CHAPTER III

FIELD METHODS

As was indicated in the chapters on the analysis of background information and the research design, the goal of the field study was to provide a systematic characterization of the archeological and historic resources in the Russell Reservoir area. There are two aspects to this characterization: 1) observations at the site level and 2) observations at the regional (project area) level. Concern at the site level was for observation of a number of attributes that would satisfy both the criteria of 36 CFR 63: Appendix A and the measure of research and other values for assessing the potential significance of a resource. Concern at the regional level was for the implementation of a sampling design that would result in the identification of a representative sample of the variability (as observed along a number of dimensions--artifactual, locational, etc.) within the project area.

Above it was mentioned that we would follow the suggestions of Glassow (1977). Below, his argument as a basis for a discussion of the site attributes that we observed will be reviewed.

The term archeological resource is employed by Glassow to denote what have been previously called sites (1977: 414-415). He defines three categories of archeological resources: items, deposits and surfaces. Items are things such as artifacts, in the normal sense, but also "bones, flakes, charcoal, pollen grains and so forth" (1977: 415). Deposits are "strata, lenses, and fills of various kinds of 'containers' (1977: 415)." Surfaces are "two-dimensional features...including rooms, firepits, 'utility' or 'living' floor" (1977: 415).

Central to his argument are Spaulding's (1960) three dimensions of archeology--form, space and time. Form, in Spaulding's use, may have both qualitative and quantitative attributes. In order to define the properties of archeological resources, Glassow goes beyond Spaulding to suggest that emphasis be placed on the characterization of "variations between discrete units of archeological resources" (1977: 415). In order to accomplish this, Glassow feels that it is profitable to view each of three dimensions--form, time and space as having both qualitative and quantitative aspects which vary. As he says:

We may be interested in qualitative and quantitative differences in the form of a given class of archeological resources more or less as an end in itself, or we may be interested in qualitative and quantitative variation in the distribution of archeological resources through the dimensions of time and space (Glassow 1977: 415).

The first two of Glassow's properties follow from this:

Variety: Qualitative (morphological or stylistic) variability in form, either by itself or in combination with temporal and/or spatial distributions.
**Quantity:** Quantitative variability in form, either by itself, or in combination with temporal and/or spatial distributions. This would refer to differences in density or frequency of items, surfaces or deposits (Glassow 1977: 417).

Three other properties of archeological resources are discussed: clarity, integrity and environmental context. Clarity refers to the "degree which archeological resources can be isolated from their contexts" (Glassow 1977: 415). We would be interested when monitoring clarity to be able to specify whether or not an item, deposit or surface could be recognized apart from other resources with which it is associated. The strata of a buried site if sharply separated by intervening alluvial events could be said to exhibit more clarity than a shallow site that has been plowed, for example.

Integrity refers to the amount of preservation that a resource exhibits. There can be, of course, tremendous variability in this property. Sites like Ozette Village (Richard Daughtery, personal communication), Cape Alava, Washington, where soil conditions result in the preservation of everything except flesh, and Pompeii are examples of excellent preservation of certain materials. On the other end of the scale is the ultimate case, total destruction of the resource.

Environmental context "refers to the nature of the surroundings of archeological resources" (Glassow 1977: 415). This property is most commonly monitored at the site level. It is important to note, however, that observation occurs at different scales, such as the observation of individual items in association with other items, deposits, or surfaces or at a regional level, when conducting distributional studies.

It should be clear from this presentation that the observation and measurement of these properties of the archeological record require imagination and ingenuity on the part of archeologists or others engaged in cultural resource evaluation. In many important ways, the Russell Reservoir was unknown archeologically. In many important ways, the Russell Reservoir was unknown archeologically. To be sure, preliminary information on sites in the reservoir, and the location of the project area along a major Atlantic slope river provided much basis for inferences about what might be there. As was mentioned in the research design above, however, there were longer-term interests that needed consideration. Although cultural resource evaluation ideally should play a large role in project planning and implementation, this would not be the case with the Richard B. Russell Dam and Lake Project. The project was authorized in 1966 (Corps of Engineers 1974: 1) and although some surveys were conducted (Hemmings 1970; Hutto 1970; Hanson n.d a, n.d. b), these were performed before the issue of regulations designed to implement Executive Order 11593 and the Archeological and Historic Preservation Act of 1974 (P.L. 93-291). Two of these regulations, 36 CFR 63 and 36 CFR 66, provide most of the guidelines for cultural resource location and identification studies. Because of this time lag, project planning and implementation for the Russell Dam proceeded independently and was so far advanced by spring 1977 that project completion and consequently inundation was the most likely possibility. Given this time constraint, we had to devise a strategy of investigation with both contemporary and future concerns in mind. We had to develop a "picture" of the
archaeological resources of this poorly known area that would permit the identification of research and cultural values. In addition to this, this "picture" must be of use to other scholars for them to identify research and cultural values missed by us. Our "picture" must also permit the design of effective mitigation efforts for these values. It would be hubristic for us to think that we might also anticipate research and cultural values of the future in an effective manner. We can, however, think of this entire investigation in such a way that its implementation and completion would contribute to the definition of some of these presently unanticipated values by answering some questions, and also by asking some new questions that could be addressed elsewhere.

Field Methods

The presentation below will be in terms of the two levels of observations sought: the resource or site level and the regional level, which presumably permits integration and generalization of the site level observations. These are two levels that accommodate well to the monitoring of the five properties: variety, quantity, clarity, integrity and environmental context.

The Site Level: Figure 20 shows pages one and two of the site form used when recording all sites located during the 1977 survey and for recording the sites located during previous surveys. The discussion below will follow the site form.

County, State: self explanatory

Site Number: A Smithsonian trinomial site number was assigned in the field as sites were encountered. This system was employed also during the previous surveys. Sites located during the 1977 survey can be distinguished from previously known sites because site number assignment began at 38AB100, 38AN100, 9EB200 and 9HT100. In retrospect, it appears that the practice of assigning official state site numbers in the field is unwise. Use of the state site number as a field record device removes the flexibility necessary to make different assignments. Rather a survey specific provenience system accommodated to the methods used on that survey should be employed. In the current survey, we designated individual items (isolated finds) as sites because that was the only record-keeping device we had. A different provenience system allowing recording of units if observations compatible with Glassow's (1977) items, surfaces and deposits would preserve analytical comparability between different units of observation. Also, the agglomeration of units could be permitted after artifact analysis, or revisits.

Site name: Names of landowners, informants and historical individuals were used in some instances to name sites. Unusual or distinctive features or events were used as site names (the Cooperhead site, Gregg Shoals site, etc.).
<table>
<thead>
<tr>
<th>County:</th>
<th>State:</th>
<th>Site Number:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Site Name:</th>
<th>Map Reference:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Transect Location:</th>
<th>U.T.M. Coordinates:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>North</td>
</tr>
</tbody>
</table>

### Landowner:

### Tenant:

### Environment

#### Landform:

<table>
<thead>
<tr>
<th>Local Topographic Position:</th>
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</table>

#### Associated Drainage System:

<table>
<thead>
<tr>
<th>Elevation:</th>
<th>ft.</th>
<th>Aspect</th>
<th>Percent Slope:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Soil Description:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Vegetation:</th>
</tr>
</thead>
</table>

### General Remarks:

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### Site Description

#### Cultural Stage (Temporal Components):

<table>
<thead>
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<th>Site Definition:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Site Extent:</th>
<th>Depth:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Midden Present?:</th>
<th>Faunal Preservation?:</th>
</tr>
</thead>
</table>

### Cultural Features:

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### Present Site Condition

#### Modern Land Use:

<table>
<thead>
<tr>
<th>Erosion or Other Disturbance:</th>
</tr>
</thead>
</table>

#### Relation of Site to Project Impact:

<table>
<thead>
<tr>
<th>Other Probable Impact:</th>
</tr>
</thead>
</table>

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### Site Evaluation (Field Observations)

#### Apparent Research Potential:

<table>
<thead>
<tr>
<th>General Recommendations for Research:</th>
</tr>
</thead>
</table>

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RUSSELL ARCHEOLOGICAL PROJECT SITE SURVEY FORM

Site Number: ____________________________

SAMPLING PROCEDURES

Date(s) of Investigation: ____________________________
Site Discovery Technique(s): ____________________________

Ground Surface Visibility: ____________________________
Collection Methods: ____________________________

Time Spent on Collection: ____________________________
Catalog Numbers Assigned: ____________________________
Photograph Numbers Assigned: ____________________________

ARTIFACT SUMMARY

Flakes of Bifacial Retouch / Other Flakes / Chunks /
Hafted Bifaces (Points) / Other Bifaces/ Unifaces /
Other Lithics / Prehistoric Ceramics / Historic Ceramics /
Other Historic / Bone / Shell / Miscellaneous /
Non-Local Raw Materials: ____________________________

Diagnostics: ____________________________

Collection Remarks: ____________________________

MISCELLANEOUS REMARKS

Previous Investigations and Site Numbers: ____________________________

Excavations at Site: ____________________________

Subsequent Investigations: ____________________________

General Comments: ____________________________

CREW MEMBERS: ____________________________

RECORDED BY: ____________________________ DATE RECORDED: ____________________________
Photograph numbers assigned: Each time a site was photographed, the number of the picture was noted here and a caption was noted in the photograph catalogue (a separate form). The photograph number denoted whether the picture was taken by either Smith's or Taylor's survey party, the roll number and the frame number (e.g. S-4-16).

Artifact Summary

The presence of the artifact categories listed was noted if they were found on a site. The primary function of this was to prompt the survey archeologist. The artifact types here are fully described.

Non-local raw materials: The presence and type of non-local raw material was noted here. Categories used were Coastal Plain Chert, Slate, Steatite, other (unidentified) and Ridge and Bailey chert. These are fully described below in Chapter IV.

Diagnostics: If "temporally diagnostic" artifacts were collected, their type was noted. The diagnostic lithic and ceramic artifacts are described below by Poplin and Smith in Chapter IV.

Collection remarks: Any unusual circumstances influencing the collection methods employed were noted here.

Miscellaneous Remarks

Previous investigations and site numbers: When a previously recorded site was revisited, this was the site number employed at that time.

Excavations at the site: If 1 x 1 meter test pits were excavated, this was noted.

Subsequent investigations: Used to denote revisits to a site.

General comments: Self-explanatory

Crew members: Names of crew members who were present when the site was recorded.

Recorded by: The name of the person who completed the form. Most of the sites were recorded by the crew chiefs. If it was done by someone else, they were supervised by the crew chief to preserve consistency of observation.

Date recorded: Self-explanatory

These were the observations recorded for every site encountered, whether it was prehistoric or historic. An attempt has been made to indicate when the recording of certain items was problematical. Detailed discussion of what was learned in terms of survey methodology will be presented in a later section of this chapter.
Map reference: Each survey team carried United States Army Corps of Engineers Richard B. Russell Dam and Lake Project maps. The scale of these maps is 1:12000. Each sheet has an index number and this was recorded in the field and the site location was plotted. In the laboratory, we coded the U.S.G.S. 7.5 minute quadrangle map on which the site was located. Also, some historic sites could be located on the 1928 Elbert County Soil Map (Fuller and Hendrickson 1928) or the 1932 Abbeville County soil map (Lesh, et al. 1928). When this could be done, the appropriate map was referenced.

Transect location: When a site was located on a transect, the transect number was referenced.

Universal transverse Mercator Coordinates: These were not determined in the field but were determined after site location had been transferred from the U.S.A.C.E. project map used in the field.

General location: Originally intended to provide a verbal description of how to reach the site, this was found to be cumbersome and, at times, impossible to describe. This was also redundant because of plotting site locations on the field and laboratory maps.

Landowner: Included because this is a necessary documentation required in 36 CFR 63, Appendix A. In practice, this was rarely filled in because landowner determination was not possible the vast majority of the time.

Tenant: Rarely filled in because of same reasons listed under landowner.

Informant: If the location of a site was provided by an informant, their name was listed here. If informants had made collections from a site or could provide oral documentation about the history of a site, their names were listed also. In a later section of this chapter, a discussion of work done with informants will be presented.

Landform: This was systematically recorded in the field using the typology discussed below. There are two classes of landform, riverine and upland, and these will be presented in turn.

Riverine Landforms (Fig. 21)

1) active floodplain: areas subject to frequent flooding, or poorly drained, with active channel movement across the floodplain. A rule of thumb was also adopted for laboratory use, defining this landform below the first 10 foot contour interval away from a stream channel.

2) levee: ridges of sand along the bank of the river formed during overbank flooding when the velocity of water decreased resulting in the deposition of the heavier sand particles. These are present on the Savannah and its major tributaries, but only those on the Savannah appear to be large enough to have been used for prehistoric occupation.
HYPOTHETICAL AREA OF PIEDMONT TOPOGRAPHY
ILLUSTRATING CLASSIFICATION OF TOPOGRAPHY

A. ACTIVE FLOOD PLAIN—Alluvium associated with a stream
B. RIDGE TOP—A relatively level area wholly or almost wholly enclosed by contours
C. RIDGE SLOPE—Contours roughly parallel with axis of ridge
D. UPLAND KNOLL—Contours fall away on all sides
E. SADDLE—Area on ridge top between two higher portions
F. RIDGE NOSE—Contours convex outward away from ridge
G. TERRACE—One or more contour intervals above active flood plain
H. BOTTOMLAND KNOLL—Elevated above surrounding terrain
I. LEVEE—(see text)
J. ISLAND

(after Hack and Goodlett 1960)

FIGURE 21
3) terrace: level to nearly level surfaces adjacent to the stream or river channel or abutting active floodplain. These occur in a wide range of size from quite small to very large and were used extensively for prehistoric occupations. No attempt was made to further classify these landforms into a terrace sequence (i.e. T0, T1, T2, etc.) because the geomorphological data needed to make such a classification is lacking.

4) bottomland knoll: features elevated above the surrounding terrain and probably remnant terraces composed of material more resistant to erosion. The difference in elevation can be slight, a few feet, or it can be very pronounced, being as much as forty feet above the surrounding area.

Upland Landforms (Fig. 21)

1) ridgetop: relatively level, or gently rolling surfaces that form the crest of a ridge.

2) ridgenose: also relatively level, but unlike a ridgetop, there is a sharp increase in slope downwards on three sides into a ravine or tributary valley. These can also be thought of as promontories which offer an excellent view of the surrounding area.

3) ridgeslopes: sections of a ridge between the top and the ravine or riverine landforms below. These are usually marked by very distinct changes in slope from that characteristic of the adjacent ridgetop. The gradients of these slopes vary but it can be said that the vast majority of these surfaces in the project area were too steep to have been utilized as site locations.

4) bluff: distinguished from ridgenoses in that the slope of the surface breaks very sharply and steeply on one or more sides to the river below. These landforms are restricted to the Savannah and are few in number.

5) upland knoll: landforms on a ridge that are elevated above the surrounding area so that the ground slopes away in all directions from the center.

6) saddle: landforms located on a ridge between two areas of higher elevation. These were used very rarely for sites.

The distribution of sites on landforms will be discussed below in the next chapter. These definitions were the ones used to define the landform categories in Appendix A.

Local Topographic position: This is intended as a verbal description of a particular site in relation to the surrounding area. A typical description would be "300 meters south-southeast of confluence of Van's
Creek with Savannah." As a field entry, this description was found to be of little utility because nearby features would often be unnamed rank one or rank two tributaries.

**Associated drainage system:** Intended to index sites by nearest named tributaries, such as Beaverdam Creek – Savannah River.

**Elevation:** Determined from map inspection when site location was plotted on field map. Not monitored by us, though it probably should have been, was relative elevation. This refers to the elevation of a site in relation to a feature of interest such as a high rank tributary or the Savannah River itself. For example, a site located at 450 feet at the southern end of the reservoir would be 120 feet above the Savannah, while in the northern portion of the reservoir, an elevation of 450 feet would mean that the site was only 25 feet above the river.

**Aspect:** This is intended to monitor the differential exposure of a surface to solar radiation. It is known that plant communities are strongly conditioned by this variable (Oosting 1956; Odum 1971; Pianka 1974). In retrospect, however, the utility of this variable at the site level is questionable. It cannot be measured in the field, and must be determined in the laboratory (which we decided not to do). At present this variable has little analytical utility for monitoring site location behavior because the large majority of our sites are located on level areas with little apparent differences in aspect.

**Percent slope:** We attempted to monitor this in the field with visual estimates. This, in retrospect, was clearly unsatisfactory. Accurate measurement in the field should be made with an inclinometer. This is potentially a very important variable for estimating relative displacement of artifacts on site surface. As a monitor of behavioral variability, it is, as of yet, of little utility. For the present, the landform typology can serve as an approximate measure of slope.

**Soil description:** In the field, a color based description of the soil was given. A horizon, when present, was described by color and texture, such as "reddish-brown sandy loam." The red clay indicating complete erosion of the A horizon was noted as B horizon. In a few areas, the saprolite was exposed and this was noted as the C horizon. In the laboratory, sites were located on the available soil maps of the project area. These were the soil descriptions provided on the Cultural Resource Inventory forms submitted to Interagency Archaeological Services-Atlanta on February 15, 1978 and April 15, 1978. Although modern soil mapping has been completed, this information was not available to us in a usable form.

**Vegetation:** Historic land use has resulted in tremendous change in the vegetation of the project area since the time it was visited by Bartram in 1776 (Harper 1958). Because of this, our vegetation categories are intended as a rough indication of the land use history of a particular area. This allows for fairly accurate estimation in some instances as to the amount of erosion that has occurred, and from this, an area's potential for containing, in upland context, subsurface archeological remains. The categories used were the following:
1) agricultural field: an area currently in cultivation (Fig. 22).

2) pasture: area currently used for grazing (Fig. 23).

3) old field from agriculture: in the strict sense, almost the entire cultivable portion of the survey area could be placed in this category, but our use was restricted to those fields which had been abandoned within the last 15 years (Fig. 24).

4) bottomland hardwoods: this vegetation type was restricted to the Savannah and the major tributaries, and again while technically old field, this allowed approximate measure of the length of time a particular area had not been cultivated or pastured by observing the diameters of the trees (Fig. 25).

5) mixed pines and hardwoods: this vegetation type results from abandonment of agricultural fields or previously logged areas, not commercially replanted. Besides being areas of low to nonexistent ground surface visibility, these areas also have been subjected to tremendous erosion prior to abandonment (Figs. 26 and 27).

6) pine plantation: this vegetation denotes commercially planted pines on prepared sites. These areas also tend to be heavily eroded and unsuitable for either cropland or pasture (Fig. 28).

7) old field from clearcut pine plantation: as mentioned above, 7,000 acres of upland area is scheduled for use by the public for recreation and access. The areas intended for such use in Georgia were primarily pine plantation when the Russell Dam and Lake Project was first begun. For the most part, these areas have been logged by their owners and not replanted. This has resulted in this vegetation type which produces areas with better ground surface visibility than is found in agricultural old fields. The disturbance caused by logging varied from area to area. The most disturbed areas were those logged when the ground was very wet which caused much rutting from vehicle use and gouging from dragging logs. Infrequently encountered in the survey area were areas commercially prepared for replanting. Here the damage to the ground surface is substantial and site preparation is done in such a way as to enhance erosion. It is possible to make fairly accurate estimations of site size when sites are found in this type of area (Figs. 29, 30, 31).

8) Commensal vegetation: in certain areas, primarily historic homesites, and, in a few instances, recently abandoned agricultural fields, dense commensal vegetation was encountered. This vegetation was primarily honeysuckle or other low-growing leafy vines. This had the effect of completely obscuring surface visibility. While we are not sure of what factors enhance the growth of this type of vegetation in the different settings, it is a good indicator that the site surface has not been disturbed since abandonment, especially in the case of historic homesites (Figs. 32, 33, 34).

This typology of contemporary vegetation types is a first approximation developed as we encountered the various categories. Some of the types exhibit more internal variability than others, as, for example, mixed pines and hardwoods and old fields from logging clearcuts. It would
FIGURE 22. 9EB387, the Clyde Gully Site. Woodland/Mississippian View is of an agricultural field on a terrace immediately south of the confluence of Pickens Creek with the Savannah River.

FIGURE 23. Active pastureland. Pasture is in the vicinity of 38AB136 within the Wilson Creek Recreation Area.
FIGURE 24. Early stages of old field growth in abandoned agricul­
tural field.

FIGURE 26. Mixed pines and hardwoods surround 38AB116 (the Quartz Pebble Site), revealed from logging operations. Dense scatter of quartz is eroding out of slope.

FIGURE 27. 9EB389. Unidentified prehistoric lithic scatter. View of mixed pines and hardwoods.
FIGURE 28. Pine plantation in the background and in the foreground 38AB12 and old field from clear cut pine plantation.

FIGURE 29. 9EB209. Middle Archaic and Mississippian/Woodland cultural affiliation. Site is in 5-7 year old, old field surrounded by pine plantation.
FIGURE 30. 9EB272. Woodland site located in an earlier (from 1-2 years) stage of old field from clear cut pine plantation.

FIGURE 31. 9EB276. Middle Archaic and potentially diagnostic biface cultural affiliation. Presence of a quartz outcrop on the slope off the ridge, suggest that this is possibly a quarry, also. View of site provides evidence of pine logging in an area of mixed pines and hardwoods.
FIGURE 32. Commensal vegetation covering a stone feature at 38AB9, Millwood Plantation.

FIGURE 33. Dense commensal growth on house foundations at 38AB112.
FIGURE 34. An abandoned house, 38AB220, with growth of vines beginning to cover the structure. This is a typical example of commensal vegetation on still standing structures found in the project area.
be extremely useful to employ an increment borer when making observations about the vegetation. An increment borer will permit more accurate estimations of the age of the stand at the time since logging. Another thing that would increase sophistication of observation would be the inclusion of personnel trained in identifying plants on the survey team.

General remarks: Any distinguishing or unusual features were noted here.

Site Description: This was a designation made in the field based on the recovery of temporally diagnostic artifacts during collection. Site description originally intended to provide a rough index of cultural historical variability so that this could be monitored while the survey was ongoing and permit site to site comparisons as an internal check on potential inspection bias. In the future, however, it is recommended that this not be monitored in the field, and be determined only after detailed laboratory analysis.

Site definition: This was intended as a functional categorization of site types (i.e. habitation), but for prehistoric sites this information is virtually worthless when this determination is made in the field. More accurate attributions were possible with some kinds of historic sites (homesites, mills, ferries, etc.). For the purposes of Appendix A, the following site types were employed. These categories are primarily descriptive and functional assignations are minimized.

1) Fort: used to denote a military fortification
2) fish weir: used to denote rock alignments located in the river which may have been used for fishing.
3) historic ferry: self-explanatory
4) hotel: self-explanatory
5) homesite with structure: an historic homesite that is still standing
6) mound: used to denote prehistoric mounds
7) mill: used to note former location of mill or race
8) mound and village: prehistoric mound with associated village deposits
9) nonstanding structure other than a home: used to denote evidence of non-domestic structures such as outbuildings, barns, sheds and the like
10) other: used to denote a site type not accommodated by this list
11) probable homesite: when there is good evidence (homesite tree, for example) for the former presence of a domestic structure
12) plantation: when archival or informant data indicate that a site was probably a cotton plantation, this was noted.

13) possible village: used to denote ceramic scatters in likely habitation area.

14) quarry: used to denote what is thought to be a location where lithic raw materials were procured and initially processed. This is discussed below in Chapter IV.

15) surface scatter with depth: a lithic and/or ceramic artifact scatter on a site which still has some A horizon left.

16) standing structure not a home: used to note the presence of a non-domestic structure such as a barn, shed, blacksmith shop and the like.

17) surface scatter: a lithic and/or ceramic scatter on the surface which has been eroded so that the B horizon has been exposed.

**Site extent:** The size of the site was placed here. This was determined in a number of ways. In open areas with good ground surface visibility (agricultural fields, some logging clearcuts), site extent could be observed accurately. In areas of poor surface visibility (old fields, bottomland pastures, pine plantations), a landform assumption was employed. The basis for making the landform assumption was the result of surface collection of open areas in primarily upland settings. In these areas, it was noticed that the dispersion of artifacts was co-extensive with level ground, with the dispersion ending when there was a sharp change in slope. With this knowledge, when artifacts were encountered on roads in pine plantations, artifact dispersion was estimated laterally on the basis of the topography. It was also our experience that subsurface testing and ground clearing were unproductive in recovering artifacts in pine plantations even when artifacts were densely scattered on the road through the pine plantation. Yet in similar settings, after logging, artifacts would be observed dispersed over the landform to the breaks of the slope. The landform assumption for site extent was employed primarily for planning purposes. Rather than provide data just on those sites where extent could accurately be determined, and list undetermined for the rest (which compose a considerable fraction of the site inventory), the landform assumption was used as a reasonable estimate of site extent. The landform assumption needs to be evaluated, of course, but it is of immediate utility as a maximal estimate of this parameter. During further data recovery at sites of this type, the investigation strategy can be designed to evaluate the validity of the assumption. The labor investment can be made at this level in determining the presence of artifacts under the pine duff. Hopefully, the number of cases where site extent has been underestimated will be minimized.

At present, we can see no realistic alternatives to this problem. The vegetation cover characteristic of the project area makes it extremely time consuming to determine accurately site extent in the way this is normally done in areas with excellent surface visibility.
Depth: In upland settings this was used to denote the amount of A horizon present. In riverine settings, this denoted the lowest depth below surface that artifacts were recovered. As was noted above, historic land use resulted in the erosion of tremendous quantities of topsoil and subsequent deposition in the bottomlands where 4 to 6 feet of alluvium have accumulated in places since the early Historic Period (Trimble 1974, see Most and Brooks, this volume). As a result, most of the upland areas that were surveyed had no "subsurface." When the A horizon was present, shovel testing with screening through 1/4 inch mesh was performed down to the contact with the red B horizon. Alluvial landforms presented very different problems. Here the depth of the contemporary sediments, and, at times, the poor drainage conditions prevented effective subsurface testing. Also, vegetation in these bottomland settings tended to be of the pernicious variety with waist-high poison ivy (Rhus toxicodendron) quite common. After a couple of forays into situations like this it became apparent that some survey personnel were air sensitive to this plant. Everyone else was contact sensitive, so the risks of lost labor time due to this "peril" of the Piedmont were too great. For the purposes of Appendix A, the kinds of subsurface testing performed were coded as follows:

1) Deep (DP): deep testing by power auger. This was done not to recover artifacts but to determine the potential depth of deposit on selected alluvial landforms

2) Limited (LM): used to note excavation and screening of postholes and shovel tests

3) None (NO): subsurface testing was not done in areas where B or C horizon was exposed on the surface

4) Substantial Test Unit (TU): the excavation and screening of a 50 cm by 50 cm or one by one meter test pit

5) Midden present (MP): if a midden were encountered during subsurface testing, this would be noted

Faunal preservation: If there was evidence of this, it would be noted.

Cultural features: Very seldom were these encountered on prehistoric sites, but useful for historic sites to note the presence of foundations, structures, bricks, chimneys, wells and the like.

Present Site Condition

Modern land use: This was to note how the land was currently used. Several categories were distinguished:

1) agricultural: land in crops, or plowed awaiting planting, also refers to agricultural old fields

2) house site: currently occupies house

3) logging: used when site had been logged or was in pine plantation
4) none apparent: this was for old fields resulting from logging activities and not replanted

5) pasture: area being used at least part of the year for grazing animals

6) right-of-way: refers to location of site in right-of-way of power line or pipeline.

7) varied: one or more of the above in combination

Erosion or other disturbance: If erosion was evident by exposure of B or C horizons, or if gullying was present, these were noted. Also noted were indications of heavy equipment use, bulldozers, logging trucks, skidders used during logging. On agricultural fields, gullying, if present, was noted. Flowing was also noted.

Relation of site to project impact: The relationship of the site to the type of impact was noted. We employed five categories.

1) edge of project: noted for sites within 100 meters of limit and 475 foot floodpool

2) floodpool: noted for sites below the 475 foot contour that will be inundated

3) outside of project: some sites were recorded that were, on closer inspection, outside of the project area

4) railroad relocation route: sites located in planned railroad relocation right-of-way.

5) public use areas: when sites were located within any of the 26 recreation and public access areas planned, this was noted (see Appendix K for a list of these areas)

Other probable impact: If another impact could be anticipated, this was listed. This was most frequently used to denote the potential for mechanical impact resulting from a site being located on the shoreline of the proposed reservoir. Sites with elevations from 470 feet to 480 feet were noted in this way.

Site Evaluation (Field Observations)

Apparent research potential: An in the field assessment by the survey archeologist as to the future potential of a site for research purposes. These judgements were based on consideration of the various kinds of observations made. Judgements ranged from excellent, good, fair, poor or none.

General Recommendations for research: A judgement made by the survey archeologist as to what should be done in the future. These suggestions included excavation, controlled surface collection, measured drawings, archival research and photography, among others.
Sampling Procedures

Date(s) of investigations: The day or days when the site was visited was recorded here.

Site discovery technique: This was used to note how the site was found. The entries in this category were transect, predicted stream confluence, road survey, informant and map.

Ground Surface visibility: A relative estimate of this was given ranging from excellent (recently plowed field) to nonexistent (heavy cover of leaf litter of pine duff).

Collection methods: When a site was encountered, one of five collection procedures was employed depending on factors such as site size and artifact density.

1) areal content sample: all visible artifacts were collected in two or more areal proveniences.

2) grab sample: here, only selected artifacts (generally diagnostic or unusual) were collected. The use of this procedure was minimized.

3) radial content sample: on certain sites that were large and dense, diagnostic or exotic artifacts were used as the center of a 1 to 3 m radius circle within which artifacts were collected.

4) simple content sample: on certain sites, generally small and with good to fair visibility, all visible artifacts were collected within one provenience.

5) no collection: on certain sites, no collection of artifacts was possible or necessary for their description. Sites of the first sort are sites like fish weirs and historic dams. For some historic sites, other evidence would indicate research values and measures of integrity. A good example of this is an historic site with heavy, dense commensal growth indicating little disturbance since abandonment.

Time spent on collection: The amount of time spent on the collection was noted here.

Catalog numbers assigned: The system employed was as follows: Simple content samples were indicated by the assignment of provenience 1. Any time a site was further subdivided, the first provenience number assigned was 2. Subsurface tests were noted by the use of a letter after the provenience number (2A for example). If subsurface tests are excavated by levels (when some 10 cm levels were used), then the letter sequence for an individual indicated the depth below surface in 10 centimeter increments.
Site Discovery Methods

As was discussed above, there are two aspects of developing a characterization of the archeological record of an area. In this section, the methods employed in discovering and locating sites will be discussed. Project-specific conditions, including the size of the area, extensive vegetation, poor access and amount of time allocated to perform the survey, made it necessary to employ sampling strategies as the bases for determining which areas were to be inspected. In addition, documentary and informant evidence were employed in order to discover sites and these will be discussed also.

The Survey Teams

Two 3 person crews conducted the pedestrian survey. Each crew consisted of a chief (Smith and Taylor) and 2 assistants. Because of the large size of the area to be surveyed, 1 crew chief would be responsible for each side of the river. This would allow that person to gain intimate familiarity with his side of the project area. This would also reduce the chance that coverage would be duplicated. Changes in visibility and access conditions could be closely monitored also (newly logged areas, fresh plowing, etc.). It also permitted each chief to develop his own informant networks and minimize chances that individual informants would be approached by different persons asking the same questions. It should be noted that each chief did not stay exclusively on one side of the project area, but efforts were made to keep each broadly informed on the survey conditions in each state by driving around and discussing differences and similarities between their respective areas. Also fostering communication was the rotation of the assistants so that they worked 2 days at a time in each side of the project area. These personnel were questioned frequently on similarities and differences encountered in both areas.

Equipment

Each 3 person crew was furnished with the following equipment:

1) Vehicle: At various times, the following vehicles were used: 1968 International four wheel drive truck with crew cab; 1975 Ford one-half ton pickup with automatic transmission; 1975 Ford one-half ton van with automatic transmission; 1975 Chevrolet three-quarter ton van with three speed transmission; 1975 Plymouth station wagon; and a 1966 Ford Econoline Van with three-speed transmission.

2) Safety: At all times, a Johnson and Johnson Industrial First Aid Kit No. 10, Amerex Industries Snakebit Freeze Kit, Cutter Laboratories Snakebite Kit and Thermotabs (salt tablets) were carried. Each crew member also had fiberglass snake leggings.

3) Recording forms: Transect forms, site recording forms, photograph catalog forms and field notebooks were carried.
4) Photographic equipment: A Canon FTb 35 mm single-lens reflex camera with 50 mm f/1.8 and 35 mm f/3.5 lenses was carried. Initially, Kodak Kodachrome (ASA 64) was used but it was determined that this was unsatisfactory and Kodak High Speed Ektachrome (ASA 200) was used.

5) Subsurface testing equipment: Posthole digger with 4 foot handles, shovels, rake, pick-mattock, entrenching tool and trowels were used in conjunction with a hand-held sifting screen with one-quarter inch mesh (see below).

6) Locational aids: U.S. Army Corps of Engineers Richard B. Russell Dam and Lake Project Map sheets (scale 1:12000) were carried. Also employed when necessary were county highway maps. A suunto KB-14 compass was also used to maintain precise on-the-ground control of location.

7) Collection aids: bags, provenience cards, flagging tape, chaining pins and a Keson Ny-clad 60 meter tape were used.

8) Water and food

9) Machetes: 22 inch carbon steel machetes with sheaths were used for clearing paths through dense vegetation and for clearing around subsurface test units if necessary.

10) Packs: Two rucksacks and a packframe were used to carry this equipment.

Sampling Strategies

It has been suggested that there are five properties that condition the probabilities of encountering sites (Schiffer, et al. n.d.). These are abundance, dispersion, obtrusiveness, visibility and accessibility. Abundance refers to the frequency or density of sites in an area. Dispersion is some measure of degree of clustering of sites of various kinds in an area. Obtrusiveness refers to the ease with which sites can be observed with different techniques. The Temple of the Sun at Teotihuacan, for example, is very obtrusive, while some deeply buried sites can be characterized as unobtrusive. Visibility refers to those factors which enhance or otherwise influence our ability to visually observe sites. Accessibility refers to those factors which condition a surveyor's ability to get to any one particular place.

The review of data available for planning indicated that in this survey area, sites were abundant, dispersed and unobtrusive. These data also indicated that visibility and accessibility of sites would be low.

The sampling strategies employed during the 1977 field season were designed with these considerations in mind. Because fairly accurate estimates of population parameters can be obtained by the use of probabilistic sampling designs in areas where sites are abundant and dispersed (Schiffer, et al. n.d.), the employment of such a technique was warranted in this instance. Pedestrian survey combined with informant data was
an appropriate strategy given the unobtrusive character of the sites in this region (surface scatters of lithics, ceramic and historic artifacts). This permits close visual inspection of the ground surface.

It is more difficult, however, to cope with those factors which condition visibility and accessibility when designing a survey strategy. As a result, two strategies of encountering sites were implemented; one minimized visibility and accessibility as criteria for selecting areas for inspection; and one maximized them. The use of these two strategies was an attempt to evaluate in the riverine zone two survey strategies employed by other members of the Institute in their surveys of areas in the inter-riverine zone. House and Ballenger in their survey of a proposed highway corridor between Columbia, South Carolina and Rock Hill, South Carolina employed a 20% stratified random sample that minimized visibility and accessibility (1976: 44-46). Goodyear employed a strategy that favored accessibility and visibility in a highway corridor survey between Laurens and Anderson, South Carolina (Goodyear, Ackerly and House n.d.). The differences in results between these two techniques are striking. In terms of sites recovered, the I-77 survey located 22 sites within their sampling units. Goodyear, et al. located 125 sites in the Laurens-Anderson corridor. In the present instance, however, the simple adoption of one strategy was not warranted because the size of the Russell Reservoir area (approximately 40,000 acres, see below) dictated that some attempt be made to obtain a sample that could be generalized to provide an estimate of the total inventory of sites present and, if possible, estimates of the population size of various kinds of sites.

Probabilistic Sampling in the Russell Reservoir

The sampling strategy was designed in the following way. The Savannah River (starting at the dam site) and the major tributaries (starting at their confluences with the Savannah) were divided in one kilometer segments. Each of these one kilometer segments was further subdivided into ten one hundred meter intervals. From each segment, two intervals were randomly selected as the origins of random vectors. One vector was plotted to the left of the segment line, the other to the right of this line. The azimuth of a vector was also randomly selected from within a range of -10 degrees to 170 degrees using the segment line as the 0°-180° axis. These vectors were the centerline of a transect one hundred meters wide and one kilometer long (Fig. 35). One hundred and sixty transects were plotted in this way. This design has the desired effect of dispersing the sample over the entire project area and insuring that the total range of landforms present would be encountered. In addition, this design would result in the inspection of areas considered by some to be uninhabitable or of low probability for site locations. This design was seen as an excellent opportunity to evaluate the validity of such an assertion. If sites were found in such areas, then future surveys would have to take this into account when designing strategies for selecting areas for inspection.
FIGURE 35. Sample Transects.
The transects were supposed to be inspected by having the survey team walk three abreast about 50 meters apart with the center person using a compass to maintain the proper azimuth. Crew members were walking in a zig-zag manner, looking for disturbed ground. This was to be done for the length of the transect with crew members noting especially favorable locations for subsurface testing. Then the transect was to be subsurface tested at 50 meter intervals or in favorable locations as the crew moved back to the transect origin. If sites were encountered, they would be collected and recorded. If artifacts were recovered in a subsurface test, then a cruciform subsurface testing procedure was to be used to determine site extent. Two of these were to be done per crew per day.

When implementation of the design was attempted in the field, a number of things became apparent. We knew from map inspection that the terrain was rugged, especially in the slope area between a ridgetop and the valley bottom, which is highly dissected by rank one and two tributaries which head on the ridges. What we did not anticipate was the tremendous variety in the types of vegetation that would be encountered within one transect, much less the variety that was present in the survey area. We had worried about ground surface visibility and had posthole diggers, shovels and rakes for subsurface testing and clearing leaf litter and pine duff. We had not taken into account, however, line of sight visibility necessary to maintain the proper direction of the transect. We had planned subsurface tests or ground clearing at 50 meter intervals within each transect. In order to measure these intervals, it was often necessary for the point man to travel circuitously around clumps of dense vegetation, deadfalls, etc., to achieve line of sight in the desired direction, often only 10 to 15 meters away. The other crew members would then also move up, and the process would resume. In some areas, it would take as long as 15 minutes to travel 50 meters. We were also frustrated by the fact that we were not finding sites on these transects as a result of subsurface testing or ground clearing, but were finding sites in roads, agricultural fields, and logged areas that were intercepted by a transect. Travel to transect origins and away from completed transects was also very time consuming because many of these areas were not accessible and had to be reached by travelling cross-country.

These experiences, as might be guessed, led to a reevaluation of the feasibility of implementing this design in the time we had allotted, which was eight weeks. It became obvious that completion of the design would use up all of our field time and prevent us from meeting other project goals, one of which was an open ground survey. Our experiences to this point, while frustrating, had been instructive. Sites had been found in roads and cleared areas when intercepted by a transect, or once a transect had been completed, on the way back to the truck. Recording and collection of these sites gave us some pretty good ideas about both the spatial extent and artifact densities that could be expected for the majority of the sites that we might encounter. This information reinforced the need for reevaluation of the sampling strategy because we were performing an intensive survey which requires a level of documentation outlined in 36 CFR Part 63 for each resource found. After seeing the size of a few sites, it became obvious that posthole or small area samples from a transect, while useful for site location, were,
of course, not adequate for other documentation requirements (see also Goodyear, Ackerly and House n.d.). Any attempts to define site boundaries by postholing or ground clearing would be too labor intensive.

In addition, our travels around the project area in search of the wily and elusive transect origins made us aware that our maps showed fewer roads than were actually present. Many of these roads had been made in the ten years since the aerial photography used to make the 1:12,000 scale project maps was flown. We also noticed that many of the areas shown on the map as forested had been logged and not replanted. In addition to underestimating time and labor requirements of the probability sample, we had also grossly underestimated the amount of accessible and visible area in the project area.

Nonprobabilistic Sampling in the Richard B. Russell Reservoir

On the basis of the above information, a decision was made to forego implementation of the probability sampling design and to move ahead to the second phase of the survey: pedestrian survey that stressed accessibility and visibility as the criteria for selecting areas for inspection. Roads were the primary means of access to various areas. This fact means that there would be substantial bias in the relative proportions of landforms covered in favor of ridgetops and wide alluvial bottoms, in other words, level ground. As a rule only the major county roads would traverse the slope areas and maintenance of these roads has resulted in them being cut into the original land surface as much as 3 to 5 meters. Our strategy was to favor accessibility first and then visibility. As a result many roads were walked that were nearly overgrown. Old roads are, of course, prime indicators of past land use, either for domestic, agricultural or logging purposes. Often these roads would lead to areas that had been cleared and had at least patchy visibility that would permit, in some instances, a fairly reliable determination of the presence, and especially, absence, of sites. Roads also permitted movement through a variety of vegetation types that would vary in the density of the understory. When access was favorable, these areas could be inspected for disturbances or patches of visible ground.

In addition to roads which tend to be transect-like in shape, it was also possible to inspect logged areas that had not been replanted. Visibility was variable in these areas and a function of the length of time since the logging was done. Agricultural fields were also inspected and these too, varied in visibility because of the time of year during which the survey was performed from fallow fields to abandoned cornfields covered with a carpet of Bermuda grass. Pastures were also inspected. Visibility was poor in bottomland pastures, the growth being more luxurious than pastures in upland settings on eroded surfaces. Our inspection of pastures was hampered by the fact that most of the pastures were still in private ownership which restricted our ability to do much, if any, subsurface testing. Inspection of these kinds of areas gave us samples that were much more landform extensive than samples obtained by walking roads. This was desirable because it gave us samples of different shapes. This will permit analysis of the relationship, if any, between artifact content and unit shape.
Comparison of Probabilistic vs. Nonprobabilistic Sampling

When the effectiveness of these two techniques is evaluated in terms of project goals, nonprobabilistic sampling is the most effective strategy in terms of both research and management needs. As was mentioned above, completion of the Russell Dam and consequently, inundation of the reservoir was an apparent certainty. This area was poorly known archeologically and we were faced with the design and implementation of data recovery strategies that would permit effective evaluation of the resources located. The strongest rationale for probabilistic sampling is that when effectively used, it recovers a representative sample of the population of interest. The problem is how to evaluate how effective a particular design is in yielding reliable estimates. It appears, that at the present moment, this is difficult to do and often requires comparison with the known populations which are, of course, rarely available because that is why sampling was performed in the first place (see Judge, et al. 1975). The point here is that sophistication in sampling is a trial and error process. Rarely can sampling designs be implemented in poorly known areas with any confidence in their results the first time. Can we permit ourselves the luxury of a "representative" sample? In the present instance, no. Sampling of other than archeological populations usually assumes unrestricted access to the sample units. This is probably only approximated in arid, lightly vegetated settings. This assumption is quite clearly not met in heavily vegetated areas like the Russell Reservoir.

Probabilistic sampling as it was proposed here is labor intensive and costly in terms of information return. Remember, it was not so much that sites were not being located but that time constraints (in the immediate sense) and newly acquired knowledge about how much open ground was present in the survey were the factors that led to the premature termination of the probabilistic design.

Nonprobabilistic sampling was of utility in this area. It had the desired effect of permitting the discovery of sites (over 400, see below) and in most instances, the recording of enough information to satisfy the requirements of 36 CFR 63, Appendix A.

The areas selected for survey in terms of accessibility and visibility could also be thought of as a possible random sample of the area, though this would need evaluation, which is not presently possible. Most of the proscriptions against nonprobabilistic sampling derive from investigators in areas where visibility and access problems are minimal and these investigators are rightly complaining about others who chose areas by "judgement" or "intuition" (Redman 1975). A conscious attempt was made to minimize the role of judgement and intuition as bases for selecting areas of inspection. The accessibility and visibility conditions in the project area were determined independently of archeological concerns, and because of this a reasonable argument can be advanced that these are "random" with respect to investigator's possible interests.
In balance, it is argued that nonprobabilistic sampling is the most effective strategy that can be employed. It furnishes data useful for both research and management needs. In areas like this one, where site density is high in visible areas, enough data is recovered to permit evaluation of bias and also the design of probabilistic strategies based on this information.

Collection Methods

As might be expected, conditions for surface collection were less than ideal. Visibility of site surfaces varied tremendously from fallow agricultural fields to forest with dense understory vegetation. Size of sites varied also, which influenced the intensity of collection. As a result, whenever possible, a determination of site size and artifact density was made prior to collection. Depending on this information, different collection techniques were employed. If a site appeared to be small and artifacts were present in low densities, then content samples were collected. Content sampling involves the collection of all visible material (see Goodyear, Ackerly and House n.d.). When sites were large or dense, proveniences were selected within the site. In some instances, different landforms were employed as the basis for choosing provenience boundaries. In sites where this was not possible or where visibility was patchy, diagnostic artifacts were selected as the centers of collection circles of varying diameters, dependent on density. We were especially interested in patterns of association in circle collections around diagnostic artifacts.

None of these solutions is ideal, but we felt that the application of various techniques in the field would permit laboratory analysis of the effectiveness of different techniques. In some cases, no collections were made. This was done only in very special circumstances when visual inspection of the site surface indicated that collection would result in significant destruction of information relative to that obtainable by spatially controlled sampling. In these instances, artifact types would be recorded as present or absent.

We were aware that surface collections can suffer from what House (House and Schiffer 1975: 174-175) and others have called the "size effect." Simply stated, this means that the larger the artifact, the greater the probability that it will be collected, resulting in samples with a disproportionate representation of larger specimens. We attempted to control for this by requiring survey personnel to collect all visible material, regardless of size, whenever a collection of any type (i.e., content sample, topographic provenience, circle collection, etc.) was being made. As an aid to survey personnel, a policy of "when in doubt, pick it up" was instituted. This was to avoid time-consuming discussions in the field about whether something was indeed an artifact, in favor of making these determinations in the laboratory after the material had been washed. This was also necessary given the peculiar nature of the most common raw material in the project area and in this region--quartz.
In retrospect, it appears that our efforts would have been more effective had we employed different recording techniques in collecting these sites. When sites were content sampled, all artifacts went into one bag with one provenience card. I would suggest that instead of this system, the area collected by the individual collector be the smallest provenience unit. If this procedure were in force then when content sampling of whole sites is done, the survey personnel would have to make sure that their collection areas do not overlap. The specifics of such a technique would vary depending on conditions at specific sites, but the use of this technique would result in finer scale spatial control over the collections made. Also it would permit evaluation of bias, if any, of individual collectors in terms of size or types of artifacts. Record keeping would be more complex, but the potential for better data recovery outweighs this consideration.

Some Comments on the Utility of Surface Collected Data

It should be noted that there is good reason to believe that surface collected data from the Piedmont, no matter how tightly controlled, suffers from significant biases. Since this area was occupied by Europeans in the late eighteenth century, it has been cleared and cultivated. The intensity of cultivation, especially of upland cotton, has resulted in almost total erosion of the A horizon from the upland surfaces and the deposition of these materials in the valleys of streams and rivers (Trimble 1974). This has had a twofold effect. First, the vast majority of sites in upland settings have been disturbed by plowing, and in recent years, commercial pulpwood plantations. Second, the increased alluviation in valley bottoms has undoubtedly buried many sites, especially from the late prehistoric period, by as much as three or four feet (Trimble 1974). We should also mention that land clearing and subsequent erosion has had a profound effect of the stability of discharge regimes of the major rivers and their tributaries. This has resulted in extensive, disastrous flooding, referred to locally as freshets. Two major floods are known to have occurred on the Savannah River within the historic period, one in 1852 and the other in 1908. Accounts of the last flood indicate that damage was heavy, the railroad trestle across the river being washed away. Damage to prehistoric sites was also extensive. The Rembert Mound group is a good illustration of this point. The site is located to the south of the project area in what is now Clark Hill Lake. The first description of these mounds comes from William Bartram, a naturalist who visited this area in 1773 (Harper 1958). He described the largest mound as being almost fifty feet high with a spiral ramp up to the top. When Caldwell visited the site in 1948, however, the mound was almost totally destroyed, with only a remnant about four feet high still visible (Caldwell 1953: 309). This is of interest because no mounds are known to occur on the trunk of the Savannah in our project area, even though two small mounds are located on Beaverdam Creek.

These facts, combined with extremely variable ground surface visibility, give us little confidence at this point about the utility of surface collected information for detailed assessments of intersite variability. Another factor which conditions this is the knowledge
that this area has been selectively collected for many years by farmers and fieldhands. Conversations with local residents indicate a high degree of awareness of the presence of prehistoric artifacts, and there are reports of "coffee cans" full of projectile points that have been collected from certain sites over a period of years. In recent years, a few sites that have remained in cultivation have been subjected to intensive selective collection by pothunters. Fortunately, we know which sites are involved, and in some instances, collectors have made their collections from those sites available to us. To be sure, the problem of prior collection of artifacts is not unique to this area, but is mentioned here as yet another source of bias.

Collector behavior studies have been suggested by others for other areas, but it is our feeling that this is not an option available to us because most of this area is no longer cultivated and the land has reverted to woodlands, and the people involved have either died or moved away.

While the tone of the foregoing discussion may be pessimistic, we are not advocating throwing up our hands and moving back to the Southwest. It is important that archeologists faced with these or similar problems, consciously recognize those factors which might potentially affect the reliability of different observational techniques for evaluating variability in the archeological record. This is a necessary first step in developing strategies that permit effective use of whatever information is collected or recorded.

We are not suggesting that disturbed sites have no research potential. We are very encouraged by the publication of The Importance of Small Surface and Disturbed Sites as Sources of Significant Archeological Data (Talmage, et al. 1977) by the Interagency Archeological Services, and are in wholehearted agreement with the approach that they are advocating. Although we may be disturbed by disturbances to the archeological record, they can be considered in Schiffer's (1972) terms as a formation (or perhaps, deformation) process that must be understood as an aid to understanding the archeological record. Our mitigation plan for this project will include a program whose goals are to evaluate the effects of different kinds of disturbance on the integrity of sites. These studies will provide a useful basis for better estimations of research significance for various classes of disturbed sites.

Subsurface Testing

In this section, our experiences with subsurface testing as a discovery and evaluation method will be discussed. In other areas, subsurface testing has demonstrated its usefulness as a site discovery method (Lovis 1976; Wood 1975; Teague 1976; House and Ballenger 1976; Goodyear Ackerly and House n.d.). During the transect sampling phase of this project, over 400 subsurface tests were conducted without the recovery of a single artifact. This, needless to say, was disheartening. The utility of this method is probably dependent on the density of artifacts and degree of erosion of the surface. Although we were aware of the tremendous erosion of the uplands and slopes of this area, this fact was forcefully made apparent to us while trying to shovel or posthole test.
in these eroded areas. Slopes, if not eroded, were quite rocky, render­ing a posthole digger useless for excavation.

Subsurface testing in bottomlands during the transect phase was also fruitless. This is a reflection of modern alluviation and the size of the test units. As noted above, erosion of the uplands resulted in the deposition of these materials, causing major changes in drainage patterns (Trimble 1974). It was difficult to tell from a posthole the difference between historic and prehistoric sediments. Screening of these tests was also compounded by the high clay content of the sediments, which gummed up the screens and greatly increased the time necessary to complete a single test.

During the open ground phase of the survey, subsurface testing was also conducted along the Savannah River with little success. First of all, a posthole digger can be used only to a depth of five to six feet. Some tests were still recovering unconsolidated sands at this level. At other locations, such as the confluence of Van's Creek with the Savannah River, the extremely clayey sediments made testing to any great depths very time and labor consuming.

Some success was achieved with what can only be called a pothole at 9EB91, which was a site previously located by Hutto. Surface inspection of the river level on three different occasions had resulted in the recovery of only 2 quartz flakes. It was decided to put a substantial test unit on the level of 1 m x 2 m to examine the morphology, and secondarily, to recover artifactual material.

A description of the profile is given below.

Below surface:

0-10 cm: current organic zone, roots, very sandy
10-85 cm: unconsolidated yellowish-brown coarse sand
85-95 cm: lenses of dark organic material; sand is browner and redder than above
95 cm: very distinct contact zone of overlying sand with a brown silt loam
95-125 cm: brown silt loam. Two ceramic sherds were recovered in situ by troweling side wall at 105
125-135 cm: transition from brown silt loam to yellowish brown silt loam
135-200 cm: yellowish-brown silt loam, apparently sterile
200-300 cm: light brown unconsolidated sand (this sand was finer than that of the 0-95 cm levels)
Screening of the material from 0-125 cm level did recover flakes, another biface and sherds. The point of this discussion is, however, about subsurface testing as a discovery or evaluation technique, and it should be clear that this is labor intensive (12 person hours for this 1 m x 2 m test unit with not all material screened).

Also conditioning our views of subsurface testing in alluvial areas were our experiences at 9EB259, the Gregg Shoals site. Erosion caused by water release from Hartwell Dam upstream has resulted in the formation of a 4 to 5 meter high cutbank. Collections made by us indicated that this site had been occupied since the Early Archaic. These collections and other materials left on the beach in front of the site were indicative of intensive utilization of this location. There was, however, no visual evidence of midden staining present along the exposed face. Trowelling of the face at different times failed to recover artifacts, although this trowelling was not extensive because we did not want to make this site or technique any more obvious to potential vandals.

These experiences suggested that our hopeful picture of a buried site, one with well defined strata with obvious midden staining, was not accurate, or at least, not to be observed in most instances. Backhoe testing had been proposed as a discovery technique (Hanson n.d.a: 13), but these experiences suggested that backhoe testing should be combined with screening of material. Also, because the use of a backhoe is potentially very destructive, it was thought that this should be postponed until personnel trained in sedimentology and/or geomorphology were present to maximize the information potential of a test trench. As a substitute, we employed a hydraulic auger on three sites (9EB76, 9EB207, and 38AB136) to determine the depth of alluvial deposits. Artifactual material was not sought. These tests indicated that as much as 5 meters of alluvium are present at these sites.

These observations provide good evidence for the existence and potential for buried sites in the Russell Reservoir area. It appears that the discovery and evaluation of more buried sites will be expensive and time-consuming. The recovery of this data, however, will contribute immeasurably to our understanding of the patterns of prehistoric subsistence and settlement. If backhoes are used as a discovery tool, geomorphologists and/or sedimentologists should be consulted both to increase the efficiency of the search procedure, and, regardless of whether or not artifactual materials are found, to record stratigraphic data that will contribute to an understanding of the geomorphology and, through this, the reconstruction of paleo-environments.

One further comment about subsurface testing on known sites is necessary. On sites with A horizon in the uplands, and in the bottomlands, shovel tests do recover artifactual materials that facilitate better estimations of both site extent and variability in the depth of deposits.
Coverage

Estimates of the coverage of the 1977 field survey are difficult to make because of difficulties involved in recording coverage and the topographic variation present in the survey area. Concern was expressed by Interagency Archeological Services - Atlanta personnel during the proposal preparation stage about the amount of inhabitable versus nonhabitable land in the project area, and Hanson (n.d.b.: 4-5) provided estimates of 70% in the upland public use areas and 50% in the floodpool. On the basis of the field survey, it has been decided to redefine these areas as high probability versus low probability areas. It should also be noted that confusion has existed about the size of the project area. Until recently, it had been considered to be 34,105 acres (26,650 acre floodpool at 475 foot contour and 7,455 acres of public use area). What was not taken into account was the 300 foot buffer zone between the 475 foot contour and the legal boundary definition of a public use area. When this area was measured, it amounted to an additional 6,593 acres (14,048 acres measured minus 7,455 acres known). Project personnel were under the impression that the acreage of a public use area provided by the Savannah District Corps of Engineers referred to all land above the 475 foot contour. When this additional acreage is added to the 34,105 acre figure a project area size of 40,698 acres is obtained. This is the figure that will be used here. It should also be noted that it would have been impossible to have made a field determination of the legal boundary of a public use area in the field.

High probability area, as used here, are distinguished from low probability areas primarily on the basis of slope in upland areas. Although Hanson (n.d.b.: 5) used a slope estimate of 25% as the dividing line between "habitable" (less than 25%) and "nonhabitable" (more than 25%), this appears to be excessive on the basis of field inspection. The dividing line between high and low probability areas can be conservatively placed at 10%. This estimate also accords well with observations made during other surveys made in the South Carolina Piedmont (Cable, et al. 1978; Goodyear, Ackerly and House n.d.).

In the riverine zone, another assumption was made concerning what constituted high and low probability areas. In this zone, the same slope assumption was employed and all land within one contour line (10 feet elevation) of flowing water was defined as a low probability area. This is to reflect channel movement across a floodplain.

It was in these bases that the measurement of the high and low probability areas within the floodpool were made. Because of measurement difficulties, an estimate of high versus low probability areas is provided for the public use areas (including 300 foot buffer zone). To make all measurements of area below, a Keuffel and Esser compensating polar planimeter (Model No. 62 0000) was used. The project area was, for measurement purposes, divided into 6 areas: 1) Savannah River floodpool, 2) Rocky River floodpool, 3) Beaverdam Creek floodpool, 4) Van's Creek floodpool, 5) Coldwater Creek floodpool and, 6) Public use areas (see Table 22).
TABLE 22

<table>
<thead>
<tr>
<th>HIGH PROBABILITY AREAS</th>
<th>LOW PROBABILITY AREAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAVANNAH RIVER 5453.43 acres</td>
<td>9477.44 acres</td>
</tr>
<tr>
<td>BEAVERDAM CREEK 1103.33 acres</td>
<td>3214.90 acres</td>
</tr>
<tr>
<td>ROCKY RIVER 955.28 acres</td>
<td>5003.01 acres</td>
</tr>
<tr>
<td>COLDWATER CREEK 227.53 acres</td>
<td>656.53 acres</td>
</tr>
<tr>
<td>VAN'S CREEK 261.68 acres</td>
<td>391.92 acres</td>
</tr>
<tr>
<td>PUBLIC USE AREAS 11238.48 acres</td>
<td>2809.62 acres</td>
</tr>
<tr>
<td>TOTAL 19,239.73 acres</td>
<td>21,553.08 acres</td>
</tr>
</tbody>
</table>

(* estimate, see text)

Measurement of the survey coverage was also done with the compensating polar planimeter. Unfortunately, coverage was only measured in terms of three areas—Savannah River, Rocky River and Beaverdam Creek. Coverage in both the floodpool and public use areas was measured together, which may not be satisfactory, but these are the only data available. The measurement of coverage was also not broken down by probability areas because of error factors involved in measuring very small areas. It should be noted that measurement of the coverage and the high probability areas involved making three observations, and the acreage represented is the mean of these three observations minus an error factor (5.4%) determined by measuring a known area, the 26,650 acre floodpool.

TABLE 23

COVERAGE (INCLUDING PUBLIC USE AREAS)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Savannah River: 7331.85 acres</td>
<td></td>
</tr>
<tr>
<td>Rocky River: 2304.75 acres</td>
<td></td>
</tr>
<tr>
<td>Beaverdam Creek: 1471.56 acres</td>
<td></td>
</tr>
<tr>
<td>Survey Coverage: 11,108.16 acres</td>
<td></td>
</tr>
</tbody>
</table>

This coverage figure represents 27.23% of the project area total of 40,792 acres. Because the inability to separate measurement of coverage of high and low probability areas, and the survey strategies employed, that coverage was biased in favor of high probability areas. If this bias is estimated at 80% in favor of high probability areas, then we can calculate the following:

\[
11108.16 \times 0.80 \text{ (high probability bias estimated) } = 8886.53 \text{ acres of coverage of high probability area}
\]

\[
11108.16 \times 0.20 \text{ (low probability bias estimate) } = 2221.63 \text{ acres of coverage of low probability area}
\]

These figures can be divided by the average of both probability areas:

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Because the survey strategy for most of the field time was to favor accessibility and visibility, there were certain areas that were poorly covered or not covered at all. Along the Savannah River, south of Paris Island, the topography is extremely rugged and access was limited. The survey performed in this area indicated that site density was potentially high (64 sites were found). Given that this area below the Highway 72 bridge, was not plowed for crops (see Informant data, Appendix F), the potential for undisturbed upland sites is high. This area is currently being harvested of marketable timber by the Corps of Engineers (Joseph Durham, personal communication) and this should improve both access and visibility. On the South Carolina side of the Savannah, adjacent to McCalla Island and continuing north, is a wide expanse of levee and terrace very similar to the 9EB91-9EB75 area in Georgia. Two roads were walked in this area but no cultural materials were found. It is likely that sites similar to 9EB91 are located here, but that extensive subsurface testing would need to be done in order to locate them.

There were a number of active pastures in the area, and our ability to inspect them was limited for the most part to surface examination. It was decided that postholing in these areas would result in a hazard to livestock who might step in these postholes after the fill had settled. It should also be noted that most of these pastures were still privately owned, and those areas owned by the Corps of Engineers were still being used as pastures under a lease agreement.

Access was not permitted by the landowners of part of the north unit of Coldwater Creek Recreation area. The size of this area was 738.16 acres. It is in this area, in the floodpool, that the location of Edinburgh, a community or village, established about 1815 is suspected to be (1893 Elberton, Georgia-South Carolina sheet, United States Geological Survey).

A construction and dredge spoil area on the Georgia side of the river immediately north of the Russell Dam site was not surveyed. This area was "cleared" in terms of its archeological resources by personnel involved in one of the earlier surveys.

The north coffer dike associated with the dam construction raised the river level north of the coffer dike by a minimum of 12 feet (to 342 feet above sea level). Depending on water release from Hartwell Dam, the level would be raised by 17 feet.

No islands in the Savannah River were visited during the 1977 survey. Safety of the personnel and access problems were the main factors affecting this. The 1977 field season was during the months of June, July, August, September and October, which is euphemistically referred to as the time of greatest "biological activity" in the
survey area. At low water level all the larger islands (McCalla, Parris and Carter) have high cutbanks, which would require climbing up them by grabbing exposed roots. Complicating this is the presence of the Eastern Cotton-mouth (*Agkistrodon piscivorus piscivorus*), which "do not hurry away from humans the way nonpoisonous snakes do" (South Carolina Museum Commission 1977). Local residents often commented on the large number of cottonmouths on the river and this made the prospect of reaching into a mass of roots for a handhold very unappealing.

The level of water in the river fluctuated greatly every day except Sunday because of water released for power generation from Hartwell Lake upstream. This causes very turbulent water conditions, especially in shoal areas. For example, the high water coming through the breach at the Gregg Shoals Dam (38AN36) has been classified as a Class VI rapid (Speight 1976). None of the project personnel were familiar with boating on rivers, and the remoteness of some of these areas on the river cautioned against attempting to reach the islands.

Archeological sites are known to occur on the islands. 9EB16, 9EB94 and 9EB414 have been visited by collectors and collections have been made on these sites. Also, an historic homesite is believed to be on Parris Island (James Ellis, personal communication). It is recommended that these islands be surveyed during later phases of data recovery and during the winter season when snakes and vegetation will not affect personnel safety. If done during this winter, it would be possible for survey teams to move out to the islands for 3-4 day stretches which would minimize time on the river.

**Revisitation of Known Sites**

It was envisioned that the 109 known sites would be revisited during the 1977 survey. Because the project area boundary had changed since these earlier sites from the 490 foot contour to the 475 foot contour, 41 of the previously known sites were located outside of the present project boundaries. Of these, 29 were in South Carolina and 12 were in Georgia. Three of the Georgia sites in this category, 9EB86 (Tate's Mound), 9EB69 and 9EB93 were revisited and recorded. 9EB86 and 9EB93 are still retained within the inventory although 9EB86 is beyond the buffer zone, as are parts of 9EB93. These are retained because efforts should be made to preserve them, especially Tate's Mound (9EB86). Six other sites listed by Hutto were not visited by him, but information was available from the site files at the University of Georgia. Two of these sites are located on McCalla Island (9EB16 and 9EB94) but were not revisited by us. The other four were 9EB8, 9EB9, 9EB10 and 9EB15. Information included artifact counts for both sites and for 9EB15, "the location is unknown, but the site ought to be within a few miles of the bridge that crosses the Savannah River on State Highway 72" (Hutto 1970: 32). Because of this lack of information, no attempt was made to relocate these sites and sites found in the general area were assigned current survey numbers.
For two other previously known sites, 9EB77 and 9EB78, the
description of the location was poor (9EB77) or nonexistent (9EB78).
The Gregg Shoals site (9EB259) may be Hutto's 9EB77 but there is no
way to be sure, because although he is in the general area, all he
describes are flakes and sherds in a road (Hutto 1970: 16). No
description of 9EB78 was given in the report, but information made
available to us after completion of the field season indicates that
9EB78 is located south of the confluence of Pickens Creek with the
Savannah. The site is plotted on the 1928 soil map, so scale influences
accuracy. 9EB387 located during this survey was in this area but north
of where Hutto had 9EB78 plotted.

Sites 9EB64, 9EB79, 9EB82 and 9EB83 were revisited but this area
had reverted to old field since it was visited by Hutto. His collections
were extensive and ample enough to document cultural-historical
affiliations for these sites. These four sites, however, were combined
by us into one site, 9EB83, because it is clear from reading Hutto that
these sites overlap and rather than being four discrete occupations, there
likely is a multiple component site here (see Hutto 1970: 8, 20).

Sites 9EB60, 9EB87, 9EB88, 9EB90 could not be relocated because of
the inadequacy of the descriptions provided and the fact that this area
had reverted to old field since the sites were visited in 1969.

All the other sites in Georgia were relocated, recorded and collected
and are the 9EB sites with two digits.

Of the 54 sites in South Carolina that were still within the
project area boundaries, five were sought but could not be relocated
(38AB71, 38AB87, 38AB91, 38AN6, 38AN7). Because of time constraints,
14 sites were not revisited (38AB11, 38AB14, 38AB22, 38AB23, 38AB24,
38AB33, 38AB34, 38AB53, 38AB68, 38AB75, 38AB79, 38AB83, 38AB85 and
38AN34). There was no access to sites 38AB66 and 38AN6. All of
the other sites were revisited, recollected and recorded during the
1977 field season.

Some Comments on Historic Site Location, Identification and Collection

The survey strategies outlined above were designed to encounter
both prehistoric and historic sites. Any time a site was discovered,
regardless of whether or not it was prehistoric or historic, an
attempt was made to record all of the observations on the site form
discussed earlier.

In addition, other techniques were employed to locate and identify
historic sites. These techniques included documentary research,
cartographic inspection and interviews with local residents or others
knowledgeable in the history of the area.
Documentary research was most useful for elucidating the full range of historic sites variability that was potentially present within the project area. General background had, of course, indicated that historic occupation had been intensive, especially during the period 1810 to 1930. This area was intensively used for the cultivation of upland short staple cotton (Gossypium hirsutum L.), which was economically viable after the invention of the cotton gin in 1793 (Gray 1933). Brooks (this volume) will present the historic overview of the area, but for present purposes, documentary research did indicate that a wide variety of site types were present. Unfortunately, this research did not facilitate the location of specific sites.

Three maps, the 1893 Elberton, Georgia–South Carolina sheet (scale 1:125000), the 1928 Elbert County Soil Map (Fuller and Hendrikson 1928), and the 1932 Abbeville County Soil Map (Lesh, et al. 1932) (both at a scale of 1 inch = 1 mile) were inspected for evidence of historic sites. These maps showed many buildings, bridges, ferries and mills. The scale of these maps, however, was too large to facilitate on-the-ground location of specific resources, but, in some cases, the fact correlations of sites with map features was possible. These maps, especially the soil maps, were most useful as an index of archeological visibility, because while dense occupations were indicated in some areas, on-the-ground inspection did not result in the location of any of these sites, primarily because of dense vegetation cover.

Oral interviews were very productive in terms of providing information on both the location and evaluation of specific resources. For example, the Diamond Springs Hotel (38AB280) and Maddox Mill (9EB415) were located solely on the basis of informant interviews. Some informants would accompany us to sites and point out features that would not be otherwise obvious or, if obvious, they would have been problematical in terms of functional identification. Brooks has summarized the informant interviews (both from notes and tape recordings) and these are provided in Appendix F. Hardwood loggers provided very valuable information about "homesite" trees, which are large hardwoods, primarily oaks (Quercus spp.). It seemed anomalous to us that in completely logged areas, clumps of hardwoods would be left standing (see Figure 36). According to the loggers, these trees are not harvested because they are quite likely to contain metal (primarily nails) associated with the domestic use of the site. If these trees were to be logged and sawn for lumber, and these metals were hit by a saw, the saw would be ruined. Homesite trees were a very useful index for marking the presence of an historic site, especially when no other evidence was available.

On some historic sites, piles of brick rubble would be encountered. According to the loggers, these rubble piles were the result of bulldozing of pine plantations. The razing of these structures was done to reduce tax that pulpwood companies would have to pay if their land contained habitable structures. This, needless to say, has had a tremendous effect on the integrity of these resources.

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On certain historic sites, disturbance of the ground associated with domestic uses (gardens, etc.) has resulted after abandonment, in these areas being overgrown with a very dense low shrub ground cover. This, of course, completely obscured visibility of the ground surface. This commensal vegetation in combination with homesite trees with an excellent indication of site function and integrity. The commensal vegetation under the trees indicated that the surface of the site had not been disturbed since abandonment and, because of this, could be considered intact. In these instances, subsurface testing was not done because the potential for damaging an intact site was greater than the potential for diagnostic artifact recovery. This area is completely unknown in an historical archeological sense, and in addition to the evidence of significant modification of certain kinds of historic sites (above), this placed great value on undisturbed domestic homesites. For this reason, spatially uncontrolled subsurface testing for artifact recovery was not initiated at these sites.

Historic sites with standing structures were recorded in the same manner as other historic sites, with the addition of complete photographic documentation to permit evaluation of the architectural values by qualified architectural historians. This photographic documentation is provided in Appendix G.
Age of Historic Sites Recorded

Because of the phrase "properties that have achieved significance within the past 50 years shall not be considered eligible for the National Register" [36 CFR 800.10 (b)], the present survey did not record features that appeared to be less than fifty years of age, when this could be determined. In retrospect, this was naive on our part for two reasons. First of all, the determination of age of historic objects in the field is not reliable in all instances. The second, and most important, reason is that the exclusion of a resource as not significant solely on the basis of age in the present instance fails to take into account that the potential adverse effect of this project will remove resources younger than 50 years of age from the purview of scholars of the future. If age of a resource is the sole criterion employed as the basis for assessing significance, then these resources and their potential to contribute information important in history are being "penalized" in those instances where the implementation of an adverse effect is the result of contemporary planning processes. This artificial truncation of the archeological record in situations like the present one, the impending inundation of the Russell Reservoir, means that these resources will be no longer available as sources of information about cultural and historical values of this period of history.

These considerations also impose constraints on the contemporary community of scholars of the potential of these resources less than 50 years of age to contribute valuable data to the understanding of the processes of adaptation and change that characterize individual project areas. It could be envisioned that these data about the last 50 years of an area's "life" could be very important to some future individual interested, for example, in a comparative study of reservoir areas and the factors which led to the selection of these areas as opposed to other areas.

It is suggested for those surveying in areas where the potential adverse impact will remove the resources of those areas from the purview of the public and scholars of the future, that efforts be made to systematically observe, record and evaluate the cultural and historical resources of the area regardless of their present age. Implementation of such a strategy will do much to enhance the preservation of archeological and historical values for our children and their children.

Impact of the Proposed Richard B. Russell Dam and Lake Project on the Cultural Resources Present

The cultural resources survey of the proposed Richard B. Russell Dam and Lake was conducted in anticipation of some effect by a federal agency on the cultural resources present within the legal boundaries of the project area, which have yet to be finalized (see Appendix K). For a
discussion of impacts on these resources the project area can be sub-
divided into three zones: the floodpool, which is all land below the
477 foot a.s.l. contour; the lake shoreline zone, which is all land
between the 470 foot and 480 foot a.s.l. contours; and the public use
areas, which are located beyond the 300 foot buffer zone in certain
areas. As we mentioned above, the buffer zone between the 477
foot contour and the adjacent public use areas was surveyed due
partly to a misconception on the field study team's part and also
because of the practical difficulties involved in locating this
imaginary boundary in the field. The discussion of impacts below
specifically excludes the buffer zone of the reservoir in all areas
which do not have public use areas adjacent.

The Floodpool

Archeological resources located in the project area below the 475
foot contour will be inundated by water from a depth at the dam site
of 147 feet to a depth of a few inches in the northern part of the
reservoir and at the upper reaches of the tributaries which flow into
the Savannah River.

Inundation can be considered to have a direct effect on the
cultural resources impacted (Garrison 1977; Lenihan, et al. 1977).
At present it is not possible to state with certainty that this impact
will have either a favorable or adverse effect. As Garrison says,
"a systematic body of method, theory or data on which logical,
scientific conservation measures for inundated resources can be based
simply does not exist" (1977: 151). The possibility of alteration or
destruction of cultural resources in inundated contexts is so great,
however, that this type of impact is generally presumed to be adverse.
Garrison (1977: 153) has discussed four processes that occur in
inundated contexts. These are:

1) Natural mechanical - waves, currents, either surface or sub-
surface, and erosion caused by waves or currents or by runoff
2) Manmade mechanical - waves from boat operation, currents caused
by floodgates or power generation
3) Natural chemical - pH and temperature related to reduction/
oxidation or precipitation/solublizations; and biological, in
the euphotic zone or bottom sediments resulting from oxidation/
reduction, etc.
4) Manmade chemical - as in 3) above but resulting from industrial
waste or effluents from power generation

These four processes will have certain effects causing the loss or
alteration of the following (after Garrison 1977: 153):

1) geological and cultural strata
2) geomorphological features
3) structures, middens and cultural feature
4) distributional patterns of artifacts and cultural features
5) soil structure
6) artifacts
7) faunal and floral materials
8) soil chemistry
9) archeometric data, hydration rates, radiocarbon content, trace element concentrations and themoluminescence.

Garrison suggests in his model, that process 1 and 2 will affect categories 1 through 7 and that processes 3 and 4 will affect categories 5 through 9.

The National Reservoir Inundation Study has attempted to come to grips with inundation effects as has Garrison (Lenihan, et al. 1977). This study is in its nascent stages, but there are three charts that provide some guidelines as to the relative impact of inundation on the environmental matrix (soil type) and the susceptibility of certain types of cultural resources to mechanical impacts (Lenihan, et al. 1977: 20-22). A variety of environmental matrices or soil types are present in the floodpool zone of the project area. Using the types of Lenihan, et al. (1977: 20), it can be seen that types SC (clayey sands), OL (organic silts), MH (micaceous fine sandy or silty soils) and OH (organic clays of medium to high plasticity) are present. The effects of various erosion factors vary among these types from minimal to maximum impact. In terms of mechanical effects, moderate to maximum impact can be predicted for these types resulting mostly from liquefaction (Lenihan, et al. 1977: 20).

In terms of susceptibility of certain kinds of cultural resources to mechanical impact (resulting from waves or erosion), types A (standing structures of concrete); B (standing structures of fitted stone without mortar or plaster); C (standing structures of stone with mortar or plaster); H (low-lying rubble of stone); K (lithic and/or ceramic scatter); and R (soil midden) are present within the floodpool. Susceptibility values used vary from 0 (none) to 3 (maximum). The susceptibility values of these types are as follows: A-1; B-1; C-2; H-1; K-1; R-2.

This study also discusses the differential preservation of different types of cultural materials. At the present time, it can only be said that alteration or destruction is possible or likely, but the methods of observing alteration or destruction must be case-specific. In certain instances, complete obliteration is predicted. To be able to assess this, one would have to have had prior knowledge of the existence of the object, which places the investigator in a "catch-22" situation because, in most instances knowledge of a particular object is gained through the removal of that object.

The impact on analytical and dating techniques is also discussed and here too the tone of the study is equivocal; specific predictions relative to a specific technique being highly dependent on local conditions or reservoir specific variables. (Lenihan, et al. 1977: 56-110).

Another impact that can be expected in the floodpool zone that is not related to inundation is the harvesting of marketable timber prior to inundation. According to Mr. Herbert DeRigo, Chief, Environmental Section, Corps of Engineers, Savannah District, the floodpool zone will
not be cleared of all vegetation as has been the case with certain reservoirs like the Wallace Reservoir on the Oconee River in Georgia. Instead, only marketable timber will be harvested. This operation can be expected to result in direct impacts of differential severity depending on what kind of timber (hardwood or pulpwood) is harvested.

As was mentioned above in the chapter on methods, techniques differ for logging pulpwood and hardwoods, and the damage that results depends on whether or not heavy equipment is used and if the ground surface is wet or dry. At present, the field study team has no information available on which specific areas will be subjected to timber harvesting, although we are aware that this operation is underway and has been since January, 1978. At that time, project personnel traveled to the project area because it had been learned that timber harvesting was underway on the Georgia side of the Savannah River south of the Highway 72 bridge. Fortunately, it was possible to avert possible damage to two potentially eligible sites, 9EB249 and 9EB253. Subsequent to this experience, the field study team transmitted to the timber harvesting operation a set of project maps showing the sites which were considered by us to be potentially eligible.

The Lakeshore Zone

This zone is defined as being located between the 470 foot and 480 foot contour of the project area. The 10 foot interval is chosen because it hopefully reflects the magnitude of fluctuation of the reservoir level during its operation. Resources in this zone will be subject to periodic inundation and drawdown, and, because of this, will be subject to the mechanical and chemical impacts discussed for the floodpool zone. In addition to this, this zone will be subject to the greatest impact from mechanical effects of the reservoir operation in terms of wave action caused by winds or the operation of boats. In certain areas of this zone, intensive use of the shoreline can be expected from recreational activities. If personal observations made at Clark Hill Lake can be allowed, it appears that in certain instances, which are strongly determined by slope of the ground surface, the mechanical impact of water on the lake shoreline can be substantial, causing undercutting of the bank and the formation of exposed surfaces far in excess of that which might be expected to result from normal fluctuation of the reservoir level. These areas at Clark Hill Lake are areas which were formerly upland areas with clay subsoils. This phenomenon can be expected after inundation of the Russell reservoir.

Another impact to be considered is the clearing of the lakeshore edge in order to provide an accessible shoreline. In this zone, all trees and vegetation that would project above the lake level of 475 feet a.s.l. will be removed. This clearing activity will involve the removal of stumps and will cause substantial ground disturbance, so that almost complete destruction of any cultural resources that would be present can be expected.
Impacts in this zone may result from two kinds of effects: direct and indirect. Direct effects refer to the actual physical process of undertaking the modifications and result in either damage or destruction of a cultural resource. Indirect effects make "possible, or inevitable, damages to the property without directly impacting it" (King 1975: 18). There are different kinds of indirect effects, such as 1) permitted—which result when the responsible agency permits another agency to engage in damaging activities; 2) managerial—which result from the day-to-day operations of a land or resource managing agency; and 3) contingent—which result from non-federal actions that are not explicitly permitted by the federal agency responsible, and which would not occur in the absence of federal action (King 1975: 18).

Direct impacts will result from facilities construction at the various public use areas that will be associated with the proposed Russell Lake. Impacts from indirect effects may be anticipated unless a sound plan of cultural resource management is implemented as an integral component of day-to-day reservoir operations. Because certain areas are expected to be leased to the States of Georgia and South Carolina for use as state parks, it is possible that indirect effects of the "permitted" and "contingent" types could occur.

The discussion of impacts upon resources located in the public use areas must remain tentative because planning of this phase of the Russell Dam and Lake Project is still continuing and has not progressed beyond the site selection phase. Since the present survey began in June of 1977, there have been substantial modifications in the site selection plan which deleted many of the areas that were surveyed during the field phase. A letter to Dr. R.L. Stephenson from Hubert C. Miles, Assistant Chief, Planning Division, Corps of Engineers, Savannah District, dated June 9, 1978, states that the master plan (which will finalize sites selection) will not be completed until March 1979. The feature design memorandum which will detail road alignments and construction details for the recreation facilities is scheduled for completion in March 1980, according to this letter. Appendix K contains a copy of this letter and a list of sites affected by changes in the site selection plan of May 30, 1978, which was received by the Institute of Archeology and Anthropology on June 9, 1978.

Composition of the Field Study Team

Below the composition of the field study team and the responsibilities of team members is discussed. Curriculum vitae of the field study team members are presented in Appendix I.

1) Dr. Robert L. Stephenson, co-principal investigator, was responsible for overall project guidance, including budgetary and personnel matters.

2) Glen T. Hanson, M.A., co-principal investigator, was responsible for project design and implementation, budgetary and personnel details and supervision of the field and laboratory phases of the survey.
3) Richard L. Taylor, M.A., archeological assistant, was responsible for the operation of the field camp and conduct of the Georgia portion of the survey. In the laboratory phase, he was responsible for the preparation of the Cultural Resource Inventory forms for the prehistoric sites in Georgia, and for research on the Archaic period as this related to sites found during the survey.

4) Marion F. Smith, M.A., archeological assistant, was responsible for the conduct of the South Carolina portion of the survey during the field phase. During the laboratory phase, he was responsible for the preparation of the Cultural Resource Inventory forms for the prehistoric sites in South Carolina and research on the Ceramic period as this related to sites found during the survey.

5) Richard D. Brooks, B.A., survey crew member and laboratory technician, participated in the preliminary preparations for the field phase, including background research on the project area, and was a survey crew member during the field phase. During the laboratory phase, he was responsible for the preparation of Cultural Resource Inventory forms for the Historic period sites in Georgia and South Carolina, the identification and analysis of artifacts from the Historic period and research on the Historic period as this related to sites found during the survey.

6) Rachel Most, B.A., archeological assistant, was involved in the preliminary planning of the field phase and served as a survey crew member until she left the project on July 31, 1977. Her contribution to Chapter 1 was not supported by project funds.

7) James O'Hara, survey crew member and laboratory technician, participated in part of the field phase and during the latter part of the laboratory phase of the project. His contribution to Chapter 1 was not supported by project funds.

8) Eric C. Poplin, B.A., survey crew member and laboratory technician, participated in the latter part of the field phase and was responsible for the description and analysis of the hafted bifaces in Chapter IV.

9) Stanley A. South, M.A., consultant, prehistoric and historic archeology was not supported by project funds. He consulted during all phases of the project with survey team personnel on various aspects of historic and prehistoric archeology.

10) Dr. Albert C. Goodyear, consultant, prehistoric archeology was not supported by project funds. He consulted during all phases of the project with survey team personnel on various aspects of prehistoric archeology.

In addition, Richard Atwell, Beverly Leichtman, Marvin Miller, Nancy Sullivan, and Claudia Wolfe served as survey crew members during the field phase of the project.