grove Creek and Cooper River marshes.

Finally, in view of the considerable subsistence resource variability between the riverine and inter-riverine areas and their constituent biotic (microenvironmental) zones, environmental and ecological factors strongly support the archeological and ethnohistoric data suggesting that not only were deer, acorns, and hickory nuts heavily relied upon by prehistoric groups in the southeastern United States, but also that these seasonally associated resources can be most efficiently procured in upland inter-riverine areas during the fall and early winter when the nuts ripen and the deer aggregate to feed on them (Smith 1975). The environmental and ecological factors that support this hypothesized relationship between the seasonal association of nuts and deer and their procurement during the fall and early winter include:

1) Except when stored, acorns and hickory nuts are available only during the fall and early winter.

2) The storability of nuts would make them a particularly attractive resource in that they could be utilized during the leaner winter months.

3) The high densities of oak and hickory in upland mesic areas (well to moderately well drained soils) and the nonmobile nature of these resources would make them particularly economical to exploit.

4) Deer territories tend to be less than 2 square miles, with seasonal movement within these territories according to the seasonal availability of different plant foods. Beginning in August, with the availability of acorn mast, acorns become the primary food of deer, and there is a high concentration of deer in upland hardwood zones (Smith 1975).

5) Two factors of white-tailed deer behavior make fall and early winter deer hunting optimal during this season. First, within upland zones there is a high and predictable deer concentration. Second, the fall rutting season produces a "personality" change especially in male deer, allowing them to be decoyed within killing range by rustling bushes with a stuffed deer head, or other means (Smith 1975).

6) Nutitionally, acorns and hickory nuts are complimentary, with acorns being rich in carbohydrates and hickory nuts rich in plant protein and fats (Asch, Ford and Asch 1972). Deer, of course, would be an important source of animal proteins and fats.

7) These fall and early winter resources in upland inter-riverine zone areas would not produce substantial scheduling conflicts with the procurement of winter through summer seasonally available resources in the riverine zone. Actually, they
would be complimentary components of a seasonally varied yearly diet.

8) The procurement of deer and nuts during the fall and early winter would be particularly economical in that both could be efficiently exploited due to their close spatial association. Further, the high densities and biomass of these resources during the fall and early winter would make them more economical to exploit than other upland inter-riverine zone resources which, regardless of the season, would be too dispersed and/or in insufficient biomass to be efficiently exploited, except on an opportunistic basis.
SURVEY METHODS

Introduction

Fieldwork during the survey was carried out in three phases. Phase I was designed to relocate and test sites already recorded for the project area. Phase II was designed to discover sites in a systematic manner so that the number and distribution of sites found, as well as their character, would allow prediction, for culture resources management purposes, of high probability areas. Sites located during Phase II were also tested and evaluated for significance. An important point to note is that the Phase II sampling plan was also designed to recover basic site and environmental data in such a way that information important to ongoing prehistoric studies would also be supplied. Phase III involved checking all roads, trails, firebreaks, etc. where the ground surface was visible, as well as testing sites located during this phase.

Phase I

During Phase I, previously discovered sites were relocated and examined. These sites were all located on exposed ground surface areas along transmission line rights-of-way. All archeological material on exposed ground surfaces was collected. If observed, differential densities of archeological material, as well as spatially separated clusters of material, were recorded and collected as separate proveniences.

Unless a site was judged to be too badly disturbed, as most were, at least one 1 x 1 meter test pit was excavated in an undisturbed, or in the least disturbed, area of the site down to consolidated clay. The soil was screened through 1/4" mesh hardware cloth. All archeological material was collected and recorded by provenience. Soil profiles were recorded and photographed.

Additional 1 x 1 meter test excavations would have been excavated at these sites if the density of material and lack of disturbance had indicated that it would be possible to determine the extent and variability of the archeological deposits. At most of the sites, however, the material collected on the surface, and the degree of disturbance, suggested that the sites had low artifact densities and that subsurface testing would not be cost-effective.

Environmental data were recorded and photographs taken at each site. This phase was also utilized for purposes of familiarizing ourselves with the survey area.
Phase II

Phase II was directly oriented toward understanding the nature of prehistoric utilization of the inter-riverine zone. A sampling strategy was desirable because of the relatively large extent of the project area and subsurface testing was necessary because of its heavily vegetated condition.

Given the belief that prehistorically the inter-riverine zone was utilized primarily for nut gathering and deer hunting during the fall and early winter, and that these resources and associated sites should be strongly correlated with well to moderately well drained soils, it was decided to conduct intensive subsurface sampling in randomly selected units (quadrats) within each of seven sampling strata developed from soil types. An eighth stratum composed of saturated soils occurring in the marshes or underwater was not included in the sampling design. Each sampling stratum was created by combining soil types with similar physical characteristics, with an emphasis on drainage: poorly drained, somewhat poorly drained, moderately well drained and well drained. Unpublished soil data for the project area was provided by Mr. Charles E. Glover, Jr. of the Soil Conservation Service District office in Monck's Corner, South Carolina. Table 2 shows the soil types, their physical properties, and how they were combined to form the sampling strata. Figure 2 shows the distribution of the combined soil types in the project area and the location of the sampling units chosen.

The number of units selected within each sampling stratum was determined by the relative proportion of each of the combined soil types (sampling strata) within the project area. Thus, since the poorly and somewhat poorly drained soil types were dominant in the area, they received the greatest sampling emphasis. In order to test the hypothesized association between prehistoric sites and well to moderately well drained soils, it was necessary to demonstrate not only that sites tend to be associated with these soils, but also that they tend not to occur on poorly and somewhat poorly drained soils. It would not be adequate to test the hypothesized relationship by examining only or emphasizing, the well to moderately well drained soils. Consequently, given the high relative proportion of the poorly drained and somewhat poorly drained soils in the project area, a strong argument for the hypothesized relationship can be presented if it can be demonstrated that a high percentage of the prehistoric sites are located on the small amount of well and moderately well drained soils.

A sampling frame or grid consisting of two hundred eight 200 by 200 meter quadrats was superimposed over the soil strata map. The areally dominant soil stratum within each of the 208 quadrats was then determined. For each of the seven soil strata, the number of quadrats in which that stratum was dominant was then calculated. It was felt that the total number of quadrats in which each soil sampling stratum was dominant in comparison with the 208 total quadrats, would be a close approximation of the relative proportion of that soil sampling stratum to the other six strata defined for the project area.
<table>
<thead>
<tr>
<th>Sampling Strata</th>
<th>Soil Series</th>
<th>Drainage Characteristics</th>
<th>Soil Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>22 Pinckney</td>
<td>very poorly drained slow on ponded runoff, rapid permeability</td>
<td>0 to 86.36 cm - loamy fine sand</td>
</tr>
<tr>
<td></td>
<td>26 Witherbee</td>
<td>somewhat poorly drained slow runoff, rapid permeability</td>
<td>86.36 to 203.20 cm - fine sand</td>
</tr>
<tr>
<td>2</td>
<td>11 Tawcaw</td>
<td>somewhat poorly drained slow runoff and slow permeability</td>
<td>0 to 274.32 cm - fine sand</td>
</tr>
<tr>
<td>3</td>
<td>57 Wahee</td>
<td>somewhat poorly drained slow runoff and slow permeability</td>
<td>0 to 96.52 - silty clay loam</td>
</tr>
<tr>
<td>4</td>
<td>70 Meggett</td>
<td>poorly drained, slow runoff and moderately slow to slow permeability</td>
<td>0 to 22.86 cm - loam; 22.86 to 33.02 cm - clay loam; 33.02 to 106.68 cm - clay and 106.68 to 172.72 cm - sandy clay loam</td>
</tr>
<tr>
<td>5</td>
<td>41 Dunbar</td>
<td>poorly drained, very slow runoff, slow permeability</td>
<td>0 to 17.78 cm - loam; 17.78 to 25.40 cm - clay loam; and 25.40 to 246.38 cm - clay</td>
</tr>
<tr>
<td></td>
<td>40 Lynchburg</td>
<td>somewhat poorly drained slow runoff, moderately slow permeability</td>
<td>0 to 22.86 cm - sandy loam; 22.86 to 45.72 cm - sandy clay; 45.72 to 127.00 cm - clay; and 127.00 to 152.40 cm sandy clay with shell fragments</td>
</tr>
<tr>
<td>17 Rains</td>
<td></td>
<td>poorly drained, slow runoff, moderate permeability</td>
<td>0 to 20.32 cm - sandy loam; 20.32 to 35.56 cm - clay loam; and 35.56 to 233.68 cm - sandy clay</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0 to 30.48 cm - loamy sand; 30.48 to 50.80 cm - sandy loam; 50.80 to 147.48 cm - sandy clay loam; 157.48 to 200.66 cm - sandy loam; and 200.66 to 215.90 cm - loamy sand</td>
</tr>
</tbody>
</table>
### TABLE 2 (continued)

**AMOCO ARCHEOLOGICAL PROJECT SOIL DATA** *(from Glover)*

<table>
<thead>
<tr>
<th>Sampling Strate</th>
<th>Soil Series</th>
<th>Drainage Characteristics</th>
<th>Soil Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>45 Goldsboro, 31A, 31B, and 79 Bonneau, 18A, 18B Duplin</td>
<td>moderately well drained, slow runoff, moderate permeability</td>
<td>0-30.48 cm - loamy sand; 30.48 to 38.10 sandy loam; 38.10 to 165.10 - sandy clay loam; and 165.10 to 193.04 sandy clay loam with strata of sandy loam. 0-55.88 - loamy sand; 55.88-68.58 cm sandy loamy; and 68.58 to 127.00 cm - sandy clay loam.</td>
</tr>
<tr>
<td>7</td>
<td>75 Chipley-Echaw</td>
<td>moderately well drained, slow runoff, rapid permeability</td>
<td>Well drained—Moderately well drained</td>
</tr>
<tr>
<td></td>
<td>15B Lucy, 30A and 30B Norfolk, 58B Caroline</td>
<td>well drained, slow to medium runoff and slow to moderate permeability</td>
<td>0-60.96 cm - loamy sand; 60.96 to 88.80 - sandy loam; and 88.80 to 177.80 sandy clay loam. 0-35.56 cm - loamy sand; 35.56 to 43.18 cm - sandy loam; and 43.18 to 254.00 cm - sandy clay loam. 0 to 22.86 cm - fine sandy loam; 22.86 to 165.10 cm - heavy clay loam; and 165.10 to 284.48 cm - clay loam.</td>
</tr>
</tbody>
</table>
Given the constraints of time, personnel and the heavily vegetated field conditions, balanced against the need for sampling dispersion in order to obtain representative coverage of the entire project area, a 10% sample was decided upon. The sample was drawn by randomly selecting 10% of the quadrats from each of the seven groups. Although we aimed for a 10% sample, the method utilized resulted in an 11.57% sample because of two factors. First, when dealing with proportions, the effects of rounding-off to the nearest whole number can, and did, increase the total sample size. Second, soil sampling stratum 1, a poorly drained soil, was not dominant in any of the 208 quadrats but was a minority element in four of them. Since none of these four quadrats was selected during the initial random selection procedure, one of the four was randomly drawn and added to the sample. In this manner, 23 quadrats were selected for testing.

Like Stratum 1, Strata 2-5 are poorly to somewhat poorly drained soils and received 3 (13.04%), 1 (4.34%), 6 (26.08%) and 4 (17.39%) quadrats, respectively. Stratum 6, consisting of moderately well drained soils, received 7(30.43%) of the total number of quadrats to be tested. One of these selected quads included stratum 1 soils. Stratum 7, consisting of well drained soils, received 2 (8.69%) of the quadrats selected for sampling. In terms of the hypothesized correlation between prehistoric sites and well to moderately well drained soils, this proportional breakdown indicates that approximately 39.12% of the soils in the project area are well to moderately well drained, with the remaining 60.88% being poorly to somewhat poorly drained.

The decision to utilize 200 x 200 meter quadrats during Phase II of the survey was based on a number of considerations. First, consistent use of this size quadrat would provide comparable data collection units. Second, they would be large enough to intensively examine relatively large areas. Third, given the constraints on the project, they would be small enough to allow a large number of units to be examined, increasing sampling dispersion and allowing more representative coverage of the area.

There were also several limitations involved in the utilization of quadrats. Given the irregular shape of the project area, it was inevitable that a few of the randomly selected quadrats would straddle the project area boundaries. This did not occur along the western border and, therefore, presented no problem. Those that straddled the northern and southern borders presented no problems in that permission was obtained from Georgia Pacific and Amoco Chemicals Corporation to examine those portions extending out of the project area. The three quadrats that extended over the eastern border did present a problem in that this land was either privately owned or part of the Francis Marion National Forest. Subsurface testing was conducted in portions within the eastern border; however, none was conducted outside of the boundary. This seemed preferable to disregarding these three quadrats and randomly selecting three other quadrats from the appropriate groups. To do so would have biased the sample by precluding portions of the project area from being selected and receiving subsurface examination.
A similar problem was presented within the project area. Three of the quadrats were partly in marsh and underwater. A fourth quadrat surrounded Grove Cemetery. Again, it was felt that it would be preferable to test those portions of the quadrats that could be tested, avoiding the Cemetery and underwater areas, rather than deleting portions of the project area from being selected and examined. It could be argued that the deletion of portions of some of the quadrats selected for examination would alter the proportional representation of the seven soil sampling strata in terms of subsurface testing. This, however, is not the case, since proportional representation is based on the dominant soil sampling stratum in the quadrats. This was calculated with the knowledge that portions of some of the quadrats could not be examined. That each soil stratum received proportional representation through subsurface testing is further indicated by Table 3, which compares the proportion of each stratum in the project area based on the number of quadrats with the number and proportion of test pits actually excavated in each soil stratum. As can be seen, the proportions of soil strata as determined by number of quadrats in the sample and as observed in the field in the test pits excavated are very similar.

<table>
<thead>
<tr>
<th>Dominant Soil Strata</th>
<th>Number of Quadrats</th>
<th>% of Total Quadrats</th>
<th>Number of 1/2 m square Test Pits</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0%</td>
<td>11</td>
<td>2.46%</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>13.04%</td>
<td>65</td>
<td>14.54%</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>4.34%</td>
<td>17</td>
<td>3.80%</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>26.08%</td>
<td>114</td>
<td>25.50%</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>17.39%</td>
<td>78</td>
<td>17.44%</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>30.43%</td>
<td>135</td>
<td>30.20%</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>8.69%</td>
<td>27</td>
<td>6.04%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>99.97%</td>
<td>447</td>
<td>99.98%</td>
</tr>
</tbody>
</table>

Subsurface testing within each of the quadrats selected was done systematically along five transects, with five 1/2 meter square test excavations spaced at 50 meter intervals along each of the transects. Thus, with the exception of those few quadrats that had portions deleted 25 test pits (sample points) were excavated in each of the quadrats. This resulted in the excavation of 447 test pits, as opposed to 575 if portions had not been deleted.

In each quadrat, the transects were numbered from 1-5, with transect 1 coinciding with the western border of the quadrat and transect 5 coinciding with the eastern border. Transects 2-4 were spaced at 50 meter intervals between, and parallel to, transects 1 and 5. The transects originated at the southern border. Test pits designated A-E were spaced at 50 meter intervals along each transect, with test pit A being on the southern border and test pit E on the northern border. This system of transects and test pits produced a grid within each quadrat, such that there was an area of contiguous 50 x 50 meter blocks, with a test pit, or sample point, at each corner of each block.
There are several advantages to this systematic approach. First, test pits that are systematically spaced at relatively close intervals enable us to examine areas intensively. Second, this approach allows for the accurate plotting of sites discovered and environmental features by referencing them in terms of specific transects and test pits along transects. In effect, the transects, in combination with the test pits, provide a grid coordinate system. For example, a site discovered along transect 4 in test pit C would have its location referenced in terms of 4C. Third, the uniform application of this systematic approach in each of the twenty-three quadrats allows for the collection and recording of comparable data, so that the data collected in one quadrat can be directly and accurately compared with that obtained in any, or all, of the other quadrats.

The test pits, or sample points, were 1/2 meter square and were excavated down to consolidated clay. The soil removed from these units was carefully trowelled for artifacts, and any artifacts recovered were recorded according to their vertical provenience. The soil profiles for each test pit were recorded, as were the physical properties of the soils, primarily as a cross-check to assure that each test pit was sampling the appropriate soil stratum. If archeological material was encountered, then the test pit was expanded to a 1 x 1 meter unit and the contents screened. The number, size and location of additional test pits was largely dependent on the density of material encountered in the test pit that discovered the site. For example, if the initial test pit indicated a low-density site, then an additional 1 x 1 meter unit would have a greater likelihood of recovering additional material than would a 1/2 x 1/2 meter unit. However, given the constraints on the project, it would not be cost-effective to excavate several 1 x 1 meter units in an attempt to determine the spatial extent of a low-density site. On the other hand, if the initial 1 x 1 meter unit indicated a moderate to high density site, then the excavation of a number of 1/2 meter units should be sufficient to determine not only the spatial extent of the site, but also to derive information regarding internal variability.

The use of 1/2 meter square units during Phase II for site discovery was based on the desire to achieve the maximum coverage possible within each of the quadrats selected. Since maximum areal coverage is dependent on the dispersion of sample points, it was felt that 1/2 meter units would be optimal. Larger units, of course, would have been better if time had permitted, especially for increasing the likelihood of detecting archeological sites with low artifact densities; however, within our limited time frame, the utilization of larger excavation units would have greatly reduced the coverage by reducing the number of units that could be excavated. Consequently, given the time allotted, it was felt that 1/2 meter units would be best for achieving maximum coverage, and at the same time, would be large enough, and spaced close enough together, to detect most archeological sites, even those with low artifact densities.
Phase III

Phase III was primarily oriented toward finding sites in a very cost-effective way in line with our cultural resource management commitments. However, because of the lack of sampling rigor in this phase, site location predictions could only be made in a limited way from this phase alone. Phase III was to be utilized for examining all exposed ground surface areas in the project area, including dirt roads, transmission lines and firebreaks. Because of the heavily vegetated condition of most of the project area, it was felt that this phase would have the greatest likelihood for discovering sites—especially small, low artifact density sites that are difficult to detect through subsurface testing. Initially, it was also planned to conduct additional subsurface testing during this phase in order to discover sites in areas that were considered subjectively to have "high site probability." However, with field time running out, and the limited success of subsurface testing in Phase II for discovering sites, it was decided not to conduct subsurface testing during this phase for purposes of site discovery. Nevertheless, once a site was discovered in exposed ground surface areas, subsurface testing was undertaken as a means of obtaining data relevant to determining site extent and variability.

As expected, most of the archeological sites discovered during the survey (18 out of 20) were located during Phase III. These 18 sites include five discovered along the dirt roads just north of the project area on Georgia Pacific property, and 13 in the project area and along the firebreak on the Georgia Pacific project area border. As with Phase I, all material on the exposed ground surface of sites discovered during Phase III was collected, and assigned to different proveniences if variability in the spatial distribution of artifacts was observed. The sites were photographed and environmental data recorded.

Subsurface testing during Phase III usually consisted of at least one meter unit excavated in undisturbed or least disturbed portions of the site. These test units were usually placed a few meters back into the wooded areas adjacent to where the site was observed on an exposed surface. If differential densities of material, or other indications of spatial variability, were noted during surface collecting, then additional 1 x 1 meter units were excavated. Further, if the density of material recovered in the 1 x 1 meter units seemed sufficient to be detected in 1/2 meter units, then a series of 1/2 meter units were excavated out from the 1 x 1 meter units in the four cardinal directions in an attempt to delineate the spatial extent of the site. At only two of the sites was the density of material deemed sufficient for this to be cost-effective. Because the contract did not include the five archeological sites discovered along the dirt roads on Georgia Pacific property, no subsurface testing was conducted at these sites. Those sites discovered along the firebreak on the Georgia Pacific project area border, however, received subsurface testing on the project area side of the border. Each 1 x 1 meter unit excavated during Phase III was photographed and soil data recorded. Archeological material was recorded by vertical provenience. All soil removed from these units was screened through 1/4" mesh hardware cloth.
Evaluation of Methods

Because a portion of the design of this survey was oriented toward the collection of data necessary for formulation of an explanatory model for predicting site locations and thereby establishing a foundation upon which to make management recommendations, it is essential that we evaluate the effectiveness of the methods utilized to collect these data. Within the framework of the research, it was necessary to obtain archeological data pertaining to: (1) site location with reference to soil types; (2) temporal periods represented at each site, as indicated by diagnostic artifacts; and (3) intensity of site use, as indicated by site size, density of archeological material, and artifact variability. The acquisition of these data sets was dependent on the capability of each survey phase for site discovery and site definition, with each phase designed for the recovery of data under different conditions. With this in mind, we will evaluate the effectiveness of each phase in terms of its strengths and limitations for recovering the desired data.

Phase I was not concerned with site discovery as the sites examined during this phase had been previously recorded. Consequently, Phase I can only be evaluated in terms of its capabilities for site definition. All sites dealt with in this phase were located in exposed ground surface areas in a transmission line right-of-way. The shallow nature of these sites, in conjunction with low artifact densities and the highly disturbed condition of the sites, indicated in most instances that subsurface testing would not be cost-effective. Consequently, this limitation is more the result of the types of sites being investigated, in conjunction with their existing condition, rather than of the survey methods. However, given the condition of the sites, it was possible in most instances to estimate site size and the density of archeological material without subsurface testing. The overall artifact variability, which was typically low, could also be estimated. This variability, however, could not be reliably controlled vertically or spatially, since the integrity of these sites had been destroyed. Nevertheless, the exposed nature of the sites increased the likelihood of discovering temporally diagnostic artifacts. Further, these sites would be accurately plotted according to their soil associations. Therefore, it is concluded that Phase I of the survey was adequate for recovering the desired data given the types of sites and their conditions.

Phase II of the survey was designed for both site discovery and site definition in heavily vegetated areas. As such, the advantages of collecting data from exposed sites during Phase I were not available during Phase II. Consequently, site discovery and site definition were dependent only on the strengths of the subsurface sampling design.

Only two sites were discovered during Phase II. Since the sites examined or discovered during Phase I and II indicate that most of the sites in the project area, especially the prehistoric ones, are characterized by low artifact densities, it is likely that the failure of Phase II to discover more sites was in part due to the relatively small excavation units (1/2 x 1/2 meter) employed during this phase. It is likely that the use of larger sample units would have produced better results; however, had the larger units been used during this project.
given the constraints of time and personnel, areal coverage would have been reduced. This would also have tended to reduce the likelihood of discovering sites. That the small sample units, in conjunction with low artifact density sites, were partly responsible for the failure to discover more sites during this phase is indicated by the failure of 1/2 x 1/2 meter and 1 x 1 meter units, in many cases, to encounter archeological material in known site areas during Phases I and III. The discovery of site 38BK323, a low artifact density site, during Phase II indicates that this phase was not totally ineffective for discovering low artifact density sites. Nevertheless, this sampling strategy would appear to be most effective for discovering moderate to high artifact density sites, as indicated by the discovery of historic site 38BK327 and the detection of one of the historic sites (38BK197) recorded by Dr. Herold (Herold, Knick and Liss 1978). This latter site happened to be in one of our sampling units and was detected in several of our subsurface 1/2 x 1/2 meter sample units.

Another factor that may have played a large part in our failure to discover more sites during Phase II was that most of the soils sampled were poorly to somewhat poorly drained. These soils were predicted to have few prehistoric sites in association. This view is supported by the fact that most of the prehistoric sites discovered during the survey are situated on well to moderately well drained soils.

Based on the above considerations, it is difficult to assess the capabilities of Phase II for detecting low artifact density sites. The considerable number of low artifact density prehistoric sites discovered during Phase III indicates not only that these sites are probably most typical of the project area, but also that at least some went undetected in areas sampled during Phase II. Therefore, as indicated also by the previous discussion, the sampling strategy utilized during Phase II appears to have been best adapted for discovering moderate to high artifact density sites.

Since one of the goals of Phase II was to demonstrate the association between prehistoric sites and well to moderately well drained soils, the failure of this phase to detect more sites is unfortunate. However, this is compensated for by the archeological sites examined or discovered during Phase I and III, which indicates that most of the prehistoric sites, as predicted, are located on well to moderately well drained soils. Over 60 percent of the soils in the project area are poorly to somewhat poorly drained, yet most of the prehistoric sites occur on the less than 40 percent well to moderately well drained soils. It must be determined if these general soil percentages are comparable to the total exposed ground surface areas on which the Phase I and Phase III sites are located. A comparison of Figures 1 and 2 indicates that most of the exposed ground surface in the project area, in the form of dirt roads and transmission lines, is located on the poorly to somewhat poorly drained soils. In terms of the sites discovered during Phase III on Georgia Pacific property immediately north of the Project area, a comparison of soils and exposed ground surface areas indicates that a similar relationship exists. Therefore, it is maintained that the limitations of Phase II for demonstrating the hypothesized site-soil relationship are compensated for by data recovered during Phases I and III.
Another major limitation of Phase II, which, for the most part was also compensated for by data recovered during Phases I and III, was the inability to adequately define the two sites discovered in terms of site size and artifact variability. This was largely due to heavily vegetated conditions and, at one site (38BK323), the low density of archeological material. These factors precluded extensive subsurface testing at the two sites. The limited subsurface testing conducted at these sites did enable us to estimate the general density of archeological material and to make broad temporal assignments.

Phase III of the survey, which involved the examination of all exposed ground surface areas, proved to be the most effective for both site discovery and site definition. It would appear that exposed ground surface is essential for discovering many, if not most, low artifact density sites. This is demonstrated by the fact that 18 of the 20 sites discovered during the survey, most of which had low artifact densities, were discovered during this phase. Of course, the presence of exposed ground surface areas is also the most effective means of discovering most moderate to high artifact density sites. Once discovered, the sites were easily plotted in terms of their soil associations.

Although the presence of exposed ground surface areas greatly enhanced the discovery and the definition of the archeological sites discovered during Phase III, very few of the sites were entirely exposed. In most cases, they extended into adjacent vegetated areas. Consequently, subsurface testing was also usually necessary in order to define better the sites in the vegetated portions of the sites. That is, the lower the artifact density, the less likely archeological material would be encountered through subsurface testing. As such, when little or no material was encountered through subsurface testing, little additional information was contributed toward determining site size and artifact variability. The overall success of subsurface testing during this phase is indicated by archeological material being encountered in five (38.4%) of the twelve 1 x 1 meter units and three (23%) of the thirteen 1/2 x 1/2 meter units that were excavated at 11 of the 13 sites discovered in the project area in Phase III. Given the low density of archeological material at most of these sites, the subsurface testing is considered to have been moderately successful.

Finally, the survey methods utilized were, on the whole, effective for obtaining the desired data. However, in spite of our efforts to collect comparable data from each site during the three-phase survey, this was often not possible, primarily because of the considerable variability in the amounts of ground cover (0-100%) at each site. Additional problems concerned the limitations of obtaining data from low artifact density sites through subsurface testing. Consequently, it is often difficult to reliably compare the data obtained at one site with that of the other sites. Therefore, for testing the hypotheses, it will be necessary to standardize the data for purposes of comparability. To do so, a degree of subjectivity is inevitable. Although this cannot be entirely avoided, every effort will be made to quantify the data as objectively as possible. This can be accomplished through manipulating the data in a consistent manner.
ARCHEOLOGICAL SITE DATA

Introduction

Preliminary to actual field survey, a check was made of the state wide inventory of archeological sites at the Institute of Archeology and Anthropology, University of South Carolina, in order to determine if any sites had been previously recorded in the proposed project area. The site files at the Institute indicated nine previously recorded sites within the area. Five of these sites were recorded during an historic sites survey of the project area (Herold, Knick and Liss 1978). The remaining four sites were recorded by Hartley and Stephenson (1975) and Wood (1977) during two previous environmental impact surveys of small parts of the area. Twenty additional sites were recorded during the present survey. Sixteen of these sites were prehistoric, one was historic, and three contained both historic and prehistoric components.

Once identified, sites were plotted on United States Geological Survey topographic maps and surface collections were made in order to determine temporal affiliation, site extent, site density and internal variability. Also, subsurface testing was conducted at each site, except where noted, in order to supplement the above data and recover adequate soil data. Site data and artifacts, as well as project photographs, were processed by Institute of Archeology and Anthropology personnel and are on permanent file at the Institute.

The purpose of this section is to describe in detail the cultural resources in the project area and their location relative to specific environmental variables. Table 4, summarizes the cultural material from each site.

Previously Recorded Sites from the Amoco Project Area

38BK156. This site was recorded by Hartley and Stephenson (1975) during a survey of the Amoco Chemicals Corporation plant area. The site was relocated and surface collections were made during this survey. Although no diagnostic artifacts were found during the present survey, Hartley and Stephenson report the presence of Cape Fear fabric impressed ceramic fragments and several non-diagnostic sand tempered sherds. Material collected during this survey consists of six undecorated sand tempered prehistoric ceramic fragments.

This site is located in a South Carolina Electric and Gas Company powerline cut south of Grove Cemetery (see Fig. 1). It is situated on a small rise overlooking a low, marshy area approximately 30 m from a small tributary of Grove Creek. The site area is about 15 feet above sea level and slopes gently to the west-southwest toward the creek. Both sides of the powerline cut are heavily wooded with hardwoods and...
Site Number

<table>
<thead>
<tr>
<th>Artifacts from Historic Sites with Possible Prehistoric Components</th>
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</thead>
<tbody>
<tr>
<td>Shell fragments</td>
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<tr>
<td>Nails/metal objects</td>
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<tr>
<td>Brick fragments</td>
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<tr>
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<tr>
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<tr>
<td>Polychrome</td>
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<td>Pearlware</td>
<td></td>
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<tr>
<td>Yellow lead-glazed slipware</td>
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<td>Yellow lead-glazed slipware (combed &amp; trailed)</td>
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<tr>
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</tbody>
</table>

* Indicates numbers unavailable but presence noted
a dense understory of vines and briars. The entire site has been heavily disturbed by clearing activities associated with the powerline cut. The top layers of soil have been removed down to the clay zone. The primary soils in the site area are from the Meggett series. These soils are poorly drained with slow runoff and permeability. The archeological material collected came from remnant B horizon soil, mottled gray-tan sand, which could be found in isolated pockets over the area.

Artifacts were collected from an area of approximately 16 x 16 meters. Due to the heavy disturbance down to clay, from powerline construction activities, it was felt that subsurface testing would not be cost-effective and was not implemented.

38BK197. This site was recorded during the historic sites survey (Herold, Knick and Liss 1978). Historic research and maps of the area indicate that this site represents an early 19th century occupation. Cultural material collected from the site includes bottle glass fragments, ceramic fragments, 1 brick with "hotfired" grey glaze on 3 surfaces, and several shells. Several clusters of brick were found and subsurface testing revealed the presence of structures.

This site is located along the northern border of the Amoco-Georgia Pacific boundary, within one of the sampling quadrats. Artifacts were located in two of the subsurface tests within the quadat. The site is situated on a ridge tongue (25 foot contour) which overlooks low bottomland to the south. The terrain is relatively flat but slopes gently (approximately 2-3%) to the south and southeast. The nearest permanent water is Cowbell Branch (a rank 2 stream) located approximately 550 meters to the north of the site.

The existing vegetation consists of an upper story of pine and mixed hardwoods with an understory of shrubs, vines and briars. Soils in the area are composed of the Tawcaw series which are somewhat poorly drained.

The area of occupation as indicated by the presence of several brick rubble piles is approximately 75-80 square meters. The brick fragments were concentrated in the areas of rubble; however, heavy grass and leaf litter would not allow for estimations of artifact density outside of the concentrated areas. Five 50 x 50 cm test excavations, which were part of the routine sampling strategy fell within the boundaries of this site. Several brick fragments were encountered in two of the tests. Soils in the area, as indicated from the subsurface tests, are composed of four zones. The organic zone, 0-8 cm, is composed of a loose, unconsolidated layer of root and leaf material; 8-38 cm consist of a medium brown-gray fine sandy clay, followed by 38-52 cm of medium tan-yellow fine sandy/silty clay which is very moist and gums up while screening. The bottom layer, 52 cm and below, is composed of an orangetan consolidated sandy clay. The artifacts came from the B zone to approximately 20 cm in depth.
38BK272. This multicomponent (historic and prehistoric) site was recorded by K. Wood during an environmental impact survey for South Carolina Electric and Gas Company (Wood 1977). Material recorded for this site by Wood consists of 1 plain prehistoric ceramic fragment and 1 yellow combed lead glazed slipware ceramic fragment. Additional artifacts recovered during the present survey include 1 yellow combed and lead glazed slipware sherd, 1 plain lead glazed slipware sherd, 1 burned salt glazed ironstone sherd, and 1 plain, sand tempered prehistoric sherd as well as 1 oyster shell fragment. The artifacts from this site are indicative of a late 17th to late 18th century historic occupation and a prehistoric, probable Woodland (1000 B.C. - A.D. 100) occupation of the area.

The site is located in a South Carolina Electric and Gas powerline right-of-way approximately 110 meters north of Grove Cemetery between H-frames 38 and 39. The site is situated about 20 feet above sea level, on a relatively flat area overlooking low bottomland and adjacent to Grove Creek to the northwest and a tributary (rank 1) of Grove Creek to the southwest. The terrain to the northwest, west, and southwest is gently sloping (2-5%) into low bottomland. A small, rank 1 tributary of Grove Creek is located to the west approximately 210 meters and Grove Creek, a rank 2-3 drainage, is located approximately 400 meters north of the site.

Vegetation existing in areas adjacent to the powerline cut consists of an upper story of pine and mixed hardwoods and an understory of hardwood shrubs, vines and briars. The primary soil type in this area is the Meggett series which is poorly drained, with slow runoff and permeability. The site has been heavily disturbed from powerline construction activities and the top soil layers have been removed.

Surface examination by both Wood (1977) and the present survey suggest a very low density scatter of material. Only seven artifacts were located over an area of at least 30 x 30 meters. Full site extent could not be determined because of the heavy disturbance and ground cover. No subsurface testing was considered, as sterile clay was encountered immediately below the grass mat zone.

38BK273. This site was recorded by K. Wood (1977) during an environmental impact survey for South Carolina Electric and Gas Company. Material collected from this site by Wood consists of 4 plain sand tempered prehistoric ceramic fragments. One plain sand tempered fragment, 2 Deptford linear check stamped ceramic fragments and 1 chert flake were collected during the present survey.

This site is located in powerline right-of-way near the intersection of the Williams-Mt. Pleasant transmission line and the main dirt road through Amoco Realty property. The site is situated on a low flat area (5 feet above sea level) between H-frames 12 and 13. The area to the left of the site is a small marshy depression with standing water present at the time of the survey. The powerline corridor has been heavily disturbed by clearing and powerline construction activities. The top layers of soil have been removed by construction. The nearest permanent water is two small rank 1 drainages located approximately 320 meters to
the south of the site. These drainages are tributaries of Grove Creek and are surrounded by marsh.

The vegetation existing adjacent to the powerline cut is extremely dense and is composed of a mixed hardwood upper story and an understudy of shrubs, vines and briars. The dominant soil type in the area is the Tawcaw series. These soils are somewhat poorly drained with slow runoff and permeability.

As determined by surface collections, this site seems to be a low density scatter of ceramic and lithic material over an area approximately 30 x 50 meters. Due to the heavy disturbance from construction activities no subsurface testing was considered necessary for this site.

38BK274. This site was recorded by K. Wood (1977) during an environmental impact survey for South Carolina Electric and Gas Company. The material collected by Wood consists of a Savannah River projectile point, indicative of Late Archaic utilization of the area, and Stallings Island and Thom's Creek ceramic fragments. The present survey produced 7 plain sand tempered sherds, 2 Thom's Creek punctate sand tempered sherds, 1 thinning flake, 1 oyster shell fragment and 1 decorated baked clay object. The material was collected from a borrow area which was eroding away.

This site is located in powerline right-of-way in the North Charleston United States Geological Survey quadrangle, near the northern boundary of the Amoco property. The site is situated on a ridge (25 feet contour) which slopes approximately 5 to 10% to the south to a small marshy creek with cattails and other aquatic vegetation. The borrow pit is located to the west of the powerline centerline and measures approximately 10 x 20 meters. The topsoil has eroded away exposing the red-orange clay substrate. The material was found on top of the clay; however, several remnant patches of B horizon (gray-tan clayey fine sand) contained some cultural material.

Vegetation adjacent to the powerline right-of-way consists of a dense upper story of pine and mixed hardwoods and understudy of dense shrubs, vines and briars. The primary soil type in the site area is the Dupline Series. These soils are moderately well drained and have slow runoff and permeability.

Surface collections from this site indicate a low density scatter of lithic and ceramic material. A 1 x 1 meter test excavation was placed in the site adjacent to and 2 meters west of the borrow pit. The soils, as indicated by the test excavation, are composed of four distinct zones. The first zone (0-12 cm) is composed of a red-orange clay and mottled gray-tan sand. This zone is interpreted as slope wash. The B zone (12-22 cm) is medium to dark gray clayey sand—the original organic zone—followed by a layer of mottled gray-tan clayey fine sand from 22-52 cm. From 52 cm and below is a thick, gummy red-orange clay with some fine sand. No cultural material was located in the test pit, supporting the surface indications of a low density site.
38BK315. This site is represented by 2 plain sand tempered ceramic fragments of unknown types, which probably represent Woodland utilization of the area. The sherds were found in an existing road cut along the main dirt road through Amoco property in the Cainhoy United States Geological Survey quadrangle. The site area is situated on a 25 foot contour on a relatively flat area overlooking low bottomland and swamp to the north. The site itself is located on a slightly elevated area which slopes gently 2-3% in all directions before dropping off into low bottomland to the north. The nearest permanent water is Little Johnson Creek, a rank 2 drainage, located approximately 260 meters to the north of the site.

Vegetation present today consists of an upper story of pine and an understory of pine and hardwood saplings, shrubs, shrubs, vines, and grass. Heavy leaf litter restricted ground surface visibility except in the road cut. Soils in the area of the site consists of the Bonneau series. These soils are moderately well to well drained with slow runoff and moderate permeability.

The artifacts from this site, 2 plain ceramic fragments, were located along a road cut over an area of approximately 6 x 10 meters. The lack of additional material indicates a low density site. A 1 x 1 meter test excavation was implemented 4 meters north of the road approximately half way between the two sherds. The test excavation showed the soil to consist of four zones. The first zone (0-5 cm) consists of loose, friable gray top soil followed by an intermediate transitional zone (5-13 cm) of mottled gray and yellow-tan fine sand. The 13-45 cm zone consists of yellow-tan fine sand with very little clay and 45 cm and below is red-orange sandy clay. No cultural material was located in the test excavation, thus supporting the surface indications of a low density site.

38BK316. This site is represented by 1 plain sand tempered prehistoric ceramic fragment. The presence of sand tempered ceramics probably indicates Woodland utilization of the area. The site is located in the Cainhoy United States Geological Survey quadrangle in an existing road cut along the main dirt road through Amoco property, approximately 100 meters west of site 38BK315. This site is situated on a 25 foot contour overlooking low, swampy bottomland to the north. Although the site is situated on a relatively flat area, the terrain to the north and east slopes dramatically (5-10%) into low, swampy bottomland. The nearest permanent water is Little Johnson Creek, a rank 2 drainage, located approximately 220 meters to the north of the site.

The vegetation in the site area consists of a pine upper story and a dense understory of shrubs vines and grass. The heavy leaf litter present here restricted the ground surface visibility except in the road cut. The primary soils in the site area are from the Bonneau series. These soils are moderately well to well drained with slow runoff and moderate permeability.
The single sherd found at this site was located in an existing road cut. A 1 x 1 meter test unit was excavated to determine site density and size. The test excavation was placed 3 meters north of the road at the point where the sherd was located. The soils, as indicated by the test excavation, consists of 4 distinct zones. The top organic zone (0-9 cm) is composed of a gray sand and root zone with a moderate amount of charcoal flakes. The second zone (9-25 cm) is composed of mottled light gray-tan and yellow fine sand with some charcoal flakes present. The third layer (25-45 cm) consists of yellow-tan fine sand with some mottling with orange clay toward the bottom. From 45-65 cm and below is a thick gummy red-orange to brown sandy clay. No cultural material was found in the test, thus supporting the surface indications of a low density site.

38BK317. This site is represented by two thinning flakes, one of sandstone and one of heat treated chert. The site is located in the Cainhoy United States Geological Survey quadrangle, in the existing main road cut through Amoco property. The site is located on a 15 foot contour overlooking low bottomland and Little Johnson Creek, 150 meters to the south. The terrain is gently sloping, 2-5% up to the north and west and down 2-5% to the east and south.

The existing vegetation in the site area consists of an upper story of pine and an intermediate level of mixed hardwoods (mainly oak) with a few young pines. The under story is fairly open; however, heavy leaf litter restricted ground surface visibility, except in the road cut. The primary soils in the area are from the Meggett series. These soils are poorly drained and runoff and permeability are slow.

Surface collections from the road cut indicate a low density lithic scatter over a 6 x 50 meters section of the road. A 1 x 1 meter test excavation was placed 2 meters north of the road approximately halfway between the two flakes in order to test site density. Soil profiles as indicated by the test excavation consists of a top layer (0-8 cm) of dark gray organic soil with heavy charcoal concentration from forest burning. The second zone consists (8-15cm) of heavy wood charcoal over a third zone (15-30 cm) of compacted tan-brown clayey sand. Subsurface stump and root burning baked the clay to a hardpan consistency. The fourth zone (30-60 cm) consists of a light-yellow fine sand, which was the original B horizon soil. No cultural material was located in the test, supporting the surface indications of a low density lithic scatter.

38BK318. This site contains both historic and prehistoric components and the material consists of 2 historic pipe fragments, 1 chert flake, and 1 plain sand tempered prehistoric ceramic fragment. The presence of sand tempered ceramics probably indicates Woodland utilization of the area. The site is located in the Cainhoy United States Geological Survey quadrangle along a secondary dirt road through Amoco property approximately 500 meters northeast of Grove Cemetery (see Fig. 1). The site is situated on a 25 feet contour overlooking a small drainage. The terrain slopes to the east toward the gully at 5 to 10%. The nearest drainage is the small rank 1 drainage 120 meters to the east and Little Johnson Creek, a rank 2 drainage, is located 400 meters to the north of the site.
Vegetation in the area consists of an upper story of pine, and an intermediate story of predominantly hardwoods. The understory is extremely dense and consists of young hardwood and pine saplings, shrubs, vines and briars. The primary soil type in the site area is the Caroline series. These soils are well drained with medium surface runoff and moderately slow permeability.

The cultural material from this site was collected from a road cut over an area of 3 x 8 meters, indicating a low density artifact scatter. A 1 x 1 meter test excavation was placed 2 meters north of the road cut near the center of the scatter. No cultural material was found in the test excavation, thus supporting surface indications of a low density scatter. The soil profile consists of five distinct zones. The first zone (0-8 cm) is composed of a dark gray organic root and leaf litter zone. Zone 2 (8-20 cm) is composed of gray-tan mottled fine sand over a third zone (20-50 cm) of mottled yellow-tan fine sand. The fourth zone (50-55 cm) consists of mottled yellow-tan fine sand and red-orange clay. The final zone (below 55 cm) is red-orange compacted clay with fine sand.

38BK319. The site is represented by 39 undecorated sand tempered prehistoric ceramic fragments which probably indicate Woodland utilization of the area. Thirty of the sherds were collected on the surface, while 9 were located in a 1 x 1 meter test excavation. It is located on the Cainhoy United States Geological Survey quadrangle in an existing powerline cut through Amoco property (see Fig. 1). The site is located along the southeast-southwest powerline approximately 400 meters east of the intersection of the northeast-southwest powerline with a southwest-southeast powerline. The site is situated on a knoll (30 feet contour) overlooking low bottomland to the west, north and east. Little Johnson Creek, a rank 2 drainage, is located approximately 360 meters north of the site and low, marshy bottomland gully areas are located on the west and east of the site. The site is situated on the highest part of the knoll, which is fairly level, but some material was found on the slopes to the east and west. The terrain slopes at approximately 5-8% to the west, north, and east of the knoll top.

The entire area has been cleared for construction of the powerline; however, the existing vegetation surrounding the site area consists of an upper story of pine and mixed hardwoods. The understory is dense and is composed of pine and hardwood saplings, vines and briars. The dense understory and leaf litter restricted ground surface visibility in areas adjacent to the powerline cut. Due to recent clearing the powerline corridor had almost 100% ground surface exposure. The soils in the site area are primarily from the Caroline series. These soils are well drained with medium surface run-off and moderately slow permeability.

The material was fairly well scattered over the top of the knoll (10 x 30 meters) with a relatively dense concentration at the western end of the site. Thirty undecorated sand tempered ceramic fragments were located on the surface indicating a low-to-moderate density scatter of material. Ten of the 24 sherds were concentrated in a 3 x 3 meter area on the western end of the site. Six additional sherds were collected from the concentrated area as a separate provenience. Two 1 x 1 meter
test pits were excavated in the site. Test pit 1 was placed in the approximate center of the site. No cultural material was located in the first test. Test pit 2 was located in the area of the sherd concentration. Nine undecorated sand tempered sherds were recovered from this test. The test excavations support the surface indications of a low to moderate density scatter of material over the site, with a moderate to high concentration of material at the western end. All of the cultural material came from the 0-10 cm level of the B horizon, a mottled gray-tan, fine, clayey sand. The A zone had been removed by powerline clearing activities. The soil profile as indicated by test pit 2 is 0-20 cm of mottled gray-tan fine clayey sand over 20 cm and below of consolidated, gummy red-orange clay, with some fine sand.

38BK323. The cultural material from this site consists of 1 undecorated sand tempered ceramic fragment found in a posthole during the sampling phase of the project. This sherd probably indicates Woodland utilization of the area. The site is located in the Cainhoy United States Geological Survey quadrangle approximately 160 meters north of the main road through the tract. The sherd was located in posthole 2C of quad 6-146 during the sampling phase of the project. The site is situated on a ridge (25 feet contour) overlooking low, swampy bottomland to the north. The terrain to the west, south, and east is relatively flat, but slopes dramatically 5-10% into swamp to the north. The closest water is Little Johnson Creek, a rank 2 drainage, located approximately 630 meters to the northeast. The Little Johnson Creek swamp, which is intersected by numerous small drainages is located approximately 80 meters to the north.

The vegetation in the site area is an upper story of moderate density pine, with an intermediate story of dense pine and hardwood saplings, and an understory of dense hardwoods, pines, vines, shrubs, and a few briars. North of the site toward the swamp, the vegetation becomes much denser with more briars, vines and cane thickets. More water tolerant species of hardwoods replace pine as the dominant vegetation. The primary soils in the site area are from the Goldsboro series. These soils are moderately well drained, with slow to medium runoff and moderate permeability.

No surface collections could be made of this site due to the dense vegetation and heavy leaf litter. The cultural material was located in a 50 x 50 cm test excavation. The material was found at 20-30 centimeters below surface which is a fine light yellow-tan sand zone. The test pit was expanded to a 1 x 1 meter square and an additional 1 x 1 meter test was placed approximately 3 meters west of test pit 1. No additional material was located in either of the tests thus indicating a low density site.

The soil profile, as indicated by test pit 1, consists of 0-20 cm of fine light tan-gray sand, over 20-53 cm of fine light yellow-tan sand. Zone 3 consists of 53-88+cm of fine yellow sand, with clay content becoming greater with depth.

38BK324. The artifacts from this site consist of 7 plain sand tempered sherds, 1 plain fiber tempered sherd, 3 simple stamped sand tempered sherds and 1 deteriorated decorated sand tempered ceramic fragment from the general surface and 21 plain, fine to coarse sand tempered
ceramic fragments from the sherd concentration at the western end of the site. The artifacts from this site indicate a probable Woodland utilization of the area. This site is located in the existing northeast-southwest powerline corridor in the Cainhoy United States Geological Survey quadrangle, approximately 700 meters southwest of the intersection of the powerline and the main road through the property and approximately 80 meters north of H-frame 17 (see Fig. 1). The site is situated on a ridge nose (15 feet contour) that protrudes into low floodplain of Little Johnson Creek, a rank 2 drainage located 160 meters to the north of the site. The terrain in the site area is gently sloping, 2 to 5%, into low marshy bottomland to the west, north, and east.

The vegetation adjacent to the powerline corridor consists of an upper story of predominantly pine and a dense understory of mixed hardwood saplings, vines and briars. The upper story vegetation approaching the low bottomland to the north contains a higher percentage of hardwoods and other water tolerant vegetation. The primary soils in the site area are from the Norfolk series. These soils are well drained with slow to medium runoff and moderate permeability.

Surface collections indicate a low density ceramic scatter over a 40 x 40 meter area with a slightly higher density sherd concentration over an area of 5 x 5 meter at the western end of the site. Two 1 x 1 meter test pits were excavated in this site. Test pit 1 was placed in the approximate center of the sherd concentration at the western end of the site. Test pit 2 was placed at the southern edge of the powerline corridor in order to determine the site extent in relation to the forested high ground adjacent to the corridor. No additional material was located in the test excavations, thus supporting the surface indications of a low density ceramic scatter. The soil profile as indicated by test pit 2, which was relatively undisturbed, consisted of 3 zones. The first zone (0-16 cm) consists of a fine, light gray sand with a zone of roots and decaying organic matter. Zone 2 (16-56 cm) consists of a fine, light gray-tan sand over (56 to 86 cm and below) a fine tan-orange sandy clay. From the surface collections in the corridor the cultural material seemed to be coming from the top of the B horizon, a fine, light gray-tan sand.

The artifacts from the site consist of 15 undecorated, fine to coarse sand tempered ceramic fragments, 3 Cape Fear fabric impressed sand tempered sherds, 1 Deptford linear check stamped and 2 undecorated fiber tempered ceramic fragments (probably Stalling's ware), 3 baked clay fragments, 1 quartz pebble (possibly hammerstone) and 1 chert thinning flake. The ceramics from this site indicate probable Stalling's Island, Deptford and Cape Fear utilization of the area. The site is located in the existing northeast-southwest powerline corridor in the Cainhoy United States Geological Survey quadrangle, approximately 600 meters southwest of the intersection of the powerline and the main road through the property, and approximately 30 meters west of H-frame (see Fig. 1). The site is situated on a ridge nose (10-15 feet contour) that protrudes into the low floodplain of Little Johnson Creek, a rank 2 drainage, located 90 meters north of the site. The terrain in the site area is gently sloping (2-5%) into low, marshy bottomland to the southwest, north and northeast.
The vegetation adjacent to the powerline corridor consists of predominantly pine and a dense understory of mixed hardwoods, saplings, vines and briars. The upper story approaching the wooded, low bottomland to the north contains a higher percentage of hardwoods and other water tolerant vegetation. The primary soils in the site area are from the Norfolk series. These soils are well drained with slow to medium runoff and moderate permeability.

Surface collections indicate that this site is a low density ceramic scatter over an area of 30 x 30 meters. Due to the construction disturbance and removal of soil down to the clay, no subsurface testing was considered necessary for this site.

38BK326. This early historic site is represented by 3 green wine bottle fragments; 1 burned hand painted polychrome, 1 brown saltglazed, and 1 white saltglazed ceramic fragments; 1 burnished (possibly Colono-Indian) ceramic fragment and 1 chert flake. This site is located north of and adjacent to Grove Cemetery in the North Charleston United States Geological Survey quadrangle (see Fig. 1). A burnished ceramic fragment was located in posthole 2-D of sample quad 4-173 during the first phase of the project. The test was expanded to a 1 x 1 meter square and additional material was recovered. The site is situated on a small knoll (20 feet contour) overlooking a rank 1 tributary of Grove Creek, 160 meters to the southwest of the site. The terrain slopes 2-5% in all directions, especially toward the creek.

The existing vegetation consists of an upper story of moderately dense pine and oak and an understory of sparse dogwood and gum saplings with some vines and briars. The vegetation becomes more dense toward the creek with additional water tolerant vegetation being present. Heavy leaf litter did not allow for any ground surface visibility. The primary soils in the site area are from the Meggett series, which are poorly drained. The test unit indicates a moderately well to well drained soil, therefore it seems probable that this small knoll exists as an isolated unit surrounded by primarily poorly drained soils.

A single ceramic fragment was located in a 50 x 50 cm test excavation during the sampling phase of the project. Poor ground surface visibility did not allow for surface detection or estimates of site size or density of artifacts. The test pit was expanded to a 1 x 1 meter square and additional material was recovered. An additional 1/2 m test pit was placed 10 m east of test pit 1. No cultural material was found. The site was surrounded by Grove Cemetery to the south and swamp to the north and west, which prevented additional testing. The cultural material came from the bottom half of the organic zone and extended into the B horizon, a mottled gray-tan sand. The material from the test pit suggests a moderate to high density scatter of material. Site extent could not be determined. This site is probably related to 38BK273 which was located in a powerline cut 60 meters east of the site. The soil profile as indicated by test pit 1 is composed of 4 distinct zones: 0-8 cm gray organic root zone, 8-20 cm mottled gray-tan sand, 20-40 cm medium yellow-tan sand, and 40 cm and below orange sandy clay.
38BK327. The cultural material from this site consists of 6 undecorated sand tempered ceramic fragments and 3 undecorated fiber tempered ceramic fragments. The artifacts from this site indicate probable Stallings and probable Woodland (1000 B.C.-A.D. 1000) utilization of the area. The site is located on property owned by Georgia Pacific Company in the Kittridge United States Geological Survey quadrangle. The cultural material was collected from an existing road cut, which roughly parallels the Amoco-Georgia Pacific boundary on the north of the tract (see Fig. 1). The site is situated on a 10-15 foot contour overlooking Cowbell Branch Creek, a rank 2 drainage located 160 meters to the west of the site. The terrain is characterized by a slight slope to the west and south (2-5%) and a slight rise (2-5%) to the north and east.

The existing vegetation consists of a pine upper story and an understory of young saplings of pine with a few hardwoods and dense vines and briars. The western side of the road has been cleared by logging operations and has grown up in dense vines, briars, and weeds with some young pines. The primary soils in the site area are from the Dunbar series. These soils are somewhat poorly drained with slow runoff and moderately slow permeability. The soil profile as indicated by the road cut consists of 3 zones: 0-10 cm organic zone, 10-20 cm light to medium gray to yellow-tan clayey sand, 20 and below red-orange sandy clay.

Surface collections indicate a sparse scatter of ceramic material over an area of approximately 6 x 50 meters along the road. Poor ground surface visibility due to heavy leaf litter outside of the road cut negated any estimates of site extent. Due to the lack of time, as well as the location of this site outside of Amoco property, no subsurface testing was implemented.

38BK330. The material from this site consists of 50 undecorated sand tempered ceramic fragments; 1 linear check stamped sherd; 1 reed punctate sherd; and 6 linear punctate ceramic fragments. Fourteen of the 50 plain sherds have fiber as well as medium sized angular quartz pebbles in the paste. Among the lithics from this site are 1 slate Savannah River biface, 1 quartzite biface fragment, 36 chert flakes, 26 fossiliferous chert breccia flakes, and 1 slate flake. The artifacts from this site are indicative of Late Archaic, Thom's Creek, Deptford and Cape Fear utilization of the area.

This site is located on property owned by the Georgia Pacific Company in the Kittridge United States Geological Survey quadrangle. The material was collected from an existing road cut north of the Amoco property boundary (see Fig. 1). The site is situated on a 10-15 feet contour overlooking Cowbell Branch Creek, a rank 2 drainage, located 120 meters to the west of the site. The site is situated on a slightly raised (.5 to 1 meter) area above a relatively low, flat terrain. The site was exposed by a recent road cut through the area, and material was found along the embankment, as well as in the road bed. At the western end of the site, where the terrain drops a relatively dense concentration of material was located. The terrain in the site area slopes gently (2-5%) to all sides.
The area has been recently cleared by timbering activities and is now in the secondary growth stage. Small shrubs, vines, briars, and grass represent the existing vegetation in the site area. The primary soils for this area are from the Dunbar series, which are somewhat poorly drained; however, the soil profile, as indicated by the road cut, suggests a moderately well to well drained soil. The soil profile as indicated by the road cut consists of 4 zones: 0-15 cm light to medium gray organic, 15-25 cm mottled light gray and yellow-tan fine sand, 25-55 cm light, fine, yellow-tan sand, and 55-65 cm and below consolidated yellow-tan clay with a small amount of sand and some mottled red-brown clay.

Surface collections indicate a moderate density scatter of lithic and ceramic material over an area of approximately 80 x 20+ meters. Due to the absence of adequate time, as well as the location of this site outside of Amoco property, no subsurface testing was implemented.

38BK331. The cultural material from this site consists of 6 fabric impressed sherds; 1 linear check stamped sherd; 2 reed punctate sherds; 1 cord marked, probably Cape Fear sherd; and 14 undecorated, fine to coarse sand tempered ceramic fragments. The lithic material consists of 1 quartz Palmer biface, 1 Coastal Plain chert scraper, 6 Coastal Plain chert flakes, 1 sandstone retouched flake, and 2 quartz flakes. The artifacts from this site are indicative of Early Archaic, Thom's Creek, Deptford, and Cape Fear utilization of the area. The site is located in the Kittridge and North Charleston United States Geological Survey quadrangles on property owned by the Georgia Pacific Company. The cultural material was collected from an existing road cut which is north of and roughly parallel to the Amoco property boundary (see Fig. 1). The site is situated along a 20-25 feet contour overlooking Cowbell Branch Creek, a rank 2 drainage, that runs 80 meters to the north of the site. The material was collected from a road cut for approximately 400 meters. The terrain in the site area is relatively flat with several small rises and depressions along the road. Slope is from east to west and is very gradual, at 2-3%.

The existing vegetation in the site area is an upper story of young pines and an understory of hardwood and pine saplings, with dense vines, and briars. The area is owned by Georgia Pacific and has been planted in pine following timbering. The primary soils in the site area are from the Carolina series. These soils are well drained with medium runoff and moderately slow permeability.

Surface collections along the road cut indicate a sparse, but relatively continuous scatter of ceramic and lithic material for approximately 6 x 400 meters. There are no apparent artifact concentrations. Due to heavy leaf litter and dense understory vegetation outside of the road cut, the full extent and density of the site could not be determined. No subsurface testing was implemented because the site is located outside of Amoco property. The soils as indicated by the road cut consist of 4 zones: 0-5 cm organic root zone, 5-15 cm light gray fine sand, 15-45 cm medium yellow-tan fine sand, 45 cm and below red-brown to yellow-orange sandy clay.
38BK332. The cultural material from this site consists of 1 Coastal Plain chert biface fragment of unknown temporal affiliation. The site is located on property owned by the Georgia Pacific Company, on the North Charleston United States Geological Survey quadrangle. The biface fragment was collected from an existing road cut that roughly parallels the Amoco Georgia Pacific boundary (see Fig. 1). This site is situated on a 30 foot contour ridge top. The nearest permanent water is Cowbell Branch Creek, a rank 2 drainage, which is located approximately 260 meters north of the site. The terrain in the site area is relatively flat with several small rises and depressions along the road.

The vegetation in the site area is an upper story of young pines. The understory consists of hardwood and pine saplings with dense vines and briars. The area is owned by Georgia Pacific and has been planted in pines following timbering. The primary soils in the site area are from the Caroline series. These soils are well drained with medium runoff and moderately slow permeability.

The biface fragment represents an isolated find and the absence of additional material along the road cut suggests a low density site. No subsurface testing was implemented at this site. The exact depth and character of the soils in the site area could not be determined; however, the road cut indicates the same composition as the soils of 38BK331. These soils are composed of 4 zones: 0-5 cm organic zone, 5-15 cm light gray, fine sand; 15-45 cm medium yellow-tan fine sand, and 45 cm and below red brown to yellow-orange, sandy clay.

38BK333. The material from this site consists of 25 undecorated, sand tempered ceramic fragments; 1 undecorated, fiber tempered fragment; 1 reed punctate (Thom's Creek) sherd; 1 fabric impressed (Cape Fear) sherd; and 2 cord marked (Cape Fear) ceramic fragments. The lithics consist of 1 biface fragment, and 1 sandstone, 1 quartz and 1 chert flake. This site is located in the Cainhoy United States Geological Survey quadrangle on property owned by the Georgia Pacific Company. The cultural material was collected form an existing road cut, which is north of and roughly parallel to the Amoco-Georgia Pacific property boundary (see Fig. 1). The site is situated on a 25 foot contour overlooking low bottomland to the south. Cowbell Branch Creek, a rank 2 drainage, is located 450 meters south of the site. Little Johnson Creek, also a rank 2 drainage is 700 meters south of the site. The terrain in the site area is relatively flat but slopes gently at 2-5% on the southeastern end.

The vegetation consists of pine with an understory of young hardwood and pine saplings, dense vines and briars. The area is owned by Georgia Pacific and has been planted in pine following timbering. The primary soil in the site area are from the Dublin series. These soils are moderately well drained, with slow runoff and moderately slow permeability.

Observation along the road cut indicates a sparse, but relatively continuous scatter of ceramic and lithic material for approximately 6 x 500 meters with no apparent artifact concentrations. Due to heavy leaf litter and dense understory vegetation outside of the road cut, the full extent and density of its site could not be determined. No subsurface
testing was implemented in the site area. The soils as indicated by the road cut consist of 0-5 cm organic zone, 5-15 cm light gray organic zone, 15-30 centimeters mottled transitional zone, 30-45 cm yellow-tan fine clayey sand, and 45+cm red-brown sandy clay.

38BK334. The material from this site consists of 51 undecorated, fiber tempered sherds; 1 reed punctate, fiber tempered sherd; and 1 undecorated sand tempered sherd. The lithics from this site include 2 Coastal Plain chert flakes. The presence of undecorated fiber tempered associated with reed punctate fiber tempered suggest a Stalling's Island utilization of the area. This site is located in the North Charleston United States Geological quadrangle on the main road through Amoco property. It is approximately 210 meters west of the powerline corridor which runs through Amoco property (Fig. 1). The site is situated between a 5 and 10 foot contour overlooking two small rank 1 tributaries and the marsh of Grove Creek, which is located 210 meters to the south of the site. The terrain in the site area is relatively flat, but begins to slope at 2-5% to the west, south, and east of the road.

Vegetation in the area consists of a pine upper story with a few hardwoods, and an understory of pine saplings, vines, and briars of moderate density. The primary soils in the site area are from the Bonneau series. These soils are well to moderately well drained with slow runoff and moderate permeability.

This site was initially represented by an isolated surface find indicating a low density site of unknown extent. Subsurface testing revealed the site to be more extensive and of moderate to high density. A 1 x 1 m test square (Fig. 10) was excavated 10 meters north of the center of the road where the original sherd was found. Test pit 1 produced a heavy concentration of 51 fiber tempered ceramic fragments and 2 chert flakes at a depth of 30-37 cm. Nine additional 50 x 50 cm units were excavated at 10 meter intervals to the north, south, east, and west of test pit 1. Test pit 2 and test pit 6, located 10 meters north and 10 m east of test pit 1 produced an additional sherd each. The material from each of the test units was located at a depth of 30-37 cm which is composed of a medium yellow-tan fine sand. The soil profile as indicated by test pit 1 consists of 4 zones: 0-10 cm light gray organic material; 10-30 cm mottled, light to medium fine gray sand, with light to medium yellow-tan fine sand; 30-60 cm medium yellow-tan fine sand; and 60+cm medium orange-brown fine sandy compacted clay.

38BK335. This historic site is represented by 6 brown salt glazed stoneware sherds; 3 sherds of green wine bottle glass; 1 delft sherd; 5 pipe bowl and stem fragments; 4 lead glazed slipware sherds; 2 combed yellow, lead glazed, slipware sherds; 2 alkaline glazed slipware ceramic fragments; and 9 Colono-Indian ceramic fragments. The artifacts from this site indicate a late 18th-19th century occupation. This site is located on a secondary road through Amoco property in the Cainhoy United States Geological Survey quadrangle (Fig. 1). The site is situated on a 30 foot contour overlooking Little Johnson Creek and swamp approximately 300 meters to the north of the site. The terrain in the site area is relatively flat, sloping at 0-2% to the west.
The vegetation in the site area consists of an upper story of pine and a few hardwoods and an understory of moderately dense pine and hardwood saplings, shrubs, vines and briars. The primary soils in the site area are from the Bonneau series. These soils are moderately well to well drained with slow runoff and moderate permeability.

The lack of any ground surface visibility outside of the road cut did not allow for determination of the full site extent or artifact density. Material collected from the road indicates a low to moderate density of ceramic fragments over a 6 x 30 meters segment of the road. No obvious structures were located and no subsurface testing was implemented at this site. During the sampling phase of the project, a 200 x 200 meter quad was examined adjacent to the site and subsurface testing was implemented. No structures or artifacts were recovered from the sampling unit.

The existing vegetation in the site area is composed mainly of pines with a few scattered hardwoods, which become more frequent on approach as the low bottomland. On the Georgia Pacific side of the firebreak, the site has been planted in pine following timbering. The understory is composed of young pine and hardwood saplings, vines, and briars. Ground surface visibility was poor in the firebreak. The primary soils in the site area are from the Bonneau series. These soils are well to moderately well drained with slow runoff and moderate permeability.

Surface material was collected from an existing firebreak along the northern boundary of Amoco property. The material extended along the firebreak for approximately 3 x 30 meters, indicating a moderate density site. The lack of good ground surface visibility outside of the firebreak did not allow for an estimation of full site extent or density; therefore several test excavations were implemented in the wooded areas adjacent to the firebreak. A 1 x 1 meter test excavation (Fig. 11) was placed 18 meters west of a secondary road and firebreak intersection and 8 meters south of the firebreak. This test yielded 7 undecorated, sand tempered sherds; 1 fabric impressed (Cape Fear) sherd; and 1 check stamped sherd. Four additional 50 x 50 cm test pits were excavated on the Amoco side of the boundary. Test pit 3, located 10 meters west of test pit 1, yielded 1 undecorated, sand tempered ceramic fragment. The material from the test excavation was found at a depth of 18-30 cm. The soil profile as indicated by test pit 1 is composed of 4 zones: 0-6 cm light to medium, gray organic zone; 6-26 cm light gray and light yellow-tan, mottled, fine sand with little clay; 26-46 cm light yellow-tan fine sand; 46 cm+ orange sandy clay.
FIGURE 10. Site 38BK334. Test Pit 1--view looking West.

FIGURE 11. Site 38BK336. Test Pit 1--view looking North.
The test excavations support the surface indications of a moderate density ceramic scatter probably extending along the entire ridge which overlooks the bottomland.

38BK337. The material from this site consists of 64 burnished, undecorated sand tempered sherds; 1 undecorated, coarse sand tempered sherd; 1 slate stemmed biface; 1 sandstone and 1 chert chunk; 20 brick and baked clay fragments; 3 nails and unidentified metal objects; 1 green glass fragment; 1 lead glazed slipware sherd; 1 underglazed polychrome pearlware sherd; and 1 refined red lead glazed slipware sherd. The association of plain burnished ceramics with brick fragments and historic site (38BK197) suggests a Colono-Indian time period for this site. The historic material suggests an early 19th century occupation of the area.

This site is located along the northern border of Amoco property in the North Charleston United States Geological Survey quadrangle. Although the site was not discovered during the sampling phase of the project, it is located within quad 2-23 of the sampling units (see Fig. 1). The site is situated on a ridge tongue (25-30 feet contour) which protrudes into low bottomland to the south. The terrain is relatively flat with a slight rise 0-2% to the north and a slight slope (0-2%) to the south, east, and west. At the edge of the ridge tongue the terrain drops rapidly at 8-12% slope into low bottomland. The closest permanent water is Cowbell Branch Creek, a rank 2 drainage, located approximately 500 meters to the north of the site.

Vegetation in the site area consists mainly of large hardwoods (oaks and hickory) on the Amoco property while the Georgia Pacific side is mostly young pines of 15-25 feet in height. These have been planted in recent times following timber activities in the area. The understory is composed of young hardwood and pine saplings, vines and briars. The primary soils in the site area are from the Tawcaw series. These soils are somewhat poorly drained with slow runoff and permeability.

Surface collections from the firebreak indicate a moderate to high density ceramic scatter for 3 x 173 meters across the ridge tongue with the heaviest density of material at approximately 70 meters from the western boundary. A 1 x 1 meter test unit was excavated approximately 10 meters south of the point of heaviest concentration. The test unit yielded 49 sand tempered burnished sherds (possibly Colono-Indian), brick and metal fragments and historic ceramics, thus supporting the surface indications of a moderate to high density site. The proximity of the site to 38BK197, a known historic site, and the temporal overlap indicated by the artifacts suggests an association between the two sites. Material was found in the top three soil zones. The soil profile as indicated by test pit 1 consists of 4 zones: 0-10 cm medium to dark gray organic, 10-22 cm mottled medium gray fine sandy clay and light yellow-tan fine sandy clay, 22-52 cm light yellow-tan sandy clay, and 32cm+ medium yellow-orange fine sandy clay.

38BK338. The material from this site consists of 2 sand tempered linear punctate (probably Thom's Creek) and 1 undecorated sand tempered ceramic fragments. The site is located along the northern border of Amoco property in the Cainhoy United States Geological Survey quadrangle. The material was collected from a firebreak which follows the Amoco-Georgia
Pacific Company property boundary (see Fig. 1). The site is situated on a 30 feet contour ridge top. The terrain is relatively flat with a gradual (2-5%) slope to the south and east of the firebreak. Approximately 100 meters east of the site, the terrain begins to drop into low bottomland. The closest permanent water is Little Johnson Creek, a rank 2 drainage, located 700 meters south of the site.

The existing vegetation consists mainly of an upper story of pine (35-40 feet) with some hardwoods. The under story consists of dense pine and hardwood saplings, vines and briars. The primary soils in the site area are from the Bonneau series. These soils are well to moderately well drained, with slow runoff and moderate permeability.

Surface collections from the firebreak indicate a low density ceramic scatter over an area of 3 x 20 meters. The lack of ground surface visibility outside of the firebreak area did not allow for determination of full site extent or density. A 1 x 1 meter test unit was excavated 16 meters east of the intersection of the secondary road with the firebreak and 14 meters south of the firebreak. No additional cultural material was located with the test unit thus supporting surface indications of a low density site. The soil profile, as indicated by the test excavation consists of 4 zones: 0-9 cm dark gray organic, 9-22 cm light gray and yellow-tan mottled fine sand with little clay, 22-45 cm fine yellow-tan clayey sand, and 45 cm+ orange sandy clay.

38BK343. The material from this site consists of 2 undecorated sand tempered ceramic fragments, 1 baked clay object, and 1 chert flake and probably represents Woodland utilization of the area. This site is located along the northern border of Amoco property in the Cainhoy United States Geological Survey quadrangle. The material was collected from a firebreak which follows the Amoco-Georgia Pacific property boundary (see Fig. 1). The site is situated on a small rise (30 feet contour) overlooking low bottomland to the east and southeast. The terrain is relatively flat at the apex of the site, then slopes into low bottomland to the east. The closest permanent water is Little Johnson Creek, a rank 2 drainage, located approximately 650 meters south of the site.

The existing vegetation consists mainly of an upper story of pine with some scattered hardwoods. The understory is composed of moderate to dense pine and hardwood saplings, vines and briars. The primary soils in the site area are from the Norfolk series. These soils are well drained, with slow runoff and moderate permeability.

Surface collections from the firebreak indicate a low density ceramic scatter over an area of 3 x 70 meters. The lack of ground surface visibility outside of the firebreak did not allow for full site extent or artifact density to be determined. A 1 x 1 meter test unit was excavated 100 meters east of the firebreak and road intersection and 15 meters south of the firebreak. One chert flake was located from a depth of 20-25 cm. The test excavation supports the surface indications of a low density site. The soil profile as indicated by the test pit consists of 4 zones: 0-10 cm light gray organic, 10-25 cm mottled light yellow-tan and light gray organic fine sand, 25-79 cm light yellow-tan fine sand, and 79-85 cm+ yellow-tan sandy clay.

-42-
BACKGROUND FOR SIGNIFICANCE ASSESSMENT:
PRESENTATION OF HYPOTHESES

Introduction

The purposes of this survey study were (1) to locate a representative sample of prehistoric archaeological resources in the project area, (2) to assess for archaeological significance of these resources and the potential of the project area as a whole, and (3) to formulate a plan for long-term archeological resource management. Phases I, II and III of the field stage of the study resulted in the location of a representative sample of prehistoric sites. These sites have been described in the previous chapter. In this chapter a detailed background for significance assessment will be presented.

In the introductory chapter of this report previous work in the interior Coastal Plain region and the Berkeley County area was described, and general conclusions of our present understanding of regional prehistory were presented. These conclusions are as yet very tentative, as the data upon which they rest cannot be considered reliable. Most of the data for the region has been collected in ways that may introduce systematic bias. Most prehistoric sites have been found and reported by chance rather than as a result of systematic rigorous investigation. One of the goals of this study project was to collect data in such a manner that, in addition to being directly useful in management decision-making, the data could also be used to test, confirm, and refine our present hypotheses of the prehistory of the region. This refined understanding could then be more reliably used to outline where further data are needed and thus provide the basis for the assessment of archeological significance.

To aid in the testing, confirming, and refining of our present understanding a series of explicit hypotheses has been constructed. Taken as a whole these hypotheses describe an important portion, tentative as it is, of our present knowledge. After presentation of these hypotheses and test implications, they will be evaluated in terms of data gathered during this survey project. A final chapter of the report provides a detailed assessment, based on our newly evaluated knowledge, of the significance of the archeological resources of the Amoco Realty property.

Discussion

The Amoco Realty project area is ideal for testing hypotheses concerning changes in the prehistoric utilization of the inter-riverine zone of the interior Lower Coastal Plain. Although this tract of land is primarily an inter-riverine area, its close proximity to the Cooper River makes it particularly applicable for examining a hypothesized relationship between a generally rising, though possibly fluctuating, sea level and the intensive utilization of adjacent inter-riverine areas during
Woodland—especially Middle/Late Woodland—times. As such, the survey was designed to collect specific archeological and environmental data for purposes of testing hypotheses about changing patterns of utilization of the inter-riverine zone. Given the hypothesized relationship between sea level variability and changes and patterns of utilization of the inter-riverine zone, it was also necessary to examine paleoenvironmental data from the Cooper River and associated marsh. This was accomplished under the direction of Dr. Donald J. Calquhoun of the University of South Carolina Department of Geology.

It has been suggested in earlier sections that the primary resources exploited in the inter-riverine zone throughout prehistory were acorns, hickory nuts, and deer. These resources were exploited during the fall and early winter when the nuts ripened and the deer aggregated to feed on them (Smith 1975). Site-settlement data suggest that different exploitive patterns were involved in the procurement of these resources over time. This is seen as resulting in part from sea level variability and its consequent effects on the amounts, distribution and productivity of the better drained soils.

Upon examining available archeological site-settlement data from Berkeley County (Statewide Archeological Inventory, Institute of Archeology and Anthropology, University of South Carolina) it was observed that Archaic period sites, when contrasted with the subsequent Woodland Period, are typically small, relatively few in number and contain low densities of archeological material. This data may indicate that the inter-riverine zone was utilized by Archaic populations characterized by small group size, high mobility, and wide ranging exploitive patterns. If this characterization of the Archaic is substantially correct, it fits well with environmental data suggesting that the forests of the southeastern United States supported the highest densities of mesic adapted oak and hickory during this period (Whitehead 1965, 1972, 1973).

The Berkeley County site sample (Table 5) consisted of 100 sites. All sites with useably locational data (drainage rank association, distance from nearest drainage, elevation above nearest drainage) were selected. Consequently, the sample size was purely coincidental. Further, the selection of sites based on useable data adds randomness to the sample. Because of this, it is felt that the sites attributed to the various temporal periods were likely represented in the sample in approximate proportion to their actual occurrence in prehistory.

During the Woodland Period, especially the Middle-Late Woodland as defined by Deptford, Wilmington, and Cape Fear ceramics (South 1976), there is a much higher frequency of sites in the Inventory sample studied than during the Archaic. According to Berkeley County sample of one hundred sites drawn from the Statewide Archeological Inventory (Institute of Archeology and Anthropology, University of South Carolina) by Brooks (Green and Brooks n.d.), 76% are Woodland. Although most Woodland sites are relatively small, they are comparatively larger and contain higher densities of archeological material than the earlier Archaic sites.

This data suggests that the inter-riverine zone of the interior Lower Coastal Plain was more intensively utilized during the Woodland period than it was earlier. During this time (ca. 1000 B.C. to A.D. 1000) oak
### TABLE 5
BERKELEY COUNTY SITE SAMPLE (a)

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(a) - Site typologies based on size, density of archeological material, types of archeological material, artifact diversity, non-artifactual attributes (eg. presence/absence of midden shell, etc.), and the above site locational variables are presented in Green and Brooks (n.d.).

(b) - Sites most closely associated with rank 5 drainages (Cooper and Santee Rivers) are considered here to be riverine sites.
and hickory were declining in density, a trend that began during the Archaic at about 5000 B.C. (Whitehead 1965, 1972, 1973). It is thought by Whitehead that this decline in density resulted in a more dispersed distribution of oak and hickory, such that high densities of oak and hickory became restricted to fewer localities. He further suggests that in the Lower Coastal Plain this decline may be due in part to increasing oceanicity (a generally rising sea level).

A general decline in oak and hickory density during the Woodland period, as well as the dispersion of localities optimal for these resources (better drained soils), is thought here to have been largely responsible for the dispersed Woodland settlement patterning observed in the inter-riverine zone (Green and Brooks n.d.). This may be accounted for by the dispersal of Woodland populations into small groups for purposes of establishing short-term deer hunting and nut collecting camps as a means of efficiently exploiting these dispersed resources.

As with the preceding Archaic and Woodland periods, the Mississippian utilization of the inter-riverine zone is seen to have been oriented toward the exploitation of nuts and deer in the fall and early winter. The archeological evidence from Berkeley County suggests that the Mississippian subsistence strategy was more strongly oriented toward the riverine zone, especially the floodplain bottomland areas having considerable agricultural potential. Many of the larger Mississippian sites in and adjacent to the riverine zone may represent permanent, or nearly permanent, habitation sites. Utilization of the inter-riverine zone during this period seems to have been comparatively minimal, as indicated by an occasional isolated find or small, low artifact density site. In part, this is thought to be related to a continuing decline in the oak–hickory forest (Whitehead 1965, 1972, 1973).

**Chronological Controls**

Since change through time in patterns of prehistoric utilization of the inter-riverine zone is the focus of this research, chronological control is essential. The only chronological sequence established for the South Carolina Coastal Plain was developed largely by cross-dating ceramics with the Georgia and North Carolina sequences (South 1976), and as such, the occurrence of these ceramics in archeological sites in the Coastal Plain of South Carolina can only be taken as rough temporal indicators.

It is partly for this reason that sites in the project area containing Deptford and Cape Fear ceramics are grouped together and defined here as Middle–Late Woodland, especially since many Amoco project area and other Berkeley County sites contain various combinations of these Woodland type ceramics. Further, since many sites in the inter-riverine areas of Berkeley County are shallow it is usually not possible to segregate the various ceramics stratigraphically. Therefore, it is unclear whether the ceramic variability observed is due to temporal, functional, or socio-ethnic variability. All or various combinations of these factors...
may be involved. However, given the absence of good temporal control, the major consideration in lumping these two ceramic complexes under Middle-Late Woodland resulted from an examination of Berkeley County site-settlement data during the formulation of the subsistence-settlement hypotheses being tested. This data indicated that the settlement patterning reflected by these two ceramic complexes, at least in Berkeley County, was virtually identical, given the site locational variables considered (drainage rank association, elevation, distance from nearest drainage). Based on these settlement similarities, it may be that much of the ceramic variability may not be due to temporal differences.

For our purposes, Early Woodland is defined here on the basis of Thom's Creek ceramics. Again, based on Berkeley County site locational data, sites containing these ceramics are more similar to Middle-Late Woodland sites in that they have greater site locational variability than sites of the Archaic. This suggests a dispersed settlement patterning more in line with that of the Middle-Late Woodland than the Archaic.

Finally, the Late Archaic period is defined here as being represented by Stalling's Island fiber-tempered ceramics. The Early and Middle Archaic periods, which are preceramic, are defined by diagnostic lithic bifacial tools similar to those occurring in dated stratigraphic sequences in North Carolina (Coe 1964).

**Explicit Hypotheses**

H₁: The prehistoric utilization of the-inter-riverine zone of the interior Lower Coastal Plain was primarily for the exploitation of acorns, hickory nuts, and deer during the fall and early winter when the nuts ripen and the deer aggregate to feed on them. If this is substantially correct, we would expect the following test implications:

T.I.₁: There should be a high correlation between prehistoric archeological sites and well to moderately well drained soils, such that sites should be strongly associated (statistically) with these soils. These soils, as discussed earlier, are capable of supporting the highest densities of mesic adapted vegetation, including various species of oak and hickory.

T.I.₂: Most prehistoric sites should be relatively small in areal extent. This would be due to at least two factors. First, the soils that produce the highest densities of oak and hickory are often dispersed and restricted to small patches. Second, the most economical way to exploit resources distributed in this manner would be through the dispersal of human populations into small groups, thereby producing a considerable number of small sites (Schneider 1974; Cleland 1976; Jochim 1976).
A few larger sites are also expected. These sites are expected to be functionally equivalent to the smaller sites, with the larger size likely resulting from reoccupation of the larger and more productive patches of better drained soils occurring at the environmentally stable, at least in terms of sea level variability, higher elevations.

T.I.3: Most prehistoric sites should exhibit relatively low densities of archeological material. Small group size and the relatively narrow range of behavioral activities being performed, in conjunction with the short-term use of these sites (until the seasonally available resources were largely depleted from the immediate vicinity), would usually result in low outputs of archeological material. The few larger, multicomponent sites, however, are expected to have higher densities of archeological material. This would be largely due to reoccupation.

T.I.4: Most prehistoric sites should exhibit relatively low artifact diversity. This would be due to the relatively narrow range of behavioral activities involved in the procurement and processing of nuts and deer at temporary camps. The few larger, multicomponent sites, however, are expected to have greater artifact diversity. This would be largely due to stylistic rather than functional variability over time.

Artifacts expected at these sites include ceramics, bifacial tools/projectile points, lithic debitage and possibly scrapers and baked clay balls. Ceramics should occur in sites dating from the Late Archaic (Stallings Island) through the Mississippian periods, representing vessels broken while performing activities such as nut gathering, temporary storage and possibly food processing or cooking. Baked clay balls should represent boiling or roasting activities (South 1969). The lithic material expected should represent deer hunting and processing activities. Assuming short-term use of these sites, and the activities thought to be represented, it is not expected that artifact manufacture, e.g. ceramics and lithics, will be indicated. Rather, the evidence should indicate tool use and maintenance. Consequently, lithic debitage, for example, should consist primarily of small thinning and resharpening flakes, which would represent the maintenance of bifacial tools, projectile points, and scrapers. In most instances, the presence of these latter artifacts should represent the discard of broken or exhausted tools.

Assuming short-term usage of these sites and the highly storable nature of non-hulled nuts for future use, we would not usually expect to find grinding or "nutting stones," indicative of nut processing and immediate consumption. We would also not expect evidence of structures or storage and refuse pits.
T.I.5: Since the activities involved in nut extraction and deer hunting and processing are independent, and since deer should avoid areas of human activity (nut gathering areas), it is expected that sites representing deer hunting camps may not always co-occur with nut extraction camps. In other orders, deer hunting camps, represented primarily by lithic material, may be distinct and separated spatially from nut extraction camps, represented primarily by ceramics. However, assuming that nut extraction and deer hunting activities were being performed simultaneously (perhaps by kin-related groups), then we would expect that the "more permanent" nut extraction sites, by virtue of the presence of non-mobile resources, would be the scene of domestic activities and that hunters would perform at least some lithic maintenance activities at these sites between short, nearby hunting trips. On the other hand, we would not expect to often find evidence of domestic activities, such as ceramics, at hunting camps.

H₂: The Woodland Period, especially the Middle-Late Woodland, represents the most intensive utilization of the inter-riverine zone of the Interior Lower Coastal Plain during prehistory. In part, this is due to a higher, though possibly fluctuating, sea level than during earlier prehistoric times. If this is substantially correct, then we would expect the following test implications:

T.I.1: An examination of the prehistoric sites known to exist within the project area should demonstrate that Woodland period components especially Middle-Late Woodland, are by far more highly represented than sites of the other periods.

T.I.2: Assuming T.I.1, it is expected that radiometric dates obtained by coring the Cooper River/Grove Creek marsh will indicate a higher, though possibly fluctuating, sea level stand during the Woodland period, especially the Middle-Late Woodland, than during earlier prehistoric times. The relationship between sea level variability and changes in the prehistoric utilization of adjacent upland areas has already been discussed.

It should be noted that this aspect of our research is only in the preliminary stage. Future research will deal more specifically with the relationship between environmental changes and changes in prehistoric subsistence-settlement strategies. Initially, we will focus on establishing a detailed sea level curve for the Lower Cooper River Valley and refining our cultural chronologies. It will then be possible to equate paleoenvironmental data with archaeological data at specific points in time. Only through establishing such a framework can we begin to understand the finer details of human adaptations to a changing environment.

-49-
In this section the hypotheses presented above are tested and evaluated against data obtained during the survey. This testing will be done by comparing survey data patterns observed with data expected or predicted by the hypotheses and their corresponding explicit test implications. Divergences from predicted patterns are discussed and evaluated.

H1: The prehistoric utilization of the inter-riverine zone was primarily oriented toward the procurement of nuts and deer in the fall and early winter.

T.I.1: Expected Data: A high correlation between prehistoric archeological sites and well to moderately well drained soils is expected.

Observed Data: As indicated by Table 6, 15(78.9%) of the 19 sites with only prehistoric components are located on well to moderately well drained soils.

Evaluation: This lends strong support to the hypothesis, especially since nearly 80% of the pure prehistoric sites occur on proportionally less than 40% of the soils. However, the remaining 4(21.1%) of the pure prehistoric sites appear to be located on poorly drained soils. These sites are 38BK156, 38BK273, 38BK317, and 38BK327.

In addition to being located on poorly drained soils, these sites, as indicated by Table 7, have several things in common. They are all relatively small sites, with relatively low artifact densities and low artifact diversity. Further, three of the four are single component sites. An examination of the Archeological Site Data section also indicates that all four of these sites occur at relatively low elevations (5-15' above sea level) fairly close to Rank 1 or 2 drainages (Strahler 1964). The existing vegetation indicates a mixed hardwood climax forest (Quarterman and Keever 1962).

It is possible that these sites represent the exploitation of aquatic resources from the nearby drainages and associated marshes. However the artifact inventories from these sites are very similar to those from sites located on well to moderately well drained soils (compare Tables 2 and 6). Assuming that these four sites do represent nut extraction and/or deer hunting, then there are a number of possibilities that could account for the apparent discrepancy in site-soil association.

First, these sites are all located on slightly higher areas than the immediately surrounding terrain. This may indicate that the sites are actually located on small, isolated soil patches that are better drained than the general soil characterizations suggest.
### TABLE 6

**SOIL DRAINAGE AND SITE ELEVATIONS**

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* - Historic with possible prehistoric component
Second, the existing vegetation suggests that the soils associated with these sites do support oak and hickory, though not in high densities. This, in combination with the site characteristics discussed above, indicates that these four sites were not intensively utilized. Since three, and possibly all four of the sites were utilized during the Woodland period, which, as hypothesized, represents the most intensive utilization of the inter-riverine zone, we would not necessarily expect only the highest productivity areas to be utilized. We would, however, expect these areas to be most intensively utilized.

Third, assuming that sea level, and hence the freshwater table, was lower during the Woodland period, low lying soils that are currently poorly drained may have been better drained and capable of supporting higher densities of oak, hickory, and deer than at present.

Fourth, with the dispersed nature of the better drained soils, it may sometimes have been most economical to strategically locate a site in relation to a number of high density resource areas so that maximum efficiency in procurement may be obtained. Similarly, if deer are the target resource, locating
camps in high nut-deer density locales might not be economical in that deer would tend to shy away from areas of human activity. Site 38BK317, which is represented only by thinning flakes, may represent such a camp.

Any, or all of the above possibilities in various combinations, may account for why none of these four sites appears to be located on the better drained soils. It is suspected, however, that the low intensity of utilization of these sites is tied most directly to their association with low lying soils, which, in regards to sea level variability, would be the most unstable environmentally.

Finally, an examination of the six historic period sites discovered or examined during the survey provides an interesting source of comparative data relevant to variability in land-use patterns over time. Although these six sites provide an extremely small sample, they do indicate that 3 of the sites occur on well to moderately well drained soils and 3 occur on poorly to somewhat poorly drained soils (Table 6). This tentatively indicates that the better drained soils were not as strongly selected for during the historic period. Quite possibly this reflects general historic period land-use patterns characterized by a broad range of economic functions within and between historic settlements, such that no given soil type was necessary or sufficient for carrying out the full range of economic activities.

By comparison, the strong association between prehistoric sites and well to moderately well drained soils in the inter-riverine zone suggests economic activities oriented toward a much narrower range of resources, i.e., nuts and deer.

T.I.2: Expected Data: Most prehistoric sites should be relatively small.

Observed Data: Based on estimates of minimum site size, 13 (68.42%) of the 19 pure prehistoric sites were less than 1000 square meters. As indicated by Table 7, most were considerably less than this estimate. The remaining 6 (31.57%) sites varied from 1260 to 3000 square meters.

Evaluation: Minimum site size was estimated by calculating the area from which archaeological material was recovered. This included exposed ground surface areas and subsurface testing units in vegetated areas. Since most archaeological sites were characterized by low densities of material, subsurface testing was often of little value in determining site size. As such, in many instances, site size was estimated solely on the basis of the areal extent of artifacts on exposed ground surfaces. Obviously, this would vary from site to site, making the estimates rather subjective.
Similarly, there was the problem of sites being defined on the basis of single, isolated finds, either in exposed ground surface areas or in subsurface testing units. In such instances, 60 square meters was assigned for the minimum site area in an effort to standardize the data for comparative purposes. Sixty square meters was the size of the smallest exposed area site, as indicated by the distribution of a total of three artifacts over this area.

A few sites occurred completely in exposed ground surface areas. All of these sites fell within the range considered here to be small sites. Of the remaining sites, at least one dimension could be reliably estimated in the exposed areas.

Although the actual size of some of the sites could not be determined, it is felt that the data is sufficient to compare the sites with each other. On this comparative basis, most of the sites fall into the "small" range. Therefore, this test implication tends to support the hypothesis.

As expected, a few of the sites (6) tended to be relatively larger. However, since larger sites are thought to have resulted primarily from greater intensity of use, as generally indicated by relatively high artifact density and artifact diversity, this discussion will be reserved for test implications 3 (density) and 4 (diversity) of this hypothesis.

T.I.3: Expected Data: Most prehistoric sites should exhibit relatively low densities of archeological material. Observed Data: As indicated by Table 7, 14 (73.68%) of the 19 sites have a Site Density Index of 5.0 or less. The remaining 5 sites (26.31%) have a Density Index ranging from 6 to 91.
Evaluation: The Site Density Index was calculated by dividing the number of artifacts discovered at each site by the total area (measured in square meters) from which the artifacts were recovered, including the surface area of each subsurface testing unit in vegetated portions of a site where artifacts were recovered. This figure was then multiplied by one hundred.

Although vegetated areas intervening between exposed portions of sites that contained archeological material were considered in estimating minimum site size, these intervening vegetated areas were not included in estimating the overall density of material. However, area for isolated finds was calculated at 60 square meters.

This test implication tends to support the hypothesis in that most of the prehistoric sites have relatively low artifact densities. However, an examination of Table 6 indicates that 4 (80%) of the 5 sites having the highest density of material fall within the small site range. This was not expected. Nevertheless, of the thirteen sites falling within the small range, the majority of these sites (9-69.23%) do have artifact density values of 5.0 or less.
Although this test implication supports the hypothesis, it still remains to explain why most of the higher density sites are small, rather than the reverse, which was expected. The following discussion is offered as a potential explanation for this apparent discrepancy.

Three (38BK274, 38BK334, 38BK336) of the four small exhibiting high densities of material have two temporal sites components present. The fourth site (38BK319) has only one temporal component. As can be seen in Table 7, of the 10 sites having only one temporal component, eight of them are the smaller sites. It was expected that most of the smaller sites would have only one temporal component, since the small sites are generally assumed to have been the result of a low intensity of utilization. A small, single component site, therefore, would generally be expected to have lower artifact densities than a site, large or small, with multicomponent representation. That is, with an increase in the number of components, overall intensity of use, as indicated by higher artifact densities and artifact diversity, should also increase. Consequently, the multicomposnency of three of the four small sites is in part seen to be responsible for the high densities of material at these sites.

In conjunction with the multicomposnency of three of these sites, the relatively small areas from which overall artifact density was calculated would also tend to increase the density values. Conversely, the larger areal extent of the larger sites would tend to decrease their density values. Thus, these factors in combination are seen as largely accounting for the apparent discrepancy.

Nevertheless, it still remains to explain why these particular four sites exhibit greater intensity of use than the other sites in the small range, many of which likely resulted from one-time usage. Part of this may be accounted for by the fact that three (38BK274, 38BK319, 38BK336) of the four sites occur at the higher elevations, with all four of the sites occurring on the better drained soils (Table 6).

It has been argued that the soils at the higher elevations have remained most stable over time and that the better drained soils in these areas would, therefore, provide the most consistently productive localities for nuts and deer. As such, we would expect these localities to be most intensively utilized over time, often producing multicomponent sites, i.e., 38BK274, 38BK334, and 38BK336, on the better drained soils.

Finally, the relatively small size of these four sites, which would not normally be expected of sites exhibiting fairly intensive utilization, may be due to correspondingly small patches of high productivity. It is also possible
that the sites are considerably larger than our minimum estimates indicated, which could drastically alter their overall artifact density value and, estimates of intensity of use.

**T.I.4:**

**Expected Data:** Most prehistoric sites should exhibit relatively low artifact diversity.

**Observed Data:** As indicated by Table 7, 15 (78.94%) of the 19 pure prehistoric sites have low artifact diversity indices—.20 or less. The remaining 4 sites (21.05%) have relatively high indices, ranging from .20 to .40. Three of these four sites, as expected, fall within the large site size range. The other falls at the upper end (900 square meters) of the small site range and at the lower end of the high artifact diversity range (.28). Also as expected, all four of these relatively high artifact diversity sites have either three or four temporal components present. All other sites have only one or two components.

**Evaluation:** The artifact Diversity Index was calculated by dividing the total number of artifact "types" present at each site by the total number of artifact types present (25) at all nineteen pure prehistoric sites.

This test implication lends strong support to the hypothesis in that most sites, including all but one of the smaller sites, have low-artifact diversity. The low artifact diversity of these sites, which is indicative of low intensity of utilization, is probably due in large part to the fact that all 15 of the sites with low artifact diversity were utilized during only one (10-66.66%) or two (5-33.33%) temporal periods.

By contrast, as expected, the few larger sites with relatively high artifact diversity (4 sites) have either three or four temporal components present. It has been argued that these sites were functionally equivalent to the smaller, less intensively utilized sites, with the major difference being that the larger sites resulted from more frequent utilization over longer spans of time. By dividing the number of temporal components present at each of these four sites into their respective artifact diversity indices, the artifact diversity values obtained are well within the range of those of the smaller, less intensively utilized sites with only 1 or 2 components. For example, site 38BK331 has the highest artifact diversity index (.40) and four temporal components. By performing the above operation, a value of .10 is obtained. This value is within the relatively low artifact diversity range of .04 to .20. Thus, this tends to support the view that the larger, more intensively utilized sites are functionally equivalent to the smaller sites.

It has also been argued that the larger, more intensively utilized sites will tend to occur at the higher elevations on the larger patches of better drained soils. This is demonstrated by a comparison of Table 6 with Figure 2.
Finally, the artifact diversity present at the prehistoric sites was as expected and tends to support the view that the sites functioned primarily as nut extraction and/or deer hunting camps. Although all the artifacts expected did occur, they were not all present at all the sites, nor in the same proportions from one site to another. In addition to the artifacts expected, one unidentifiable shell fragment was discovered at 38BK274 and one quartz pebble hammerstone was discovered at 38BK325. Given the amount of historic activity in the area, it is uncertain if the shell represents historic or prehistoric utilization. The hammerstone, on the other hand, fits well into activities involving lithic tool maintenance.

Artifact variability from one site to another may be accounted for by a number of factors. These are:

1) The full range of artifacts at each site was probably not represented in our collections. However, the full range of artifact types is likely fairly well represented when all sites are considered.

2) Differential temporal representation from one site to another likely accounts for a considerable degree of artifact variability.

3) Similarly, differential intensity of use may account for some of the variability in artifact types from one site to another. That is, sites exhibiting greater intensity of use tend to have greater artifact variability, as indicated by greater artifact diversity.

4) Artifact variability would also be conditioned by specific site function(s). For example, ceramics are expected to be most likely associated with nut extraction, cooking, etc., and would not be expected to be strongly associated with small, temporary hunting camps. This source of artifact variability will be discussed under T.I.5, of this hypothesis.

T.I.5: Expected Data: Sites representing deer hunting camps may not always co-occur with nut extraction sites. Observed Data: assuming that ceramics are primarily associated with nut extraction, and lithic material primarily with deer hunting, Table 2 indicates that of the 19 prehistoric sites, nine sites (47.36%) contain only ceramics, two sites (10.52%) contain only lithic material, and eight sites (42.10%) contain both ceramics and lithics. Evaluation: Although the testing of this test implication
tends to support the hypothesis, more sites containing only lithic material were expected (representing small, temporary hunting camps). In fact, since no temporally diagnostic artifacts were found at the two sites (38BK317, 38BK332) containing only lithic material, it is possible that these are preceramic sites and that nut extraction activities may also have been involved.

The near absence of pure lithic sites, and the relatively high frequency of sites containing both lithic and ceramic material, suggests that in most instances, the maintenance of lithic artifacts associated with deer hunting took place at the "more permanent" nut extraction loci. This would tend to indicate that most deer hunting took place relatively close to the nut extraction sites. This is not surprising since deer would also be attracted to high density oak and hickory localities.

However, as indicated by a comparison of Tables 2 and 7 the eight sites containing both lithics and ceramics have the highest artifact diversity indices, ranging from .12 to .40. The remaining eleven sites have diversity indices ranging from .04 to .08. Similarly, six of the eight sites have two or more temporal components present, and include all of the three and four component sites. Consequently, the eight sites indicate fairly intensive utilization over time.

Therefore, since the lithic materials from most of these eight sites are not temporally diagnostic, it is uncertain as to whether or not the ceramic and lithic materials at these sites represent contemporary activities. As such, it cannot be said, for example, that lithic artifact maintenance activities associated with deer hunting usually occurred simultaneously with nut gathering activities at the "more permanent" nut extraction sites. In fact, the same site may have been utilized primarily for hunting related activities on one occasion and primarily for nut extraction on another. That is, although these areas produced high densities of nuts and deer, there is no reason to expect that one or the other would always be the target resource, in that productivity levels for each resource within a given locale would likely fluctuate from year to year, or at least every few years, due to such possible factors as over-hunting, life-productivity cycles of the nut producers, or climatic fluctuations.

H2: The Woodland period, especially the Middle-Late Woodland, represents the Most intensive utilization of the inter-riverine zone during prehistory, due in part to a higher, though possibly fluctuating, sea level than during earlier prehistoric times.

T.I.1: Expected Data: An examination of the 19 pure prehistoric sites and their constituent temporal components should indicate a much higher frequency of temporal components attributable to this period.
Observed Data: In the 19 sites, at least 34 temporal components were represented. These include 1 (2.9%) Early Archaic component, 0 (0%) Middle Archaic Components, 7 (20.5%) Late Archaic/Stalling's Island components, 5 (14.7%) Thom's Creek components, 5 (14.7%) Deptford components, 6 (17.6%) Cape Fear Components, 0 (0%) Wilmington components 0 (0%) Mississippian components, 8 (23.5%) undetermined prehistoric /probable Woodland Components, and 2 (5.8%) undetermined prehistoric components. This break-down by site is presented in Table 1.

Evaluation: First, it is necessary to discuss the basis upon which componenty was determined. The assignment to a particular temporal component was based on the presence of temporally diagnostic artifacts. However, these were not always present. Further, there was often the problem of some artifacts being diagnostic of only the broader temporal periods, rather than of specific components within that period.

These difficulties in temporal assignment were most apparent for the Stalling's Island, probable Woodland, Mississippian, and undetermined prehistoric temporal categories. Plain fiber tempered pottery is characteristic of Stalling's Island, but was also rarely utilized during the Mississippian period. Since no artifacts specifically diagnostic of the Mississippian Period were encountered, and decorated fiber tempered ceramics diagnostic of Stalling's Island were, then it was felt likely that those sites containing plain fiber tempered ceramics probably had a Stalling's Island rather than a Mississippian component represented.

The "probable Woodland" category resulted from the lack of diagnostic ceramics that could be attributed to a specific Woodland component (Thom's Creek, Deptford, or Cape Fear). Invariably, these were plain sand tempered ceramics, very similar to the decorated Thom's Creek, Deptford and Cape Fear ceramics encountered, minus the decoration. Thus, with an absence of specifically diagnostic sand tempered ceramics, sites were assigned a "probable Woodland" category. Although plain, sand tempered ceramics are also characteristic of the Mississippian period, the absence of specifically diagnostic Mississippian material, in conjunction with the considerable number of sites having definite Woodland material, made it likely that sites containing sand tempered plain ceramics were Woodland.

Specifically, in terms of Mississippian componenty, or lack thereof, contextual data suggests that the fiber tempered plain and sand tempered plain ceramics recovered during the survey are attributable to the Stalling's Island and Woodland periods, respectively, and not the Mississippian. Similarly, sand tempered plain ceramics with burnished surfaces could be either Mississippian or Colono-Indian. However, the association of these ceramics with Historic sites suggests a
historic rather than a Mississippian context. Thus, based on context, and the lack of artifacts diagnostic of only the Mississippian, it would appear that this period is not represented by the survey data.

The "undetermined prehistoric" category was assigned to those sites containing only lithic debitage. Such material could have been produced during any of the prehistoric periods.

Assuming that our temporal breakdowns are substantially correct, and that the resulting relative frequencies for the various temporal components are a close approximation of relative intensity of use over time, then the testing of this test implication strongly supports the hypothesis. The observed data coincide extremely well with the expected data in that the Woodland period is represented by 70.5% of all the prehistoric components. Even by excluding the "probable Woodland" components, the Woodland period is still represented by 47% of all prehistoric components.

This is particularly noteworthy when one considers that the Archaic and Mississippian periods lasted for approximately 7,000 and 500 years, respectively. The temporally intermediate Woodland period lasted approximately 1500 to 2,000 years. Thus, everything being equal, we would normally expect there to be a much higher combined frequency of Archaic and Mississippian sites in proportion to Woodland sites. With the relatively high frequency of Woodland components, we must conclude that "everything was not equal" and that the Woodland period, as expected, represents the most intensive prehistoric utilization of the inter-riverine zone.

It was also expected that the Middle-Late Woodland period would represent a more intensive utilization of the inter-riverine zone than the Early Woodland. This expectation is supported by Deptford and Cape Fear components comprising 32.3% of the total prehistoric components, in comparison with 14.7% for Thom's Creek.

Although this test implication lends strong support to the hypothesis, a detailed comparison of the Berkeley County data as a whole (Table 5--expected data) with the Amoco data (observed data) is necessary for more specific evaluation. Before presenting this comparative data, however, it should be noted that the Berkeley County data was based on a much longer sample (100 total temporal components) and that only sites whose temporal components could be determined were utilized in the sample. Further, it should be kept in mind that Berkeley County data as a whole may not be entirely indicative of the particular adaptations that took place in a relatively small geographical area, such as the Amoco project area. Based on the information in Table 5, it was expected that the Amoco project survey would yield similar proportions of sites by component.

-60-
The data obtained during the survey largely substantiated this expectation. However, it was not expected that the Middle Archaic would not be represented. Given its relatively low representation in the larger Berkeley County sample, its apparent absence in the Amoco sample may be due to the small sample size.

The Late Archaic/Stalling's Island period, on the other hand, had higher representation in the Amoco sample than was anticipated. This may be due to the particular environmental setting of the project area, in that it is adjacent to the riverine-estuarine zone, which was apparently heavily exploited during this period, as indicated by large estuarine-associated shell middens in the near Coastal sectors (Williams 1968).

In terms of Woodland representation, Thom's Creek (Early Woodland) was very similar, proportionally, in both samples. The Middle-Late Woodland period (Deptford, Wilmington, Cape Fear), however, had considerably higher proportional representation in the Berkeley County sample, whether compared as a whole or by component. In large part, this difference is likely due to the "probable Woodland" components in the Amoco sample.

A comparison of all Woodland components in the Berkeley County sample with all Woodland components in the Amoco sample, including the "probable Woodland" components, yields 76% and 70.5%, respectively, of the total components in each sample. Consequently, assuming that many of the "probable Woodland" components in the Amoco sample are likely Middle-Late Woodland, then it is probable that the Middle-Late Woodland has very similar proportional representation in both samples.

Although the Middle-Late Woodland as a whole is probably very close proportionally in both samples, the absence of Wilmington components (defined on the basis of sherd-tempered ceramics) in the Amoco sample was not expected. The relatively low representation of Wilmington in the Berkeley County sample, and the absence of these components in the Amoco sample, suggests at least some basic differences within the Middle-Late Woodland.

Anderson (1975), has observed that Wilmington sites seem to be relatively restricted to the near coastal sectors and are typically represented by small, shallow, shell midden accumulations. The present survey data and Green and Brooks (n.d.) indicate that Deptford and Cape Fear have a wider distribution and are not spatially restricted to the near coastal areas. However, in areas of spatial overlap, Wilmington settlement patterning is currently indistinguishable from Deptford and Cape Fear (Green and Brooks n.d.). As discussed earlier, the source of Middle-Late Woodland variability is currently unknown, but it is thought not to be entirely temporal.
Based on the Berkeley County sample, it was expected that the Mississippian period would be minimally represented in the Amoco sample; however, its complete apparent absence was not expected. Ferguson (1971, 1973) notes that Mississippian populations were concentrated along river systems with broad floodplain bottomland areas, presumably emphasizing bottomland agriculture. The absence of floodplain bottomland along the Cooper River may account for the apparent lack of Mississippian utilization of the Amoco project area.

T.I.2: Expected Data: It is expected that radiometric dates obtained by coring the Cooper River-Grove Creek marsh will indicate a higher, though possibly fluctuating, sea level during the Woodland period, especially the Middle-Late Woodland, than during earlier prehistoric times. Observed Data: Sixteen Cores were taken from the Grove Creek-Cooper river marsh by Colquhoun and Newman (personal communication). The following discussion is based on their preliminary analysis.

Holocene sediments were deposited within the Cooper River estuary and Grove Creek on an irregular, eroded surface that developed during low stands of sea level associated with Wisconsin glaciations. Basal peats overlain by salt marsh clays (as indicated by their contained clay mineral assemblages; see Colquhoun, et al. 1973 for further discussion) are found immediately above that surface in several locations. In addition, a buried forest composed of cypress stumps is frequently encountered on the Pleistocene basement. Additional peat beds (intercalated peats) deposited in fresh and brackish waters (as indicated by their contained diatom assemblages) are overlain and underlain by Holocene salt marsh clay sequences.

Dates obtained from the brackish basal peats and stumps above relatively compacted tertiary and Pleistocene sediments have provided information indicating the elevation of sea level at the time measured, prior to the invasion of marine water as reflected in the overlying salt marsh clays. Dates obtained from the intercalated peats indicate times of transition from marine to fresh and back to marine conditions.

Examining all these occurrences, with respect to the paleoenvironmental elevations and dates, demonstrates that the marine to fresh-water transition zone in the Cooper River-Grove Creek area has fluctuated with respect to both elevation and time during the last 5,000 years. The data indicate that at 5,000 years B.P., sea level was near -5.0 meters. It rapidly rose to -2.0 meters by 3,500 B.P. From this point it began to drop and reached -2.5 meters by 3,100 B.P. By 2850 B.P., it had risen to about -1.75 meters. It dropped again to -2.0 meters by 2700 B.P. and gradually rose to about -.75 meters by 1,500 B.P.
More simply, there was a generally rising sea level from 5,000 to 1,500 B.P., with fluctuations (low stands) at 3,000 and 2,700 B.P. Data for the time prior to 5,000 B.P. and after 1,500 B.P. could not be obtained from the Cooper River-Grove Creek marsh. It should be obvious, however, that sea level has generally risen .75 meters between 1,500 B.P. and present.

Archeologically, the Middle-Late Woodland in the South Carolina Coastal Plain is thought to have started at about 2,800 B.P. with Deptford, and lasted until about 500 B.P. (South 1976). As expected, this corresponds with a generally rising sea level that, according to our data, was higher than during earlier periods of Holocene prehistory. In terms of the Early Woodland (Thom's Creek), there may be data indicating that sites attributed to this period in the Amoco project area roughly correspond with the high sea level stand between 3,100 and 2,700 B.P.

Evaluation: Based on the above archeological and geological data, the testing of this test implication lends strong support to the hypothesis. Additional support is found in the work of DePratter and Howard (1977). These authors derived similar archeological and geological data from the North Georgia Coast by examining temporal variability in prehistoric settlement patterning in relation to beach ridge accretion rates.
SIGNIFICANCE ASSESSMENT OF ARCHEOLOGICAL SITES
LOCATED DURING THE AMOCO ARCHEOLOGICAL PROJECT

38BK156—This site is significant within the framework of the project research design because of the presence of temporally diagnostic artifacts. In terms of future research this site would likely provide little additional scientific information and future work would not be cost-effective due to the low density of artifacts and previous construction disturbance. No additional archeological study is recommended for this site.

38BK272—This site is significant in terms of future research in that additional surface collection could yield valuable information which would place the prehistoric component of this site within a more precise temporal framework. However, due to the low density of artifacts it is felt that further study would not be cost-effective. Therefore, no archeological study is recommended for this site.

38BK273—This site is significant within the framework of the project research design because of the presence of temporally diagnostic material. In terms of future research, however, this site has little potential for containing additional valuable scientific information due to the low density of artifacts and previous construction disturbance. Therefore, no additional archeological study is recommended for this site.

38BK274—This site is significant within the framework of the project research design because of the presence of temporally diagnostic material. In terms of future archeological research, however, this site has little potential for providing additional valuable scientific data due to the low density of artifacts and previous construction disturbance. Therefore, no additional archeological study is recommended for this site.

38BK315—This site is significant within the framework of future research in that additional work could yield valuable scientific information pertaining to temporal refinement. This would allow for more accurate testing of the subsistence-settlement model developed for the project area and would supply useful data for future archeological study. However, due to the low density of artifacts and lack of good ground surface visibility outside of the road cut, it is felt that additional work would not be cost-effective. Therefore, no further archeological study is recommended for this site.

38BK316—This site is significant within the framework of future research in that additional study could yield valuable scientific information pertaining to temporal refinement. This would allow for more accurate testing of the subsistence-settlement model developed for the project area and would supply useful data for future archeological study. However, due to the low density of artifacts and lack of good ground surface visibility outside of the road cut, it is felt that additional work would not be cost-effective. Therefore, no further archeological study is recommended for this site.
38BK317--This site is significant within the framework of future research in that additional study could yield valuable scientific information pertaining to temporal refinement. This would allow for more accurate testing of the subsistence-settlement model developed for the project area and would supply useful data for future archeological study. However, due to the low density of artifacts and lack of good ground surface visibility outside of the road cut it is felt that additional work would not be cost-effective. Therefore no further archeological study is recommended for this site.

38BK318--This site is significant within the framework of future research in that additional study could yield valuable scientific information pertaining to temporal refinement. This would allow for determination of the temporal relationship between the historic and possible prehistoric material. Further study would also allow for more accurate testing of the subsistence-settlement model developed for the project area, and would supply useful data for future archeological study. However, due to the low density of artifacts and to the lack of good ground surface visibility outside of the road cut, it is felt that additional work would not be cost-effective. Therefore, no additional archeological study is recommended for this site.

38BK319--This site is significant within the framework of future archeological research in that additional study could yield valuable scientific information pertaining to temporal refinement. This would allow for more accurate testing of the subsistence-settlement model developed for the project area and would supply useful data for future study. However, due to the low density of artifacts it is felt that additional work would not be cost-effective. Therefore, no additional archeological study is recommended for this site.

38BK323--This site is significant within the framework of future archeological research in that additional study could yield valuable scientific information pertaining to temporal refinement. This would allow for more accurate testing of the subsistence-settlement model developed for the project area and would supply useful data for future study. However, due to the lack of any ground surface visibility in the site area and to the low density of artifacts, it is felt that additional study would not be cost-effective. Therefore, no additional archeological study is recommended for this site.

38BK324--This site is significant within the framework of the project research design because of the presence of temporally diagnostic material. In terms of future research, however, this site has little potential for additional valuable scientific information due to the low density of artifacts. Therefore, no additional archeological study is recommended for this site.

38BK325--This site is significant within the framework of the project research design because of the presence of temporally diagnostic material. In terms of future research, however, this site has little potential for possessing additional valuable scientific information due to the low density of artifacts and previous construction disturbance. Therefore, no additional archeological study is recommended for this site.
38BK326—This site is significant within the framework of future archeological study in that additional testing could yield valuable information pertaining to temporal refinement. This would help determine the temporal relationship between the historic and possible prehistoric components. Additional testing would also help determine the relationship between this site and other historic sites in the project area. However, it is not within the scope of this report to evaluate the historic cultural resources in the project area. Therefore, additional study at this site should be included in a comprehensive study of the historic sites in the area.

38BK327—This site is significant within the framework of future archeological study in that additional surface collection could yield valuable scientific information pertaining to temporal refinement. This would allow for more accurate testing to the subsistence-settlement model developed for the project area and would supply useful data for future research. However, due to the location of this site outside of Amoco property, no additional study is recommended for this site.

38BK331—This site is significant within the framework of the project research design because of the presence of temporally diagnostic material. Additional study at this site could possibly yield additional valuable data; however, due to the location of this site outside of the Amoco property, no additional archeological study is recommended.

38BK332—This site is significant within the framework of future research in that additional study could yield valuable scientific information pertaining to refinement. This would allow for more accurate testing of the subsistence-settlement model developed for the project area and would supply useful data for future archeological study. However, due to the location of this site outside of Amoco property, no additional archeological study is recommended.

38BK333—This site is significant within the framework of the project research design because of the presence of temporally diagnostic material. Additional study at this site could potentially yield valuable scientific information pertaining to establishment of more accurate temporal and functional relationships between this and other prehistoric sites in the area. However, due to the location of this site outside of Amoco property, no additional study is recommended for this site.

38BK334—This site is significant within the framework of the project research design because of the presence of temporally diagnostic material. Additional study at this site could potentially yield valuable scientific data pertaining to site function and site variability. Due to the high density of artifacts at this site additional intensive testing is recommended.

38BK335—While this site is not significant within the framework of the project research design, additional study could yield significant scientific data pertaining to the historic background of the area. No additional study is recommended for this site specifically; however, any comprehensive study of the historic sites in the project area should include consideration of this site.
38BK336—This site is significant within the framework of the project research design because of the presence of temporally diagnostic material. Additional study at this site could potentially yield valuable scientific data pertaining to site function and site variability. Due to the high density of artifacts at this site additional intensive testing is recommended.

38BK337—This site is significant within the framework of future archeological research in that additional study could yield valuable scientific information pertaining to a more accurate determination of the temporal relationship between the historic and possible prehistoric components. Additional study could also help determine the relationship of this site to 38BK197 located nearby and to other historic sites in the project area. However, it is not within the scope of this report to evaluate the historic cultural resources in the project area. Therefore, any additional study at this site should be included in a comprehensive study of the historic sites within the project area.

38BK338—This site is significant within the framework of the project research design because of the presence of temporally diagnostic artifacts. In terms of future research, however, this site would likely provide little additional scientific information and future archeological study would not be cost-effective due to the low density of artifacts. Therefore, no additional archeological study is recommended for this site.

38BK343—This site is significant within the framework of future archeological research in that additional study could yield valuable scientific information pertaining to temporal refinement. This would allow for more accurate testing of the subsistence-settlement model developed for the project area and could supply useful data for future research. However, due to the low density of artifacts and to the lack of good ground surface visibility outside of the firebreak, it is felt that additional work would not be cost-effective. Therefore, no further archeological study is recommended for this site.
CONCLUSIONS AND RECOMMENDATIONS

Conclusions and Recommendations for Future Research

The evaluation of the test implications, based on a comparison of expected and observed data indicates that both hypotheses are probably substantially correct, in that all the test implications tend to support the hypotheses, although some lend stronger support than others. However, the evaluation of the test implications, and hence the hypotheses, indicates that in many instances the observed data did not coincide with the expected data. This is usually the case and was expected. It is through the resulting third body of data, which is essentially the difference between the expected and observed data, that research proceeds. That is, the third body of data suggests future research directions necessary for potentially explaining the apparent discrepancies between the two data sets. In this way, through continuing research, our explanations for the prehistoric utilization of the inter-riverine zone of the interior Lower Coastal Plain will become more refined as the "gap narrows" between the expected and observed data.

Consequently, with the above in mind, the following recommendations are offered for future Lower Coastal Plain research. These are:

(1) The hypotheses will have to be modified slightly to better take into account local environmental variability from one area to another within the interior Lower Coastal Plain.

(2) In order to further substantiate and enhance the explanatory power of the hypotheses, additional test implications should be deduced so that the hypotheses may be tested utilizing other lines of data. For example, given the hypotheses that the inter-riverine zone was utilized primarily for the procurement of acorns, hickory nuts and deer, we would expect that pollen data obtained from sites where nuts were procured would indicate relatively high densities of oak and hickory.

(3) The construction of detailed sea level curves is needed in order to better examine environmental variability through time. This is essential if we are to explain prehistoric adaptation as a process involving a continuous adjustment to changes in resource variability and productivity over time.

(4) Similarly, pollen curves are needed specifically for the interior Lower Coastal Plain of South Carolina. Although these pollen curves would be generally useful for environmental reconstruction, they are especially needed to demonstrate that changes in the oak-hickory forest structure occurring elsewhere in the southeastern United States also occurred in the South Carolina Lower Coastal Plain. This is especially critical, given the hypothesis that the inter-riverine zone was exploited primarily for oak, hickory and deer, but that prehistoric exploitive patterns changed over time, partly due to a changing oak-hickory forest structure that resulted from sea level variability.
(5) Precise dates need to be obtained for both archeological and environmental data. This includes obtaining radiometric dates for deposits containing "temporally diagnostic" artifacts that have been cross-dated from Georgia and South Carolina. Precise dates for both archeological and environmental data are necessary if we are to adequately examine prehistoric change in terms of environmental variability through time.

(6) In conjunction with precise dating, new typologies need to be constructed and existing ones refined. In this way many sites that do not contain radiometrically datable material, and are currently classified as "undetermined prehistoric" or "probably Woodland," may be firmly dated.

(7) Since most inter-riverine zone sites are generally characterized by relatively low densities of archeological material and usually occur in heavily forested areas, survey methods for purposes of site discovery must be designed with these factors in mind. Methods adequate for discovering most low density sites should also be capable of detecting higher artifact density sites.

(8) In line with our research concerns, more precise data need to be collected in order to better determine the extent and variability of archeological sites discovered. This will necessarily involve more appropriate subsurface sampling strategies in heavily forested areas.

(9) Finally, although soil type seems to be a good general predictor for the presence of prehistoric sites, other variables that can be linked to theory concerning those factors that strongly conditioned temporal and spatial variability in settlement patterning need to be isolated. Only in this way can we hope to understand the broader aspects of prehistoric behavioral systems and their change through time.

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Recommendations for Cultural Resource Management

Before proceeding, the criteria for the recommendations should be discussed. Essentially, the recommendations are based on two broadly related considerations. These are (1) the significance of the cultural resources in terms of the information they can provide that will be of interest to both the public and the scientific community and, (2) the feasibility or cost-effectiveness of obtaining that information. Therefore, it should be obvious that recommendations ultimately hinge upon what is considered to be significant information. Since the concern of this report is primarily for the prehistoric cultural resources, information of public interest is not a concern, since these are all "low-visibility" resources. Consequently, the greatest potential of these resources is the information they can contribute to science and history. However, when dealing with prehistory, there are no documents to draw upon for synthesis. Therefore, history must be derived through scientific inquiry.
Within this broad framework of scientific inquiry, however, the significance of prehistoric cultural resources must still be evaluated in terms of their potential for yielding information of interest. As such, an assessment of significance is ultimately based on the research interests of the archaeological community in general, and specifically on the particular research interest of a given archaeologist.

With this in mind, the significance of, and recommendation for the cultural resources discovered and examined during this survey, will be based largely on their potential for providing additional information in line with the research undertaken in this report, and outlined in the previous section on Recommendations for Future Research.

In terms of the project area as a whole, our research suggests that other similar sites may be present in the area, but are hidden by the heavy vegetation. Our research indicates a correlation between prehistoric sites and the well to moderately well drained soils. It is recognized that future development activities may impact on these same areas. Therefore, it is recommended that an intensive survey be conducted prior to the start of construction activities of these specific sites identified as having the potential for yielding additional data. Further, given the relatively small size and low artifact density of other potential sites in conjunction with the difficulties in detecting them through subsurface testing in heavily vegetated areas, it is probable that additional intensive survey would not detect additional sites. It is possible that sites could be found once the trees and vegetation are cleared for construction. A surface investigation should be considered of those areas having a very high probability of containing prehistorical sites.

Twenty-nine sites have been recorded in the project area. Five of these are Historic Period sites recorded by Dr. Elaine Herold (38BK197-38BK201). The significance and recommendations for these sites can be found in Dr. Herold's report. Five prehistoric sites (38BK327, 38BK330-38BK333) were discovered during this survey on Georgia Pacific property immediately outside the project area. One of these sites, 38BK333, is largely on Georgia Pacific Property, but extends into the project area and is likely related in some way to sites 38BK336, 38BK338 and 38BK343. Of these five sites, 38BK330, 38BK331 and 38BK333 are significant in terms of the data they have already provided for this research, such as the correlation between prehistoric sites and soil types, temporal data, comparative data through estimates of site size, site artifact density, site artifact diversity and site function. Additional work at these sites could provide a refinement of these data in addition to providing necessary environmental data. Other data recovered from these sites could be instrumental in isolating variables other than soils that strongly conditioned prehistoric settlement in the inter-riverine zone through time. Another important potential contribution of these sites is that they could be utilized for developing more refined survey methods for discovering and defining low artifact density sites in heavily vegetated areas. In spite of the potential of these sites for yielding additional valuable information in line with our research directions, however, it is felt that it would not be cost-effective to recover this information from sites 38BK331 and 38BK333 because the low density of
archeological material at these sites suggests that intensive subsurface testing would be necessary. Similarly, additional surface collecting would not likely contribute significantly to the data already in hand. Therefore, no additional work is recommended at these two sites.

Site 38BK330, on the other hand, does have sufficient density of archeological material to make subsurface testing at this site cost-effective and could, in addition to the above information, provide especially valuable information on internal site variability. Also, as discussed earlier, it was not expected that sites such as this, exhibiting evidence of intensive utilization, would be found in this particular location. Consequently, additional work at this site could aid in resolving this apparent discrepancy. Further, the density and diversity of material which suggests a fairly intensive utilization of this site, indicate that features such as hearths could be present and radiometrically dated. Additional surface collecting, however, would not likely contribute greatly to the available information. Regardless of the considerable potential of this site for contributing significant information to ongoing Lower Coastal Plain research, recommendations for future work at this site cannot be legitimately made at this time, due to its location on Georgia Pacific property.

The remaining two sites on Georgia Pacific property (38BK327 and 38BK332) have the potential of yielding the same types of information as the other three sites. Although unlike 38BK330, features would not be expected at these sites due to the low density of archeological material and low artifact diversity, suggesting low intensity of utilization. Given the low density of archeological material at these sites, subsurface testing would not likely be cost-effective for obtaining additional information. Unlike the other three sites no "temporally diagnostic" artifacts were recovered from these two sites during surface collecting. Consequently, additional surface collecting may yield such information. Therefore, the significance of these sites rests upon the data they have already contributed to this research and the possibility that they could yield "temporally diagnostic" artifacts. No recommendation for future work will be made for these two sites at this time.

For the nineteen additional sites within the project area, it is recommended that they be avoided if at all possible. In the event that this is not feasible, the following recommendations are made, based on an assessment of site significance in line with the research undertaken in this report. As indicated previously, all of these sites may be considered significant in terms of the information they have already provided; however, depending on the particular type of data being collected, some of the sites provided better, or more reliable, information than others. This is taken as being indicative of the potential of each site for providing certain kinds of additional information pertinent to present research and the future research directions recommended. Consequently the significance of the sites, and hence recommendations, will be based on the potential of each site for providing the desired additional information.
In order to avoid repetition in the following presentation, these nineteen sites will be discussed as groups of sites. The Historic sites with possible prehistoric components will comprise one major group, with the other group consisting of the prehistoric sites. Each of these groups will be further broken down and grouped according to their significance in terms of their potential for providing additional research information, and according to recommendations. Due to the "unique" nature of a few of the sites, however, they will have to be discussed specifically.

Sites 38BK272 (Woods 1978), 38BK318, 38BK326, 38BK335 and 38BK337, represent late 18th-early 19th century utilization of the area. Colono-Indian and/or possibly prehistoric material was also present at these sites. From the standpoint of the Historic Period, it is difficult to assess the significance of these sites in the absence of a research design specifically addressing research problems pertaining to this period. Consequently, it can only be recommended at this time that these five sites be included in a comprehensive study of the Historic Period Cultural resources in the project area. One possible research question, for example, may involve the socio-economic relationships between European and aboriginal populations in the area during the Historic Period. The possible Colono-Indian material from sites 38BK326, 38BK335 and 38BK337 may make these sites significant for their potential for providing information pertinent to this question.

In terms of the possible prehistoric material from sites 38BK272 and 38BK318, however, assuming that the plain sand tempered ceramics (non-hurnished surfaces) represent prehistoric utilization (probably Woodland) rather than Colono-Indian period economics, these sites may yield "temporally diagnostic" artifacts that would be significant in terms of that aspect of our research dealing specifically with variability in the utilization of the inter-riverine zone through time. However, given the disturbed nature of 38BK272, and the low density of archeological material at this site and at 38BK318, it is felt that additional subsurface testing or surface collections would not likely yield this information. Therefore, no additional work is recommended for these sites.

Of the pure prehistoric sites, no additional work is recommended for 38BK315, 38BK316, 38BK317, 38BK319, 38BK156 (Hartley and Stephenson 1975), 38BK273 and 38BK274 (Woods 1977), 38BK323, 38BK324, 38BK325, 38BK338 and 38BK343. All of these sites are significant from the perspective of the information they have already provided for this research. However, due to the heavily disturbed nature of all of these sites, with the exception of 38BK323, which was discovered during subsurface testing in Phase II of the survey in a heavily vegetated area, and the low artifact density of all of them, it is not felt that additional surface collecting or subsurface testing at these sites would be cost-effective in obtaining additional information in line with this research and the recommendations for future research, even though the potential for such information does exist.
The remaining two, pure prehistoric sites are 38BK334 and 38BK336. Site 38BK334 is predominantly of the Stalling's Island period, with 38BK336 being of the Deptford/Cape Fear Period. Subsurface testing at these sites indicated that they both contain relatively high densities of archeological material. These sites are considered highly significant for the information they have already provided and for their considerable potential for providing additional information in line with this and future research. The relatively high densities of material at these sites and their relatively intact conditions, suggests that they would be particularly well suited for providing information that would enable us to accurately determine their extent and internal variability. Such information would be invaluable for further testing the hypothesis that these sites functioned as nut extraction/deer hunting camps. Similarly it is felt that an examination of internal variability should enable us to isolate specific activity loci within these sites. The density of material at these two sites further indicates that it would be cost-effective to obtain this information.

Along similar lines, it is also felt that these sites are well suited for experimenting with different subsurface sampling strategies, so that more refined surveying techniques may be developed for discovering and examining sites such as these, in heavily vegetated areas of the inter-riverine zone of the interior Lower Coastal Plain. By accurately determining the extent and internal variability of these two sites, we should be in a position to devise more refined surveying methods to be used in the future when dealing with sites such as these, and, low-density sites, assuming that the function of most of the low-density sites was similar to these two sites, and, that their internal structure is similar. Evidence provided earlier in the report supports this view, in that it suggests that the function of most inter-riverine zone sites was basically the same, with the major difference in the sites reflecting primarily intensity of use. Consequently, if this is essentially correct, then an intensive examination of sites 38BK334 and 38BK336 should put us in a much better position in the future to deal with the more numerous low density sites.

The available temporal data from these sites, and the density of material suggest that they were utilized rather intensively for a relative short period of time. This indicates the potential for obtaining other valuable research data from these sites.

First, the intensity of use of these sites suggests the possibility of features, such as hearths, which could be radiometrically dated. Consequently, given the relatively short duration of use of these sites, there is the possibility for obtaining accurate dates for Stalling's Island and Deptford/Cape Fear utilization of the area. With such dates, in conjunction with the dates being obtained from Cooper River/Grove Creek sediments and Cypress stumps, it would also be possible to reliably test the hypothesized relationship between changes in sea level and change through time in the utilization of the inter-riverine areas.

Second, the apparent utilization of 38BK336 during only the Deptford/Cape Fear period suggests that this site may be ideal for examining the Deptford-Wilmington-Cape Fear problem discussed earlier. Although this
problem was not specifically mentioned in the section on Recommendations for Future Research, the nature of this relationship, which is currently defined solely on the basis of various ceramic associations and distributions in the Lower Coastal Plain, will have to be determined if Lower Coastal Plain archeological research is to adequately address problems pertaining to the prehistoric utilization of this area over time.

One final factor that greatly enhances the significance of these sites should be stressed. Unlike many, or most of the known sites in the project area 38BK334 and 38BK336 appear to be fairly intact and exhibit minimal disturbance. It is largely because of this factor that these sites should yield reliable archeological and environmental data. Although the potential of these sites for yielding archeological data has been stressed, their fairly intact condition suggest that reliable environmental data, such as pollen, could also be obtained for purposes discussed in the Recommendations for Future Research.

Based on the previous discussion, it is felt that both these sites might be eligible for consideration as potential nominees for placement on the National Register of Historic Places. This suggestion is made primarily for planning purposes and not as an actual recommendation. The intent being to assure the preservation or the mitigation of any disturbance caused by proposed construction through subsurface testing and investigation.

In terms of the 29 sites discussed, five of these are Historic (38BK197-201) and were recorded by Dr. Elaine Herold. Recommendations for these sites may be found in Herold, Knick and Liss (1978). Five additional prehistoric sites (38BK327, 38BK330, 38BK331, 38BK332 and 38BK333), were discovered on Georgia Pacific property during this survey. Due to their location, no recommendations have been made.

Of the nineteen remaining sites in the project area, sites 38BK272, 38BK318, 38BK326, 38BK335 and 38BK337 represent Late 18th-Early 19th century utilization of the area. Although no specific recommendations have been made for these sites, it is recommended that they be included in a comprehensive study of the historic utilization of the area. Sites 38BK272 and 38BK318 may also have prehistoric components represented; however, because of disturbance or low artifact densities no additional work is recommended.

Of the pure prehistoric sites in the project area, no further work is recommended at 38BK315, 38BK316, 38BK317, 38BK319, 38BK156, 38BK273, 38BK274, 38BK323, 38BK324, 38BK325, 38BK338 and 38BK343. It is recommended that sites 38BK334 and 38BK336 be avoided by construction and preserved. If this is not possible, it is recommended that each site should be intensively tested.
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