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WOODLAND OCCUPATION IN THE UPPER COASTAL PLAIN OF SOUTH CAROLINA: AN ARCHEOLOGICAL RECONNAISSANCE OF THE CAROLINA POWER AND LIGHT COMPANY'S LAKE ROBINSON TO SUMTER 230 kV TRANSMISSION LINE CORRIDOR
by Veletta Canouts, Michael A. Harmon, and William H. Monteith

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by

Veletta Canouts, Michael A. Harmon and William H. Monteith

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ACKNOWLEDGMENTS

A number of dedicated individuals cooperated to enhance the quality of the field survey and the final report. Their efforts are gratefully acknowledged.

Lynne Peters designed and executed the survey strategy. Her skill and experience ensured project continuity throughout, though she was only able to supervise the field phase.

Bill Monteith deserves a special thanks for his assistance both in the field and the laboratory. His tasks were many: shoveling testing in dense coverage during the hottest part of summer; analyzing the artifacts; processing field records; drafting the environmental description and transect data; and reviewing the Woodland site data.

Mike Harmon guided the analytical phase. He wrote the predictive model research design that is being used for transmission line studies. His historical expertise proved especially valuable in writing the historic background and identifying the artifacts.

Survey site file data being compiled on regional basis were also helpful. Several individuals contributed: Ken Sassaman, Paul Graham, and Kristen Stevens compiled site data from the Coastal Plain counties for the Savannah River Plant Archeological Research Program, and Jim Sexton and Dick Taylor programmed a computer-assisted site inventory for the Piedmont Synthesis, sponsored by the South Carolina Department of Archives and History.

The cumulative talent and effort that the entire Institute staff has brought to bear on problems in South Carolina archaeology are also recognized, both personally and in the referenced works.

Technical assistance in preparing this report was provided by Gordon Brown, photographer; Darby Erd, draftsman; Kenn Pinson and Sharon Merck, editorial production.
INTRODUCTION

Under contract with the Carolina Power and Light Company, the Institute of Archeology and Anthropology conducted an archeological reconnaissance survey of the proposed 230 kV transmission line from the Lake Robinson power plant to Sumter, South Carolina (Fig. 1). Since the project involves secondary impacts, which will result when an existing 115 kV transmission line is rebuilt to carry 230 kilovolts, the company's assessment was limited in scope. However, the original transmission line corridor had never been surveyed archeologically, and not only secondary but primary impacts caused by this and the original project were a consideration. In the absence of pertinent federal or state regulations, both parties agreed to a one week field reconnaissance. Even though a reconnaissance survey cannot assess fully the project's potentially adverse effects on the archeological resources without a previous survey, it can provide an opportunity to record a portion of the available archeological data which will contribute to a better understanding of prehistoric and historic activity patterns in this area of South Carolina.

The transmission line corridor extends for 39 miles (ca. 62 km) through the interior Coastal Plain. Lynne Peters, assisted by William Monteith, surveyed approximately ten linear miles (ca. 16 km) in four 10-hour days, from July 15 through July 18, 1980. Dividing the corridor into half-mile (805 m) long segments, 100 feet (30.5 m) in width, Peters randomly selected 20 segments for a 25% sample. Except for the drainage areas, the corridor was easily traversed and required minimal shovel testing. One of these segments was only partially completed and another was not shovel probed adequately due to poor ground conditions and time constraints. Survey coverage averaged approximately 13.5 (5.25 ha) acres per person day.

Trending generally south-southwest, the transmission line corridor transects several drainages at oblique angles (Fig. 2). Almost all of the tillable lands are under cultivation. The two most distinguishable, uncultivated, geomorphological features are the swamps and the Carolina Bays. The corridor aligns with the Fall Line, a distinctive ecological transition zone between the Piedmont and the Coastal Plain. Whether the adaptive implications, e.g., high resource diversity and low resource abundance, hypothesized for the Fall Line zone extend to the corridor's sandhills environment is unclear. Fortunately, the random sample gave dispersed coverage along the line without resorting to systematic sampling intervals. The transmission line, then, is essentially a random vector along which random units were selected for survey.
FIGURE 1. Lake Robinson power plant with site 38DA48 in foreground, looking north.
Six archeological sites and three isolated finds were recorded during the survey; one additional site had been previously recorded in the transmission line corridor (Fig. 3; Table 1). Such limited materials do not conform to the survey evidence found at either end of the survey. Nine sherd and lithic scatters, representing several prehistoric periods, were recorded near Lake Robinson along S.C. Highway Route 151 (Cable and Cantley 1979). Seven upland archeological sites were recorded by James Michie (1979) during a survey of a sewerline spur south of the city of Sumter. The higher number of sites from these surveys may be attributable to alignments which parallel drainages for longer distances than this transmission line corridor which cross-cuts the drainages.

All of the archeological sites can potentially contribute information for formulating subsistence-settlement models for this area. The four prehistoric sites might be termed temporary camps or limited activity sites, the result of a single event or specialized hunting and gathering activities which leave little trace in the archeological record. The importance of small surface sites in understanding the nature and range of prehistoric behavioral patterns, especially those relating to subsistence activities, cannot be underestimated (Talmage and others 1977:12). The two historic sites near Rocky Bluff Swamp probably represent sharecropper/tenant farmer occupations. These groups have been the focus of recent rural studies by folklorists.

The sites have been collected and recorded in the South Carolina Statewide Archeological Site Inventory files maintained by the Institute of Archeology and Anthropology. These collected data will form a basis for predicting future site locations and site types. As more information is gathered, the predictive capabilities will increase.

Archeological evidence of past human behavior consists primarily of surface structures, artifacts, and subsurface features. Much of what is known about activities in the past comes from studying the fragile patterning of these physical remains. Thus, severe impact to the ground surface through land modification, construction, and construction-related activities has an adverse effect on the information potential of archeological data.

On the basis of this survey's findings, the occurrence of other probably similar sites may be inferred. The fact that transmission line poles are placed at regular intervals (here, 700 feet or 213 m), which may not correspond to archeological site occurrence suggests, that an undetermined number of sites would be available for future investigation. Unfortunately, their information content will be correlated negatively with the degree of disturbance they experience. Disturbance from the construction of the transmission line will prove variable. Although archeologists are continually improving their data recovery capabilities in disturbed sites, a great deal of information
FIGURE 3. Map of archeological resources located along the Lake Robinson to Sumter 230 kV transmission line corridor.
### Table 1. Archeological resources located in the Lake Robinson to Sumter 230 kV transmission line corridor

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Description</th>
<th>Site Dimensions</th>
<th>Relative Artifact Density</th>
<th>Surface Visibility</th>
<th>Transmission Right-of-Way Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>38SU31</td>
<td>Historic artifacts cover the crest of a low ridge above Rocky Bluff swamp, west of an abandoned farmhouse. Glass, whiteware and porcelain sherds were collected.</td>
<td>100 m N-S x 10 m E-W</td>
<td>Sparse</td>
<td>76-100%</td>
<td>Soybean field</td>
</tr>
<tr>
<td>38SU32</td>
<td>Several whiteware and porcelain sherds were found lying on the slope of a low rise above Rocky Bluff swamp.</td>
<td>50 m N-S x 15 m E-W</td>
<td>Moderate</td>
<td>1-25%</td>
<td>Scrub</td>
</tr>
<tr>
<td>38LE91</td>
<td>Prehistoric ceramics and lithics and some historic debris cover a ridge above Scape Ore swamp. Prehistoric artifacts include cord marked and check stamped pottery; orthoquartzite, quartz and chert flakes; and a quartz biface (Caraway?). A yellow ware rim sherd and pink annular white ware were collected along with other whiteware and brick fragments.</td>
<td>70 m N-S x 50 m E-W</td>
<td>Sparse</td>
<td>76-100%</td>
<td>Soybean field</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Site Number</th>
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<th>Relative Artifact Density</th>
<th>Surface Visibility</th>
<th>Transmission Right-of-way Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>38LE92</td>
<td>A lithic scatter is located on a terrace above the Lynches River floodplain. One weathered sherd was found with several rhyolite and quartz flakes and one rhyolite biface (Yadkin?)</td>
<td>25 m N-S x 10 m E-W</td>
<td>Sparse</td>
<td>51-75%</td>
<td>Cornfield</td>
</tr>
<tr>
<td>38DA35</td>
<td>Several quartz, rhyolite and chert flakes and three biface fragments were located in the sandy bottomland along Beaverdam Creek.</td>
<td>?</td>
<td>Moderate</td>
<td>10-50%</td>
<td>Rye field</td>
</tr>
<tr>
<td>38DA47</td>
<td>A sherd and lithic scatter occurs on a ridge slope above Beaverdam Creek. Included in the artifact collection are several cord marked, fabric impressed and plain sherds; basalt, chert, rhyolite and quartz flakes; and a biface (Yadkin?)</td>
<td>50 m N-S x 30 m E-W</td>
<td>Moderate</td>
<td>1-25%</td>
<td>East edge of centerline</td>
</tr>
<tr>
<td>Site Number</td>
<td>Description</td>
<td>Site Dimensions</td>
<td>Relative Artifact Density</td>
<td>Surface Visibility</td>
<td>Transmission Right-of-way Position</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>---------------------------</td>
<td>-------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>38DA48</td>
<td>A light scatter of historic materials occurs at the crest of a ridge above Black Creek. Plain and decorated whiteware, green glass, and a kaolin pipestem fragment were among the several artifacts recovered from the site.</td>
<td>15 m N-S x 5 m E-W</td>
<td>Sparse</td>
<td>51-75%</td>
<td>Pine trees and scrub oaks</td>
</tr>
<tr>
<td>IF-1</td>
<td>Historic find spot on unnamed tributary of Scape Ore swamp: one brown/cream stoneware jug fragment.</td>
<td></td>
<td></td>
<td>75%</td>
<td>Centerline</td>
</tr>
<tr>
<td>IF-2</td>
<td>Historic find spot on unnamed tributary of Scape Ore swamp: brown/cream stoneware fragment.</td>
<td></td>
<td></td>
<td>75%</td>
<td>Centerline</td>
</tr>
<tr>
<td>IF-3</td>
<td>Two lithic flakes and a biface fragment were located on an unnamed tributary of Beaverdam Creek.</td>
<td></td>
<td></td>
<td>10-20%</td>
<td>West edge of centerline</td>
</tr>
</tbody>
</table>
affected by bulldozing and clearing operations, machine damage, and subsurface excavations will, in effect, be irretrievably lost.

In summary, the rebuilding of an existing line will have a relatively less cumulative impact on the total archeological resource base. The data generated by these sites should prove valuable in future considerations of the archeological record in the vicinity of the project area.
Introduction

The Institute of Archeology and Anthropology, University of South Carolina, contracted with the Carolina Power and Light Company to conduct an archeological reconnaissance of the existing Lake Robinson to Sumter 115 kv transmission line corridor which the company proposes to redesign for a larger capability. This study is part of the Institute's cultural resource management program which is developing predictive models of site occurrence. Management depends upon understanding the affected resources. Better data lead to better understanding and, thus, better decision-making. Yet data gathering is often limited by lack of time and funding. In trying to overcome these limitations, probabilistic models are used to estimate population parameters of the resources under consideration.

Although archeologists who are familiar with a geographic area can often pinpoint, with great accuracy, probable site locations, their judgements are based on subjective expertise and not upon probabilistic statements or references to behavioral processes that can be independently tested and assessed. Archeologists are now beginning to quantify the archeological record in terms of site locations, site types, site frequencies, socio-cultural and temporal affiliations, and assemblage densities. This quantification serves to generate probabilistic sampling strategies which, in turn, test further the predictive capabilities of the models.

Unfortunately, archeological data are highly skewed. Representing the transformed evidence of past human behavior, site variables do not correlate with environmental or social variables on a one-to-one basis, at least at the present level of sophistication. Other models of subsistence, settlement, and social and economic interaction must necessarily complement and explain the patterns in the predictive models, which are now being formulated at the most general level of presence and absence data. Eventually, the archeological patterning will become more meaningful as the substantive data are fitted into more detailed explanatory models.

The Project Design

A linear transmission line extends for a distance of approximately 62 km between the power plant at Lake Robinson and Sumter, South Carolina. This 21-meter (70-foot) wide corridor was cleared for construction and maintenance of the present 115 kV
transmission line. Rebuilding this line will involve expansion of the corridor, new tower poles, and new lines.

Transmission line construction involves both direct and indirect impacts to archeological resources (see Smith 1977:23; Brockington 1977: 3ff.). Direct impacts occurring during construction include disturbance of the ground through clearing, diskng, and moving heavy equipment. Indirect impacts include increased pedestrian traffic, vandalism, long-term erosion, maintenance activities, and future development of the area indirectly attributable to the presence of these facilities.

Since approximately 30 km (19 mi) of the corridor are now under cultivation, 32 km (20 mi) or 26 ha (65 acres) must be cleared of vegetation (David Roberts, personal communication). Clearing operations will disturb any sites occurring wholly or partially in the 4.5-meter to 6-meter (15-foot to 20-foot) widths paralleling the present corridor. Trees will be cut to about 10 cm (4 in) above the ground surface and piled into windbreaks by bulldozers. No stump uprooting, which would cause heavy destruction, is anticipated, however. Construction work around the new towers is expected to affect between 93 to 139.5 sq m (1,000 to 1,500 sq ft), maximum acreage about 2 ha (five acres; David Roberts, personal communication).

Sites which have undergone plowing or clearing already have been disturbed to some extent. Disturbance of these sites by projects such as a transmission line reconstruction has been considered only recently (e.g., Canouts 1980; Harmon 1980b), and archeological studies are now being conducted to document the degree of direct impact caused by new transmission line construction (Canouts 1981). Because a good portion of the impact is indirect, it remains difficult to qualify and quantify all the effects.

Research Design: A Predictive Model

The research design for this phase of the proposed Lake Robinson to Sumter 230 kV transmission line centers largely upon the development and refinement of a predictive model of site location. The primary function of the model at this early stage is to identify those aspects of the archeological data base that would be most frequently impacted by construction of transmission lines in the upper and middle Coastal Plain of South Carolina. A similar locational model was recently developed and tested, with promising results, in central South Carolina (Harmon 1980a). Many separate stages of testing, comparison, and refinement are required to ascertain the validity of predictive models.

Developing a tentative predictive model as a research design is a useful way of assimilating and expanding the data from pre-
vious archeological surveys and studies. Environmental impact studies have often been criticized for their frequently short-term goals. This model uses data from four environmental impact studies (Ferguson 1976; House and Ballenger 1976; Brooks and Scurry 1978; Harmon 1980a) to establish patterns within the archeological record. Predictive models are useful devices for testing the occurrence of these patterns, which reflect underlying regularities in prehistoric and historic cultural systems.

When thoroughly tested, predictive models can begin to assess the degree of archeological impact which construction will have in a particular area. This predictive capability increases the effectiveness of the sampling methods, which may be employed where 100% survey coverage is not feasible, and facilitates early planning toward the lessening of adverse impacts upon the archeological data base.

A predictive model of site types which will be most frequently impacted by sewerline construction in central South Carolina (Harmon 1980a) will be used to aid the design of a similar model concerned with transmission line construction. Transmission lines and sewerlines differ in four major ways, however.

A major distinction between these two forms of construction and their associated impacts is that sewerlines are more often built in close proximity to drainages. Following drainage channels is generally the most economical method by which free flow gravitational sewerlines can be installed. Direct impact occurs within the 3 m maximum width channel in which the pipe is laid. Other impacts within the 15 m indirect impact zone occur primarily in the form of equipment access and storage points, clearing operations and increased erosion, and greater susceptibility of the archeological materials to amateur artifact collectors.

Transmission lines do not necessarily follow drainages. Instead, the corridors commonly cross drainages of various ranks, since most transmission lines built in this state link various cities and towns to one another. For instance, the Lake Robinson to Sumter line will run from the generating station at Lake Robinson to Bishopville and then into and around Sumter. The impact zone of the corridor will be approximately 30.5 m wide. Smith (1977:23) has outlined four transmission line impacts which are listed in decreasing order of their effects on archeological sites:

(1) the use of power equipment in the clearing of woody vegetation, (2) road building and general improvement of access to the resources, (3) the movement of heavy equipment over archeological sites, and (4) the augering of relatively small holes for the wooden poles...
The steel towers required to carry the larger lines may involve larger excavations. In summation, transmission line impact zones are usually wider with less continuous subsurface impact areas (disregarding clearing activities for the moment) than are sewer-line impact zones.

An additional distinction between these two construction forms lies in the different range of micro-environmental zones affected by the construction. Sewerlines primarily impact drainages and their associated swamps and floodplains. Lowlying terraces and knolls adjacent to these drainages may be impacted as well. Transmission lines, such as the Lake Robinson-Sumter line, pass through a much wider range of micro-environments. The 62 km of line in the project corridor include four major drainages, intermittent streams, and several Carolina Bays, in addition to numerous fields and wooded areas located in between the uplands.

The greater range of micro-environments which will be encountered should result in the location of a greater diversity of archeological site types than were located previously. The sewerline predictive model was based upon types of sites which were located in a single stream, its tributaries and associated micro-environments. For example, five of the nine archeological sites located in the direct impact zone on Six Mile Creek were classified as prehistoric habitation sites (Harmon 1980a:35). While this site type is expected to occur in the project area, such a high percentage should not be encountered. By lessening coverage of stream channels and their associated micro-environments, the probability of encountering land forms suitable for prehistoric habitation is also lessened.

The transmission line corridor should be less biased than a sewerline corridor in terms of obtaining a representative sample of the entire range of local adaptation patterns found in these micro-environmental settings. In order to test whether a transect corridor can be environmentally representative, Goodyear and others (1979) undertook a vector analysis of the Laurens-Anderson route, a highway corridor in the South Carolina Piedmont. Five variables were selected for testing, and no significant differences occurred in slope, aspect (sun exposure), drainage rank, and land form. While transmission line corridors and the upper and middle Coastal Plain of South Carolina have not been subjected to the same kind of analysis, the highway study suggests that the transmission line survey may also encounter a representative environmental sample, and thus a representative archeological sample.

Prehistoric Sites

1. Habitation sites of all cultural periods may be impacted.

--- Archaic and Woodland period habitation sites will be more frequently impacted on smaller drainages, such as creeks and streams.
Paleo-Indian and Mississippian period habitation sites will be more frequently impacted on larger drainages, such as rivers and associated tributary streams.

Habitation sites will frequently contain buried, relatively undisturbed cultural deposits.

The Lake Robinson-Sumter line will probably impact prehistoric habitation sites when the line crosses drainages that would have been suitable for extended habitation by aboriginal groups. A further discussion of this site type will not be undertaken at this time (see Harmon 1980a:20-21). The following list of attributes should help distinguish this site type during survey:

1. Midden staining (will be difficult to identify during the survey stage).
2. Artifacts suggestive of habitation or sedentary occupation, such as fire-cracked rocks, steatite sherds, and ceramic sherds.
3. A wide variety of tools and lithic debitage indicative of maintenance activities, such as flakes of bifacial retouch, scrapers, abraders, knives, etc.
4. Favorable physiographic locations, i.e., level terrains with adequate habitation space, sheltered (protected) location, and proximity to a reliable water source.
5. A relatively high density of artifacts and debris proportionate to land form size.

2. Temporary campsites denoting extraction of biotic resources will be impacted.

Numerous lithic scatters have been recorded in the Piedmont and Fall Line zones of South Carolina (Taylor and Smith 1978; House and Ballenger 1976; Drucker, Anthony, and Harmon 1979). Similar sites have also been reported in the Coastal Plain (Brooks and Scurry 1978). These sites contain such artifacts as cutting or scraping tools and flakes and are assumed to be related to the primary extraction or processing of biotic resources. The best developed models of resource procurement and processing are those for the Piedmont and recently the interior lower Coastal Plain (Brooks and Canouts 1981). Their application to the uplands of the middle and upper Coastal Plain would probably differ only in scale, but variability relative to drainage conditions should also be considered.

House and Ballenger (1976:84-85) believe that many of these sites are the by-products of activities associated with the hunting and butchering of white-tailed deer. The majority of these scatters are located on upland ridges, hilltops, and similar
salient land forms. During fall and early winter, upland areas usually carry high concentrations of deer. Additionally, this is the male rutting season, which is the time when deer are easily stalked and killed. Southeastern Middle Mississippian data (Smith 1975) and ethnohistoric data (Swanton 1946) indicate intensive deer hunting during fall and early winter by aboriginal populations.

The scatters may also indicate nut gathering and processing. The dual proximity of biotic resources and relatively mild weather conditions would make the uplands especially favorable for repeated temporary occupation during the fall and early winter (Brooks and Scurry 1978:7).

The following list of attributes (House and Ballenger 1976:82-83) should characterize biotic resource extraction sites which may be encountered during the survey:

(1) Sites will frequently be located in less favored locations: not particularly accessible to water, on relatively high areas of relief.

(2) A narrow range of tools and debitage will be present at these sites.

(3) A low density of artifacts will be encountered at these sites.

(4) Sites characterized by the above attributes will be especially numerous in certain environmental zones.

Historic Sites

1. Eighteenth, nineteenth, and twentieth century water powered mills are sites which processed corn, wheat, cotton, and wood.

Water powered mills were common in the eighteenth through the early twentieth centuries in many areas of the United States. Slow and inefficient transportation methods and use of community mills necessitated the construction of a large number of mills (Storck and Teague 1952:46). The agrarian nature of the counties during this period may have fostered the construction of mills in areas with a sufficient stream gradient. Waterwheels with large overshoots require very little water.

The following list of attributes should help identify these water-powered mills, if they are encountered on survey:

(1) Evidence of terrain modification consists of dams (earthen, wood, stone, concrete or combinations), mill races, tail races, and spillways. Use of concrete generally
indicates later period mills or possibly repairs to old mills.

(2) Waterwheel or turbine (patented 1827) remnants consist of wooden spokes, metal collars, drive shafts, etc.

(3) Mill stones, either whole or fragmented, will probably be found at grist mill sites. Grist mills require two stones, the runner (top stone) and nether (bottom stone).

(4) Crosscut or circular (patented 1810) saw remnants may possibly be found in association with saw mill sites.

(5) Metal hardware associated with the milling operation consists of cranes, grappling hooks, screw hoists, spindles, gearing, etc. Wrought metal is generally older than cast metal.

(6) Standing mill structures or structural remnants may consist of foundation stones, structural pins, flood abutments, breakfalls, and loose beams and boards.

(7) Miscellaneous architectural hardware (South 1977:95) consists of window glass, nails, spikes, construction hardware (pintels, hinges, etc.), and door lock parts.

2. Roads, bridges, boat landings and docks, and railroad remnants are sites that indicate public transportation through or within a given area.

The sparsely populated and relatively undeveloped nature of the countryside may increase the chance of finding old roadbeds and bridges. Boat landings and docks will probably not be encountered because the line does not cross any drainages of sufficient size for water transport. The Seaboard Coast Line railroad lies in the project area and has been in continuous use since its construction in the nineteenth century.

The following list of attributes should characterize public transportation features:

(1) Old roads and roadbeds can be distinguished from more modern logging or farming road by presence of large trees, approximately 50 years or older in the roadbed. This vegetation may be absent if the road has been used in modern times. Old roadbeds may be distinguished because erosion and repeated use may have lowered them several feet below the present ground surface.

(2) Old bridges and bridge remnants may be distinguished from modern bridges by the presence of stone (cut granite blocks) and wood in lieu of concrete or steel, unless an old bridge has been modified. The bridge remains may be par-
tially intact, or they may be found in or adjacent to the drainage.

(3) Artifacts from vehicles used for land transportation may be present, such as wagon or buggy parts, old automobile parts, etc.

(4) If water transportation was used, landing and dock remnants, boat or barge fragments, ore locks, pulleys, etc. may be present.

(5) Presence of old railroads will mainly consist of earthen embankments which often contain stone or gravel and miscellaneous railroad metal, such as spikes, rail fragments, etc.

3. Moonshine stills and still remnants may occur.

The three major factors affecting still operations are a constant water supply, fuel for burning, and a sheltered or protected location (Wigginton 1972:307,318-319), all of which occur in the project area. The swampy streams and sparsely populated areas would have been especially conducive to hiding moonshine stills.

This list of attributes, although preliminary in nature, should aid in differentiating this site type from nineteenth and twentieth century historic refuse, which is frequently encountered and often dismissed on impact surveys.

(1) Stone and brick fragments may be found, perhaps as the remains of hearths.

(2) Ashes, burned areas, and other evidence of fire may be visible.

(3) Metal may be found, such as copper tubing, radiators, barrels, sheet metal, pipes and tubing, buckets, etc.

(4) Glass containers, including jars, bottles, etc., are expected.

(5) Framework remnants for hiding the still may be found.

4. Eighteenth, nineteenth, and twentieth century homesites should be encountered.
The fourth and final type of historic site that may be encountered during the Lake Robinson-Sumter survey is the historic homesite. Probably one or more of these sites will be located because the project vicinity has been settled since the middle of the eighteenth century. Many nineteenth and twentieth century tenant farmer houses are still standing. The proposed transmission line route will pass through numerous elevated, relatively dry areas near road networks which would be suitable for historic habitation. Most historic sites used wells in lieu of free flowing drainages which enabled settlement away from streams and creeks.

Special emphasis is placed on recording nineteenth and twentieth century sites and structures which probably relate to the tenant farmer/sharecropper period. Sites of this nature have been usually ignored during past surveys in this and other states. These homesites are important because they are part of our cultural heritage; they are rapidly being destroyed; and they are poorly understood. Better records of such sites will contribute toward a better understanding of their archeological significance. If the site destruction continues and few records are kept, future archeologists will have scarcely better comprehension of the nineteenth and twentieth century domestic site than today's archeologists have of small eighteenth century domestic sites.

The following attributes will aid the identification and study of these historic habitation areas:

(1) These sites will be most frequently located on hilltops, ridges, and other salient land forms.

(2) Frequently, old roads and road remnants will be found in close proximity.

(3) Numerous ceramic (whiteware), glass, and metal fragments will be found.

(4) Structural remnants may exist.

(5) More frequently, bricks and stone fragments and various machine-made nails will be the only architectural remains.
The predictive value of a model of site occurrence depends upon the extent to which archeologists understand the environmental and cultural variables affecting human adaptation. Environmental variables as they are viewed in a framework of evolutionary ecology are influential in structuring the parameters of resource use given various exploitative strategies. Exploitative strategies incorporate the following: (1) demography, involving population composition, size, and dispersal; (2) technology, involving sources and means of energy procurement, processing, distribution, and consumption; and (3) sociocultural factors, involving organization and information flow. All of these are conditioned by historical behavior and the trajectories and/or processes of adaptive change which are the objects of considerable academic controversy.

The archeological record of a specific area is the consequence of adaptive decision-making that is based on specific environmental and historical information. For example: the type of tool used by a hunter will reflect his technical repertoire, i.e., a stone point, a bow and arrow, a musket, or a high-powered rifle. Where the tool is used will depend upon the (animal) resource being hunted and its habitat and behavioral responses. What remains at a kill and/or processing site will be dependent upon logistical factors, i.e., mobility, curate behavior, etc., of the hunter(s). This simple example exhibits the underlying complexity of site formation processes. Add to these the environmental processes that act on materials after they have been deposited, and the problem of deciphering the archeological record today becomes even more complex.

Ecological Assessment

South Carolina's topography and biotic communities fall into four distinct provinces which correspond to different geological formation processes: the Blue Ridge, the Piedmont, the Sandhills (Fall Line zone), and the Coastal Plain provinces. The Fall Line, a transition zone between the eroded Piedmont peneplain underlain by crystalline rocks and the unconsolidated clays and sand of the Coastal Plain, deserves special recognition because of the tremendous environmental diversity that is conditioned by this contact. The project corridor parallels the Sandhills, extending into the Congaree Sandhills at its northern end (Figs. 4 and 5). This area has a relatively higher relief than the flat,
FIGURE 4. Map of project area in relation to Sandhills Province
FIGURE 5. Survey transect 77 (near Lake Robinson), looking south
low ridges of the middle Coastal Plain. The adaptive advantages of its position will be explored after a brief environmental description.

The Coastal Plain consists of a series of terraces formed by marine fluctuations during the Tertiary and Quaternary periods (Colquhoun and Johnson 1968). Colquhoun (1969) subdivides the Coastal Plain, thus placing the survey corridor in the upper Coastal Plain subprovince. The origin of the sediments of the upper Coastal Plain is disputed. Cooke (1936) believes they are of marine origin and are old beach terraces. Others, however, maintain that they are of alluvial origin. Due to considerable weathering, the upper Coastal Plain has little primary topography which makes interpretation very difficult.

The formation of the Sandhills is also poorly understood. The most common theory is that they were formed as beach dunes during the Cretaceous period. Duke (1961) feels that they were formed by alluvial deposits from the Tuscaloosa formation which formed the Citronelle formation of which the Sandhills consist.

Underlying these sediments of the upper Coastal Plain and Sandhills are the Black Mingo Formation in Sumter and Lee counties and the Tuscaloosa and Middendorf formations in Lee and Darlington counties. The Tuscaloosa is of upper Cretaceous age and the Black Mingo is Eocene (Colquhoun 1969).

Located throughout the Coastal Plain of South Carolina are features called Carolina Bays. These "bays" are elliptical depressions, having a northwest to southeast axis with a sandy ridge occurring at the southeastern end. The size of the bays are variable, some being relatively small, others being up to one kilometer in length. The origin of these bays is still debated; some assign their origin to a meteorite shower, others to marine wave action. Several rather large bays are located at the northern end of the transmission line near Hartsville, South Carolina.

All of this geological diversity is reflected in a soil mosaic. Nearly sixty different soil types are encountered along the transmission line corridor. The seven major soil associations to which they belong are as follows (Green 1963: General Soil Map):

Faceville-Marlboro-Grady association: nearly level to gently sloping, mostly well drained, red and yellow soils on broad ridges

Norfolk-Dunbar-Coxville association: nearly level or gently sloping, well drained to poorly drained soils

Norfolk-Ruston-Grady association: nearly level to gently sloping, generally well drained
soils, and poorly drained, dark-colored soils in depressions

Izagora-Wahee-Myatt (Kalmia) association: moderately well-drained to poorly drained soils on stream terraces

Lynchburg-Portsmouth-Rutlege association: nearly level, somewhat poorly drained to very poorly drained soils on lowlands

Wedhadkee-Swamp association: nearly level, very poorly drained soils on floodplains

Lakeland-Vaucluse-Gilead association: nearly level to steep, droughty soils of the sand hills

The typical growing season lasts for 230 days from late March to mid November. Average annual rainfall is 112 cm, which normally falls during the summer and late winter. Extreme droughts and excesses of rainfall occur one year in ten (Green 1963:82).

Although the Sandhills receive sufficient rainfall, it is percolated very rapidly through the soils. The topography is high enough to place the water table out of reach of plants, presenting a xeric habitat. The following plants characterize the region, the first two species being dominant (Batson n.d.):

Longleaf pine, turkey oak, blue jack oak, dwarf post oak, hickory, persimmon, low black huckleberry, trailing arbutus, lead plant, farkleberry, gooseberry, sand myrtle, dwarf locust, Ipa­cac spurge, nettle, sandwort, wire plant, joint weed, lupine, milk-pea, spiderworts, milkweed, club moss, lichen.

The Oak-Hickory association hardwood forests of the Coastal Plain are similar to those of the Piedmont. Loblolly long leaf and slash pine are the most important successional species. The following species are present during the climax (Batson n.d.):

White oak, black oak, Spanish oak, scarlet oak, several species of hickory, loblolly pine, yellow pine, black gum, sweet gum, dogwood, sour­wood, spotted wintergreen, beggar lice.

Pocosins and Carolina Bays have very poorly drained soils consisting of organic matter or peat. The water table is only
a few inches below the surface. Common flora of these features is as follows (Bateson n.d.):

Honey cup, fetterbush, bamboo briar, cane gollberry, leather-leaf, leather wood, wax-myrtle, dog laurel, staggerbush, maleberry, Virginia willow, cicky, loblolly bay, sweet bay, red bay, pond pine, peat moss, pigeon wheat moss, cinnamon fern.

Environmental Potential

As previously noted, environmental potential depends upon the exploitative strategies employed. Economic considerations of energy efficiency demonstrate an evolutionary continuum from hunting and gathering to agriculture (Earle 1980). The relative mix of various strategies and their production rates are dependent upon population and environmental stresses. Unfortunately, the natural production of temperate forests, especially in the Southeast, is only now being researched relative to seasonal rounds, resource abundance, scheduling strategies, etc. (e.g., Ford 1979; Christenson 1980; Hanson 1980; House and Ballenger 1976).

Ethnohistorical reconstructions of the cultural ecology of aboriginal Indians around the Great Lakes (Yarnell 1964; Cleland 1966), in the Midwest (Christenson 1980), and in the Southeast (Canouts 1971; Larson 1970) show the number, variety, and preferences of plant and animal resources used for food, beverages, and medicinal and technological purposes. For example, a Midwestern breakdown for seasonal subsistence (plant) foods is as follows: 12 sap and cambrium foods; 17 bulbs and tubers; 11 greens; 3 flowering species; 51 fruits and berries; 5 seeds; 13 nuts; and 4 lichens (Yarnell 1964:74). A comparable study in the Southeast listed the following: 10 bulbs and tubers; 6 greens; 14 fruits and berries; 5 seeds; and 10 nuts (Canouts 1971). (Approximately 50 plants were used in aboriginal technologies [Yarnell 1964; Canouts 1971].)

The question of significant differences in the production of various deciduous climax forests in the interior has not been framed in terms of human ecology. Several factors may have contributed to a lower frequency and variety of plants in the Southeast, e.g., lack of species and subspecies identification in the ethnohistorical literature or perhaps a greater reliance on agriculture.

Tables 2 and 3 list the common names of some of the plants and animals used aboriginally and known to occur in the Fall Line zone (Harmon 1980a). If not all are found in the project area, they are within exploitable distance. Two studies have already begun to document available species and their productivity in specific micro-environments near the project area. Michie (1980)
TABLE 2. Utilized floral forms (after Harmon 1980a:7-8)

<table>
<thead>
<tr>
<th>Plant Form and Name</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Roots and Tubers</strong></td>
<td>Most important wild food form utilized in the Southeast (Hudson 1976: 285)</td>
</tr>
<tr>
<td>Smilax</td>
<td>Especially important</td>
</tr>
<tr>
<td>Indian potatoes or ground nuts</td>
<td>Gathered year round</td>
</tr>
<tr>
<td>Wild Sweet Potatoes (Morning Glory)</td>
<td>Gathered from fall to late spring</td>
</tr>
<tr>
<td>Swamp potatoes (Arrowhead)</td>
<td>Found in swampy areas and gathered in late summer and fall</td>
</tr>
<tr>
<td><strong>Wild Fruits</strong></td>
<td></td>
</tr>
<tr>
<td>Persimmon</td>
<td>Most important fruit utilized by southeastern Indians (Hudson 1976: 285)</td>
</tr>
<tr>
<td>Wild grapes (Muscadine and Scuppernong)</td>
<td>Gathered in the summer</td>
</tr>
<tr>
<td>Wild cherries</td>
<td>Gathered in the summer</td>
</tr>
<tr>
<td>Paw paws</td>
<td>Gathered in the summer</td>
</tr>
<tr>
<td>Crabapples</td>
<td>Gathered in the summer</td>
</tr>
<tr>
<td>Wild plums</td>
<td>Gathered in the summer</td>
</tr>
<tr>
<td>Prickly pear (Cactus)</td>
<td>Gathered in the summer</td>
</tr>
<tr>
<td>May Pop</td>
<td>Gathered in the summer</td>
</tr>
<tr>
<td><strong>Berries</strong></td>
<td>Most frequently gathered in the summer (Hudson 1976: 286)</td>
</tr>
<tr>
<td>Blackberries</td>
<td>Bushes</td>
</tr>
<tr>
<td>Gooseberries</td>
<td>Bushes</td>
</tr>
<tr>
<td>Wild Strawberries</td>
<td>Bushes</td>
</tr>
<tr>
<td>Huckleberries</td>
<td>Trees</td>
</tr>
<tr>
<td>Black gum berries</td>
<td>Trees</td>
</tr>
<tr>
<td>Mulberries</td>
<td>Trees</td>
</tr>
<tr>
<td>Serviceberries</td>
<td>Trees</td>
</tr>
<tr>
<td><strong>Nuts and Acorns</strong></td>
<td>Generally gathered in the fall and eaten plain or utilized for oil (Hudson 1976: 286)</td>
</tr>
<tr>
<td>Hickory</td>
<td>Acorns were used primarily for oil</td>
</tr>
<tr>
<td>Live Oak</td>
<td>Acorns were used primarily for oil</td>
</tr>
<tr>
<td>Post Oak</td>
<td>Acorns were used primarily for oil</td>
</tr>
<tr>
<td>White Oak</td>
<td>Acorns were used primarily for oil</td>
</tr>
<tr>
<td>Chestnut Oak</td>
<td>Acorns were used primarily for oil</td>
</tr>
<tr>
<td>Plant Form and Name</td>
<td>Comments</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------</td>
</tr>
<tr>
<td><strong>Weeds</strong></td>
<td></td>
</tr>
<tr>
<td>Nelumbo (Water Lily)</td>
<td>Utilized for seeds and/or greens (Hudson 1976: 286-287)</td>
</tr>
<tr>
<td>Cane (Large and small)</td>
<td>Edible roots and leaves, gathered in summer and fall</td>
</tr>
<tr>
<td>Chenopodium</td>
<td>Cooked like spinach</td>
</tr>
<tr>
<td>Sumpweed</td>
<td>Cooked like spinach</td>
</tr>
<tr>
<td>Pigweed</td>
<td>Cooked like spinach</td>
</tr>
<tr>
<td>Knotweed</td>
<td>Cooked like spinach</td>
</tr>
<tr>
<td>Wild Onions</td>
<td>Gathered in the late fall and early spring</td>
</tr>
<tr>
<td><strong>Beverages</strong></td>
<td></td>
</tr>
<tr>
<td>Sassafras</td>
<td>Drunk either hot or cold</td>
</tr>
<tr>
<td>Spicebush</td>
<td>Best when dug in early spring</td>
</tr>
<tr>
<td>May pops</td>
<td>Drunk as a hot tea</td>
</tr>
<tr>
<td>Honey Locust</td>
<td>Drunk as a hot tea</td>
</tr>
<tr>
<td></td>
<td>Drunk either cold or hot, often fermented into a beer</td>
</tr>
<tr>
<td>Animal Form and Name</td>
<td>Comments</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>White-tailed deer</td>
<td>Hunted mainly in late fall and winter and considered the primary game animal of the Southeast (Hudson 1976: 274)</td>
</tr>
<tr>
<td>Black bear</td>
<td>Hunted in winter and considered a sacred animal. Oil was used for many purposes.</td>
</tr>
<tr>
<td>Rabbits</td>
<td>Hunted and/or snared year round</td>
</tr>
<tr>
<td>Squirrels</td>
<td>Hunted and/or snared year round</td>
</tr>
<tr>
<td>Opossums</td>
<td>Hunted and/or snared year round</td>
</tr>
<tr>
<td>Raccoons</td>
<td>Hunted and/or snared year round</td>
</tr>
<tr>
<td>Wild turkey</td>
<td>Hunted mainly in winter while roosting</td>
</tr>
<tr>
<td>Passenger pigeon (extinct)</td>
<td>Hunted from mid-October to mid-April</td>
</tr>
<tr>
<td>Various waterfowl</td>
<td></td>
</tr>
<tr>
<td>Catfish</td>
<td>Boiled and eaten</td>
</tr>
<tr>
<td>Shad</td>
<td></td>
</tr>
<tr>
<td>Suckers</td>
<td>Eaten in winter or if no other food forms were available. Ground bones of small mammals and insects were occasionally consumed (Hudson 1976: 305).</td>
</tr>
<tr>
<td>Bass</td>
<td></td>
</tr>
<tr>
<td>Perch</td>
<td></td>
</tr>
<tr>
<td>Sunfish</td>
<td></td>
</tr>
<tr>
<td>Mullet</td>
<td></td>
</tr>
<tr>
<td>Mussels</td>
<td></td>
</tr>
<tr>
<td>Snakes</td>
<td></td>
</tr>
<tr>
<td>Lizards</td>
<td></td>
</tr>
<tr>
<td>Frogs</td>
<td></td>
</tr>
<tr>
<td>Snails</td>
<td></td>
</tr>
</tbody>
</table>
provides a detailed list of biotic resources in the Congaree swamp. Cable and Cantley (1979) offer a detailed discussion of environmental diversity within the sandhills of the Fall Line zone itself. Based on the measure of patch, they show that the Lynches area is more homogeneous or less diverse than other sandhill locales. It has the lowest net primary productivity based on the dominant plant communities associated with the various patch settings, i.e., floodplain/terrace.

The agricultural potential is currently high (Appendix I). The dynamics of the southeastern Atlantic drainages have not been studied relative to prehistoric agricultural subsistence (cf. Smith 1978). However, a few observations can be made about the present day drainage and pedology as they affect agricultural production. Drainage is the most critical variable, and ditches drain much of the standing water today. The best agricultural soil associations in the area are Faceville-Marlboro-Grady (F-M-G); Norfolk-Dunbar-Coxville (N-D-C); and Norfolk-Ruston-Grady (N-R-G). These soils are found between the drainages, the F-M-G association is found at the juncture of the sandhills (N-R-G) and the upper coastal plain (N-D-C). The remaining soil associations are not as well drained. Although the Lakeland-Vaucluse-Gilead association is well drained the soils are low in organic materials and erode quickly (Fig. 6).

At present, the archeological models of prehistoric subsistence potential in South Carolina have not gone much further than the originally proposed riverine and interriverine dichotomy in the Piedmont and Coastal Plain (House and Ballenger 1976; cf. Goodyear, House, and Ackerly 1979; Brooks 1980; Brooks and Cannouts 1981): fall nut and deer procurement in the uplands and the spring and possibly summer harvesting of anadromous fish and cultigens have been emphasized.

Archeologists have hypothesized that transitional zones of magnitude of the Fall Line zone would be of strategic importance in exploiting a number of diverse species. However, the costs of a complex technology required to exploit a tremendous range of resources and possible population limitations (because diversity does not necessarily equate with abundance) have not been considered thoroughly. The riverine/swamp edge resources that begin to appear as the drainage conditions change along the Fall Line may provide one stable emphasis, the productivity of the scrub-oak uplands, a secondary emphasis. Further refinement of the differences between xeric sandhills, mesic woodlands, and deep and shallow swamps is presently underway.

Environmental Parameters

The natural parameters of temperate forests relate primarily to seasonal and yearly cycles of resource occurrence and abundance. Temperate forest ecosystems are highly resilient, i.e., the biotic species can withstand a wide range of climatic fluctu-
FIGURE 6. Schematic of soils in Darlington County sandhills (after Colburn 1960:2); Kalmia soils correspond to the alluvial sands and clays.
The most obvious parameters of biotic production and/or carrying capacity are caused by man's manipulation of the environment in order to develop and maintain simpler ecosystems which, albeit highly productive, are very susceptible to environmental imbalances (Odum 1969).

The major cause of prehistoric land clearing would probably have been fire, either intentional burning or lightning-caused. It is not known if or how the late prehistoric agriculturalists cleared their fields. During the historic period, the overproduction of cotton before and after the Civil War no doubt depleted some of the soil fertility, but these counties did not experience the extreme erosion suffered in the Piedmont (cf. Trimble 1974).

Probably the most significant variable affecting the resource structure is moisture. Climatic and sea level changes contribute to available moisture. The climate is thought to have remained basically stable since the Holocene about 8000 B.C. (Whitehead 1965; Watts 1971, 1975, 1980), although paleoenvironmental reconstructions indicate subtle changes in vegetation (Table 4). Some of these changes may be attributable to sea level changes. A rising sea level caused large swamps to form along major rivers due to a lower river gradient. This change would have brought about a concomitant change in resource density and diversity, especially in the riverine zones (Brooks 1980, Brooks and other 1979, Colquhoun and others 1980).

This generally rising sea level has oscillated over the past 3,500 years, affecting human settlement and subsistence strategies. Short term adaptation probably occurred at 400 to 600 year intervals, corresponding to the one and two meter sea level fluctuations which have been documented with geological and archaeological data (Brooks and others 1980; Colquhoun and others 1980).

Site Transformation Processes

Natural and culturally modified environmental processes affect the expression of the archeological record. Site discovery and assessment relate directly to horizontal and vertical vectors of artifact displacement.

Almost all of the tillable soil in these counties has been placed in cultivation at one time. The different plow blades, the depth of the plowing, the direction plowed, etc., not only disturb the site, but affect its surface appearance. Although the horizontal movement of artifacts may not completely confuse their general relationships (Roper 1976), the vertical mixing of artifacts in the plow zone will change the surface assemblages from year to year (House and Schiffer 1975:174).
TABLE 4. Vegetation changes through time (after Cable and Cantley 1979:29)

Coastal Plain Vegetation

<table>
<thead>
<tr>
<th>Cultural Period</th>
<th>Pine</th>
<th>Spruce</th>
<th>Oak</th>
<th>Cypress</th>
<th>Hickory</th>
<th>Beech</th>
<th>Sugar Maple</th>
<th>Red Maple</th>
<th>Sweet Gum</th>
<th>Black Gum</th>
<th>Ash</th>
<th>Elm</th>
<th>Ironwood</th>
<th>Holly</th>
<th>Aquatics</th>
<th>Grass</th>
<th>Sedge</th>
<th>Sage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Woodland 2000-1500 B.P.</td>
<td>i</td>
<td>d</td>
<td>s</td>
<td>d</td>
<td>d-s</td>
<td>d</td>
<td>a</td>
<td>s</td>
<td>i</td>
<td>s</td>
<td>i</td>
<td>s</td>
<td>d</td>
<td>s</td>
<td>d</td>
<td>s</td>
<td>d</td>
<td>i</td>
</tr>
<tr>
<td>Late Archaic 5000-2000 B.P.</td>
<td>i</td>
<td>d</td>
<td>s</td>
<td>d</td>
<td>d-s</td>
<td>d</td>
<td>a</td>
<td>s</td>
<td>i</td>
<td>s</td>
<td>d</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>i</td>
<td>d</td>
<td>d</td>
</tr>
<tr>
<td>Middle Archaic 8,000-5,000 B.P.</td>
<td>i</td>
<td>d</td>
<td>s</td>
<td>d</td>
<td>d-s</td>
<td>d</td>
<td>a</td>
<td>i</td>
<td>s-d</td>
<td>i</td>
<td>d</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>i</td>
<td>d</td>
<td>i</td>
<td>i</td>
</tr>
<tr>
<td>Early Archaic 10,000-8,000 B.P.</td>
<td>i</td>
<td>i</td>
<td>d</td>
<td>d</td>
<td>s-d</td>
<td>d</td>
<td>a</td>
<td>a</td>
<td>s-d</td>
<td>a</td>
<td>i-s</td>
<td>i</td>
<td>i</td>
<td>i</td>
<td>i</td>
<td>i</td>
<td>i</td>
<td>i</td>
</tr>
<tr>
<td>Paleo-Indian 11,500-10,000 B.P.</td>
<td>i</td>
<td>a</td>
<td>s</td>
<td>i</td>
<td>i</td>
<td>i</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>s</td>
<td>i</td>
<td>a</td>
<td>i</td>
<td>i</td>
<td>i</td>
<td>i</td>
<td>i</td>
</tr>
<tr>
<td>Pre Clovis ?-11,500 B.P.</td>
<td>d</td>
<td>a</td>
<td>s-d</td>
<td>d</td>
<td>i</td>
<td>i</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>s</td>
<td>a</td>
<td>i</td>
<td>i</td>
<td>i</td>
<td>i</td>
<td>i</td>
</tr>
</tbody>
</table>

KEY
i - increase
d - decrease
s - stable
a - absent
Many farmers have extensive artifact collections from their own fields (Cable 1979). Amateurs who selectively collect surface artifacts also bias the archeological record (House and Schiffer 1975:175). Thus, it is important that surface collections by professionals be as rigorous as possible in order to overcome collection biases.

Many sites will have no surface visibility, especially those now covered by swamp. Many more sites will be found in cultivated fields because of greater visibility. Cultivated fields in productive soils might also be expected to show a higher incidence of sites, especially multi-component sites (see also Cable, Cantley, and Sexton 1978), as good land is usually kept in cultivation. The high soil productivity would also be expected to influence the natural productivity of the biotic community exploited by hunters and gatherers. But the highest agriculturally productive soils appear to be away from the swamps which are highly productive.

Site Distribution

Outside of the Savannah River area, professional archeological investigations have been limited in the upper Coastal Plain of South Carolina. The Statewide Archeological Site Inventory files, maintained by the Institute of Archeology and Anthropology, record a total of 95 sites in these counties: 43 sites in Darlington County, 18 in Lee, and 34 in Sumter. A number of these sites have historic components (19). Several plantations, a mill, churches, historic houses, and historic districts have been listed on the National Register of Historic Places and the National Historical Landmarks. These sites recognize significant aspects of the early settlement of these counties. (A brief history of the counties is provided in Appendix I.)

A check of Mills Atlas (1826) shows a number of early road networks which are crossed by the transmission line corridor. Major roads on either side of Lynches River ran between Chesterfield, Marion, and Williamsburg. At least one mill is located along Cowpens Swamp, and several ferry landings are marked on Lynches River, e.g., Newman's Ferry. While none of these structures appear to lie within the 30.5-meter wide corridor, similar unrecorded sites may be encountered.

By far, the largest number of recorded sites are prehistoric (Table 5). (Appendix I provides an introductory summary for 12,000 years of South Carolina prehistory.) The Institute has conducted three surveys in the general vicinity of the project area. In 1971, George Teague inspected several sites in Lee State Park at the request of the South Carolina Department of Parks, Recreation, and Tourism. The other two surveys, conducted under recent legislative regulations concerning environmental impact assessments, are located near either end of the corridor. Michie (1979) located seven sites along the Pocotaligo drainage,
<table>
<thead>
<tr>
<th>Period</th>
<th>Dates</th>
<th>Topographic Setting</th>
<th>Diagnostic Artifacts</th>
<th>Subsistence</th>
<th>Settlement</th>
<th>Population</th>
<th>Current Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paleo Indian</td>
<td>11000 - 8000 B.C.</td>
<td>Major river valleys</td>
<td>Fluted projectile points, well-made scrapers, unifacial tools</td>
<td>Hunting (extinct mega-fauna and extant species) and gathering</td>
<td>Temporary camps</td>
<td>Very low; small, highly understood</td>
<td>Very poorly understood mobile bands</td>
</tr>
<tr>
<td>Archaic</td>
<td>8000 - 1500 B.C.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early</td>
<td></td>
<td>Floodplains and terraces of both major and minor drainages</td>
<td>Dalton and Palmer projectile points, well-made scrapers and unifacial tools</td>
<td>Hunting and gathering of plant and animal species</td>
<td>Base and seasonal camps</td>
<td>Evidence of substantial population increase and geographical expansion</td>
<td>Poorly understood</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle</td>
<td></td>
<td>Floodplains and terraces of both major and minor drainages and upland areas</td>
<td>Kirk, Morrow Mountain, Guilford and Stanly projectile points</td>
<td>Hunting and gathering</td>
<td>Base and seasonal camps</td>
<td>Evidence of occupation common throughout Southeast</td>
<td>Poorly understood except for lithic typologies</td>
</tr>
<tr>
<td>Late/ Transitional</td>
<td></td>
<td>Floodplains and terraces of major and minor drainages</td>
<td>Gary and Savannah River projectile points, knives, atlatl weights, use of polished stone, steatite and earliest ceramics such as Stallings and Thom's Creek wares</td>
<td>Hunting and gathering</td>
<td>Base and seasonal camps (tendency towards increased sedentism)</td>
<td>Evidence of increasing group size</td>
<td>Better understood than preceding periods</td>
</tr>
<tr>
<td>Period</td>
<td>Dates</td>
<td>Topographic Setting</td>
<td>Diagnostic Artifacts</td>
<td>Subsistence</td>
<td>Settlement</td>
<td>Population</td>
<td>Current Knowledge</td>
</tr>
<tr>
<td>----------------</td>
<td>-----------</td>
<td>---------------------</td>
<td>----------------------</td>
<td>-------------</td>
<td>------------</td>
<td>--------------------</td>
<td>------------------------------------------------------------</td>
</tr>
<tr>
<td>Woodland</td>
<td>1500 B.C. - A.D. 1000</td>
<td>Floodplains and terraces of major and minor drainages</td>
<td>Widespread appearance and use of ceramics such as plain wares, check stamped, cord marked and fabric impressed</td>
<td>Development and spread of horticulture, hunting and gathering</td>
<td>Villages and specialized areas</td>
<td>Burial populations and size of structures and reconstruction of demographic patterns</td>
<td>Temporal, spatial, and stylistic patterns are better understood than are the underlying socio-cultural adaptive processes</td>
</tr>
<tr>
<td>South Appalachian Mississippian</td>
<td>A.D. 1000 - 1700+</td>
<td>Floodplains and terraces of major drainages and their associated tributaries</td>
<td>Complicated stamped and plain, often burnished ceramics, small triangular arrow points used with bow and arrow</td>
<td>Relatively intense agriculture with limited hunting and gathering</td>
<td>Large villages and ceremonial centers</td>
<td>Burial populations and size of structures and reconstruction of demographic patterns</td>
<td>Temporal, spatial and stylistic patterns are understood relatively well. The underlying socio-cultural systems are modeled better than for preceding periods</td>
</tr>
</tbody>
</table>
south of Sumter. Several sites were located along the South Carolina Highway 151 on the Lake Robinson 7.5' U.S.G.S. quadrangle. (The Statewide Archeological Site Inventory; Cable and Cantley 1979). These survey results have been compiled in Table 6. The results of a fourth project involving a bridge relocation on Long Branch drainage have also been included to show that, underwater or alluviated, buried archeological sites must also be considered.

The most heavily represented period is the Woodland; 70% of the sites have been assigned one or more Woodland components. Twelve of these sites occur on swamp edges or terraces; six on the low upland ridges. This distribution may be skewed because the surveys focus on Lynches and Pocotaligo drainages. However, a Woodland emphasis does appear to reflect a general statewide pattern; that is, Woodland occupations tend to fall along the river drainages of the Coastal Plain (Table 7).

Taylor (1979) synthesized site file data for the Piedmont counties. Computer print-out available for certain counties in the Piedmont and the site data recorded in Darlington, Lee, and Sumter counties begin to reveal that there are relatively more Archaic than Woodland sites in the Piedmont and relatively more Woodland than Archaic sites in the Coastal Plain. A number of sites in the Piedmont do not have diagnostic bifaces which is skewing the low number of earlier components (cf. Goodyear, House, and Ackerly 1979). Furthermore, the recording of temporal/cultural components is not consistent; a site may be labeled Woodland, but all components would be tabulated. Therefore, by reading only a column of a component per period provides the best comparative measure of the differences.

Because the project area is adjacent to a cultural as well as environmental transition zone (Appendix I), the distribution and nature of sites in the project corridor should add useful data for identifying environmental and/or cultural gradients. These data already suggest differences in the upland settings of sites around Lake Robinson. The soils there are better drained, and the drainages have no developed swamps, though low areas can be ponded.
### TABLE 6. Recorded archeological resources in the vicinity of the project corridor

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Cultural-Temporal Affiliation</th>
<th>Land Form</th>
<th>Distance to Nearest Water (m)</th>
<th>Drainage</th>
<th>Diagnostic Artifacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>38SU24</td>
<td>Prehistoric</td>
<td>Swamp terrace</td>
<td>30</td>
<td>Turkey Creek (Pocotaligo)</td>
<td>Quartz and chert flakes</td>
</tr>
<tr>
<td>38SU25</td>
<td>Woodland</td>
<td>Swamp terrace</td>
<td>30</td>
<td>Pocotaligo River</td>
<td>Quartz, rhyolite and chert flakes; pottery</td>
</tr>
<tr>
<td>38SU26</td>
<td>Woodland</td>
<td>Swamp terrace</td>
<td>30</td>
<td>Pocotaligo River</td>
<td>Quartz, rhyolite and chert flakes; pottery</td>
</tr>
<tr>
<td>38SU27</td>
<td>Woodland Mississippian</td>
<td>Swamp terrace</td>
<td>20</td>
<td>Pocotaligo River</td>
<td>Quartz and rhyolite flakes; pottery</td>
</tr>
<tr>
<td>38SU28</td>
<td>Woodland</td>
<td>Swamp terrace</td>
<td>30</td>
<td>Pocotaligo River</td>
<td>Pottery</td>
</tr>
<tr>
<td>38SU29</td>
<td>Woodland</td>
<td>Swamp terrace</td>
<td>30</td>
<td>Pocotaligo River</td>
<td>Quartz, rhyolite and chert flakes; pottery</td>
</tr>
<tr>
<td>38SU30</td>
<td>Archaic? Woodland Mississippian</td>
<td>Swamp terrace</td>
<td>50</td>
<td>Pocotaligo</td>
<td>Quartz, rhyolite and chert flakes; check stamped, linear check stamped and punctate pottery</td>
</tr>
<tr>
<td>38LE4</td>
<td>Early-Middle Archaic Early Woodland</td>
<td>Swamp edge</td>
<td>10</td>
<td>Lynches River</td>
<td>Kirk and Morrow Mountain bifaces; simple stamped, fabric impressed pottery; flakes and ground stone</td>
</tr>
<tr>
<td>Site Number</td>
<td>Cultural-Temporal Affiliation</td>
<td>Land Form</td>
<td>Distance to Nearest Water (m)</td>
<td>Drainage</td>
<td>Diagnostic Artifacts</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------</td>
<td>-----------------</td>
<td>------------------</td>
<td>------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>38LE5</td>
<td>Woodland</td>
<td>Swamp terrace</td>
<td>10</td>
<td>Lynches River</td>
<td>Quartz and rhyolite flakes; pottery</td>
</tr>
<tr>
<td>38LE6</td>
<td>Woodland</td>
<td>Swamp terrace</td>
<td>150</td>
<td>Lynches River</td>
<td>Flakes and pottery</td>
</tr>
<tr>
<td>38LE7</td>
<td>Early-Middle Woodland</td>
<td>Swamp terrace</td>
<td>50</td>
<td>Lynches River</td>
<td>Flakes and fabric impressed pottery</td>
</tr>
<tr>
<td>38LE8</td>
<td>Middle Woodland</td>
<td>Upland</td>
<td>600</td>
<td>Lynches River</td>
<td>Flakes; fabric impressed and check stamped pottery</td>
</tr>
<tr>
<td>38LE9</td>
<td>Middle Woodland</td>
<td>Upland</td>
<td>500</td>
<td>Lynches River</td>
<td>Flakes and check stamped pottery</td>
</tr>
<tr>
<td>38LE11</td>
<td>Woodland/Mississippian</td>
<td>Swamp terrace</td>
<td>10</td>
<td>Lynches River</td>
<td>Pottery and human bone</td>
</tr>
<tr>
<td>38LE12</td>
<td>Woodland</td>
<td>Upland</td>
<td>150</td>
<td>Long Branch (Black)</td>
<td>Quartz, rhyolite and chert flakes; fabric impressed pottery</td>
</tr>
<tr>
<td>38LE13</td>
<td>Woodland</td>
<td>Upland</td>
<td>150</td>
<td>Little Long and Long branches (Black)</td>
<td>Quartz and other flakes</td>
</tr>
<tr>
<td>Site Number</td>
<td>Cultural-Temporal Affiliation</td>
<td>Land Form</td>
<td>Distance to Nearest Water (m)</td>
<td>Drainage</td>
<td>Diagnostic Artifacts</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------</td>
<td>---------------</td>
<td>-------------------------------</td>
<td>--------------------------------</td>
<td>------------------------------------------------------------</td>
</tr>
<tr>
<td>38LE14</td>
<td>Woodland Early 20th Century</td>
<td>Upland slope</td>
<td>200</td>
<td>Little Long Branch</td>
<td>Quartz and other flakes; Hanover and Cape Fear cord-marked; whiteware; ironstone</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Branch (Black)</td>
<td></td>
</tr>
<tr>
<td>38LE15</td>
<td>Prehistoric 20th Century</td>
<td>Underwater</td>
<td></td>
<td>Long Branch (Black)</td>
<td>Pottery</td>
</tr>
<tr>
<td>38LE16</td>
<td>20th Century</td>
<td>Underwater</td>
<td></td>
<td>Little Long Branch (Black)</td>
<td>Pottery and glass</td>
</tr>
<tr>
<td>38DA33</td>
<td>Prehistoric</td>
<td>Upland</td>
<td>10</td>
<td>Tributary of Black Creek (Pee Dee)</td>
<td>Quartz and rhyolite flakes; biface</td>
</tr>
<tr>
<td>38DA34</td>
<td>Woodland Mississippian</td>
<td>Upland</td>
<td>100</td>
<td>Beaverdam Creek (Pee Dee)</td>
<td>Quartz and rhyolite flakes; bifaces; pottery</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38DA36</td>
<td>Woodland</td>
<td>Terrace</td>
<td>50</td>
<td>Beaverdam Creek (Pee Dee)</td>
<td>Quartz and rhyolite flakes; pottery</td>
</tr>
<tr>
<td>38DA37</td>
<td></td>
<td>Upland</td>
<td>50</td>
<td>Tributary of Black Creek (Pee Dee)</td>
<td>---</td>
</tr>
<tr>
<td>38DA41</td>
<td></td>
<td>Upland</td>
<td>150</td>
<td>Black Creek (Pee Dee)</td>
<td>---</td>
</tr>
<tr>
<td>Site Number</td>
<td>Cultural-Temporal Affiliation</td>
<td>Land Form</td>
<td>Distance to Nearest Water (m)</td>
<td>Drainage</td>
<td>Diagnostic Artifacts</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------</td>
<td>-----------</td>
<td>------------------------------</td>
<td>----------</td>
<td>---------------------</td>
</tr>
<tr>
<td>38DA43</td>
<td>Middle Archaic</td>
<td>Upland</td>
<td>250</td>
<td>Black Creek (Pee Dee)</td>
<td>Morrow Mountain biface; bifaces; scrapers; quartz and rhyolite flakes</td>
</tr>
<tr>
<td>38DA44</td>
<td>---</td>
<td>Upland</td>
<td>100</td>
<td>Black Creek (Pee Dee)</td>
<td>---</td>
</tr>
</tbody>
</table>
TABLE 7. Distribution of Archaic and Woodland components by selected counties

<table>
<thead>
<tr>
<th>Province</th>
<th>County</th>
<th>Number of Prehistoric Sites</th>
<th>ARCHAIC COMPONENTS</th>
<th>Unidentified Ceramic</th>
<th>WOODLAND COMPONENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>EA</td>
<td>MA</td>
<td>LA</td>
</tr>
<tr>
<td>Piedmont</td>
<td>Anderson</td>
<td>96</td>
<td>11</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Cherokee</td>
<td>36</td>
<td>3</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Chester</td>
<td>78</td>
<td>1</td>
<td>3</td>
<td>3</td>
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<tr>
<td></td>
<td>Greenville</td>
<td>70</td>
<td>10</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Greenwood</td>
<td>26</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Fairfield</td>
<td>117</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Lancaster</td>
<td>38</td>
<td>1</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Laurens</td>
<td>72</td>
<td>8</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Oconee</td>
<td>63</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Spartanburg</td>
<td>31</td>
<td>0</td>
<td>3</td>
<td>2</td>
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<tr>
<td></td>
<td>Union</td>
<td>103</td>
<td>13</td>
<td>39</td>
<td>14</td>
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<tr>
<td></td>
<td>York</td>
<td>44</td>
<td>2</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Sub-total</td>
<td></td>
<td>744</td>
<td>52</td>
<td>121</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(7%)</td>
<td>(16%)</td>
<td>(5%)</td>
</tr>
<tr>
<td>Fall Line</td>
<td>Richland</td>
<td>55</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(5%)</td>
<td>(4%)</td>
<td>(4%)</td>
</tr>
<tr>
<td>Upper</td>
<td>Darlington</td>
<td>17</td>
<td>4</td>
<td>4</td>
<td>6</td>
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<tr>
<td>Coastal</td>
<td>Lee</td>
<td>29</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Plain</td>
<td>Sumter</td>
<td>38</td>
<td>3</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Sub-total</td>
<td></td>
<td>84</td>
<td>13</td>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(15%)</td>
<td>(13%)</td>
<td>(19%)</td>
</tr>
</tbody>
</table>
THE ARCHEOLOGICAL SURVEY

Field investigations of the proposed expansion of the 115 kV Lake Robinson to Sumter transmission line corridor were conducted from July 15 through July 18, 1980. Lynne Peters and William Monteith from the Institute of Archeology and Anthropology surveyed approximately 25% of the corridor.

Survey Field Methods

In order to recover representative and comparative data, which could also be used to help develop predictive models of site occurrence, a statistically random sampling strategy was designed for the survey corridor. The initial estimate that the field time would minimally permit a 15% sample did not relate well to systematic interval sampling using the 805 m (1/2 mile based on the U.S.G.S. quadrangles) transect units were expected to be the most logistically feasible. Longer transects were expected to be too long to sample the environmental diversity along the length of the line; shorter elements were considered logistically inefficient due to the increased number of points that would have to be located in the field.

The corridor was not further stratified on the basis of archeological or environmental variables. The major dichotomy in the currently developed settlement-subsistence models involves the differences between riverine and upland oriented activities. Although the riverine edges may be expected to show a higher habitation density over time (e.g., Michie 1979; Teague 1971), the survey corridor cross-cuts the drainages, thus lessening the probabilities of intersecting a point of previous activity. At what level the riverine zones should be sampled to compensate for this bias is unknown.

By far the major portion of the line transects upland areas, where the site density is virtually unknown. Site locational variables, such as what conditions the distance to water, what resources were exploited, etc., are also unknown. Thus, while the transects could be assigned riverine or interriverine status, the sampling percentage could not be based on any more than the frequency of encountering riverine and interriverine areas in the project corridor.

Furthermore, ground cover was expected to influence site discovery. The only available information about visibility was that approximately one-half of the corridor was under cultivation (David Roberts, personal communication). Out-dated U.S.G.S. quadrangles and soil maps offered little information about present day conditions.
The location of archeological sites is biased by environmental (i.e., site formation processes, site visibility, as well as exploited resources) and cultural (i.e., demography, technology, as well as subsistence economics) variables. But until there is more information about what these biases might mean in terms of probabilistic sampling, a random sample was felt to be the best survey design. An initial sample of 11 (15%) transects was statistically selected using a table of random numbers. Since the field conditions proved favorable, additional transects were added during the course of the survey to bring the total number of transects to 20, or about 25% (Fig. 7; Table 8). Transects 14 and 61 were not chosen randomly. The former was covered while traveling to a selected transect; the latter was randomly selected from a lengthy area where no transects were located.

Interestingly, when the 20 samples were compared to the total 78 transects, the ratio of riverine to interriverine transects was the same for each, 30% riverine and 70% interriverine. Riverine transects equaled 24, of which 6 were sampled. Transects with 60% of their length falling in a floodplain or swamp were identified as riverine: 6, 7, 13, 20, 33, 36, 37, 38, 48, 49, 57, 58, 59, 62, 63, 65, 66, 67, 68, 69, 70, 71, 75, and 76 (sample transects underlined). Transects 62 through 71 fall within a bay area. The remaining interriverine transects numbered 54, of which 14 were sampled (see Table 8 for the identification of these sample transects). This identification of riverine and interriverine is somewhat different from the Piedmont distinction which is based on major river drainages (cf. Goodyear, House, and Ackerly 1979: 131-145). The distinction centers around the differences between well-drained and poorly drained soils. Drainage is considered to be the most critical variable affecting resource structure.

The survey emphasis was placed on site discovery. Since the corridor had never been surveyed, the archeologists depended on the transmission line corridor clearings to facilitate site discovery. That is, if the transmission line corridor had at least 10% visibility, shovel probes were not dug even if there was heavy growth along the outer edge of the corridor. In the areas where shovel probes were necessary, the two archeologists, spaced 15 m apart, shovel probed at average intervals of 15 m. The dirt removed through shovel probes, which averaged 25 cm in diameter and 30 cm in depth, was sorted using a trowel and shovel.

Coverage was not as seriously compromised as might be expected by this approach. Transects are more statistically efficient for site discovery than other survey units, such as quadrats (S. Plog 1976:151). Relative to surface coverage, their extended perimeters allow a greater opportunity to locate sites positioned tangentially to the transect borders (S. Plog, F. Plog, and Wait 1977; Canouts and others 1977).

In this case, the archeologists' transects were viewed as narrow transects within the project corridor (Fig. 8). Depend
FIGURE 7. Profile of survey corridor from Sumter (survey transect 1) to Lake Robinson power plant (survey transect 78)
TABLE 8. Survey transects along the Lake Robinson to Sumter transmission line corridor

<table>
<thead>
<tr>
<th>Transect</th>
<th>Terrain</th>
<th>Direction</th>
<th>Survey Technique</th>
<th>Site</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Road; livestock pen; soybean field; brush; swamp</td>
<td>N to S &amp; S to N</td>
<td>Surface/shovel probes</td>
<td>0</td>
<td>Transect terminated in standing water of Rocky Bluff Swamp</td>
</tr>
<tr>
<td>7</td>
<td>Gullies; swamp; old fields; cultivated fields; eroded plow furrows; brush 2 m high in places</td>
<td>N to S</td>
<td>Surface/shovel probes</td>
<td>38SU31</td>
<td>Transect terminated at Rocky Bluff Swamp</td>
</tr>
<tr>
<td>13</td>
<td>Partially cultivated; swamp; road</td>
<td>S to N &amp; N to S</td>
<td>Surface</td>
<td>0</td>
<td>Could not cross Cowpens Swamp; in surveying either side, walked across transect 14 to reach north end of transect 13</td>
</tr>
<tr>
<td>14</td>
<td>Cultivated fields</td>
<td>N to S</td>
<td>Surface</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Brush; two cultivated fields; road</td>
<td>S to N</td>
<td>Surface/shovel probes</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Marsh; heavy vegetation; cultivated fields</td>
<td>S to N</td>
<td>Surface/shovel probes</td>
<td>38LE91</td>
<td>Also covered portion of transect 21</td>
</tr>
<tr>
<td>27</td>
<td>Cotton fields; brush road</td>
<td>N to S</td>
<td>Surface</td>
<td>IF-1</td>
<td>Ashwood quad sheet (1957) shows a dwelling was once located near the find spot</td>
</tr>
<tr>
<td>Transect</td>
<td>Terrain</td>
<td>Direction</td>
<td>Survey Technique</td>
<td>Site</td>
<td>Comments</td>
</tr>
<tr>
<td>----------</td>
<td>---------</td>
<td>-----------</td>
<td>------------------</td>
<td>-------</td>
<td>----------</td>
</tr>
<tr>
<td>28</td>
<td>Cotton fields; creek</td>
<td>S to N &amp; N to S</td>
<td>Surface</td>
<td>IF-2</td>
<td>Ashwood quad sheet (1957) shows a dwelling was once located near the find spot; different dwelling than one in transect 27</td>
</tr>
<tr>
<td>33</td>
<td>Cotton fields; corn fields; pond bottom; roads</td>
<td>N to S</td>
<td>Surface</td>
<td>0</td>
<td>Swamp at southern end not surveyed; talked with farmer who had found no artifacts in his fields but many along Lynches River</td>
</tr>
<tr>
<td>38</td>
<td>Cotton fields; drainage ditch; swamp</td>
<td>N to S</td>
<td>Surface</td>
<td>0</td>
<td>Ended transect at swamp</td>
</tr>
<tr>
<td>43</td>
<td>Road; cotton fields; soybean fields; ditch</td>
<td>S to N &amp; N to S</td>
<td>Surface</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Brush 2 m high; wooded; irrigation ditch</td>
<td>N to S</td>
<td>Shovel probes</td>
<td>0</td>
<td>Only 10% of transect covered due to logistical and time constraints</td>
</tr>
<tr>
<td>47</td>
<td>Brush; cultivated field; irrigation ditch</td>
<td>N to S</td>
<td>Surface/shovel probes</td>
<td>38LE92</td>
<td></td>
</tr>
<tr>
<td>Transect</td>
<td>Terrain</td>
<td>Direction</td>
<td>Survey Technique</td>
<td>Site</td>
<td>Comments</td>
</tr>
<tr>
<td>----------</td>
<td>---------</td>
<td>-----------</td>
<td>-----------------</td>
<td>------</td>
<td>----------</td>
</tr>
<tr>
<td>51</td>
<td>Road; cultivated fields</td>
<td>NE to SW</td>
<td>Surface</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>Cotton fields; western end of transect brushy</td>
<td>NE to SW</td>
<td>Surface/shovel probes</td>
<td>0</td>
<td>Transect terminates in a Carolina Bay</td>
</tr>
<tr>
<td>61</td>
<td>Garden; brush; field roads; cultivated fields; woods</td>
<td>SW to NE</td>
<td>Surface</td>
<td>0</td>
<td>Visibility less than 5% but time factor did not permit shovel probes</td>
</tr>
<tr>
<td>65</td>
<td>Garden; soybean field; fallow fields</td>
<td>N to S</td>
<td>Surface</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>Cultivated fields; residences; pond</td>
<td>SE to NW</td>
<td>Surface</td>
<td>0</td>
<td>Two sets of transmission lines</td>
</tr>
<tr>
<td>74</td>
<td>Graded areas; clearings; roads; ditches; fallow fields; brush; standing water</td>
<td>S to N</td>
<td>Surface</td>
<td>38DA47 IF-3</td>
<td>Two sets of transmission lines; checked ridge west of lines to see if material in the find spot had been washed downslope -- no artifacts observed</td>
</tr>
<tr>
<td>77</td>
<td>Railroad tracks; bare areas; xeric vegetation</td>
<td>S to N &amp; N to S</td>
<td>Surface</td>
<td>38DA48</td>
<td>Southern end of transect terminated at standing water</td>
</tr>
</tbody>
</table>
ing on the visibility, the edges of sites 1 and 4 might be encountered. With more of the site area lying on the transect, there is a greater chance of discovering site 2. Depending upon the archeologists' spacing, site 3 may or may not be encountered.

In the event that a site would be located in dense vegetation cover, shovel testing is a very effective technique for defining site boundaries (Chartkoff 1978). Shovel tests in the Midwest (Anonymous 1976; Canouts and others 1977; Lovis 1976), in the Northeast (McManamon 1980), and in South Carolina (Harmon 1980b) have proven to be successful in locating and defining archeological sites. Their effectiveness in mixed ground cover has not been studied, although they can account anywhere from 10 to 90% of the total number of sites located on survey (Anonymous 1976; Canouts and others 1977; Harmon 1980b).

Survey Results and Interpretation

Six archeological sites were recorded on South Carolina Statewide Archeological Site Inventory forms and are now on file at the Institute of Archeology and Anthropology (Appendix II, Table 1; Fig. 3). Three find spots were recorded but not assigned site status. Site 38DA35, located during a previous survey of the South Carolina Highway 151 expansion project (Cable and Cantley 1979), is also included for interpretive and comparative purposes.

Because the sites' artifact densities were moderate to sparse and because no further archeological work was anticipated, the artifact collections comprise 100% of the visible surface assemblage except the collections for site 38SU32 (Fig. 10). There artifacts were collected along two intersecting transects due to poor ground visibility. The historic and prehistoric artifacts are inventoried in Appendix II and Tables 11 and 12.

Three of the eight predicted site types discussed in the research design are represented: historic 18th through 20th century homesites and prehistoric temporary camps and/or extraction sites. The intensity of the habitation on the smaller drainages is difficult to measure. Many of the domestic activities may be secondarily related to specialized collecting activities.

Six historic occupations were identified: three sites, one multi-component site; and two isolated finds. Although the artifacts date to late occupations (Appendix II), the kaolin pipetem found at site 38DA48 (Fig. 1) might indicate an early 1800s component. On the average, these historic sites are located further away from permanent water than the prehistoric sites (Table 9), and they also occur on the more productive soils (Table 10—productivity is based on crop suitability). These data conform to the expected farming enterprise.
FIGURE 8. Archeologists' survey transects (dashed lines)
<table>
<thead>
<tr>
<th>Site Number</th>
<th>Cultural-Temporal Affiliation</th>
<th>Land Form</th>
<th>Area (m²)</th>
<th>Elevation (m)</th>
<th>Relative Elevation (m)</th>
<th>Distance to nearest River (m)</th>
<th>River Drainage</th>
<th>Soil</th>
<th>Vegetation</th>
</tr>
</thead>
<tbody>
<tr>
<td>38SU31</td>
<td>Historic: 19th &amp; 20th centuries</td>
<td>Crest of low rise</td>
<td>1000</td>
<td>46</td>
<td>10</td>
<td>550</td>
<td>Rocky Bluff Swamp</td>
<td>Black</td>
<td>Lynchburg sandy loam/ Norfolk loamy sand</td>
</tr>
<tr>
<td>38SU32</td>
<td>Historic: 19th &amp; 20th centuries</td>
<td>Slope of low rise</td>
<td>750</td>
<td>40</td>
<td>3</td>
<td>200</td>
<td>Rocky Bluff Swamp</td>
<td>Black</td>
<td>Rut-ledge and blackberries</td>
</tr>
<tr>
<td>38LE91</td>
<td>Prehistoric: Woodland/ Historic: 19th &amp; 20th centuries</td>
<td>Ridge-top</td>
<td>3500</td>
<td>55</td>
<td>15</td>
<td>500</td>
<td>Scape Ore Swamp</td>
<td>Black</td>
<td>Lake-land sand</td>
</tr>
<tr>
<td>38LE92</td>
<td>Prehistoric: Woodland</td>
<td>Terrace</td>
<td>250</td>
<td>52</td>
<td>3</td>
<td>350</td>
<td>Lynches River</td>
<td>Kalmia</td>
<td>Cultivated</td>
</tr>
<tr>
<td>38DA35</td>
<td>Prehistoric: Woodland</td>
<td>Bottom-land</td>
<td>?</td>
<td>58</td>
<td>3</td>
<td>10</td>
<td>Pee Dee River</td>
<td>Kalmia</td>
<td>Cultivated</td>
</tr>
<tr>
<td>Site Number</td>
<td>Cultural- Temporal Affiliation</td>
<td>Land Form</td>
<td>Area (m²)</td>
<td>Elevation (m)</td>
<td>Relative Elevation (m)</td>
<td>Distance to nearest River water (m)</td>
<td>River Drainage</td>
<td>Soil</td>
<td>Vegetation</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------</td>
<td>-----------</td>
<td>-----------</td>
<td>--------------</td>
<td>-------------------------</td>
<td>------------------------------------</td>
<td>----------------</td>
<td>-----</td>
<td>------------</td>
</tr>
<tr>
<td>38DA47</td>
<td>Prehistoric: Ridge-slope</td>
<td>1500</td>
<td>58</td>
<td>3</td>
<td>50</td>
<td>Beaverdam Creek</td>
<td>Lake-land</td>
<td>Fallow field; sc</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Woodland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>scrub; and</td>
<td>land</td>
<td>sand; vines</td>
</tr>
<tr>
<td>38DA48</td>
<td>Historic: Ridge-top</td>
<td>75</td>
<td>73</td>
<td>15</td>
<td>300</td>
<td>Black Creek</td>
<td>Lake-land</td>
<td>Pine trees;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>19th &amp; 20th centuries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>scrub oaks</td>
<td>land</td>
<td>sand</td>
</tr>
<tr>
<td></td>
<td>Prehistoric(?)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IF-1</td>
<td>Historic: Rise</td>
<td>-</td>
<td>58</td>
<td>3</td>
<td>900</td>
<td>Black Unnamed River tributary</td>
<td>Marlbro Cultivated loamy sand</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>19th &amp; 20th centuries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IF-2</td>
<td>Historic: Rise</td>
<td>-</td>
<td>58</td>
<td>3</td>
<td>300</td>
<td>Unnamed Unnamed tributary</td>
<td>Lynchburg Cultivated sandy loam/ Coxville sandy loam</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>19th &amp; 20th centuries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IF-3</td>
<td>Prehistoric Ridge-top</td>
<td>-</td>
<td>58</td>
<td>3</td>
<td>100</td>
<td>Unnamed Unnamed intermittent River drainage</td>
<td>Lake-land Cultivated</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE 10. Site location relative to soil productivity (after Green 1963:21-22; Colburn 1960:21-22)

<table>
<thead>
<tr>
<th>Corn/Cotton</th>
<th>Soil</th>
<th>Temporal Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1</td>
<td>Marlboro</td>
<td>X</td>
</tr>
<tr>
<td>1/1</td>
<td>Norfolk</td>
<td>X</td>
</tr>
<tr>
<td>1/2</td>
<td>Lynchburg</td>
<td>X</td>
</tr>
<tr>
<td>2/2</td>
<td>Kalmia</td>
<td>X</td>
</tr>
<tr>
<td>2/3</td>
<td>Coxville</td>
<td>X</td>
</tr>
<tr>
<td>3/3</td>
<td>Lakeland</td>
<td>X, X</td>
</tr>
<tr>
<td>3/4</td>
<td>Rutledge</td>
<td>X</td>
</tr>
</tbody>
</table>
A minor historic component, 38LE91, is located in Lakeland soils. It, too, may represent a preferred habitation area. The site is located on the highest ground adjacent to Scape Ore Swamp. A small tributary runs 300 m north of the site, but the channelization shown at the headwaters of the drainage affects the stream flow today. The Lakeland soils are rapidly drained (Fig. 6; Colburn 1960:82-83).

Although its historic productivity appears to be low, the prehistoric productivity of this area may have been desirable. The prehistoric artifact assemblages at 38LE91 and 38DA47 (Fig. 9), both situated on Lakeland soils, show a greater range of materials and higher diversity than found at the other three prehistoric loci (Tables 11 and 12). The other soil type associated with prehistoric sites is Kalmia. Differences between the Lakeland and Kalmia soils are the slope and distance from the stream channel as they affect drainage. Which of these soils would be most suitable for harvesting grasses or practicing horticulture cannot be assessed at the level of this present study.

It is difficult to distinguish base camps, temporary camp sites, and extraction locales from each other in a riverine zone. The values of variables relating to size and complexity of occupation grade into one another without obvious breaks. The location of sites nearer the stream channel may indicate specialized extractive activities. Sites located on the Lakeland soils may represent a strategic position which is conducive to exploitation of both uplands and stream or swamp edges. The greater diversity of artifacts may then relate to base camp activities. The adaptive advantages of a riverine/upland edge position have been recently investigated at a Middle-Late Woodland site in the interior lower Coastal Plain (Brooks and Canouts 1981).

Sites 38DA35, 38DA47, and IF-3 are part of a larger site distribution pattern partially recorded just above the confluence of Beaverdam and Black creeks (South Carolina Statewide Archeological Site Inventory files at the Institute of Archeology and Anthropology; see also Table 6). A total of thirteen sites has been recorded in a little over a one-kilometer square area. They vary in size, artifact assemblage, distance to water, and soil association. Whether the settlement patterns in the Beaverdam Creek and Black Creek drainages are contemporaneous is difficult to predict. Diagnostic artifacts from 38DA47 and from site 38DA33, which is situated directly across the creek on Kalmia soils, represent Woodland and Archaic, respectively.

The artifacts are not as temporally sensitive as one would like them to be. Bifaces, while one of the best chronological indicators in the Piedmont (Coe 1964; Tippitt and Marquardt 1981), are not well-defined for the interior Coastal Plain (Derting and Brooks 1981; cf. Anderson and others 1981). It is even difficult to assign spatial and temporal parameters to the pottery, though more ceramic studies than biface studies have been undertaken (Fig. 11).
FIGURE 9. Site 38DA47, looking southeast

FIGURE 10. Site 38SU32, looking south
Four of the five prehistoric sites can be assigned to the Woodland period on the basis of the pottery (Table 11). Cord marked and fabric impressed surface treatments in the Cape Fear and Wilmington ware-groups and simple stamping in the Deptford wares represent a developmental period on the South Carolina coast (South 1976). These wares span 2,000 years of pre-history. Changes in style, technology, and the use of local and non-local raw materials are masked under the general rubric of surface treatment. Studies are now beginning to measure the different functional and stylistic variables which will aid temporal and spatial seriation analyses (cf. Canouts, Haskell and Pearson 1981; Anderson and others 1981).

Three bifaces were collected, only one of which is complete. A triangular, Yadkin-like biface (38DA47) appears to be manufactured from a flake. Very weak side-notching gives a slight definition to the basal edge. A second broken biface (Badin or Yadkin?) from 38LE92 also appears to be an unfinished modification of a flake. The remaining bifaces are too fragmentary to identify with any degree of confidence. However, the quartz biface from 38LE91 is a basal fragment which is faintly reminiscent of a small triangular biface, e.g., Caraway (Coe 1964: 48-49). These points originate in the archeological record of the Piedmont about A.D. 1 and continue to the historic period.

The most common raw materials in the collections are quartz and rhyolite (Table 12). Rhyolite, quartz, and argillite are found in the Fall Line zone (Overstreet and Bell 1965) adjacent to the project area. Orthoquartzite outcrops in some areas of the interior Coastal Plain (Derting and Brooks 1981; Anderson and others 1981). To date, there has been no lithic material resource survey conducted in the state. The composition and technological suitability of the unconsolidated gravels in the vicinity of the project area are subjects for future study.

The diverse local and non-local raw materials at 38DA47 suggest a more complex, at least technologically complex, activity locus. Thus, the site's assemblage, as well as its position, suggest a more intensive habitation area where a large number of tools were being used and resharpened.

In general, the high number of flakes of bifacial retouch (FBR) in the entire collection contrasts with the low number of flakes from initial reduction stages and suggests heavy use and/or maintenance tasks (Table 12; House and Ballenger 1976). The low number of tools and the lower number of materials having good concoidal fracturing properties argue that the tools were conserved and used until exhausted or lost. A conservative strategy would be advantageous if raw materials had to be transported from the Fall Line zone or the coast.

To summarize, the pattern of these prehistoric sites conform to the Woodland riverine emphasis observed for the previously recorded sites. The upland extractive sites predicted to occur...
## Ceramic Chronologies*

<table>
<thead>
<tr>
<th>AD 1600</th>
<th>Coastal South Carolina (2)</th>
<th>Southern Piedmont North Carolina (3)</th>
<th>Central South Carolina (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irene</td>
<td>Ashley</td>
<td>Caraway</td>
<td>McDowell II</td>
</tr>
<tr>
<td>1400</td>
<td>Charles Towne</td>
<td>Pee Dee</td>
<td>McDowell I</td>
</tr>
<tr>
<td>1200</td>
<td>Savannah II</td>
<td>Uwharrie</td>
<td>Camden</td>
</tr>
<tr>
<td>1000</td>
<td>Savannah I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>Wilmington</td>
<td>Yadkin</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>Wilmington</td>
<td>Badin</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AD 200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BC 200</td>
<td>Deptford</td>
<td></td>
<td></td>
</tr>
<tr>
<td>400</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>Refuge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>Thom's Creek/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>Awendaw</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1200</td>
<td>Stallings III</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1400</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1600</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1800</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BC 2000</td>
<td>Stallings II</td>
<td>Stallings (2500-1900 BC)</td>
<td></td>
</tr>
<tr>
<td>?</td>
<td>Stallings I</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Sources

1. Stoltman (1974) and Williams (1968)
2. South (1976, n.d.)
3. Coe (1964) and Reid (1967)

*Adopted from Smith (Taylor & Smith, 1978: 114)

---

**FIGURE 11. Prehistoric ceramic wares**
<table>
<thead>
<tr>
<th>Site Number</th>
<th>Prehistoric</th>
<th>Historic</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cord Marked</td>
<td>Fabric Impressed</td>
<td>Simple Stamped</td>
</tr>
<tr>
<td>38SU31</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>38SU32</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>38LE91</td>
<td>4</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>38LE92</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>38DA35</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>38DA47</td>
<td>7</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>38DA48</td>
<td>15</td>
<td>24</td>
<td>14</td>
</tr>
<tr>
<td>IF-1</td>
<td>0</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>IF-2</td>
<td>0</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12</strong></td>
<td><strong>6</strong></td>
<td><strong>1</strong></td>
</tr>
</tbody>
</table>

TABLE 11. Ceramic artifacts from sites in the Lake Robinson to Sumter transmission line corridor
TABLE 12. Prehistoric lithic artifacts from sites in the Lake Robinson to Sumter transmission line corridor

<table>
<thead>
<tr>
<th>Site Number</th>
<th>QUARTZ</th>
<th>RHYOLITE</th>
<th>ORTHO-QUARTZITE</th>
<th>CHERT</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chunks/shatter</td>
<td>Other flakes</td>
<td>FBR</td>
<td>Core</td>
<td>Biface</td>
</tr>
<tr>
<td>38LE91</td>
<td>5</td>
<td>9</td>
<td>11</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>38LE92</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>38DA35</td>
<td>6</td>
<td>4</td>
<td>45</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>38DA47</td>
<td>4</td>
<td>14</td>
<td>9</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>38DA48</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>IF-3</td>
<td>1</td>
<td></td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>28</td>
<td>65</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

*Includes 2 utilized FBR

Note: Functional typology after House and Woagaman (1978:58-61)
may be difficult to recognize. Deer and nut exploitation would not necessarily require a complex procurement technology, especially the use of ceramic vessels that are easily broken and deposited. Pottery found at sites on the swamp and stream terraces may be indicative of domestic or specialized riverine resource extraction tasks or both. The isolated flakes and bifaces found at higher elevations may very well reflect Woodland resource extraction in the uplands. Unfortunately, the presence of pottery is often used to demarcate the Late Archaic and Early Woodland periods, though earlier diagnostic Archaic bifaces are indeed present (Table 6).

The distinct land use pattern revealed by prehistoric and historic sites appears to relate to agricultural production. The productivity of the riverine/swamp zone for natural resources, and cultigens apparently influenced an almost spatially continuous occupation along their edges during the Woodland and into the Mississippian (Table 6). It was not until the historic period that the interriverine, low flat uplands were used for agriculture. Why there are not more multi-component historic homesites and prehistoric lithic scatters is puzzling. It may be that the natural resources were so evenly dispersed that the artifacts will not be concentrated, and a non-site sampling strategy may have to be employed (e.g., Doelle 1977). The historic homesites were equally dispersed.

Survey Evaluation

Two archeologists traversed the survey transects. In 80 person-hours the crew covered between 15 and 16 km or about 25% of the 62-kilometer long, 30.5-meter wide corridor. The field coverage is estimated at between 5 and 6 ha per person day. Crew efficiency was undoubtedly affected by the heat in this hottest part of the Carolina summer. Fortunately, shovel probing requirements were minimal.

Shovel probes were sunk in 7 of the 20 transects. Survey conditions were variable. Figures 12 and 13 illustrate some of the field situations encountered during the survey. However, an estimated 60% of the transects were cultivated, and all of the sites were located by surface inspection. Seven (70%) sites were found in cultivated fields.

The archeological survey team located a total of nine archeological loci in the corridor. (Site 38DA35 is not included in the following transect estimates because it was not part of the sampling design.) All the resources will be considered together because, whether or not an artifact locale is assigned site status, it is part of the archeological record which should be considered in its entirety. Given the variable visibility and transect coverage (Table 8), ca. 45 ha, a little under the 25% estimate, is considered a reasonable figure for estimating population parameters. The frequency of archeological loci is cal-
FIGURE 12. Irrigation ditch in survey transect 51, looking west

FIGURE 13. Ground cover in survey transect 6, looking northeast
culated at ca. .2 loci per ha or 1 locus per 5 ha (Table 13). This is a relatively high ratio compared to upland settings in the Carolina Piedmont (Canouts 1981) and Ozark Plateau (Canouts and others 1977). (The ratio formulas are after Cochran 1963; justification of their use is after Canouts and others 1977. The transect hectares are considered equal for these computations so the variance for R is not calculated as it might have been if there were variable transect lengths.)

Using this biased ratio to estimate the population or resource parameters for the entire corridor yields a figure of 37 loci for the 189-hectare corridor. The standard deviation as calculated from the formula for the variance (Cochran 1963:163; cf. Hanson, Hurwitz, and Madow 1953:168), is 10.17. Therefore, at a standard deviation, or a 67% confidence level, the expected number of archeological loci ranges between 27 and 47.

Because these figures are based on survey data which are problematical, trying to refine the prediction as to temporal period, site type, or environmental setting is probably spurious except at the most general levels of observation. The recorded sites were divided almost evenly between prehistoric (5) and historic (6) components with one definite multi-component site, 38LE91 (11%). One-third (33%) of the sites were isolated finds. Two sites were located in the riverine zone, which might suggest the possibility of finding two more sites in the remaining 45 riverine hectares, i.e. 38DA35. More sites should also be located where the line parallels Lynches River.

Formulating a settlement-subsistence model is a necessary complement to this probabilistic model. For example, if a number of sites are located in a particular setting, it would not be advisable to assume a similar pattern for all settings until all the critical variables were assessed. The Black Creek and Beaverdam Creek area is located in the sandhills and the site distribution even though the soils may be the same, is probably not the same as that for the edge of Lynches swamp (i.e., 38LE92). "The ideal predictive model [should] be able to account for both the patterning the archeological record and the biases of the probabilistic sampling technique" (Canouts 1977).

The survey effectiveness is hard to calculate without any comparable data against which to assess site frequency, environmental and site diversity, and site discovery techniques in the upper coastal plain or along the Fall Line zone. All the sites were discovered on the surface, which in many areas was less than 50% and even 10% visible. If all isolated artifacts and sites could be located in the corridor, the site frequency would no doubt err on the high end of the range.

The problem of buried sites in the riverine zone has not been considered and should be investigated in conjunction with drainage changes though time in order to assess which areas might have proved suitable for exploitation by prehistoric groups.
TABLE 13. Transect Sampling Estimates

Population parameters from the sample were estimated by using a ratio estimate:

\[ \hat{Y}_R = \frac{Y}{x} \cdot X = \frac{9}{45.84} \quad (189) = 37.04 \]

where \( \hat{Y}_R \) = Number of archeological loci
\( Y \) = Number of loci in transects
\( x \) = Number of hectares in transects
\( X \) = Total number of hectares in transmission corridor

(after Cochran 1963:155)

The variance of the ratio estimate which is biased \((1/n)\) takes advantage of the correlation between \( x \) and \( y \). The primary reason for selecting it was for the slightly smaller variance obtained by using:

\[ s^2_{\hat{Y}_R} = \frac{N^2(1 - f)}{n} \sum_{i=1}^{N} (y_i - \hat{R}x_i)^2 \]

Computation form for calculator:

\[ s^2_{\hat{Y}_R} = \frac{N (N - n)}{n (n - 1)} (\Sigma y^2 + \hat{R}^2 \Sigma x^2 - 2\hat{R} \Sigma yx) \quad s^2_{\hat{Y}_R} = 103.49 \]

where
\( N \) = Total number of transects (78)
\( n \) = Number of sample transects (20)
\( f \) = Percentage of coverage
\( \hat{R} \) = Ratio of \( y/x \) (.196)
\( y \) = Number of loci on transect (9)
\( x \) = Number of hectares in transects (2.4 except for transect 46 which was calculated at .24)

(after Cocharan 1963:163; cf. Hanson, Hurwitz, and Madow 1953:168)
Flooding and alluviation have probably affected historic utilization of the riverine zone, as well, e.g. Revolutionary War bivouacs (Appendix I).

In conclusion, survey evaluation is important to the long term management of archeological resources. Although many historically unique sites exist, many more exist as part of a larger data set, contributing important information for modeling man's adaptive stance though time. The resource base is unrenewable. If sampled data are to be used in decisions about how resources (time, effort, funding, and the sites themselves) should be spent relative to mitigating the impacts to the archeological record, then both substantive and methodological findings must be incorporated into a continuous evaluative program. This study is a step in that direction.
MODELING WOODLAND OCCUPATION ON THE
UPPER COASTAL PLAIN: A COMMENT

Four Woodland sites have been identified in the project corridor. These data are compared in a very general way to other Woodland components in the Coastal Plain, Fall Line, and Piedmont (Table 14). Comparability of these data is very hard to achieve since there has been very little systematic survey coverage of the state. The two largest and most systematic surveys at the present time are those at the Savannah River Plant (Hanson, Most and Anderson 1978; Hanson and Brooks 1978; Hanson and Most 1978) and at the Richard B. Russell Reservoir (Taylor and Smith 1978). The Woodland components from these two research areas are approximately 25% and 13% respectively (diagnostic sites only). Several other smaller studies within and adjacent to the Fall Line zone were also reviewed (Ferguson and Luttrell 1973; Anderson, Trinkle and Michie 1974; Ferguson 1976; Drucker 1977; Smith 1977, 1978; Cable, Michie, Cantley, and Perlman 1978; Cantley, Sexton, and Perlman 1978; Cable and Cantley 1979; Michie 1980; Harmon 1980a, 1980b). The Woodland components comprise a larger percentage of the Coastal Plain studies (50 to 100%) than of the Fall Line or Piedmont studies (5-27%).

Two of the project sites were situated on terraces or bottomlands, conforming to the data from the upper Coastal Plain (Savannah River Plant) but not from the rest of the provinces. The average site size for the project area was 1750 sq m ($s = 1,639$) which does not conform to the larger site sizes of the Savannah River drainage. Smaller sized sites away from the Savannah River may reflect more single component sites. The distance to water for the project sites averaged 227 m ($s = 237$) which is further than either the Coastal Plain or Fall Line sites. However, four of these sites were based on distance to intermittent rather than permanent drainages.

The artifact density was calculated to determine if the collections were providing a comparable data base, which they are. What is surprising is the low number of artifacts recovered per site area, even if these are survey data. For the project, the collection averaged 1 artifact for 37 sq m ($s = 33$). A 100% mitigative collection policy was implemented.

This comparison has temporal as well as adaptive implications. Pottery which is used as a temporal indicator of the Woodland period has an earlier beginning in the Coastal Plain (Fig. 11). Pottery does not enter the archeological record of the southern Piedmont until quite late. Thus, when Woodland sites are compared from one region to another, even within a sub-region, no contemporaneity is implied.
TABLE 14. Selected Woodland characteristics by physiographic province

<table>
<thead>
<tr>
<th>Variable</th>
<th>SAVANNAH RIVER (Savannah River Plant)</th>
<th>Coastal Plain</th>
<th>Fall Line</th>
<th>Piedmont</th>
<th>SAVANNAH RIVER (Richard B. Russell) Piedmont</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Upper Coastal Plain</td>
<td>Coastal Plain</td>
<td>Fall Line</td>
<td>Piedmont</td>
<td></td>
</tr>
<tr>
<td>Land Form</td>
<td>n = 82</td>
<td>n = 16</td>
<td>n = 12</td>
<td>n = 3</td>
<td>n = 25</td>
</tr>
<tr>
<td>Upland</td>
<td>33</td>
<td>13</td>
<td>7</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>Riverine</td>
<td>49</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Site Area (m²)</td>
<td>n = 83</td>
<td>n = 13</td>
<td>n = 11</td>
<td>n = 3</td>
<td>n = 24</td>
</tr>
<tr>
<td></td>
<td>x = 19,128</td>
<td>x = 2,709</td>
<td>x = 4,666</td>
<td>x = 1,418</td>
<td>x = 12,463</td>
</tr>
<tr>
<td></td>
<td>s = 81,388</td>
<td>s = 3,420</td>
<td>s = 6,063</td>
<td>s = 1,890</td>
<td>s = 23,238</td>
</tr>
<tr>
<td>Distance to Nearest Water (m)</td>
<td>n = 81</td>
<td>n = 6</td>
<td>n = 10</td>
<td>n = 3</td>
<td>n = 25</td>
</tr>
<tr>
<td></td>
<td>x = 274</td>
<td>x = 106</td>
<td>x = 110</td>
<td>x = 266</td>
<td>x = 180</td>
</tr>
<tr>
<td></td>
<td>s = 230</td>
<td>s = 89</td>
<td>s = 101</td>
<td>s = 208</td>
<td>s = 151</td>
</tr>
<tr>
<td>Relative Artifact Collection</td>
<td>n = 72</td>
<td>n = 13</td>
<td>n = 9</td>
<td>n = 3</td>
<td>n = 23</td>
</tr>
<tr>
<td>Density (1 artifact per ... sq m)</td>
<td>x = 296</td>
<td>x = 215</td>
<td>x = 253</td>
<td>x = 107</td>
<td>x = 309</td>
</tr>
<tr>
<td></td>
<td>s = 590</td>
<td>s = 446</td>
<td>s = 461</td>
<td>s = 66</td>
<td>s = 671</td>
</tr>
</tbody>
</table>
Pottery is more than just a time horizon to archaeologists. However, pottery, population aggregation, and sedentism appear to occur together and signal a change in adaptive responses. The development and expansion of inland swamps over the past 3,500 years changed the productivity of the riverine zone in the Coastal Plain, and at about this same time pottery made its first appearance in the archaeological record.

This is a very simple summary of a very complex problem. These data are in no way representative, though they do begin to suggest general patterns found across the state. The adaptive processes that underly these patterns require finer resolution, that is, more fine grained analysis of environmental and cultural data. The interplay between regional research programs (e.g., Hanson 1980) and statewide general research designs, incorporating studies such as this, is a dynamic way of developing cumulative data bases that will have some predictive capabilities.
APPENDIX I

CULTURAL-HISTORICAL BACKGROUND

The history of South Carolina encompasses several thousand years. Because most readers will be unfamiliar with that period of time prior to European contact and the specific history of the project area, a brief background summary has been provided. The prehistoric and ethnohistoric sections have been adapted from a previous report on an archeological survey conducted for the South Carolina Department of Highways and Public Transportation. John S. Cable and Charles E. Cantley assembled the original report, entitled An Intensive Archeological Survey of the South Carolina 151 Highway Widening Project. John Cable wrote the prehistoric section; Jim Sexton the ethnohistoric section. The survey area was adjacent to the northern end of the transmission line corridor. Since our knowledge of aboriginal cultures is subregional at best, their discussion is appropriate. The historic section of this report was prepared by Michael A. Harmon specifically for the project area.

Prehistoric Background

Pre-Clovis Horizon (before 9500 B.C.)

The concept of a pre-Clovis occupation of the New World has recently been given greater credibility than in previous years. The most notable line of evidence comes from Meadowcroft Rock-shelter in Pennsylvania (Adovasio and others 1977:152-153) where the earliest reliably dated lithic artifacts are associated with four hearths radiocarbon dated at between 11290 ± 1010 B.C. and 14225 ± 975 B.C. The assemblage consists primarily of an Upper Paleolithic-like microblade industry including a graver, a unifacial denticulate, six complete blades, a bilaterally retouched flake "knife," two unifacially retouched flakes, a rectangular and an amorphous biface. No diagnostic projectile point forms were found.

This time period corresponds to the end of Whitehead's (1965) Full Glacial period and the onset of the Late Glacial vegetational regime. Watts (1979) indicates the the sandhill environs of the South Carolina Fall Line were undergoing a slow transition from sagebrush prairies with stands of jack pine and spruce to a mesic forest dominated by oak and hickory with subdominant beech and ironwood/hophornbeam. It is not clear whether the faunal subsistence strategy of pre-Clovis populations was oriented toward the exploitation of extinct Pleistocene megafauna.
or toward more modern animal species, but Adovasio and others (1977:154) state clearly that the pre-Clovis stratum at Meadowcroft Rockshelter is devoid of megafaunal remains and contains only modern forms dominated by white-tailed deer and wapiti. Whatever the details of the subsistence of pre-Clovis populations were, the palynological evidence suggests that these groups were adapting to a slowly developing oak-hickory-beech hardwood ecosystem along the Fall Line of South Carolina.

Paleo-Indian Horizon (9500 - 8000 B.C.)

Traditionally, the Paleo-Indian assemblages of the New World have been viewed as tool kits developed according to the specialized demands of hunting extinct megafauna (cf. Mason 1962). This is primarily based on evidence from Paleo-Indian sites in the arid Southwest where extinct megafaunal associations appear to be conclusive. However, works in the eastern United States is gradually developing a somewhat different subsistence picture for Paleo-Indian, even though a general stylistic similarity in projectile point forms seems to hold on a continent-wide basis. Cleland (1965), for instance, reports barren ground caribou faunal remains from Holcombe Beach in Michigan and Funk (1977), identifies Woodland caribou from Dutchess Quarry Cave in New York associated with a radiocarbon date of 10580 + 370 B.C. The evidence from Meadowcroft Rockshelter (Adovasio and others 1977) for the Paleo-Indian micro-strata documents a continuation of the exclusive exploitation of modern fauna including white-tailed deer and wapiti.

Watts (1979) indicates that approximately 10800 B.C. in the Fall Zone of South Carolina the jack pine and spruce stands of the Full Glacial period had become almost entirely replaced by a broad-leaved forest of oak-hickory-beech associations. Therefore, adaptation along the Fall Line during the Paleo-Indian period would have been a response to a full-blown closed-canopy hardwood forest ecosystem. It is probably more likely that the primary subsistence mammals during this time horizon would have been more closely limited to the faunal assemblage reported by Adovasio and others (1977) than extinct megafauna.

Drawing largely on information from amateur collectors, Michie (1977) observes that locational patterning of Paleo-Indian projectile points (Clovis and Suwannee points) in South Carolina suggests a settlement pattern concentrated along the major rivers of the Coastal Plain and Fall Line. Perkinson's (1973) distributional study of Paleo-Indian points in North Carolina contrasts with Michie's observations somewhat in that the majority of points (60%) are located in the Piedmont. However, Perkinson also reports significant proportions from the Fall Line (15%) the Coastal Plain (13%) and the mountains (10%). This might lead to a more general pattern of settlement than Michie would suggest, but as Goodyear (Goodyear, House, and Ackerly 1979) points out, the absence of Paleo-Indian points in the collections
of the large regional level surveys in the South Carolina Piedmont conducted by the Institute of Archeology and Anthropology (see House and Ballenger 1976; Goodyear 1978; Cable, Cantley, and Sexton 1978; Taylor and Smith 1978) lends support to Michie's observations in the context of South Carolina.

Early Archaic Horizon (8000 - 6000 B.C.)

The Early Archaic horizon in the project area should be composed of three major segments, including the Dalton-Hardaway, Palmer, and Kirk phases. Goodyear (Goodyear, House and Ackerly 1979) ascribes partially overlapping temporal distributions to these parts [South Carolina] with the Dalton-Hardaway phase extending from around 8000 B.C. until near 7500 B.C.; the Palmer phase running between 7900 B.C. and 7500 B.C. until around 7000 B.C.; and the Kirk phase beginning around 7000 B.C. and ending at approximately 6000 B.C. The Bifurcate Tradition (Chapman 1973, 1975, 1977) which is most dominant in Tennessee during the later stages of the Early Archaic is almost absent from the South Carolina collections of the Institute of Archeology and Anthropology, although Poplin (Taylor and Smith 1978) identifies several bifurcate points from the Richard B. Russell Dam project along the Upper Savannah River.

Judging from the intensity of material culture concentrations at the Hardaway site and the collections stored at the Institute of Archeology and Anthropology, the Dalton-Hardaway phase represents a more abundant output than the previous Paleo-Indian material. The following Palmer phase constitutes an incredibly large increase in diagnostic (projectile point) outputs and appears to represent the first intensive utilization of the upland zones of the Piedmont and Fall Line (see House and Ballenger 1976; Goodyear 1978). The succeeding Kirk phase presents a puzzlement in this general trend. Kirk points appear to represent a dramatic decrease from Palmer point outputs in the Piedmont, whereas their concentrations in the Coastal Plain appear to increase significantly over Palmer (Goodyear, personal communication).

The general increase in material culture outputs from Paleo-Indian to Early Archaic must indicate relative population increases, but the dynamics of the increases are not well understood in terms of settlement patterning or even relative concepts of population levels. Certainly it would not be justifiable to equate people with projectile points at this stage of research, although some regular relationship might hold. From an ecological perspective, it can be seen that the Early Archaic chronicles a continued response to a closed canopy hardwood forest that gradually shifted toward an oak domination in the Fall Line of South Carolina. By around 7500 B.C. Watts (1979) demonstrates an oak maximum in the sandhills with a relatively abrupt decrease in other hardwoods at the expense of pine. This corresponds well with the florescence of Palmer in the Piedmont and Fall Line.
Since this date there appear to be short periods of relative species equilibrium.

Faunal assemblages from Early Archaic contexts in the eastern United States (Goodyear 1974; McMillan 1971; Parmalee 1962; Griffin 1974) suggest a heavy reliance on white-tailed deer, with some representation of small game species including squirrel, raccoon, turkey, and box turtle. It is interesting to note that this list is quite similar to that of the Woodland and Mississippian faunal assemblages Coe (1964) reports from the Gaston site.

From stratified Early Archaic contexts at Ice House Bottom and Rose Island, Chapman (1973, 1975, 1977) indicates that nut meats comprised a portion of the diet. The predominant nut remains are composed of acorns and hickory nuts. Chapman observes that with the exception of grape, honey locust, and pepper vine seeds, weed seeds are rare or non-existent in Early Archaic contexts.

This information suggests that Early Archaic reliance on plant foods may have been seasonal. In addition, secondary resources such as weed seeds appear to have been utilized in low frequencies, if at all. The primary subsistence pattern during this time period may still have been oriented toward hunting. The species taken tend to evince a general game exploitation pattern that survived throughout the remaining prehistoric occupation of the eastern United States.

Middle Archaic Horizon (6000-3000 B.C.)

The Middle Archaic is represented by the Stanly, Morrow Mountain and Guilford phases. Goodyear (Goodyear, House, and Ackerly 1979) presents a temporal framework for these phases with Stanly beginning at approximately 6000 B.C. and lasting to around 5000 B.C.; Morrow Mountain spanning the fifth millennium B.C. (5000-4000 B.C.); and Guilford encompassing the 4th millennium B.C.

Unfortunately Watts (1979) was not able to obtain radiocarbon dates to calibrate his pollen diagram from White Pond, South Carolina, after 7500 B.C., so it becomes mere conjecture as to the ecological situation in the Fall Zone during this period. The general trend, however, is toward a gradual increase in pine at the expense of oak with very little input from other hardwoods which are well on the wane in the sandhills by Middle Archaic times.

Stanly appears to be rare point form in South Carolina in both the Fall Zone and the Piedmont, in terms of its distribution (Institute and Archeology and Anthropology collections). In this sense, the Stanly phase forms a continuity with the previous Kirk phase. Evidence of the Morrow Mountain phase, by stark contrast,
is immensely abundant in the Piedmont and Fall Line. The Guilford phase is abundant in these areas in South Carolina, but is relatively more abundant in the North Carolina Piedmont in comparison to the Morrow Mountain phase (Cooper 1976). Not much is known of the Middle Archaic occupation of the Coastal Plain, but Hanson, Most, and Anderson (1978) indicate relatively low site frequency for this horizon in the Savannah River Plant near Aiken, South Carolina.

Without further evidence, it can only be suggested that the general hunting and gathering economy of the Early Archaic was continued through the Middle Archaic. Similar upland distributions of Morrow Mountain and Palmer in the Piedmont might support this contention, but the near absence of Kirk and Stanly diagnostic forms must remain a puzzle, if indeed these latter phases actually encompass 2,000 years of human occupational history.

Late Archaic Horizon (3000 B.C. - A.D. 1)

The late Archaic is represented by the Savannah River phase which spans the entire time range of the horizon in most areas. However, Keel (1976) has identified a small, but similarly shaped point called the Otarre stemmed point that he places between Savannah River and Woodland.

The low variability in projectile point forms for this horizon masks the tremendously complex regional variation that can be observed between the archaeological assemblages of the Savannah and Uwharrie regions. The Savannah region exhibits two distinctive Late Archaic assemblages; the earlier without pottery, the latter with the earliest dated pottery in North America (Stoltman 1974). In addition, the Late Archaic of the Savannah region exhibits the first evidence of intensive shellfish utilization of the South Appalachian area (see Claflin 1931; Stoltman 1974). In contrast, the Late Archaic of the Uwharrie region contains none of the "transitional" qualities exhibited by the Savannah region. At present, the Late Archaic Uwharrie is not associated with either pottery or intensive shellfish utilization. Instead it appears to represent continuation of earlier Archaic patterns (Coe 1964). In fact, Cooper (1976) reports that, rather than being a riverine intensive system as it is in the Savannah region, the Savannah River point is the most abundant diagnostic projectile point type in the Piedmont uplands of the Uwharrie area. Although not as abundant as Middle Archaic points in most areas of the Piedmont upland in South Carolina, Savannah River points are well represented there (Institute of Archeology and Antropology collections).

Woodland Horizon (A.D. 1 - 1550)

From present data it appears that the advent of the Woodland period occurred much later in the Uwharrie than in the Savannah
When pottery occurred in the Uwharrie region, it was a purely Woodland context and represented a distinctively different ceramic tradition than that developing along the Savannah River by this time. In the former case, the surfaces of the vessels were treated with cord, fabric, and net covered paddles, while in the latter case ceramics were stamped with carved simple and check pattern paddles. These two traditions correspond to Caldwell's (1958) "Middle Eastern" and "South Appalachian" ceramic traditions, respectively. Sometime after A.D. 1, these two ceramic traditions began to overlap spatially and to share the different surface treatments. The project area is expected to contain a ceramic assemblage with cord-marked, fabric-impressed, and check stamped surfaces (Anderson, Lee, and Parler 1979).

The presence of a ceramic industry has been interpreted generally as one indicator of increased sedentism (see House and Ballenger 1976). Another way of looking at this might be to view containers as an indicator of increased reliance on secondary resources (i.e. shellfish, seeds, cultivars, etc.). In this respect, since Late Archaic reliance on secondary resources is not expected to be visible archeologically in the project area, it will be important to monitor Late Archaic settlement patterning in relationship to Woodland and earlier Archaic site locations.

Mississippian (A.D. 1550 - 1725)

Ferguson (1971) observes that the Fall Line is the prime location for the South Appalachian Mississippian mound complexes: along the Savannah Fall Line is the Hollywood mound (Williams 1968); along the Wateree is the Camden mound complex (Stuart 1970); along the Santee is Ft. Watson (Ferguson 1973); and along the Pee Dee is Town Creek (Reid 1967). These mounds are located on the ridge terrace bottoms and bottomlands of the major river systems at their approximate intersections with the Fall Line. Irene mound (Caldwell and McCann 1941; Williams 1968) is situated on another ecotone where the Savannah River deposits its sediments into the Atlantic Ocean. Several smaller mounds are located in the Piedmont along the Savannah River, the Saluda River, and the Broad River (Ferguson 1976). The project area lies about halfway between the Town Creek mound and the Camden mound complex. It is possible that a small mound site could be situated in the floodplain of the Lynches River.

The locations of the primary mounds and their accompanying villages suggest a heavy reliance on secondary resources during Mississippian times. At this late date, secondary resources were probably associated with cultivars or agricultural products such as maize (Griffin 1967).
Ethnohistoric Background

The Catawba Indians as well as several associated groups (e.g., Esau, Sugaree, Waxhaw; Baker 1975) occupied the Catawba-Wateree valley above the Fall Zone west of the project area. To the east the Pee Dee, Keyauwee and Cheraw Indians are documented as having sometimes, occupied the Pee Dee River in the vicinity of the Fall Line and below (Swanton 1946).

Probably the first historically documented contact with the native peoples of South Carolina for any extended period of time occurred with the Ayllon colonization attempt at San Miguel de Gualdape (Swanton 1922:40). Quattlebaum (1956:23) has presented convincing evidence for locating the ultimately unsuccessful settlement of San Miguel near Winyah Bay. The accounts and descriptions of the aboriginal peoples situated near this settlement were recorded by Oviedo (Swanton 1922:48) and Peter Martyr (MacNutt 1912) and constitute the first ethnohistoric documentation of any Carolina natives.

Baker (1974), in drawing primarily from the early Spanish accounts of the DeSoto expedition in the 16th century, has presented a well argued case for locating the province of Cofitachique in central South Carolina along the upper Santee River drainage. The province of Cofitachique is seen as the center of a larger redistributive chiefdom (termed the "greater chiefdom of Cofitachique;" Baker 1974:1) that may have extended over the greater part of the state and at its zenith may have incorporated nearly all of Carolina's native peoples.

The territorial limits of this historically documented southern chiefdom society correspond quite well with Ferguson's (1971:205-207) cultural subarea of the prehistoric South Appalachian Mississippian cultural tradition. Ferguson's delineation of this cultural subarea was based on stylistic similarities observed among ceramic assemblages of the major mound sites within the region. Ferguson (1971:206) suggests that this "common unit of cultural interaction" was focused on the upper Santee drainage. Baker (1974) has suggested that the greater chiefdom of Cofitachique existed at least in part from the early 16th century until the late 17th century. By the close of the 17th century the greater chiefdom had collapsed and the individual subordinate groups that comprised it slowly emerged as the independent aboriginal peoples of the 18th century English period of documentation. Baker's synthesis and conclusions about the province of Cofitachique are illustrative of the potential effectiveness of integrating ethnohistorical documentation with pertinent prehistoric archeological investigation.

Although the exact route of Spanish explorers in this area of South Carolina and possibly North Carolina cannot always be identified accurately, they appeared to have encountered a number of subordinate Cofitachique groups within the general region of the project area (Baker 1974).
When the English settlers founded the colony at Charles Towne in 1670, they were well received by the aboriginal groups, particularly the Sewee (Salley 1959:117). Upon their arrival, the English immediately sought to establish alliances with the various native groups, both for purposes of commerce and as security against more hostile native peoples. Most of the early ethnohistoric references of the Carolina colony are composed of brief statements and generalizations scattered throughout various letters and diverse colonial records and are of limited ethnological utility. It was not until 1700 when John Lawson (Harriss 1952) traversed the Carolina interior that good ethnohistoric documentation of aboriginal peoples is provided.

Lawson (Harriss 1952) traveled up the Santee River, entered the Wateree-Catawba drainage and traveled this system well into the North Carolina Piedmont. He then headed east and eventually followed the Neuse River to the coast. Along his journey Lawson encountered aboriginal peoples, and his observations of them are probably the single best ethnohistoric source of groups of this region during the early English period. During his travels Lawson visited or spoke of the Sewee, Santee, Congaree, Wateree, Waxhaw, Esau, Sugaree, Seponi, Tutelo, Keyauwee, Woccon, and many others.

Until the latter part of the 19th century virtually nothing was known of the cultural and linguistic affiliations of these peoples. At that time evidence was collected suggesting their linguistic associations and a large number of these groups have since been classified as speakers of various "Eastern Siouan" languages (Mooney 1894; Swanton 1936, 1946). The grouping of these people under a collective Siouan identity has consistently conveyed the impression that these people participated in a common cultural system which was considered to have contrasted significantly with that possessed by their neighboring groups (the Cherokee, Creek, and Tuscarora). These were all seen to be relatively small insignificant groups occupying a marginal region between much larger, more complex aboriginal societies. This collective Siouan identity, with the concomitant cultural implications, has tended to obscure the characteristics of their individual cultural expressions and any differences that may have developed between them.

Recently Hudson (1970:6-9) has discussed this Siouan classification and has suggested that the linguistic identification for many of these people is based on tenuous evidence at best. In fact, of the groups occupying the Carolinas, only the Catawba, Tutelo, and Woccon can be classified as Siouan on direct linguistic evidence. Most of the remaining groups have been included under the Siouan identity on the basis of sociopolitical affiliations which existed between them during this time. Hudson (1970:9) has also indicated that the cultural implications of the Siouan classification may be very misleading and has suggested that this identification should be abandoned altogether.
Instead of automatically assuming a relative degree of cultural homogeneity among the groups throughout this region several authors have recently begun to define general cultural patterning as it varies among these historically documented groups of the English period. South (1972:19-20) and Hudson (1970:11-28) have each recognized, primarily from John Lawson's observations, that the Santee and Waxhaw are often associated with the southern chiefdom tradition. Cranial deformation and complex ceremonialism among the Waxhaw and platform burials and extremely centralized authority among the Santee are evidence of this. South (1972:41-42) suggests that the Waxhaw and Santee may represent cultural descent candidates from the prehistoric South Appalachian Mississippian culture which is represented by the ceremonial centers that comprise Ferguson's (1971:205-208) cultural subarea. Southeastern North Carolina and northeastern South Carolina are seen by South (1972:42, 1976) as "outside the major flow of Mississippian culture traits." These conclusions, although derived from ethnohistoric sources separated by nearly a century, lend support to Baker's (1974) notions of the chiefdom of Cofitachique as drawn from the Spanish documents.

Hudson (1970:12-28) has synthesized Coe's (1952, 1964) research relative to the historic "Siouan" peoples of the North Carolina Piedmont and suggests that their prehistoric ancestors differed culturally from the South Appalachian Mississippian traditions. As the prehistoric period drew to a close the aboriginal groups of the Piedmont (e.g., Catawba, Sapoini, Tutelo and others) were becoming similar in their cultural expressions to the more complex, chiefdom level societies to the south and the west (the Cherokee and Creek). Lawson's observations of these people, combined with the archeological appearance of "Lamar" style ceramics and "shaft and chamber" type burial practices (Coe 1952:311) which have archeological parallels in the Quail and Pisgah phases of the prehistoric and historic Cherokee (Dickens 1967; Egloff 1967), are seen as evidence of this growing cultural similarity.

By the middle of the 18th century, with European colonization and expansion, many of the native people of Carolina had either been destroyed or assimilated into other aboriginal groups. The Catawba Indians incorporated many of these surviving people during the 18th century, and emerged in the 19th century as the Catawba Nation (Baker 1975), thus essentially ending the aboriginal occupation of this region.

Historical Background

During the rule of the Lords Proprietors from 1662 through 1729, the project area was included within Craven County (South Carolina Department of Archives and History n.d.). The area was sparsely populated by traders, explorers and historical Indian tribes throughout the period. John Lawson passed through the vicinity in 1701 and noted the presence of two major Indian
tribes, the Waterees and Santees (Gregorie 1954:5-7). These tribes fought in the Yemassee War of 1715, which was a concerted effort by the aboriginals to eradicate the early settlers. After their defeat in 1717, the remaining portions of these two tribes merged with the Catawbas and other tribal remnants to form the Catawba Nation.

In 1729 Governor Johnson began implementation of a township system which divided the state into 10 townships of approximately 20,000 acres each. The project corridor was bounded by, but not included in, the areas of, Fredericksburg, Queensboro, and Williamsburg townships (Meriwether 1940:78). As population gradually increased, settlers began moving outside these townships. Open range cattle raising and subsistence farming were their main occupations.

In 1769 South Carolina was divided into eight Circuit Court Districts (South Carolina Department of Archives and History n.d.). Camden and Cheraw districts encompassed the project vicinity at this time. Camden (then known as Pine Tree Creek) and Long Bluff, two of the earliest settlements in this area, were installed as the capitals of these two districts (Lewis 1976:22).

Revolutionary War action was minimal in the interior Coastal Plain until 1780. Military activity, both before and after this time, was generally centered around major travel arteries, such as Lynches and Black rivers and the road from Charlestown to Camden. The remote and desolate nature of the area with its numerous swamps was ideal for partisan activity, such as that exemplified by General Marion (the Swamp Fox) and General Sumter (the Fighting Gamecock). After the siege (April 1, 1780) and eventual capture (May 11, 1780) of Charlestown by British forces, the majority of American troops were forced to retreat from the vicinity. After the Americans retreated, Tory bands raided and plundered the countryside. The October victory at Kings Mountain, however, made possible the return of American troops (Gregorie 1954:47).

The first recorded skirmish in this area occurred on March 6, 1781, between the forces of Major Fraser and General Sumter near the head of Stirrup Creek, approximately three miles northeast of Bishopville (McCready 1902:110-111; Gregorie 1954: 50-51). Sumter was retreating northward from the High Hills of Santee to the Waxhaws, when his troops encountered a British detachment from Camden. Sumter's forces retreated southward gradually until they crossed Redcliffe's Bridge on Lynches River. The American troops burned the bridge upon crossing, and Fraser was unable to pursue. British casualties included 20 dead, and American losses numbered 10 killed and 40 wounded (McCready 1902: 111). Both sides claimed victory, as the British were unsuccessful in their attempt to halt Sumter's retreat.

Troop and supply train movements and minor skirmishes continued locally until the end of the war. The fall of Fort Watson
on April 23, 1781 (Ferguson 1973) and the evacuation of Camden in May of 1781 essentially ended hostilities in this portion of South Carolina (McCrady 1902).

The period from the end of the Revolutionary War to the beginning of the Civil War witnessed steady population growth and the beginning of the three largest towns in the project corridor. By 1800 the Circuit Court District boundaries were very similar to those of present day Lee, Darlington, and Sumter counties (South Carolina Department of Archives and History n.d.).

Sumter was established as the seat of Sumter District in 1800. A courthouse and dependencies were built about this same time on the former plantation of John Gayle. The town grew slowly at first, but then expanded rapidly in the 1840s and 1850s. Known during this time as Sumterville (in honor of General Sumter), the town quickly became a commercial center (Gregorie 1954:89-105).

Bishopville was included in Sumter District during this period. Originally known as Singleton's Crossroads, the future town site was denoted by only a tavern and stage stop. In 1830 Singleton's Crossroads was renamed Bishopville in honor of Doctor Bishop, an eminent local physician. The town and surrounding country remained sparsely populated throughout most of the nineteenth century (Lee County Bicentennial Commission 1976). In 1902 Lee County was formed from portions of Darlington, Sumter, and Kershaw counties. Bishopville became the county seat of Lee County at this time.

Hartsville was established around 1817 on the property of Thomas Hart, from whom the town's name was derived. By 1838 the town had a post office and was known officially as Hartsville. Hartsville, like Bishopville, was sparsely populated throughout this period, serving primarily as an agricultural and community center (Errin, Conan, and Rudisell 1964:55-63).

On the eve of the Civil War, the project area was characterized by scattered plantations and farms based largely on a cotton monoculture. Many of the local settlements began either as community centers or summer villages inhabited by the wealthy planters who wished to avoid malaria and other unpleasanties of the lower Coastal Plain summers. Sumterville had developed into the principal commercial center because of its centralized location, district seat status, and railroad which first ran in 1852.

The Civil War did not impact the project vicinity directly until early in 1865. Several skirmishes occurred in close proximity to Lynches and Black rivers which were once again scenes of repeated military activity. These skirmishes were all associated with the Campaign of the Carolinas, during which time troops under the command of General Sherman made the final sweep
through this portion of the Confederacy in an effort to end the Civil War (Ainsworth and Kirkley 1901:87).

The Battle of Mount Elon occurred approximately three miles east of Bishopville and roughly one quarter mile south of Cypress Crossroads on the night of February 27, 1865. A Confederate cavalry unit under the command of Colonel Aiken surprised a smaller Union cavalry detachment under the command of Captain Duncan. The Confederates forced the Union troops across Lynches River, at which time the pursuit was stopped. Colonel Aiken is the only recorded casualty of this skirmish (Lee County Bicentennial Commission 1976).

The battle for the town of Sumter took place on April 9, 1865 (the day of Lee's surrender at Appomattox) when a group of approximately 575 Confederate troops from various military units, including militia remnants and the Sumterville home guard, commanded by Colonel Caldwell attempted to stop General Edward Potter and his army of more than 3,000 troops (Gregorie 1954: 262-263). Earthworks protecting three gun emplacements were constructed near Dingle's Mill on the main road leading from Manning to Sumter. One cannon failed to work due to improperly sized primers. The Union forces attacked this battery twice, and succeeded in knocking out one gun, but they were repulsed by the Confederate defenders both times. A regiment of Union troops guided by an ex-slave miller flanked the Confederate left and successfully silenced the remaining battery. The Confederate troops were forced to retreat the remaining three miles to Sumterville. Potter entered the town in the middle of the afternoon and succeeded in burning and destroying a substantial portion of it. When the Union troops finally withdrew from the area, most of the project zone and adjacent countryside lay in ruins.

The citizens of this area returned to an agricultural subsistence base following the end of the Civil War. Industrial development was minimal and centered around processing and transporting the more diversified agricultural products grown in the area. Most of the ex-slaves returned to farming under the sharecropper/tenant farmer system which functioned until well into the twentieth century when increasing mechanization gradually replaced physical labor as the primary energy source.

The three counties enclosing the project corridor have all experienced out-migration during the 1900s due largely to the gradual growth of mechanization which has caused the failure of many small farming operations. These counties are still predominantly agricultural. Darlington and Lee counties were ranked first and second, respectively, in agricultural acreage in South Carolina in 1959 (Green 1963:81). Twentieth century agriculture has witnessed an increasingly diverse range of products; tobacco, soybeans, oats and wheat, beef cattle, and pulpwood products have increased in importance as cotton production has decreased (Green 1963:81).
Recent trends suggest that industry is on the rise with food products, apparel, furniture, and textile manufacture becoming important industries in this area (Santee-Wateree Regional Planning Council 1972). Significant out-migration from Sumter County has stopped, while out-migration from Lee and Darlington counties is tapering off, as evidenced by areas which are rapidly becoming sites of homes rather than sites of fields, e.g. Lake Robinson housing development (Wilbur Smith and Associates 1970).
APPENDIX II

SITE DESCRIPTIONS WITH ARTIFACT INVENTORIES

This section contains physical descriptions and inventories of the site survey collections. Six archeological sites and three isolated find spots were recorded and collected by the survey crew. A seventh site, 38DA35, is also included for study and comparison, although this site was initially located during an earlier survey in the area.

38SU31

This site is a late 19th through early 20th century historic period artifact scatter located on a low ridge lying approximately 550 m northeast of Rocky Bluff Swamp. The artifacts covered a 1,000 sq m area in a soybean field. All visible artifacts were collected, except for brick fragments. These materials are probably domestic refuse associated with a small, abandoned house which lies just east of the artifact scatter. The site is presently in good condition.

Pottery: 1 porcelain plain rim (cup)
         2 whiteware plain body sherds
         1 creamy whiteware plain body sherd

Glass:  1 machine made clear bottle rim and neck (medicine)

38SU32

Site 38SU32 is a 19th through early 20th century historic period site located on the side slope of a lowlying ridge in a fallow field. Rocky Bluff Swamp is adjacent to the southwest site boundary. All visible artifacts, except bricks, were collected from two intersecting transects. The site area, 20 m east-west by 50 m north-south, is in fair condition. These materials and the occurrence of an old road bed in the area suggest that a small domestic structure was once located at this site.

Pottery: 1 porcelain plain rim (bowl or saucer)
         1 porcelain plain body sherd
         1 porcelain basal sherd (dish)
         1 whiteware red hand-painted rim sherd
         2 transfer whiteware rims with molded surface
         4 whiteware plain body sherds
38LE91

Site 38LE91 is a very sparse surface and plow zone scatter of Woodland period prehistoric artifacts and late 19th and early 20th century historic debris. The site measures 70 m by 50 m on a ridgeslope. Scape Ore Swamp is roughly 500 m west of this area, which is presently planted in soybeans. A total surface collection was made. The site condition is quite good. The site probably represents a historic period homesite set atop a Woodland period temporary habitation area.

Pottery:
- 4 cord marked (1 fine temper; 3 medium temper)
- 5 fabric impressed (1 medium temper; 4 coarse temper)
- 1 check stamped (coarse temper)
- 1 plain (medium temper, smoothed interior)
- 6 indeterminate (eroded, medium temper)
- 1 whiteware plain base
- 1 yellow ware rim with molded surface (bowl)
- 1 creamy whiteware with pink annular design

Chipped Stone:
- 2 quartz shatter
- 3 quartz chunks
- 9 quartz other flakes
- 11 quartz FBR (flakes of bifacial retouch)
- 1 quartz flaked core
- 1 quartz biface (Caraway-like), broken, re-sharpened and possibly used as a perforator; basal edge measures 19 mm in length, .9 mm thick, .5 g
- 1 orthoquartzite FBR
- 1 rhyolite, flow banded FBR

Glass:
- 1 milk glass (zinc lid liner)

Metal:
- 1 plate metal fragment

Rock:
- 2 brick fragments
- 1 ferruginous sandstone fragment

Bone:
- 1 small mammal skull fragment
This Woodland period prehistoric site is located along a terrace about 350 m from Lynches River. A scatter of surface materials was located over a 25 m by 10 m area of a cornfield. All visible artifacts were collected from the field. The assemblage suggests that this site may have been a temporary habitation and extraction site. Site integrity is relatively good.

Pottery: 1 indeterminate (eroded, medium temper)

Chipped Stone:
- 1 quartz chunk
- 1 other flake
- 6 rhyolite, flow banded FBR
- 1 rhyolite, flow banded, unfinished (Yadkin-like) biface; 27.9 mm in length, 23.2 mm wide at the base, 4 mm thick, 5.4 g

Rock:
- 1 quartz cobbled fragment (hammerstone), 9.4 g
- 3 quartz fire-cracked rock, 23.4 g

Site 38DA35, a Woodland period prehistoric site, was first recorded in April 1978. The site was located in the bottomland, approximately 10 m northeast, of Beaverdam Creek. State Carolina Highway 151 lies adjacent to the site's northern boundary. The extensive nature of the materials suggests that this site may have served as a habitation area.

Pottery: 1 cord marked (medium temper)
- 1 simple stamped (medium temper)
- 4 indeterminate (eroded, medium temper)

Chipped Stone:
- 1 quartz shatter
- 2 quartz chunks
- 2 quartz other flakes
- 40 quartz FBR
- 3 quartz biface tip fragments
- 1 quartz bifacial scraper fragment
- 3 rose quartz chunks
- 2 rose quartz other flake
- 5 rose quartz FBR
- 2 rhyolite FBR
- 16 rhyolite, flow banded FBR (2 utilized)
- 1 rhyolite bifacial scraper fragment
- 4 chert FBR
- 8 weathered flakes

Rock:
- 1 quartz hammerstone/mano fragment, 200.5 g
- 1 quartz cobbled fragment, 30 g
A prehistoric Woodland period site was discovered along a ridge side slope, lying 50 m west of Beaverdam Creek. The site covers an area 50 m x 30 m in a fallow field. A diverse moderate scatter of lithic and ceramic artifacts was collected from the site. This site contains the largest range of lithic raw materials encountered during the survey. The artifact assemblages suggest a temporary habitation area. The site is presently in good condition.

### Pottery:
- 7 cord marked (4 medium temper, 3 coarse temper)
- 1 fabric impressed (medium temper)
- 6 plain (4 medium temper, 3 coarse temper)
- 11 indeterminate (eroded, 6 medium temper, 4 coarse temper, 1 rim medium temper)

### Chipped Stone:
- 4 quartz chunks
- 14 quartz other flakes
- 9 quartz FBR
- 1 quartz core fragment
- 2 rhyolite, flow banded, primary flakes
- 1 rhyolite, flow banded, secondary flake
- 8 rhyolite, flow banded FBR (1 utilized)
- 1 rhyolite, porphyritic, secondary flake
- 3 rhyolite, prophyritic FBR (1 utilized)
- 1 orthoquartzite other flake
- 2 chert FBR
- 4 basalt FBR
- 1 argillite secondary flake
- 1 differentially crystalized buff biface (Yadkin-like) manufactured from flake; 23 mm in length, 17.9 mm across the base, 2.2 mm thick, 2.5 g

### Rock:
- 2 quartz cobble fragments, 22.3 g
- 6 ferruginous sandstone, 141.2 g

### Bone:
- 1 long bone fragment

This site contains middle 19th through early 20th century historic artifacts. The artifacts were concentrated in a small area covering approximately 75 sq m. Black Creek lies about 300 m east of the site. The Seaboard Coastline railroad runs near the northern site boundary. All visible artifacts were collected. The site was probably once a homesite. The presence of
one chert flake may not necessarily indicate a prehistoric component.

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pottery:</td>
<td>22 whiteware plain body sherds</td>
</tr>
<tr>
<td></td>
<td>2 whiteware base sherds (cup)</td>
</tr>
<tr>
<td></td>
<td>2 whiteware annular body sherds</td>
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<tr>
<td></td>
<td>1 whiteware brown hand-painted body sherds</td>
</tr>
<tr>
<td></td>
<td>4 whiteware blue hand-painted, 3 body sherds and 1 cup rim</td>
</tr>
<tr>
<td></td>
<td>1 whiteware blue beaded edge rim</td>
</tr>
<tr>
<td></td>
<td>4 whiteware green edged rims, 2 shell and 2 beaded</td>
</tr>
<tr>
<td></td>
<td>1 whiteware polychrome hand-painted rim (cup)</td>
</tr>
<tr>
<td></td>
<td>1 whiteware brown transfer-printed</td>
</tr>
<tr>
<td></td>
<td>12 pearlware/whiteware plain body sherd (bowl or dish)</td>
</tr>
<tr>
<td></td>
<td>2 pearlware/whiteware base sherds (dish)</td>
</tr>
<tr>
<td></td>
<td>1 pearlware/whiteware annular design trace</td>
</tr>
<tr>
<td>Glass:</td>
<td>2 olive green fragments</td>
</tr>
<tr>
<td></td>
<td>2 light olive green fragments</td>
</tr>
<tr>
<td></td>
<td>1 light green with whittle marks and trace of molded design (fruit jar)</td>
</tr>
<tr>
<td></td>
<td>1 clear rim (glass)</td>
</tr>
<tr>
<td>Bone:</td>
<td>2 teeth fragments</td>
</tr>
<tr>
<td>Other:</td>
<td>1 kaolin pipestem fragment</td>
</tr>
<tr>
<td>Chipped Stone:</td>
<td>1 chert flake</td>
</tr>
</tbody>
</table>

Isolated Find - 1

1 brown/cream (albany/feldspathic) stoneware basal fragment (jug or crock)

Isolated Find - 2

1 brown/cream stoneware body fragment

Isolated Find - 3

1 quartz biface
1 rhyolite FBR
1 rhyolite, flow banded FBR
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