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ARCHAEOLOGICAL INVESTIGATIONS AT SITE 9PM220

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ARCHAEOLOGICAL INVESTIGATIONS AT SITE 9PM220

by

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WALLACE RESERVOIR PROJECT CONTRIBUTION NUMBER 19

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PREFACE

This report represents the final report for site PM220 the excavation of which was provided for in Appendix 6 of the Archaeological Salvage Agreement between the University of Georgia and the Georgia Power Company.

Chapters 1, 2 and 4 were written by James Rudolph; Chapter 3, by David Hally. The report was edited by David Hally.

David J. Hally
Principal Investigator

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CHAPTER I

INTRODUCTION

Site PM220 is a small shell midden located on the south bank of the Oconee River at Tripps Bend (Figure 1). The Universal Transverse Mercator co-ordinates for the site are N3697480 E291624. The site was first recorded by a University of Georgia survey party in 1975 (DePratter 1976:274-278). The site consists of several distinct and undisturbed strata of mussel shell and artifacts dating to the Lamar period. The areal extent of the site is quite limited, covering at most only 600 m^2 to 800 m^2.

Environmental Setting

The site is situated on the extreme terminus of a long ridge that slopes down to the river, leaving room for no floodplain whatsoever (Figure 2; Plate 1). Here one find soils of the Congaree Series, streamside deposits which, though flooded at least once a year, are still considered well-drained (Payne 1976:3). In all probability vegetation along the streams of the Oconee River valley during the Lamar period (A.D. 1400-1650) differed little from the natural vegetation present during the nineteenth and early twentieth centuries. Major species probably included river birch, black willow, cottonwood, sycamore, and sweet gum (Braun 1950:264).

Across the river from the site, the floodplain of the Oconee River is relatively flat and broad, ranging from 0.5 km to 1.0 km in width. Chewacla Soils, which are poorly drained and moderate in natural

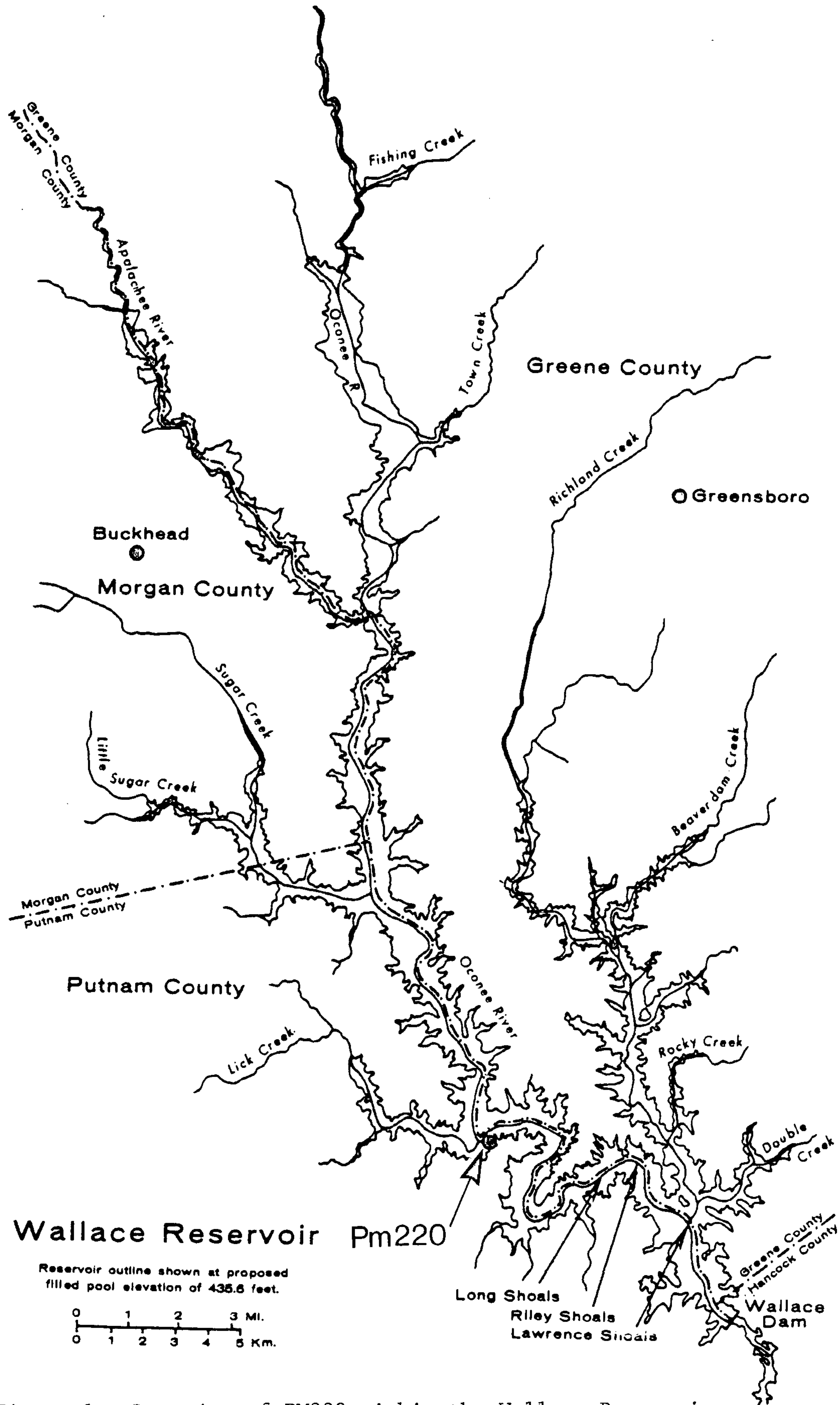

Figure 1. Location of PM220 within the Wallace Reservoir.

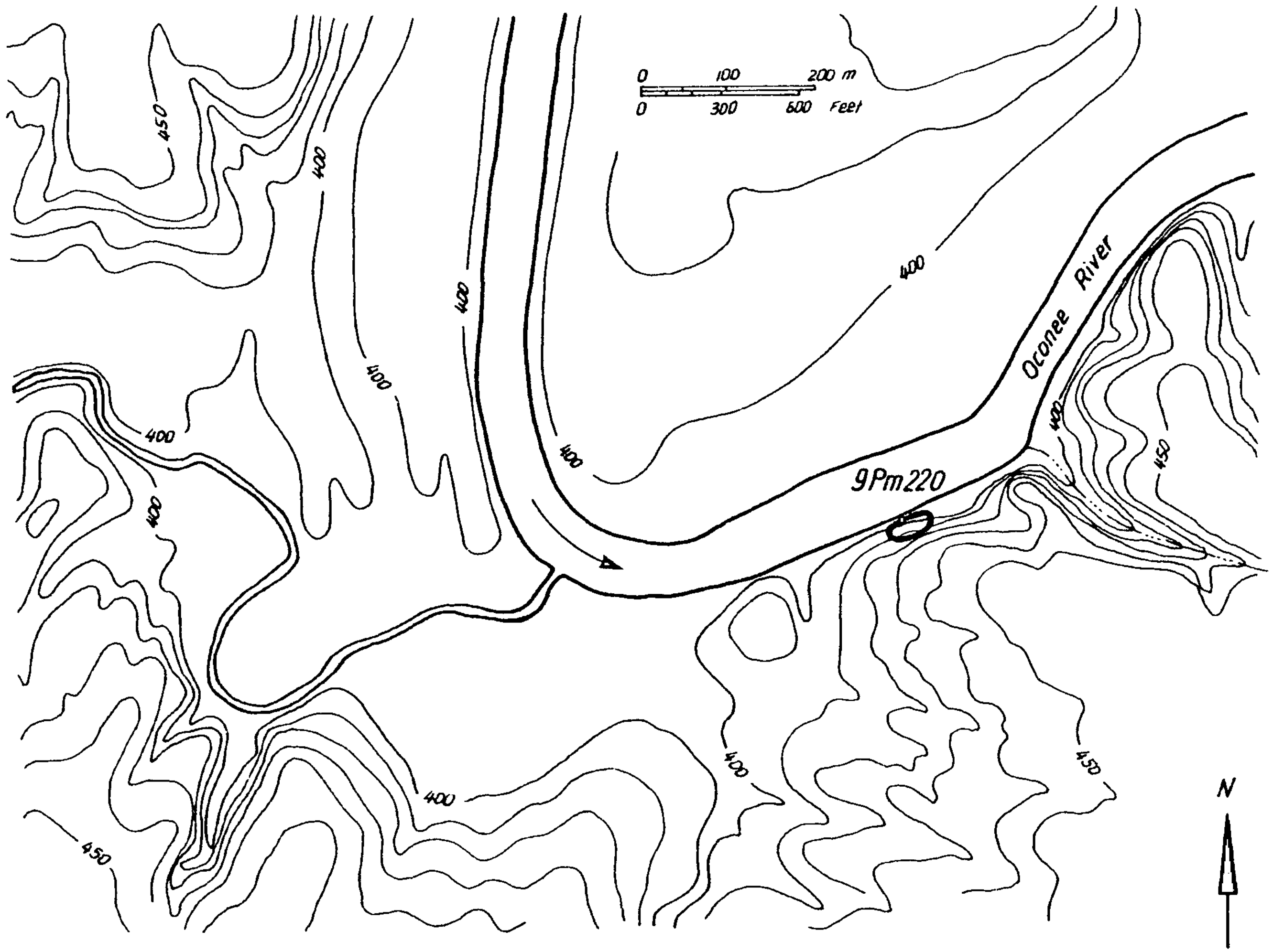

Figure 2. Topographic map showing relationship of PM220 to the Oconee River.

fertility, are found in these lower areas (Payne 1976:3). During Late prehistoric times, the broad floodplains of the Georgia Piedmont may have supported a mixed hardwood forest community with sweet gum, water oak, white and winged elms, red maple, tulip tree, and ash being the most common species (Braun 1950:264). Extensive canebrakes noted by William Bartram in the Oconee River bottoms during the late eighteenth century (Bartram 1958:28) may have existed several centuries earlier, but it cannot be said with any certainty that such stands were present near 9PM220.

The ridges above 9PM220 are characterized by soils weathered from underlying granite, gneiss, or diorite. These soils include Davidson Loam, Gwinnett Loam, and Cecil Sandy Loam, all of which are well-drained and low in natural fertility (Payne 1976:11,14,18). In the past these ridges probably supported an oak-hickory climax forest with either white oak or post oak predominating and with hickory, short-leaf pine, and loblolly pine occurring as well (Lee 1977:29).

Research Design

For many years local farmers had been aware of the shells and pottery washing out of the river bank at this popular fishing spot, but 9PM220 did not come to the attention of archaeologists until 1975 when the site was recorded by Chester DePratter (1976:274-278). At that time 6 core tests were excavated and demonstrated that the shell covered a small area 8.0 m wide and 19.0 m long. A test unit with dimensions of 1.0 m by 1.5 m (Figure 3) indicated that 2 shell strata were present, both of which contained Lamar ceramics. Wood charcoal

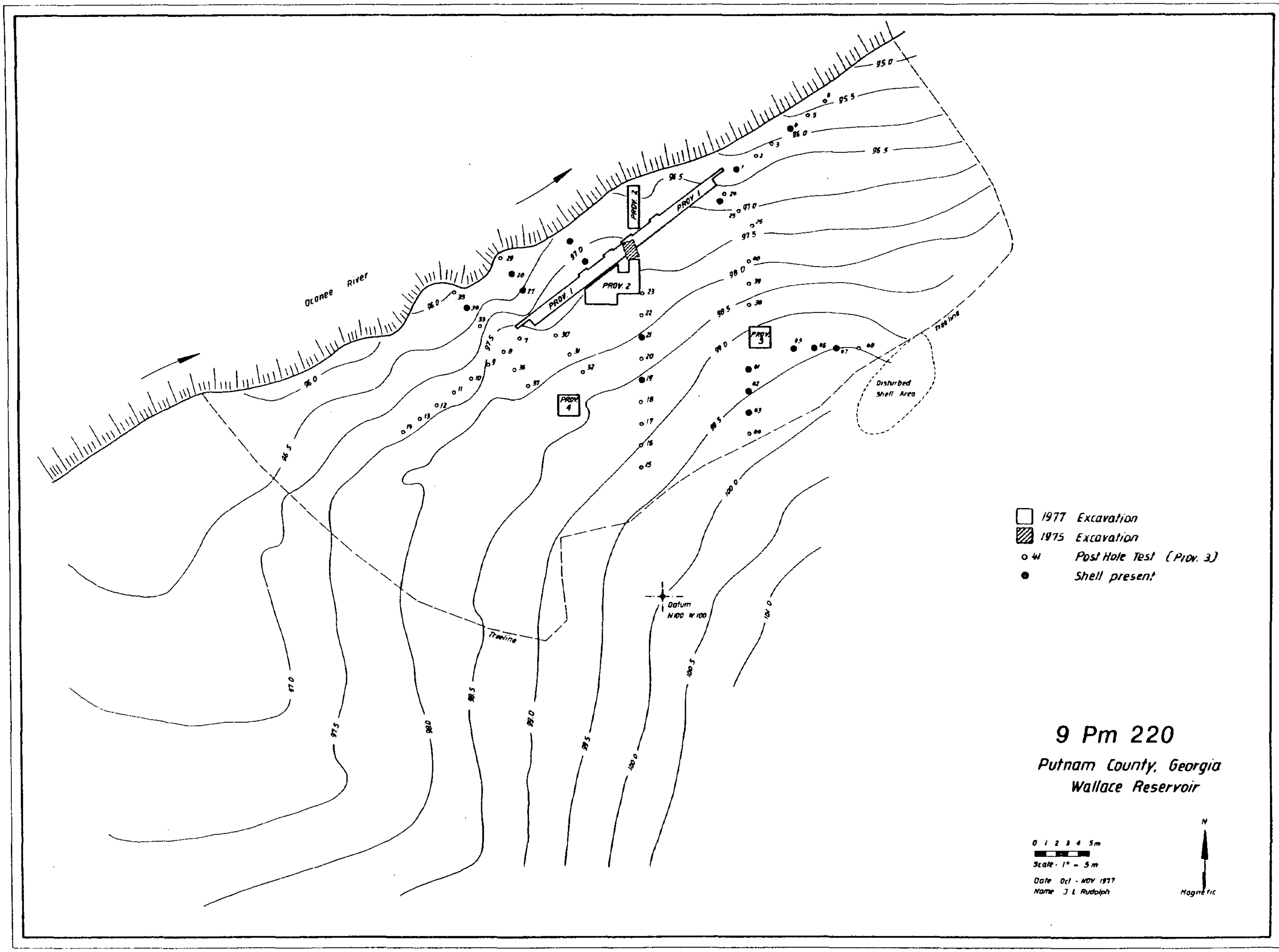

Figure 3. Excavation plan of PM220.

and animal bones were found in very small quantities. DePratter (1976: 278) reports that a postmold was found beneath the lowest level of shell, suggesting the possible existence of a structure at the site.

In the original research proposal for the Wallace Reservoir Project (Hally and Fish 1976) sites were considered to be worthy of further investigation if they met at least one of the following criteria:

1. Site will yield artifact assemblage useful in defining local manifestations of cultures or phases known elsewhere in the state.
2. Site has multiple stratified components and has potential for yielding information on local sequence of phases.
3. Site location and culture content indicate it represents a distinct settlement type characteristic of a specific phase or culture. Site, as a result, has potential for yielding information on settlement pattern of that phase or culture.
4. Site has preserved organic material and hence has potential for yielding information on subsistence patterns of a specific phase or culture.

PM220 met all four of these criteria, but the characteristic of most interest to project archaeologists was the abundance of well preserved mussel shell. Late prehistoric shell middens have rarely been investigated in contrast to the more impressive middens of the Archaic period; and for this reason almost nothing is known about Lamar shellfish exploitation. PM220 provided an excellent opportunity to correct this situation.

Field Methods

Archaeologists from the University of Georgia excavated 9PM220 between October 17 and November 18, 1977. Twenty-five field days were set aside for excavation, but because of poor weather and high water only 18 days (90 man days) were spent in the field. This unexpected reduction in field time prevented our uncovering as large an area as had been planned.

The forest cover at 9PM220 was quite dense, making a controlled surface collection impossible (Plate 1). Instead, it was decided that the field crew would excavate a randomly located trench as an initial step in understanding the horizontal and vertical nature of the deposits. The northwest corner of DePratter's excavation unit served tentatively as the shell midden's central point. From this temporary datum a baseline was established in the randomly selected direction of 52° east of magnetic north. This line became the northwest wall of the Provenience 1 trench (Figure 3).

Excavation of Provenience 1, which was 1.0 m wide and 22.0 m long, proceeded simultaneously in both directions from the 1975 test. The midden was removed in 1.0 m by 1.0 m sections numbered according to the sequence of excavation. The squares were dug in natural levels whenever possible and all material, except that saved for flotation, was dry-screened through one-quarter inch hardward cloth. Collections of mollusc shells were recovered from flotation samples only. All river pebbles were saved except when their volume proved unmanageable. In such cases samples of the pebbles were saved and the remainder were discarded, due note being made of the unusual quantity.

The first 1.0 cm to 2.0 cm of leaf litter and disturbed soil were removed without screening (Plate 2). Next, a level of soil 4.0 cm to 16.0 cm thick and overlying the uppermost layer of shell was removed and screened. In most sections of Provenience 1 this level consisted of red to reddish-brown sandy alluvium. However, in Squares 1, 2, 4, 6, 8, and 10 (Figure 4) there was also a band of brown clay 2.0 cm to 10.0 cm thick lying between the red alluvium and the shell-bearing stratum. This brown clay layer was visible in profile, but it was inadvertantly excavated in combination with the red alluvium. Its exact nature and its contents as distinguished from those in the level above are unknown.

In removing Shell Layers A and B (Figure 4), we attempted to keep separate the material from each shell stratum and the material from the thin layer of grayish-brown soil located between the 2 shell strata (Plate 2). In some squares the distinction between the levels was extremely difficult to make, but the attempt to excavate in natural levels was continued throughout the investigation of the trench.

Beneath the lowest level of shell there was a band of dark brown clay which contained only a small amount of cultural material. Below the dark brown clay was an orange, sandy, and very rocky subsoil which contained no artifacts.

Provenience 2 was located north and south of the 1975 excavation unit (Figure 3). The placement of this second provenience was designed to allow us to estimate the width of the shell midden and to let us determine the extent to which the shell midden had been eroded by the river. We expanded the southern portion of Provenience 2 into a block

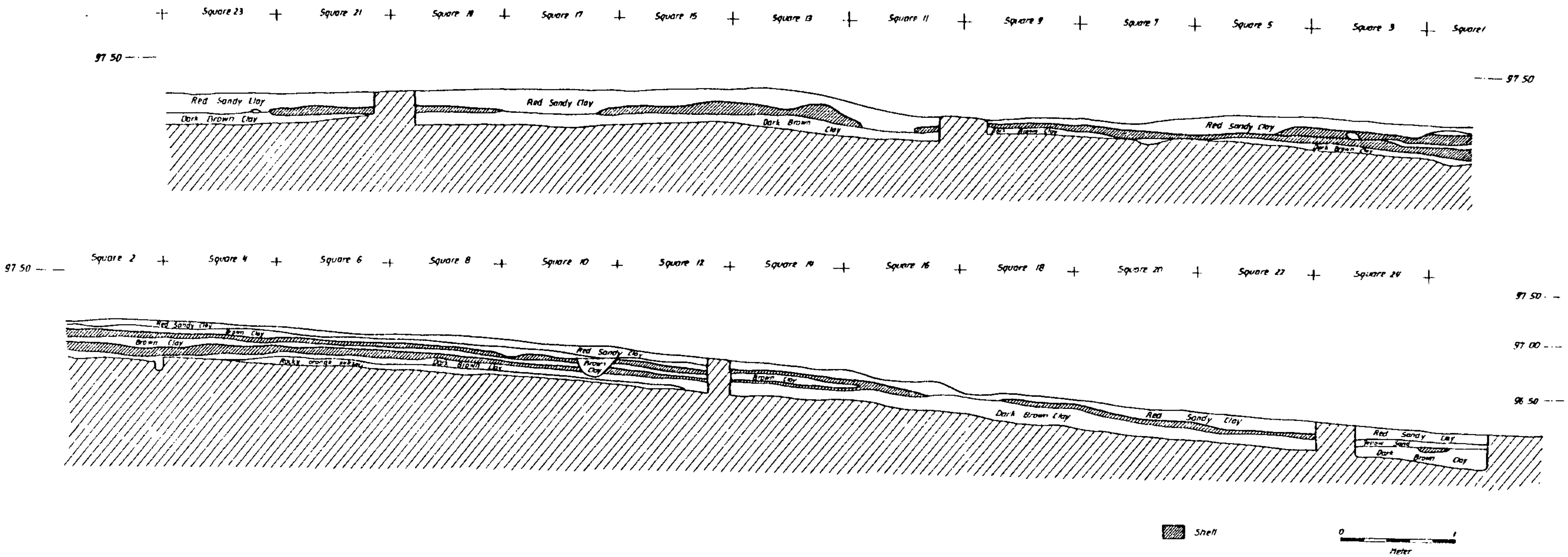

Figure 4. Profile of Provenience 1 trench, 9PM220.

excavation in anticipation of discovering features and artifact clusters along the edge of the midden.

The stratigraphy in Provenience 2 is similar to that in Provenience 1 with a few exceptions. In the northern section of Provenience 2, Shell Layer A disappears and Shell Layer B becomes much thicker. Also, Shell Layer B does not extend as far back from the river as does Shell Layer A, although the latter becomes little more than a thin lens of shell.

Provenience 3 consisted of 48 arbitarily located core tests dug with a manually operated posthole digger in order to determine the limits of the site (Figure 3). All contents of the core tests were dry-screened, the presence or absence of shells was noted, and the total excavation depth was recorded.

As we neared the completion date for the fieldwork at 9PM220, it was decided that more information was needed from an area upslope from the main concentration of shell. We had had little success in finding evidence of either features or structures, and it was thought that these might be located toward the south. Proveniences 4 and 5 were excavated with this goal in mind (Figure 3).

Provenience 4, measuring 2 m square, contained only a shallow surface stratum of cultural material underlain by the rocky subsoil. No shellfish remains were found in this provenience.

Provenience 5 measured two meters square and was to be excavated in one level to sterile subsoil. The discovery of a thin shell stratum immediately below red sandy alluvium, altered these plans so that excavation proceeded by natural level within each of four 1 m squares. Bad weather prevented completion of more than two of these squares.

CHAPTER II

SITE STRATIFICATION

Stratum 1: Red Sandy Alluvium

This stratum is found directly below the ground surfaces in Proveniences 1 and 5, and in the southern section of Provenience 2 (Figure 5). The thickness of this level ranges between 5 cm and 20 cm, with the thickest deposits occurring in Provenience 5 and at the extreme western end of Provenience 1.

Table 1 summarizes the contents of the dry-screened samples of red sandy alluvium. The estimated total volume for the portions of Stratum I included within Table 1 is 2.6 cubic meters. Some of the red sandy alluvium was inadvertently excavated in combination with an underlying stratum. The contents of these combined strata are tabulated in Table 3.

DePratter (1976:274) believed that this level was sterile, but the results of the 1977 excavations clearly demonstrate that this is not the case.

Stratum II: Brown Clay

This stratum lies directly above the uppermost layer of mollusk shells in portions of Provenience 1 and 2 (Figure 6). In Provenience 1 this level ranges between 2 cm and 10 cm in thickness, and in the northern portion of Provenience 2 the stratum is 15 cm thick. Unfortunately, only in the northern portion of Provenience 2 was Stratum II excavated as a level distinct from Stratum 1 (Table 2). The estimated volume of such

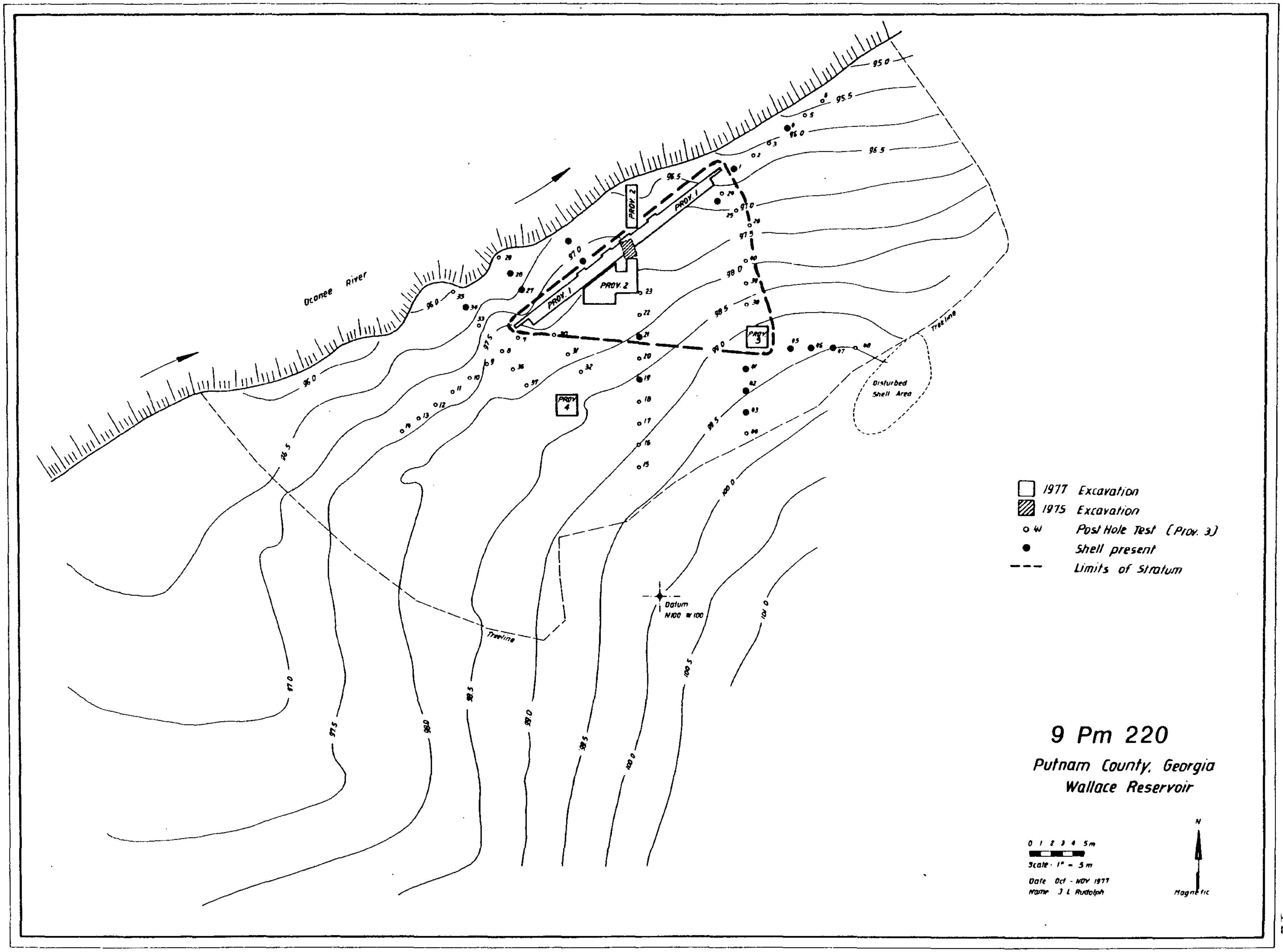

Figure 5. Distribution of Stratum I, Red Sand Alluvium, at PM220.

Table 1

Artifact Contents of Stratum I

Lithic Material		
Biface fragment	1	
Percussion flakes	12	
Retouch flakes	12	
Unidentifiable flake debris	25	
Hammerstone	1	
Fire-cracked rock	3.0 kg	
Pebbles	10.8 kg	
Other stone	57.7 kg	
Ceramic Material	body sherds	rim sherds
Plain, grit-tempered	297	25
Burnished plain, grit-tempered	14	2
Lamar Incised	18	5
Lamar Complicated Stamped	13	
Unidentified simple stamped	1	
Unidentified stamped	4	1
Unidentified decorated	7	1
Vertebrate Faunal Material		
Turtle shell fragment	1	
Turtle shell fragment, burned	1	

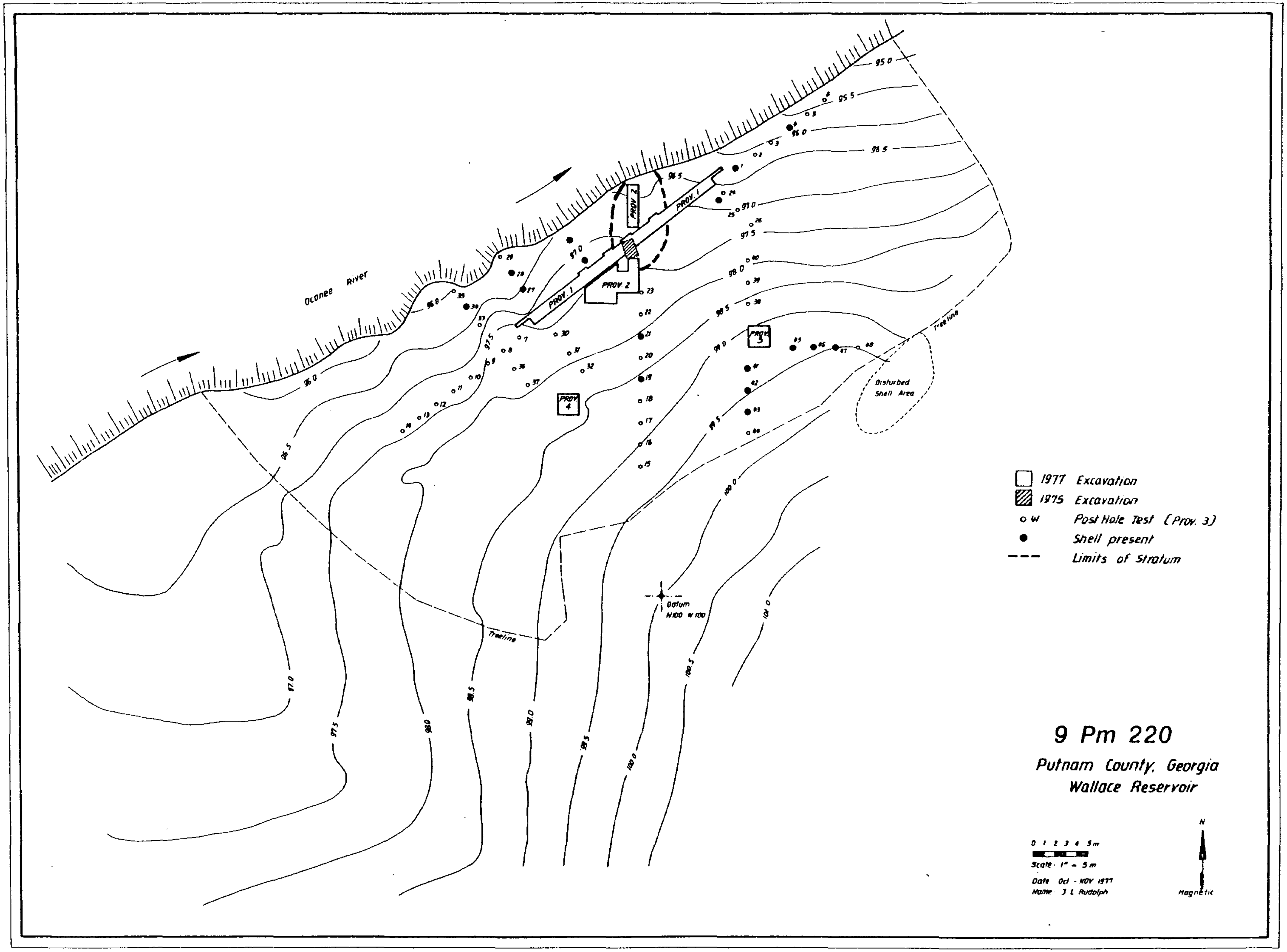

Figure 6. Distribution of Stratum II, Brown Clay, at PM220.

Table 2

Artifact Contents of Stratum II

Lithic Material		
Pebbles	1.0 kg	
Other stone	3.2 kg	
Ceramic Material	body sherds	rim sherds
Plain, grit-tempered	64	3
Lamar Incised	3	2
Unidentified simple stamped		1
Unidentified stamped	4	
Unidentified decorated	1	
Vertebrate Faunal Material		
Turtle shell fragment	1	
Unidentified bone	1	

Table 3

Artifact Contents of Excavation Units

Where Strata I and II Were Combined

Lithic Material		
Percussion flakes	1	
Unidentified flake debris	34	
Fire-cracked rock	2.1 kg	
Pebbles	3.5 kg	
Other stone	10.4 kg	
Ceramic Material	body sherds	rim sherds
Plain, grit-tempered	280	13
Lamar Incised	12	12
Lamar Complicated Stamped	3	
Unidentified simple stamped	4	
Unidentified stamped	2	
Unidentified decorated	3	
Vertebrate Faunal Material		
Turtle shell fragment, burned	1	
Odocoileus virginianus, patella	1	
Unidentified mammal bone fragments	2	

screened soil is 0.3 m^3. Table 3 summarizes the contents of those excavation units in which Strata I and II were inadvertently mixed.

DePratter (1976:278) interpreted this level of brown clay as an old humus zone, but because of its limited distribution, it is thought by the present author to be a cultural deposit.

Stratum III: Brown Rocky Soil

This stratum is found only in Provenience 4 and overlies sterile subsoil. None of the shell deposits were found in this location, and it appears that the Lamar Phase occupation of 9PM220 may not have extended to Provenience 4 either. The thickness of Stratum III is approximately 20 cm. Dry-screened contents of this level are summarized in Table 4.

Table 4

Artifact Contents of Stratum III

Lithic Material		
Bifaces fragment	1	
Retouch flakes	3	
Unidentified flake debris	22	
Steatite sherd	1	
Fire-cracked rock	3.7 kg	
Pebbles	0.8 kg	
Other stone	23.2 kg	
Ceramic Material	body sherds	rim sherds
Plain, grit-tempered	5	
Unidentified simple stamped	1	

Stratum IV: Shell Layer A

Shell Layer A was the uppermost shell-bearing stratum at 9PM220. The thickness of this level ranged from 2 cm in Provenience 1 (Figure 3) to 12 cm in the northern portion of Provenience 2. Stratum 4 was estimated to cover 20 m^2 to 30 m^2 (Figure 7) and its total volume was estimated to be between 1 m^3 and 2 m^3. Of this total volume, approximately 0.2 m^3 of midden soil, uncontaminated by adjacent levels, contained material which is included in Table 5. Contents of those excavation units in which Stratum IV was excavated together with Strata V and VI are tabulated in Table 8.

Analysis of the artifacts from Stratum IV indicated that this level of shell was deposited during the Lamar Phase. Despite close inspection, only one possible feature (Feature 1) was definitely associated with Stratum IV. This feature consisted of a 30 cm by 23 cm cluster of 19 plain, grit-tempered sherds which rested on top of the shell layer in Square 3 of Provenience 2.

Table 5

Artifact Contents of Stratum IV

Lithic Material		
Percussion flakes	3	
Fire-cracked rock	0.1 kg	
Pebbles	0.7 kg	
Other stone	1.4 kg	
Ceramic Material	body sherds	rim sherds
Plain, grit-tempered	66	4
Lamar Incised	4	6
Lamar Complicated Stamped	6	
Unidentified stamped	6	

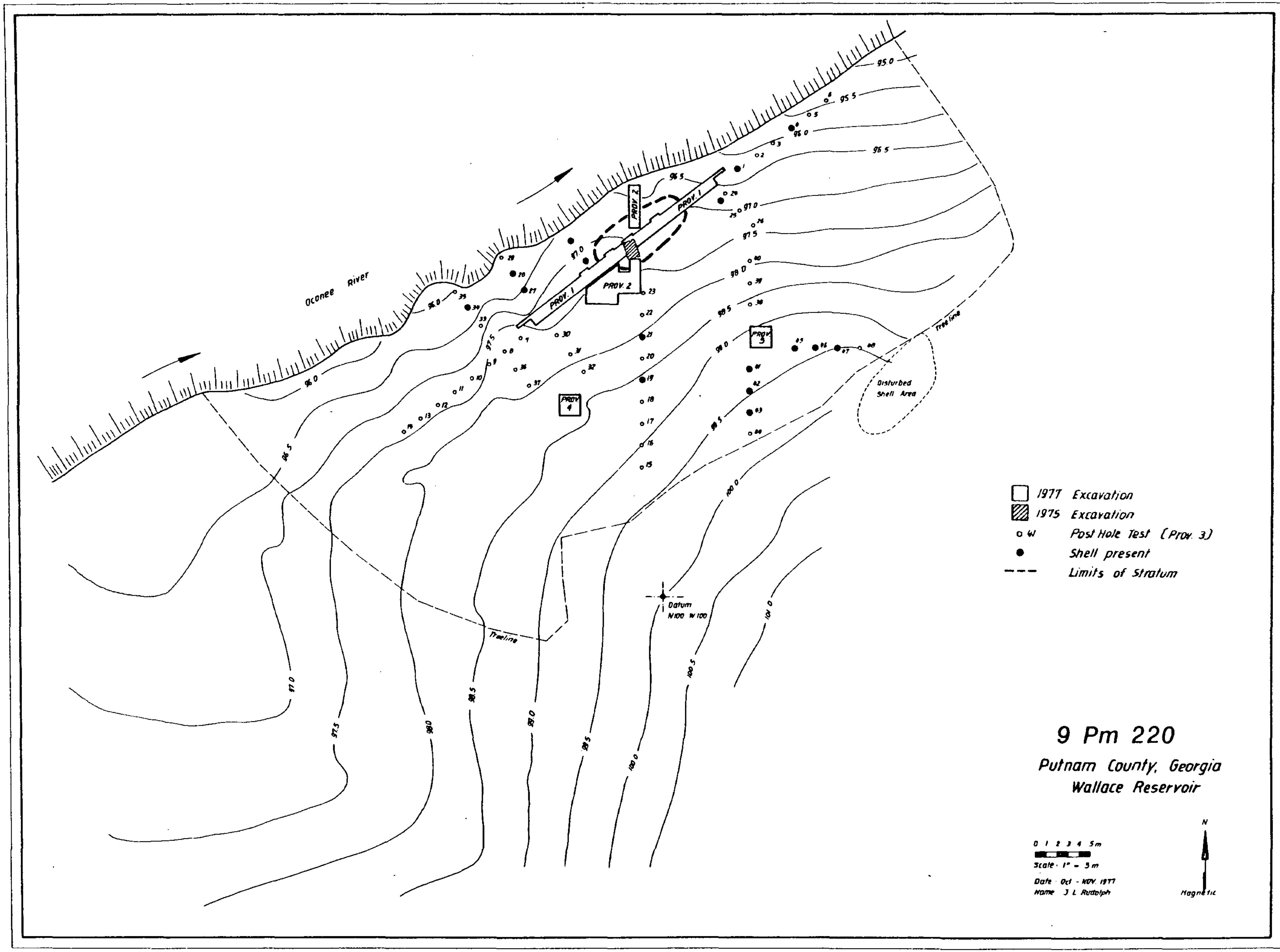

Figure 7. Distribution of Stratum IV, Shell Layer A, at PM220.

Stratum V: Gray/Brown Silt

This level, situated between two bands of shell, is composed of a gray/brown silt with small flecks of shell scattered throughout. It is likely that these flecks of shell are the result of accidental mixture dūe to roots, rodents or insects. Although this level reaches a thickness of 10 cm in certain areas, it is generally less than 5 cm thick (Figure 4). The total volume of this level is estimated to be approximately 2.0 m^3, of which the contents of a volume of 0.12 m^3 are summarized in Table 6.

The distribution of Stratum V (Figure 8) is very similar to that of Stratum IV. However, this appears to be a result of the fact that Shell Layers A and B (Strata IV and VI) merge beyond the edge of Stratum V.

Stratum V and Stratum II are similar in color and in their relationship to underlying levels of shell. It is believed, therefore, that Stratum V is, as we suspect Stratum II to be, a cultural deposit. Once again, however, its function as such is unknown. On the basis of 8 incised sherds, it is determined that this level dates to the Lamar period.

Table 6

Artifact Contents of Stratum V

Lithic Material		
Pebbles	0.5 kg	
Other Stone	1.7 kg	
Ceramic Material	body sherds	rim sherds
Plain, grit-tempered	23	3
Lamar Incised	9	
Lamar Complicated Stamped	2	
Unidentified simple stamped	1	
Unidentified stamped	1	
Vertebrate Faunal Material		
Turtle shell fragment	2	

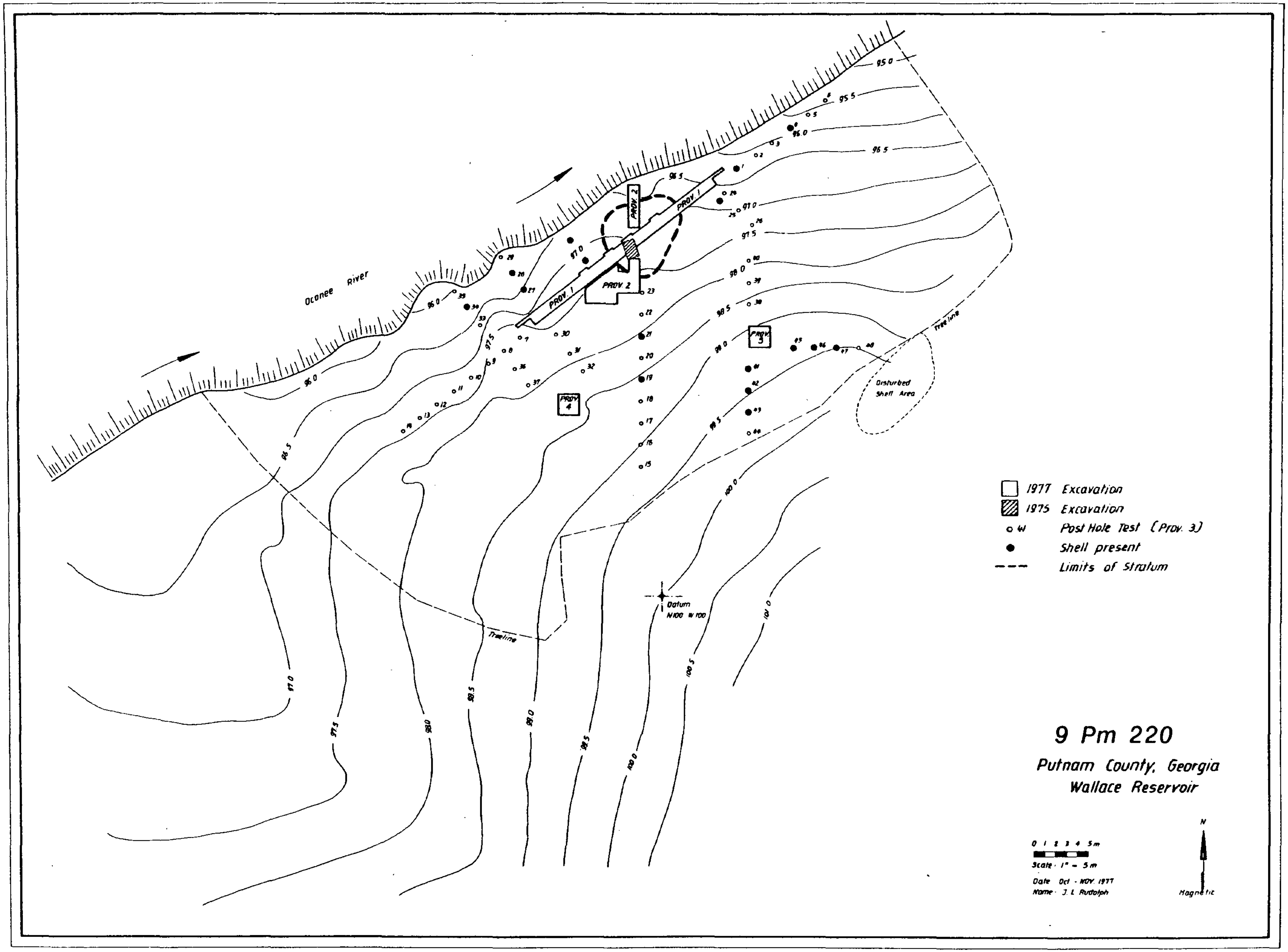

Figure 8. Distribution of Stratum V, Gray/Brown silt, at PM220.

Stratum VI: Shell Layer B

Shell Layer B is the most extensive shell-bearing stratum at PM220. This layer covers at least 75 m^2 and may cover as much as 90 m^2 (Figure 9). Its thickness ranges from 2 cm to 24 cm with the thickest portion being located near the river's edge in Provenience 2.

The unmixed contents of Stratum VI are summarized in Table 7. The dry screened volume of this level is 0.8 m^3. Contents from squares in which Strata IV, V and VI were combined are summarized in Table 8. In both tables, diagnostic pottery appears to date to the Lamar Period with the exception of a single fibre-tempered sherd.

Three features were associated with Shell Layer B. The first of these, Feature 2, was a possible postmold filled with mollusk shells. The postmold was a mere 1.5 cm deep, but its circular shape, its diameter of 12 cm, and its descent to a level which contained no shell suggests that the feature might have once supported a post. Feature 2 also contained a small quantity of pebbles, quartz debris and other stone. This was the only postmold found at PM220 in 1977. In 1975, DePratter located a similar postmold in his test square.

Feature 3 was a cluster of pottery located within Shell Layer B near its northeastern end. The feature contained one Lamar Incised sherd, 9 plain grit-tempered body sherds, less than 30 g of pebbles and a small quantity of charred material.

Feature 4 was another cluster of pottery located on top of Shell Layer B. It contained 6 complicated stamped body sherds, 4 plain grit-tempered body sherds, 1 plain grit-tempered rim sherd and 140 g of quartz debris.

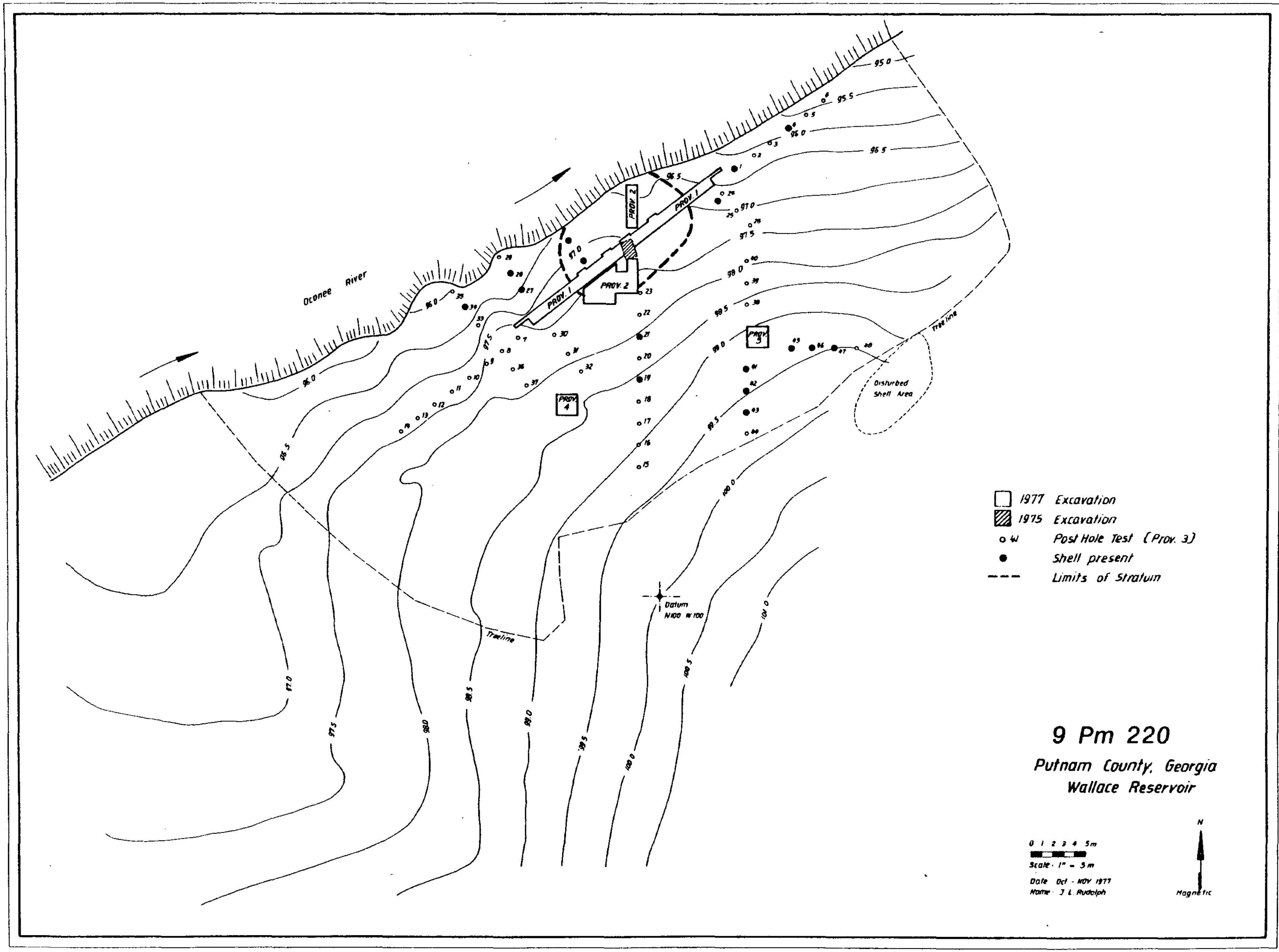

Figure 9. Distribution of Stratum VI, Shell Layer B, at PM220.

Table 7

Artifact Contents of Stratum VI

Lithic Material	
Percussion flakes	6
Retouch flakes	1
Unidentified flake debris	3
Ground stone	3
Fire-cracked rock	1.1 kg
Pebbles	1.7 kg
Other stone	18.4 kg

Ceramic Material	body sherds	rim sherds
Plain, grit-tempered	63	4
Burnished plain, grit-tempered	1	
Lamar Incised	7	2
Lamar Complicated Stamped	13	
Unidentified simple stamped	1	
Unidentified check stamped	1	
Unidentified stamped	6	
Unidentified decorated	4	1
Stallings Island punctated	1	

Vertebrate Faunal Material	
Odocoileus virginianus, cuboid-navicular, fragment	1
Turtle shell fragment	4
Turtle shell fragment, burned	1
Turtle, unidentified bone	1
Fish, vertebra	1

Table 8

Artifact Contents: Mixed Strata IV, V and VI

Lithic Material

Serrated biface fragment	1
Percussion flakes	1
Retouch flakes	1
Unidentified flake debris	6
Cores	2
Fire-cracked rock	0.2 kg
Pebbles	2.3 kg
Other stone	13.2 kg

Ceramic Material

	body sherds	rim sherds
Plain, grit-tempered	72	3
Burnished plain, grit-tempered	2	
Lamar Incised	8	1
Lamar Complicated Stamped	4	1
Unidentified checked stamped	6	
Unidentified simple stamped	1	
Unidentified stamped	5	

Vertebrate Faunal Material

Odoicoileus virginianus, calcareum	1
Odoicoileus virginianus, metatarsal	2
Odoicoileus virginianus, cuboid-navicular, fragment	1
Odoicoileus virginianus, phalenx II	1
Mammal, unidentified bone, fragments	2
Turtle shell fragments	44
Turtle shell fragments, burned	1
Turtle bone, unidentified	2
Unidentified bone fragments	1

There were several squares in which the vertical distinction between Strata IV, V and VI--that is Shell Layers A and B and the layer in between--was very unclear. In such squares, it was not possible to separate the three levels during excavation. The contents of these combined levels are summarized in Table 8. The dry screened volume of these levels is approximately 1.0 m^3.

Stratum VII: Shell Layer C

Shell layer C is a very small cluster of mollusk shells found near the western end of Provenience 1 (Figures 4 and 10). Its diameter is approximately 2.2 m and its thickness ranges from 4 cm to 16 cm. Total volume for this stratum is estimated to be 0.3 m^3. Volume of excavated material from this stratum is 0.2 m^3. Few artifacts and no features were found in association with Shell Layer C. The dry-screened contents are summarized in Table 9.

Table 9

Artifact Contents of Stratum VII

Lithic Material		
Unidentified flake debris	4	
Fire-cracked rock	0.8 kg	
Pebbles	0.1 kg	
Other stone	18.4 kg	
Ceramic Material	body sherds	rim sherds
Plain, grit-tempered	1	

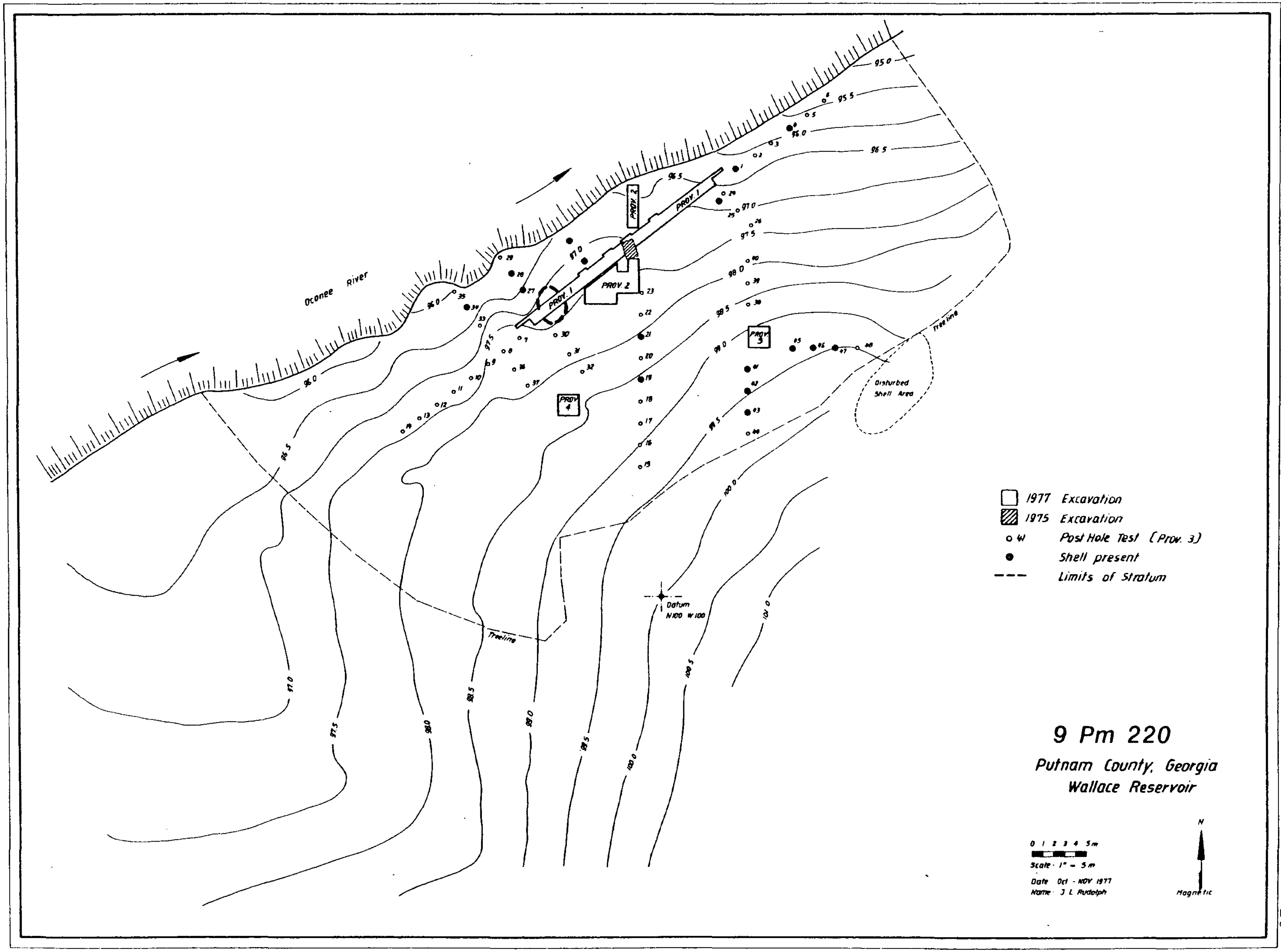

Figure 10. Distribution of Stratum VII, Shell Layer C, at PM220.

Stratum VIII: Shell Layer D

Shell Layer D is another small lens of shell-bearing soil situated at the extreme western end of Provenience 1 (Figures 4 and 11). This level appears to be approximately 2.0 m in diameter, with a total area of approximately 3.0 m^2. Total volume for Shell Layer D is estimated to be 0.2 m^3, of which only 0.04 m^3 was recovered. The thickness of the level ranged between 2 cm and 8 cm. Once again, few artifacts and no features were recovered from Stratum VIII. Contents are summarized in Table 10.

Table 10

Artifact Contents of Stratum VIII

Lithic Material		
Unidentified flake debris	3	
Fire-cracked rock	0.6 kg	
Pebbles	0.1 kg	
Other stone	2.0 kg	
Ceramic Material	body sherds	rim sherds
Plain, grit-tempered	3	

Stratum IX: Shell Layer E

Shell Layer E is located at the eastern end of Provenience 1 (Figures 4 and 12). The area excavated had a thickness ranging from 3 cm to 6 cm. The total surface area is estimated to be approximately 5.3 m^2 and the volume of the layer is estimated to be 0.2 m^3. Excavated material totalled 0.1 m^3. No features were found in the stratum. Contents of the dry-screened portion of the stratum are summarized in Table 11.

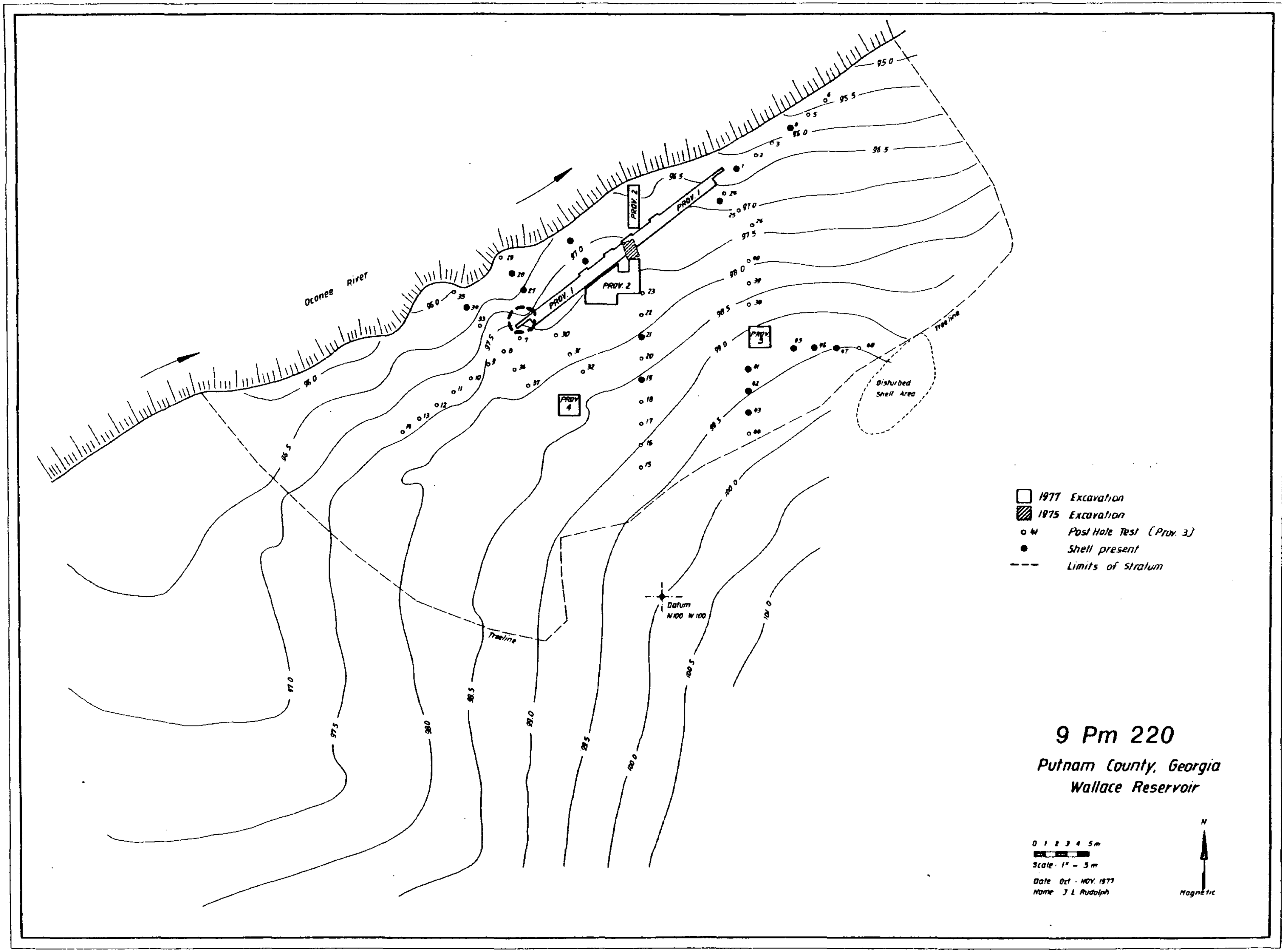

Figure 11. Distribution of Stratum VIII, Shell Layer D, at PM220.

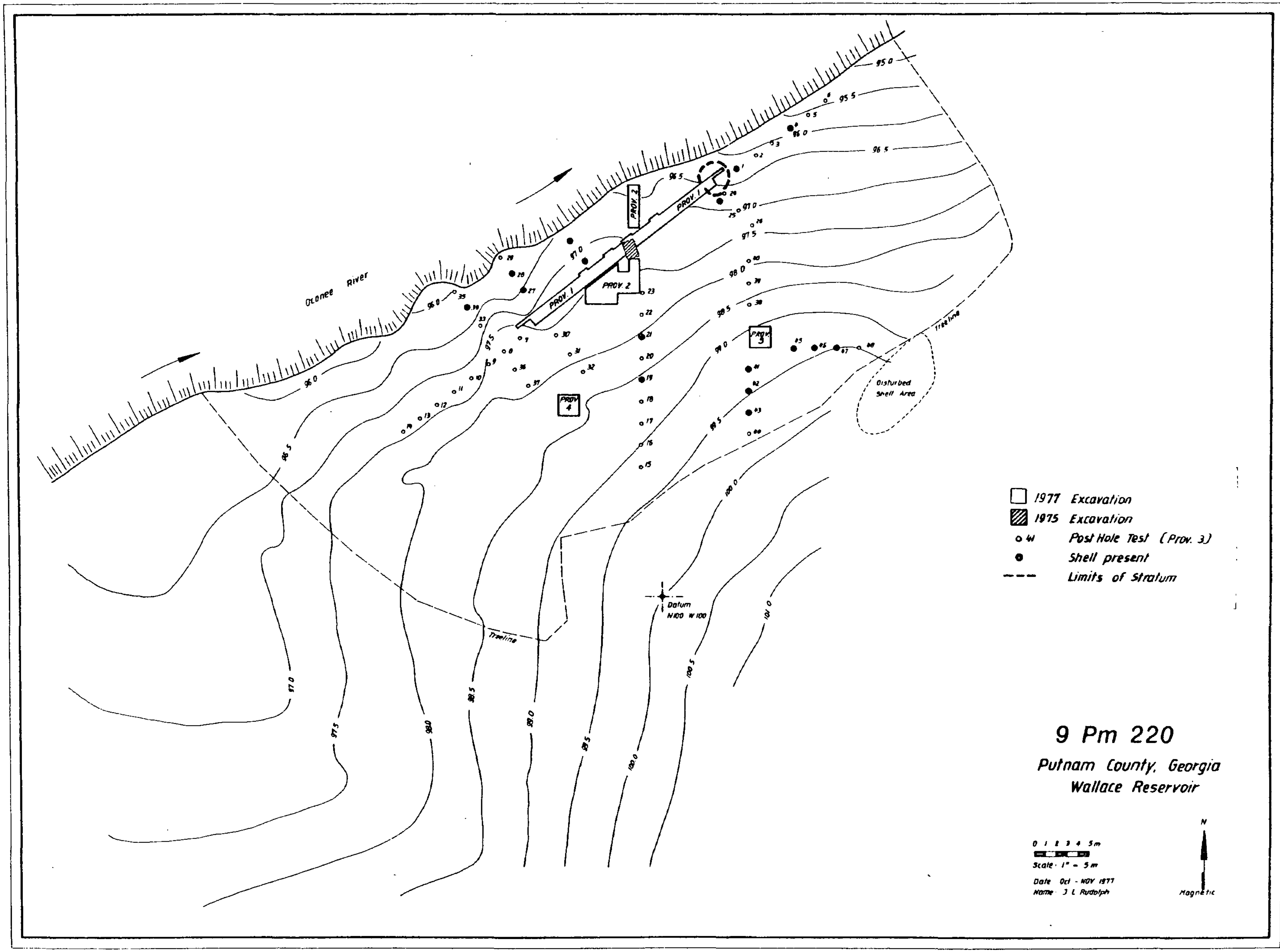

Figure 12. Distribution of Stratum IX, Shell Layer E, at 9PM220.

Table 11

Artifact Contents of Stratum IX

Lithic Material		
Pebbles	1.9 kg	
Other stone	9.4 kg	
Ceramic Material	body sherds	rim sherds
Plain, grit-tempered	11	4
Lamar Incised	5	2
Unidentified incised		
Lamar Complicated Stamped	1	
Unidentified check stamped	1	
Unidentified simple stamped	1	

Stratum X: Shell Layer F

Shell Layer F is located in Provenience 5. Core tests (Figure 4) indicate that the shell layer covers approximately 32 m^2. Thickness of the stratum ranges from 2 cm to 18 cm. Only a very small portion of the layer was excavated, with a volume of approximately 0.2 m^3. Contents are summarized in Table 12.

Table 12

Artifact Contents of Stratum X

Lithic Material		
Retouch flakes	2	
Unidentified flake debris	23	
Fire-cracked rock	5.2 kg	
Pebbles	0.8 kg	
Other stone	25.0 kg	
Ceramic Material	body sherds	rim sherds
Plain, grit-tempered	48	
Lamar Incised	14	
Lamar Complicated Stamped	2	
Unidentified simple stamped	1	
Unidentified decorated	1	
Other Material		
Bottle neck, glass	1	
Vertebrate Faunal Material		
Turtle shell fragment	1	

CHAPTER III

ARTIFACTS

One-thousand-two-hundred-thirty-five sherds were recovered from Excavation Units 1, 2, 4 and 5. With few exceptions, all can be classified as Lamar types (Table 13). The exceptions include a single Stallings Island Punctated sherd which has been heavily water worn (Plate III, Row 4, no. 2), 12 unidentified simple stamped sherds, 8 unidentified check stamped sherds, and 29 unidentified stamped sherds. Most of the unidentified simple stamped sherds appear to be Lamar Complicated Stamped on the basis of paste and stamping execution. At least three sherds, however, appear to be Woodland in age (Plate III, Row 4, No. 1). These are weathered to a considerable extent and may also be water worn. The unidentified check stamped and unidentified stamped sherds appear to be Lamar in age on the basis of paste and stamping execution. None can be reliably identified as Woodland or early Mississippian types.

Table 13

Pottery from Dry-screened Lots, all Proveniences

Lamar Incised	110
Lamar Complicated Stamped	45
Unidentified Simple Stamped	12
Unidentified Check Stamped	8
Unidentified Stamped	29
Unidentified Decorated	18
Stallings Island Punctated	1
Grit Tempered Plain	992
Grit Tempered Burnished Plain	19
Indeterminant	1

One-hundred-ten sherds, or 9.1% of the Lamar pottery, can be identified as Lamar Incised (Plate III, Row 2). Incised lines are predominantly medium in width (1-2 mm). The Carinated bowl is the most common vessel form, although bowls with outflaring rims and jars are also represented by at least one specimen each.

Forty-five sherds can be identified as Lamar Complicated Stamped with confidence (Plate III, Row 3). These sherds manifest typical characteristics of the type as it is represented in the Wallace Reservoir: light, sloppy stamping and simple designs based on concentric circles and parallel straight lines. If the unidentified stamped sherds are included, the number of Lamar Complicated Stamped sherds in the sample rises to 74 or 6.1% of the Lamar pottery.

One-thousand-eleven sherds, or 84.0% of the Lamar pottery, is undecorated. The folded rim, associated with the jar vessel form, is represented by 17 specimens (Plate III, Row 1). One folded rim has cane punctations, while the remainder are pinched or notched. As discussed in Chapter IV of this report, rim folds average 17.6 mm in width suggesting a relatively late date within the Lamar period.

The Lamar pottery from PM220 is best seen as representing a relatively short term occupation during the late Dyar phase. Type frequencies conform rather closely to those published by Smith (n.d.: Table 1) for late Dyar phase. The width of incised lines suggests Dyar phase rather than the later Bell phase. The width of folded rims and the placement of pinching and notching at the bottom of the fold suggest Bell phase or late Dyar phase. There are, furthermore, no sherds in the collection which can not be accommodated by this temporal assignment.

The ceramic evidence for pre-Lamar occupations of PM220 is negligible. The single fiber-tempered sherd has been water worn to a considerable degree, and there is a suggestion of water wear on most of the simple stamped sherds that may date to the Woodland period. This evidence indicates that these sherds may not have been deposited on the site by the people who manufactured and used them.

Lithic Artifacts

One-hundred-fifty-six pieces of flaked stone debitage were recovered from excavation soil screened through one-quarter inch wire cloth. There are 22 percussion flakes, 18 retouch flakes, 114 unidentified debris flakes and 2 cores. Ninety-four percent of the debitage is quartz; the remainder, light colored chert.

The two cores are quartz crystal and quite small in size (30.9 x 27.0 x 13.5 mm and 22.7 x 20.8 x 12.4 mm) (Plate III, Row 5, no. 4). Both show abrasion on one or more edges which is suggestive of bipolar flake removal.

Only three flaked stone implements are identifiable in the collection. One of these is the mid-section of a biface and measures 34.4 x 20.6 x 5.1 mm (Plate III, Row 5, no. 1). The edges are parallel in orientation suggesting the implement was rather long prior to breaking. Edges are serrated, but not bevelled. The piece may be Early Archaic in age.

A second fragmentary implement measures 35.2 x 23.2 x 7.4 mm (Plate III, Row 5, no. 2). It has been bifacially worked and bears step flaking along one utilized edge. The third fragmentary implement measures 44.5 x

31.0 x 15.5 mm (Plate III, Row 5, no. 3). It has been bifacially flaked but bears no edge retouching or evidence or edge abrasion.

Two non-flaked stone items were recovered in excavation lots. One is a sherd from a thin walled steatite vessel. Both surfaces of the sherd are well smoothed. The second piece is a small river cobble (41.4 x 36.2 x 33.2 mm) that bears percussion marks on one surface (Plate III, Row 4, no. 3). It is probably a hammerstone of some kind.

Faunal Remains

Faunal remains from 35 1/4 inch dry-screened lots (each lot representing a single excavation level within a 1 meter square) and three flotation lots (each lot representing 1 liter of soil) were analyzed in the laboratory. The dry-screened lots analyzed comprise approximately one third of the soil that was excavated at the site and should therefore be representative of the faunal material larger than 1/4 inch that is present at the site. The analyzed flotation lots amount to less than 1% of the excavated soil and are clearly not representative.

Identified faunal material is listed in Table 14. The most outstanding feature of this sample is the small quantity of vertebrate remains that are present. Only 6 turtle elements and 7 mammal elements are identifiable to the family, genus or species level. The number of elements identifiable to the class level is not much greater. This situation can be contrasted with that reported for GE153, a Lamar shell midden site of comparable age and situated in an environmentally similar location approximately 8 km down stream. Sixty-one 1/4 inch dry-screened lots from GE153 have been analyzed. This represents approximately twice as much

Table 14

Faunal Material Recovered and Analyzed from all Excavations

	Screened	Floated
UNIONIDAE	712	
Elliptio complanatus	1289	
Elliptio sp.	17	
Goniabasis sp.	31	
TOTAL IDENTIFIED SHELL	2049	
EMYDIDAE (aquatic turtles)	1	
Chrysemys sp. (pond and river cooter)	2	
Terrapene carolina (box turtle)	3	
TOTAL IDENTIFIED TURTLE	6	
Odocoileus virginianus (white-tailed deer)	7	
TOTAL IDENTIFIED MAMMAL	7	
Unidentified bivalve	260	
Unidentified land gastropod	46	
Unidentified shell	69	5
Unidentified fish		1
Unidentified turtle	31	4
Unidentified mammal	4	
Unidentified bone fragments	1	

soil as was processed and analyzed at PM220. The difference in quantity of recovered faunal elements, however, is considerably greater (Table 15). Although the exact volume of soil in analyzed lots from the two sites can not be accurately compared, and although the number of analyzed lots from shell midden strata is probably greater from GE153, it nevertheless seems clear from comparisons of the two samples that PM220 contains an unusually small quantity of vertebrate remains.

The PM220 faunal sample is also unusual with respect to the small variety of identified taxon represented. While this may in part reflect the small size of the faunal sample, it can also be argued that the size of the faunal sample itself is in part due to the small number of vertebrate species exploited at the site. Again comparison with GE153 is interesting. As Table 16 shows, 6 times as many vertebrate taxon were identified in the GE153 sample.

Table 15

Number of Vertebrate Faunal Elements Identified in 1/4 Inch Screened Samples from PM220 and GE153

	PM220	GE153
Total identified fish	-	74
Total identified turtle	6	1589
Total identified mammal	7	271
Unidentified fish	-	67
Unidentified turtle	31	3101
Unidentified mammal	4	777

Table 16

Number of Vertebrate Taxon Identified in PM220 and GE153 Faunal Samples

	PM220	GE153
Fish	-	5
Turtle	3	6
Snake	-	3
Bird	-	1
Mammal	1	9
	4	24

Comparison of large flotation and 1/4 inch dry-screened samples recovered from the Dyar site, 9GE5, demonstrates the kinds of bias which result from reliance on the 1/4 inch screen recovery technique.

> ...the number of identified bones and MNI for the fine-screened (flotation) sample is nearly double that for the 1/4 inch screened sample. Six categories of animals which are not represented in the 1/4 inch sample appear in the fine-screened sample. Five of these are represented by one identified fragment each and probably were unimportant as subsistence resource, if indeed they were food items at all. These are the toad (*Bufo* sp.), fence lizard (*Sceleporus* sp.), poisonous snake (Crotalidae), pine mouse (*Pitymys pinetorium*) and the field mouse (*Peromyscus* sp.). With the exception of the fence lizard, all of the above are known to inhabit burrows, and may be intrusive into the archaeological deposits. The chain pickerel (*Esox niger*) is identified only from the fine-screen sample (4 fragments) and thus is the only species added to the list of subsistence resources by fine-screening.
>
> The most dramatic difference between the two samples is the increased number of fish bones identified from the fine-screened sample (approximately five-fold) and the increased MNI (more that two-fold) for fish. On the other hand, the occurrence of turtle and bird bone is hardly affected by the difference in screen size. This is also true of deer bone. Although the occurrence of bone from small mammals increases dramatically, the MNI for small mammals is not altered greatly.
>
> It appears then, that the major information gained by fine screening is the increased representation of fish in the vertebrate fauna... (Shapiro 1981).

In light of these observations, it seems probable that the use of 1/4 inch mesh in the recovery of faunal remains may have contributed to both the small number of elements and the small variety of taxon identified in the PM220 sample. The comparison with the GE153 1/4 inch screened sample, however, indicates that this is only part of the story. The most reasonable interpretation of the PM220 faunal sample is that the Lamar occupants utilized few vertebrate species while visiting the site.

Botanical Remains

Botanical remains from 25 flotation lots (each lot representing 1 liter of soil) have been analyzed by Dr. Betsy Sheldon (Auburn University at Montgomery). Identified plant remains are listed in Table 17.

All 25 lots yielded wood charcoal, but only 5 lots yielded identifiable seeds or nuts. Only 5 types of plants with known economic value in the aboriginal southeastern United States are represented: Carya sp., Quercus sp., Passiflora incarnata, Phytolacca americana and Vitus sp. None of these is represented by more than 6 fragments. The nuts, especially Carya, usually dominate charred botanical samples in the Southeast, but are here represented by a total of only 7 fragments.

It is possible that some of the identified plant parts in the sample are not the result of human activity. Partridge pea and American hornbeam, which have no known aboriginal uses (Sheldon n.d.), could have been brought to the site by non-human agents such as rodents and accidently carbonized in "camp" fires. Acorn, hickory nut, maypop and grape, on the other hand, are known to have been important elements in the aboriginal diet. The parts of these plants preserved in the PM220 sample--seeds and nut shells--are probably the byproduct of human food preparation and consumption. The fruit of pokeweed is not edible. The seeds of this plant may represent non-dietary uses of the fruit such as dye making or they may have been unintentionally gathered along with the edible leaves.

Most of the identifiable plant parts could have been gathered in late summer with the exception of acorn and hickory nut which are not available before September or October. All species, however, have

Table 17

Botanical Remains from PM220

NUTS	
Carya sp. (hickory)	6 (.85 g)
Quercus sp. (acorn)	1 (cap)
SEEDS	
Chamaecrista sp. (partridge pea)	2
Carpinus caroliniana (American Hornbeam)	1
Passiflora incarnata (maypop)	4
Phytolacca americana (pokeweed)	2
Vitus sp. (grape)	5
Indeterminant partial fruit	1
WOOD CHARCOAL	31.8 g

harvest periods that overlap in October. The botanical sample then indicates that site utilization occurred at least during the period, late summer - early fall.

The most striking feature of the PM220 botanical sample is the low frequency with which economic plant parts occur. This may be due in part to preservation since only two of the plant species--hickory nut and grape--are known to have been processed in a way that exposed them to open fires (Hally 1981), and there is no stratigraphic evidence of massive burning on the site. Yet hickory shell itself is represented by only 6 fragments, and it is usually very common in prehistoric botanical samples from the Southeast.

The infrequency of preserved economic plant material may be due to two factors besides preservation: 1. site utilization occurring prior to the harvest of seed and nut bearing plants and subsequent to the depletion of food stores from the previous year's harvest; and 2. minimal preparation and use of plant foods during site occupation. Carbonized plant remains are generally sensitive seasonal indicators. Unfortunately, plant parts that are available for consumption in the spring and early summer (generally shoots and leaves) are seldom preserved in archaeological sites. The absence of these from a sample, therefore, does not rule out site use during those seasons of the year.

Since mollusc shell is the major constituent of the midden strata at PM220, it is likely that site utilization focused on the exploitation of this resource. Information on the aboriginal exploitation of fresh water molluscs is largely non-existent. The gathering of shell fish would have probably been easier during late summar and early fall when the water level in the Oconee River was lowest. This, however, is the very time of the year that is suggested by the plant species preserved in the botanical sample.

It may also be argued that few plant foods were procured and consumed at the site. This alternative is supported by the small variety and quantity of non-mollusc animal remains recovered in the excavations. According to this interpretation, PM220 was visited for brief periods of time solely or primarily for the gathering and processing and probably consumption of shell fish.

Neither explanation is backed by sufficient evidence to merit complete acceptance. The available evidence, however, does seem to favor the second one: minimal use of plant food during site occupancy.

CHAPTER IV

LAMAR PERIOD EXPLOITATION OF AQUATIC RESOURCES IN THE MIDDLE OCONEE RIVER VALLEY

Introduction

One outcome of the investigations in the Wallace Reservoir has been the recovery of significant information on freshwater mollusc exploitation during the late prehistoric and protohistoric Lamar Period (A.D. 1400-1650). Nearly 80 percent of the project area was surveyed prior to inundation and the remains of riverine molluscs were identified at 98 sites (Figure 13). Twenty-nine of the sites were either compact shell middens or middens containing high proportions of shell. Another 32 sites, although lacking actual shell-bearing strata, had subsurface features containing shell or surface indications that such features might have been present. Isolated occurrences of one or two mussel shells were reported from 37 sites.

The importance of these sites lies not in the overall quantity of shellfish remains in the Oconee River Valley nor in the range of mollusc species represented; our data appear unexceptional on both counts. Of more interest is the nearly complete absence of evidence for the consumption of shellfish prior to the Lamar Period. Only at the Dyar site (9GE5) and at Cold Springs (9GE10) have mollusc shells been found in undisturbed contexts that definitely predate this period. At Dyar, shells were found within several Etowah Period features (M.T. Smith, personal communication 1979). At Cold Springs, small quantities of mussel shell

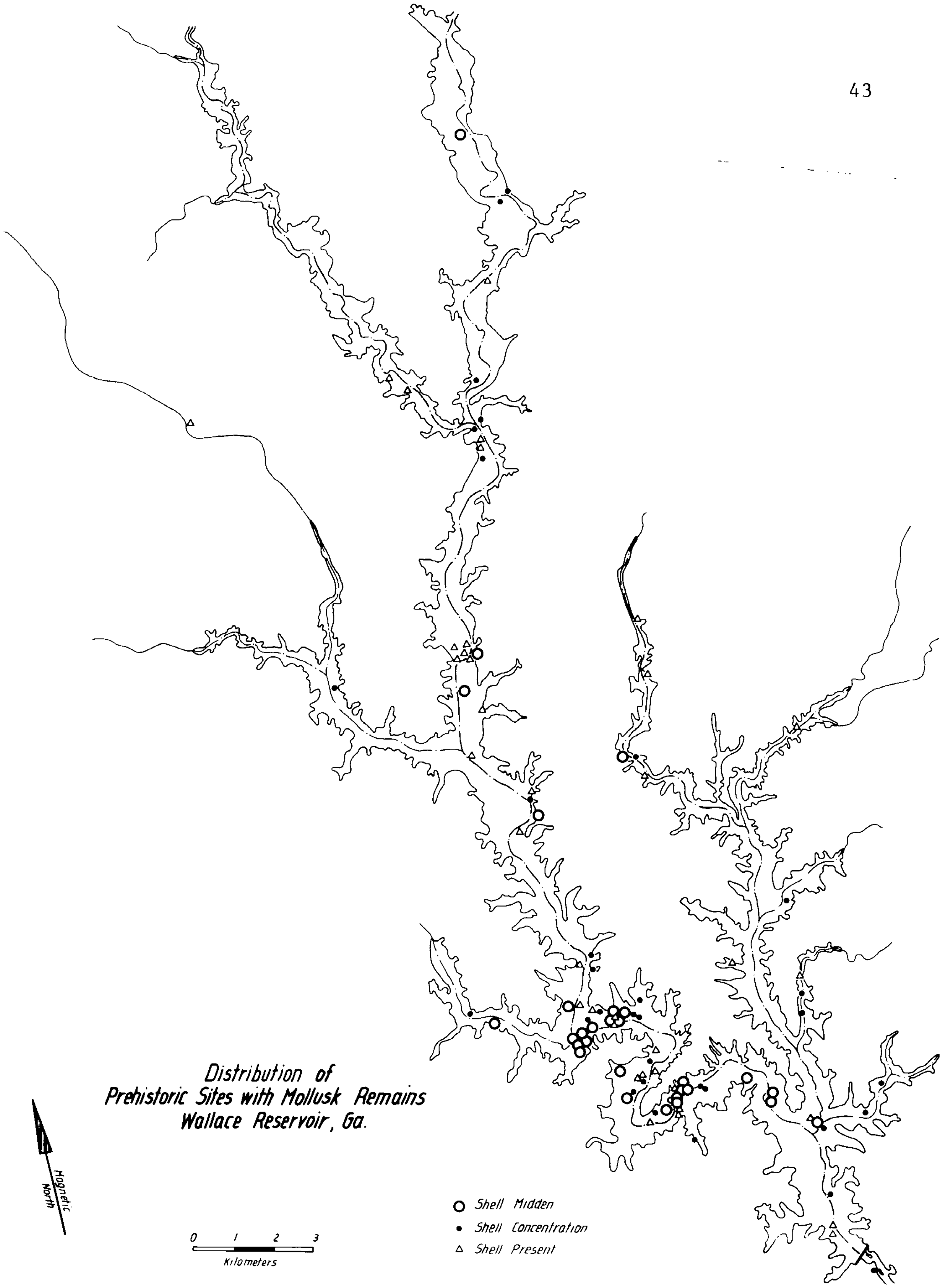

Figure 13. Distribution of prehistoric sites with mollusc remains in the Wallace Reservoir.

were discovered on a Swift Creek house floor and in an Etowah feature (S.K. Fish, personal communication 1979). Also, at 9GE153 DePratter (1976:331-336) reported a stratum of shell containing Cartersville pottery, but later excavations failed to reveal any molluscs in the Woodland level (W.D. Wood, personal communication 1978). While shells were also found in association with Archaic artifacts on the surface at several sites, in most cases Lamar pottery was found in the same locations.

This apparent correlation of shell middens with a particular time period was first noticed in 1977. Since then additional data recovered through survey and through excavations have failed to alter the pattern in any significant way. The following discussion includes a descriptive summary of the shell middens in the reservoir based on the most recent analysis of survey data and also includes a more detailed examination of shell midden chronology. Finally, various hypotheses which might explain this temporal patterning are considered.

The Lamar Period

The Lamar Period was first defined in the middle Ocmulgee River Valley near Macon, Georgia. This period represents a time in Georgia's prehistory when maize horticulture, substructure mounds, plazas, and rectangular houses were associated with several distinctive ceramic traits. These included various forms of incising, poorly executed complicated stamping, folded or applique rims, deep connoidal jars, carinated bowls, and high frequencies of grit tempering. Similar pottery has been found in the mountains of eastern Tennessee and western North Carolina, in the

Piedmont from eastern Alabama to North Carolina, and on the Georgia coastal plain. Generally speaking, Lamar sites postdate A.D. 1400, although the beginning date for the Lamar Period is still subject to considerable debate. In the Wallace Reservoir the Lamar Period came to an end around A.D. 1650.

Non-ceramic characteristics of Lamar components have led Ferguson (1971) to group them with sites of immediately preceding periods into a cultural system designated "South Appalachian Mississippian." Such a categorization implies, of course, that there are various shared traits; but as Ferguson (1971:233) has pointed out, the temporal span of the Lamar style and the widespread use of the style in the Southeast together indicate that a variety of social and political units may have been associated with Lamar pottery. For this reason, "Lamar" will be used in this paper only as a temporal designation for certain sites and for certain pottery types. Its use should not be taken to imply that a specific social and political system was shared by all sites at which this pottery was manufactured.

Descriptive Summary of the Shell Middens

Most shell middens in the Wallace Reservoir were discovered on floodplains and terraces overlooking shoals in the Oconee River. Since the most extensive shoals were restricted to the southern part of the reservoir, it was not surprising that all but a few shell middens were found there as well. However, several middens were located along lesser tributaries, and at least one small shell midden was discovered on a ridge top nearly 0.5 km from the Oconee.

Archaeologists familiar with the large midden deposits along the Tennessee and Savannah Rivers might consider those along the Oconee relatively insignificant were it not for their rather abrupt appearance during the Lamar Period. These shell middens ranged from only 10 m^2 to 1750 m^2 in size and had a median size of 325 m^2. The thicknesses of the shell strata at these sites rarely exceeded 30 cm. In comparison, the Stallings Island shell mound is 1.0 m to 2.5 m thick and covers 14,000 m^2 (Claflin 1931:1, plate 6). In the Pickwick Basin on the Tennessee River, the nine shell mounds investigated ranged from 2800 m^2 to 12,600 m^2. The depths of the deposits at these sites ranged from 45 cm to 6.0 m (Webb and DeJarnette 1942:200). In the Wheeler Basin, Webb (1939) reported 29 sites with distinct shell strata. Sizes ranged from a mere 14 m^2 to 23,000 m^2, with a median of 1800 m^2. Maximum thicknesses of the midden levels varied from 30 cm to 5.0 m. These shell mounds were probably formed over many centuries.

The figures illustrate dramatically that shellfish gathering never played as great a role in the late prehistoric subsistence strategy of the middle Oconee Valley as elsewhere in the Southeast at earlier times. However, the main consideration of this paper is the extent to which this role, as small as it may have been, changed during the Lamar Period.

Samples of mollusc shells from various sites in the Wallace Reservoir and a collection of mollusc specimens gathered in the Oconee River were submitted for identification to Mr. Herbert Athearn of Cleveland, Tennessee. Mr. Athearn was able to identify seven bivalve species and a minimum of four aquatic gastropod species (Table 18). The molluscs most frequently encountered in every midden in the study area were of the genus *Elliptio*.

Table 18

Modern and Prehistoric Freshwater Molluscs
From the Wallace Reservoir, Oconee River, Georgia

Bivalves	Modern Specimen	Prehistoric Specimen
Corbicula manilensis Phillippi	x	
Elliptio complanatus Solander		x
E. complanatus hopetonensis Lea	x	x
Lampsilis cariosa Say	x	x
L. dolabraeformis Lea		x
Lasmigona subviridis Conrad	x	
Pisidium casertanum Poli		x
P. compressum Prime		x
P. dubium Say		x
Gastropods		
Amnicola sp.		x
Campeloma crassula Rafinesque		x
Goniobasis catenaria catenoides Lea	x	x
G. symmetrica Haldeman		x

Specimens identified by:

H.D. Athearn
Museum of Fluviatile Mollusks
Route 5, Box 376
Cleveland, Tennessee 37311

THe most commonly found gastropods were Goniobasis catenaria and, much less frequently, Campeloma crassula. Corbicula manilensis, Elliptio sp., and Goniobasis sp. were the molluscs most often found in the Oconee River proper when our modern specimens were collected. By that time disturbance to the reservoir area had been considerable and may have had drastic effects on the mollusc population in the river. Each of the species is discussed below.

Corbicula manilensis Phillippi

This species, the small Asiatic Clam, was introduced to the mainland U.S. during the twentieth century. Since then it has spread rapidly, displacing indigenous mollusc populations. Specimens were found in the Altamaha River as early as 1971 (Gardner et al. 1976:117), and in 1978 C. manilensis was the most frequently observed bivalve in the project area.

Elliptio complanatus Solander

This species is found throughout the Atlantic Slope from Lake Superior and Hudson Bay southward to the Altamaha River system, of which the Oconee is a major tributary (Johnson 1970:321). Small, isolated populations are found also to the west in the Appalachicola and Alabama-Coosa River systems (1970:269).

E. complanatus is "...found in lakes, ponds, small streams, and large rivers on nearly every substrate, though it appears to prefer sand. Throughout its range it is sometimes the only unionid found at some stations, and at others it is generally found in greater numbers than any other species save where its distribution overlaps with Elliptio icterina (Conrad)" (Johnson 1970:320). E. icterina ranges from northern Florida to North Carolina (1970:328), but no representatives were found in the Wallace area.

E. complanatus often reaches 100 mm in length, but its size is quite variable and the species has many ecophenotypes. In minor tributaries individuals tend to be smaller (Johnson 1970:319).

Elliptio complanatus hopetonensis Lea

There is some question whether individuals of this group should be classified as a distinct species or as a subspecies. Johnson (1970: 324) refers to this mollusc as *Elliptio hopetonensis*, but Athearn's classification will be followed here. In either case, *E. complanatus* and *E. complanatus* hopetonensis are morphologically very similar (Johnson 1970:325).

E.c. hopetonensis is restricted to the Altamaha River system, principally to the main channel and its larger tributaries (1970:325). Individuals generally prefer sand or sandy mud. The shells are quite large and often exceed 150 mm in length (1970:324).

Lampsilis cariosa Say

This species is reported by Johnson (1970:384) to extend along the Atlantic Slope from the St. Lawrence River southward to the Ogeechee River. The Ogeechee River system lies east of the Altamaha River, so the discovery of *L. cariosa* in the study area apparently represents a new western limit for its distribution. However, it was not common in either the river or the middens.

The shells of *L. cariosa* are generally medium in size though their length may reach 130 mm (Johnson 1970:382). The largest specimens are found on sand bars and on gravelly bottoms in the swift waters of large rivers; but the species is also found in smaller streams and, occasionally, in ponds (1970:383).

Lampsilis dolabraeformis Lea

This species is very similar to L. cariosa, but is known only from the Altamaha River system (Johnson 1970:385). It is usually found in sand bars where the river is wide and the current is rather swift, although it also may be found in mud (1970:385). The shell often exceeds 130 mm (1970:384).

Lasmigona subviridis Conrad

One modern specimen of L. subviridis was found in the Oconee River; none were found in prehistoric contexts. Individuals are generally small, rarely exceeding 55 mm in length (Johnson 1970:344).

The discovery of L. subviridis in the Oconee is something of a surprise, since its distribution was thought to extend from the Hudson River system to the upper Savannah River system in South Carolina (Johnson 1970:345). Furthermore, individuals tend to avoid large rivers, preferring instead gravelly or sandy bottoms in smaller streams (1970:345).

Pisidium casertanum Poli

This species, like other members of the Sphaeriidae family, is quite small, generally only 2.0 mm to 8.0 mm in length (Herrington 1962:33). Its distribution is virtually worldwide, and in the western hemisphere the species is found as far north as the Arctic Circle (1962:34). P. casertanum has adapted itself to a wide range of habitats, including ponds, swamps that dry up for several months, beach pools, lakes, streams of all sizes, and rivers (Herrington 1962:34; Heard 1963:142).

Pisidium compressum Prime

P. compressum is generally only 2.0 mm to 4.0 mm long (Herrington 1962:35). It is common in lakes, streams, and rivers from northern Canada to Mexico and from the Atlantic to the Pacific (Heard 1963:111). The species prefers shallow, sandy bottoms with vegetation, but specimens have been collected from depths as great as 20 m (Herrington 1962:33).

Pisidium dubium Say

This bivalve ranges in length from 5.0 mm to 9.0 mm (Herrington 1962:35). It is distributed east of the Mississippi drainage from northern Canada (1962:38) to Florida and Alabama (Heard 1963:113). *P. dubium* has a preference for muddy creeks and is found only rarely in lakes and ponds (Heard 1962:146). Specimens have been collected occasionally in deeper water and in fine sand (Herrington 1962:38). Typically the species lives in very small colonies (Heard 1962:146).

Amnicola sp.

This gastropod is distributed throughout much of North America and is found in both brackish and clear water (Berry 1943:22). Determining speciation from shells alone is extremely difficult for the entire *Amnicolidae* family because of the wide variation in shell morphology within each species (1943:14) caused perhaps by ecological factors. For example, individuals inhabiting lakes are usually smaller than those inhabiting rivers (1943:19). The members of the genus rarely reach 5.0 mm in height (1943:22).

Campeloma crassula Rafinesque

The shells of the genus Campeloma are large, thick, and spired (Baker 1928:52). The genus is found throughout North America east of the Mississippi Valley and as far north as Ontario and Quebec. Individuals are usually observed, often in great numbers, buried in 2.0 cm to 3.0 cm of sand or mud in lakes, rivers, and streams (Clench 1962:276). However, this gastropod is considered exceptionally tolerant of adverse ecological conditions and can be found in other habitats (Clench and Fuller 1965:387).

Goniobasis catenaria catenoides Lea

The genus Goniobasis is found from Mississippi to New England and from Florida to the Great Lakes. The Alabama-Coosa River system is particularly noted for the range of species present, while the Atlantic Slope contains only a few representatives of the entire Pleuroceridae family (Clench and Turner 1956:126-127). Subspecies of G. catenaria have been found in the Chattahoochee River (1956:135), in the Santee River of South Carolina, and in the Ogeechee, Ocmulgee, and Altamaha Rivers of Georgia (Goodrich 1939:131). Similar species have been reported in the Coastal Plain from Virginia to Florida and southwest Georgia (Goodrich 1928). This small gastropod is found in permanent bodies of water and is very sensitive to siltation and pollution of its habitats (Leonard 1954:37).

Goniobasis symmetrica Haldeman

This species resembles G. catenaria. Its distribution is not certain, but individuals have been reported from eastern Tennessee, Alabama, northern Georgia, and South Carolina. G. symmetrica is believed to occur no farther north along the Atlantic Slope than the Roanoke River (Ortmann 1913:331).

Changes in riverine environments have been demonstrated elsewhere through examination of the species composition of shell middens (Matteson 1958; 1960); but several factors complicate interpretations of this sort in the Oconee Valley. These include modern water pollution, heavy siltation resulting from nineteenth and early twentieth century farming practices (Trimble 1969), and the spread of Corbicula manilensis (Gardner et al. 1976). Also, certain species were recovered from middens in such low frequencies that if they existed in equally low numbers in the river, their absence in the modern collections might have been due principally to sampling error. These collections were not extensive and were limited only to three collecting sites.

Only two of the identified species can be considered outside their expected ranges. One, Lasmigona subviridis, is represented by a single specimens collected from the river in 1978. Not only is this mollusc located beyond its normal range, but its preferred habitat is in smaller bodies of water than the Oconee. Its presence in the Oconee River cannot be explained easily. The other unexpected species, Lampsilis cariosa, is reported to extend no farther west than the Ogeechee River (Johnson 1970: 384). Since the main channels of the Oconee and Ogeechee Rivers lies only 35 km apart in the Piedmont, the presence of L. cariosa in prehistoric or modern contexts is probably not significant as an indication of environmental change.

Of the 13 species reported, two were found only in the modern collections, Lasmigona subviridis and Corbicula manilensis. L. subviridis, as mentioned above, being introduced to this particular river system only in the past decade. In neither case do the occurrence of these species in the river appear to be of interpretive value.

Eight species were found only in shell middens. Several of them, most notably those of the genus Pisidium, were so small and occurred so infrequently that their absence in the modern collections might be a result of inadequate collecting techniques. Five of the prehistoric species, E. complanatus, C. crassula, P. casertanum, P. compressum, and Amnicola sp., are adaptable to a wide range of habitats. The other three, P. dubium, L. dolabraeformis, and possibly G. symmetrica, are less so. But for all eight of these species, the preferred habitats are present in the Oconee Valley today and very probably have existed in the area for many centuries.

Three species were found in both prehistoric and modern contexts: E. complanatus hopetonensis, L. cariosa, and G. catenaria catenoides. Once again, the preferred habitats are common in the Oconee River.

In summary, the shellfish recovered from sites in the Oconee Valley fail to indicate that significant environmental changes have occurred in the region since A.D. 1400. This is not to say that such changes did not take place, but that for various reasons the particular species found are inadequate for demonstrating so.

Dating the Shell Middens

The recovery of protohistoric pottery types at several shell middens and the co-occurrence at two sites of mollusc shells and European trade material suggest not only that the exploitation of shellfish was a phenomenon of the Lamar Period, but that this activity was most intensive late in the period. Radiocarbon dates from Lamar sites in the reservoir proved too inconsistent to test this hypothesis, so a ceramic seriation was undertaken using the folded or applique rim, a decorative device often seen on Lamar vessels from central Georgia.

At the Little Egypt Site (9MU102) in northern Georgia, David Hally (1979:151-155; 168-171) discovered that the vertical width of rim folds had increased gradually between the fifteenth and seventeenth centuries A.D. To determine whether a similar trend had taken place in the middle Oconee Valley, the author examined several hundred rim sherds from three sites in the Wallace Reservoir (Figure 14). One of the sites, 9MG28, was radiocarbon dated to the early or middle seventeenth century A.D., and another site, 9PM222, was dated to A.D. 1485 $\pm$ 60, uncorrected (UGA-2283). At the third site, Dyar (9GE5), folded rims were obtained from several well-defined strata of a single excavation unit near the mound. These strata were believed to have been deposited over the entire course of the Lamar occupation at the site, but no radiocarbon dates were available from this particular provenience. Figure 14 illustrates the mean rim fold widths and standard deviations for sherds from three features at 9MG28, five strata at 9GE5, and one shallow midden level at 9PM222.

A one-way analysis of variance performed on the data revealed differences among the nine groups significant to a probability level of less than .001. T-tests werethen calculated to determine the least significant differences between each pair of groups. The results of these tests, again significant to a .001 level of probability, allow us to place each group into one of three categories. Category One, which includes the rims from 9MG28 and those from the two uppermose strata at Dyar, has a combined mean width of 19.1 mm. Category Two, composed of

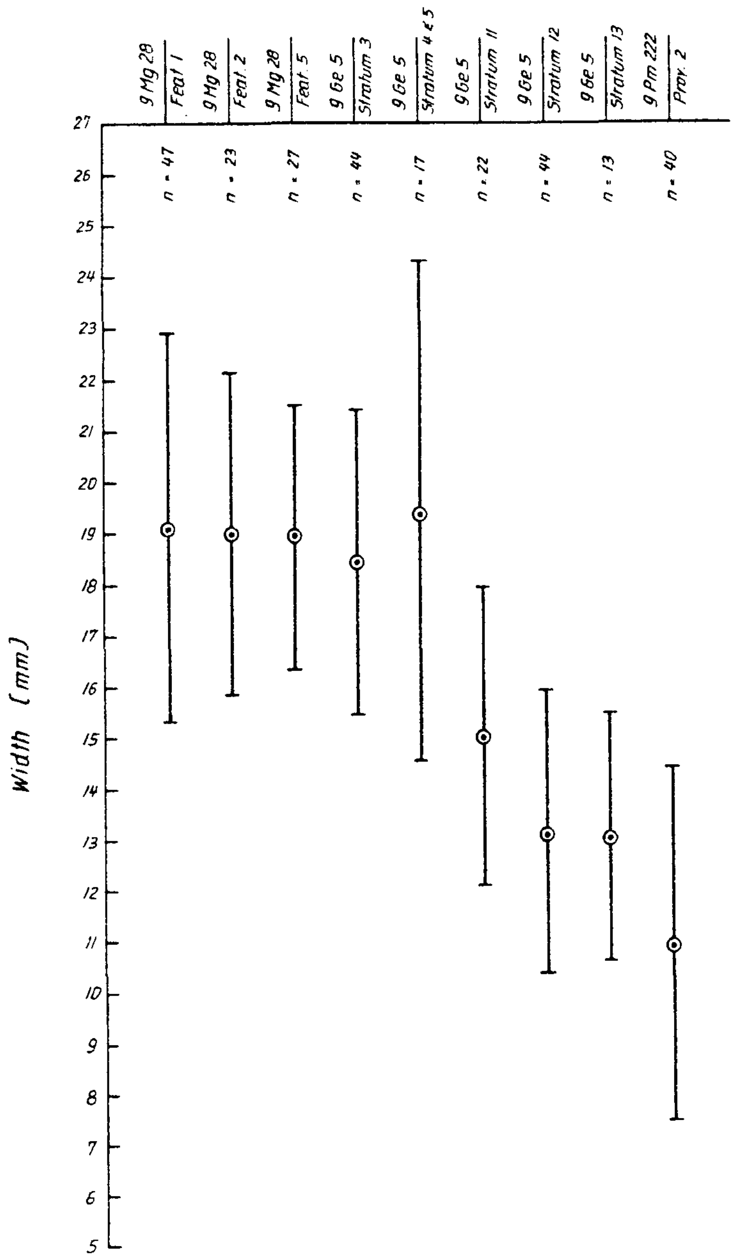

Figure 14. Folded rim widths from three sites in the Wallace Reservoir.

folded rims from the three lowest levels at Dyar, has a combined mean width of 13.6 mm. Category Three, composed of the pottery from 9PM222, has a mean width of 10.9 mm. One can conclude from these results that in the Oconee River Valley, as in northern Georgia, Lamar folded rims became wider between the fifteenth and seventeenth centuries.

Following this initial analysis, folded rims were then examined from six shell middens and from six other sites with shell-bearing features or surface shell concentrations. These 12 sites were the only ones available at the time of the analysis from which adequate numbers of folded rim sherds had been obtained. While this sample of sites was not selected randomly, there was no intentional temporal bias in the selection. Since then, additional rim sherd samples have been obtained from other sites, and these are being incorporated into a more detailed seriation study.

The author is aware that the seriation might have been affected by variation in vessel breakage rates due to differences in vessel size, shape, and function. It is assumed that such distortion has been lessened to some degree, since in middle Georgia, Lamar folded rims are usually found on jars, especially large jars. Bowls of all varieties almost invariably have unmodified rims.

In Figure 15 it appears that the rim sherds from the 13 sites generally correspond to Category One, the latest of the three categories. One possible exception is 9GE175; another, not illustrated in Figure 15, is 9GE153, a shell midden excavated subsequent to this analysis. The ceramics from both sites have since been examined, and stylistic evidence suggests that they both date to the "middle" Lamar Early Dyar Phase

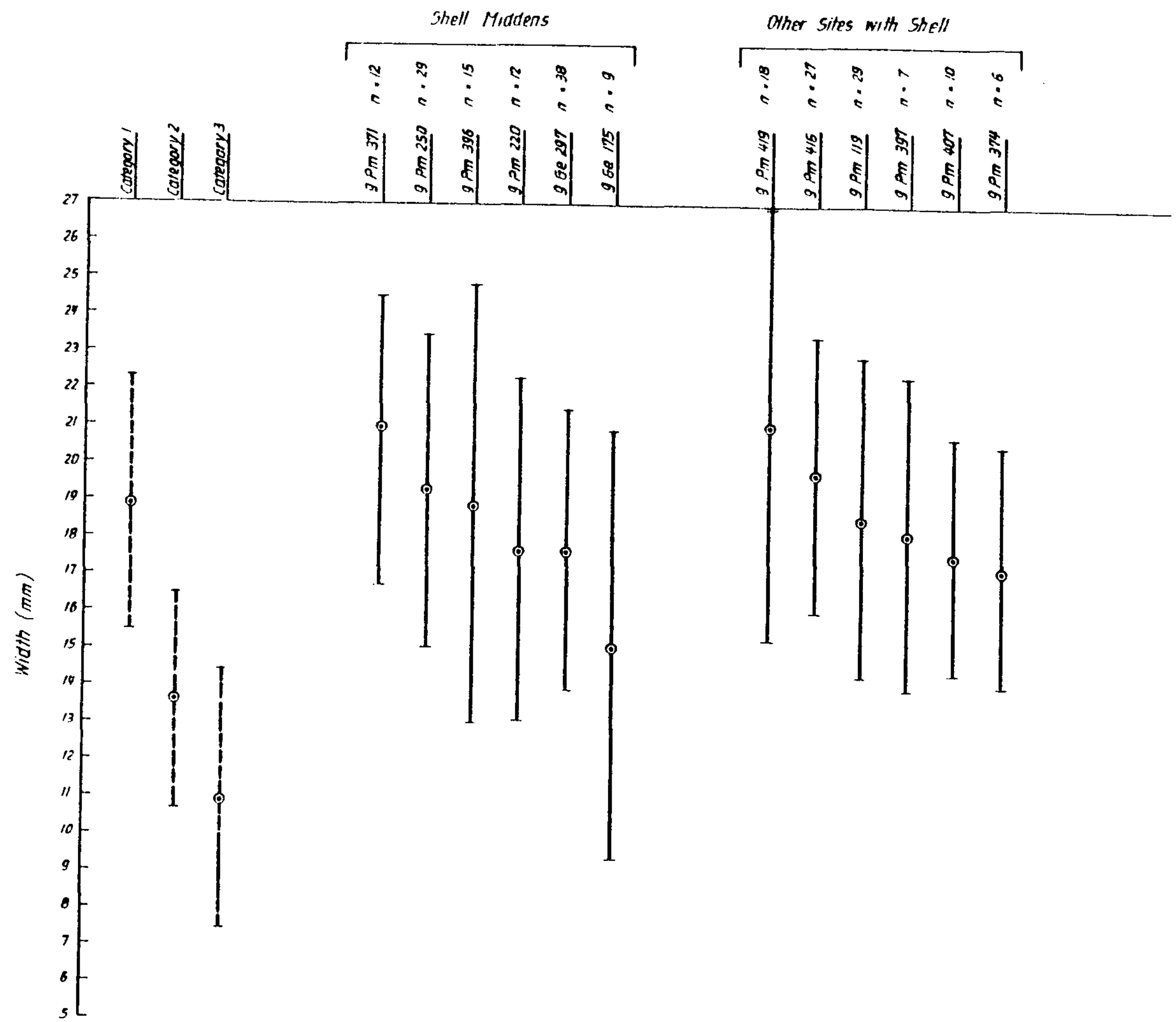

Figure 15. Folded rim widths from various sites in the Wallace Reservoir.

(M.T. Smith, personal communication 1980). It can be concluded on the basis of the information presented thus far that in the Wallace Reservoir most of the sites containing shellfish remains date to the latter part of the Lamar Period. It is proposed tentatively that most of these components postdate the middle sixteenth century.

Hypotheses Concerning the Appearance of Shell Middens in the Study Area

The late occurrence of shellfish remains in the middle Oconee River Valley might have been caused by a combination of many different natural and cultural factors. It will be shown below, however, that in all likelihood natural phenomena and sampling error were not responsible for the increase in shell at archaeological sites.

Sampling Error

Perhaps the most elementary hypothesis to be considered is that the surveys in the Wallace Reservoir area were biased against the discovery of pre-Lamar shell middens. However, sampling error can be ruled out quite easily because of the intensity of the coverage during the Wallace Mitigation Survey. As a result of land clearing by the Georgia Power Company, nearly 80 percent of the ground surface had at one time or another nearly complete visibility. Since mollusc shells are readily seen under these conditions, there is little chance that significant surface concentrations escaped discovery.

Two methods were employed for locating buried sites in the floodplain. In numerous places bulldozers had scooped out large volumes of soil to bury piles of burned timber that had accumulated during the clearing operations. Most of these disturbed areas, or "burn burials," were inspected. Also, more systematic subsurface survey was attempted using a backhoe to excavate trenches along several transects that crossed the reservoir. Both methods resulted in the discovery of buried shell middens and of features containing shell, and in every case the associated artifacts dated to the Lamar Period.

It can be maintained with some confidence that the thoroughness of the surface and subsurface surveys insures that sampling error had little effect on the association of shellfish remains with Lamar sites.

Shell Preservation

The scarcity of bones and plant remains at many sites in the reservoir indicates that preservation of organic matter is generally quite poor, principally due to the medium to strongly acid soils typical of the Georgia Piedmont (Payne 1976). Thus, one might hypothesize that the temporal change was a consequence of the disintegration of shell at earlier sites, not the result of an increase in shellfish consumption.

Evidence suggests, however, that had pre-Lamar shell middens ever existed in the study area, some indication of their presence would remain, if only in the form of very poorly preserved shell fragments. Upon first consideration this statement might seem unsupportable; calcium carbonate, the major component of shell, has a neutral pH and is usually poorly preserved in even slightly acid soils (Evans 1969:171; 1972:23). Aragonite, the crystalline form of calcium carbonate found in unionid shells, is especially unstable under these conditions (Solem 1970:10; Wilbur 1964:263).

However, according to Dr. R.A. Isaac, a chemist with the Soil Testing Laboratory of the University of Georgia, calcium carbonate breaks down in the soil to form carbon dioxide, which dissipates, and calcium oxide. Calcium oxide joins with water to form calcium hydroxide, a base. Isaac suggests that as a result of these reactions, a concentration of mollusc shells might become surrounded by an alkaline buffer zone of calcium hydroxide which could protect the calcium carbonate from further disintegration. Essentially, an initial period of rapid chemical reaction would be followed by a long period of minor deterioration during which the shell would have preserved itself (R.A. Isaac, personal communication 1980). Thus, it would be unlikely for early shell middens to disappear completely.

Erosion

At 9PM220 the Oconee River had cut under its bank causing part of the shell midden at the site to collapse. Nevertheless, lateral erosion of this sort cannot explain the complete absence of shell middens predating the Lamar Period. First of all, there were numerous Archaic and Woodland sites located next to the river which had not been damaged significantly by lateral erosion and which contained no shell. Also, George Brook (personal communication 1979) has determined that the Oconee River was more likely to have shifted course abruptly than to have changed its course by slow meandering and lateral erosion. Under these circumstances shell middens on the river bank might have been bypassed completely by a new channel rather than destroyed by its gradual migration.

Ecological and Climatic Changes

Braun (1974) has demonstrated that ecological changes on the New England coast were paralleled by changes in the species composition of prehistoric marine shell middens. In a similar vein, it has been suggested to the author that the sudden increase in the number of shell middens along the Oconee River might reflect a drastic change in the prehistoric mollusc population caused by ecological or climatic fluctuation. But is it possible that prior to the sixteenth century the shellfish population in the river was non-existent or too small to justify intensive exploitation?

No information is available specifically for the Oconee River Valley, but Johnson (1970:285) reports that several unionids found in Georgia today, including *Elliptio complanatus*, were present in the region as early as the Late Tertiary. More recently, especially since 2500 B.C., the climate of the Southeast was clearly suitable for freshwater molluscs; Late Archaic and Woodland shell middens have been found along the Savannah, St. Johns, lower Chattahoochee, Alabama, Etowah, and Tennessee Rivers. There is, in fact, evidence from the Great Lakes region that the climate became cooler and moister around A.D. 1400 (Baerreis, Bryson, and Kutzbach 1976:52), and this trend might have been paralleled by similar changes in the Southeast. But fluctuations of this nature in precipitation and temperature would have been regional rather than restricted to one river system. And while changes in the mollusc population might have occurred, there is no reason to believe that tolerant species like *Elliptio complanatus* *Campeloma crassula* could not have successfully colonized the Oconee River long before the late prehistoric period. Thus, a hypothesis that relies principally upon undemonstrated ecological and climatological changes to explain the increased incidence of shellfish remains cannot be supported at this time.

Cultural Adaptations

It has been argued thus far that natural causes were not directly responsible for the absence of pre-Lamar shell middens in the reservoir. Instead, it will be proposed that the appearance of the middens was a consequence of changes in the Mississippian subsistence strategy in the Oconee Valley. That these changes included increased shellfish consumption is implied by the very existence of the shell middens; but Gary Shapiro (personal communication 1979) has suggested that this dietary change might have been much broader in scope, entailing the expansion of a previously restricted Early Mississippian resource base. While farming and hunting probably continued to play a substantial role in the economy, Shapiro postulates that increased emphasis was placed upon the exploitation of aquatic fauna, particularly those found near shoals.

Much more analysis of faunal remains from the area is needed to determine if and when such an expansion of the resource base might have occurred. As yet no data discount the possibility, but positive evidence is limited also. Still, Shapiro's hypothesis is attractive since it accounts in part for the increased utilization of shellfish, despite their relatively low nutritional value (Watt and Merrill 1963; Parmalee and Klippel 1974). Rather than being a prime food source themselves, shellfish might have been gathered more to supplement a broad diet which placed more emphasis on fish, reptiles, amphibians, and small game. In fact, the shell middens in the reservoir might best be seen as highly visible evidence of a less obvious, but much more significant, general shift toward riverine fauna.

The proposed subsistence change is particularly interesting in light of a population increase believed to have taken place in the area during the Lamar Period. Site size data have not been examined in sufficient detail to show conclusively that substantial growth occurred, but preliminary analysis of site frequencies strongly suggests so. At least 824 sites in the reservoir area date to the 250- to 300-year Lamar Period; only 37 sites are definitely associated with the preceding Etowah Period, which lasted 300 to 400 years (Rudolph and Blanton 1980). To some extent this difference in site frequency might be due to population dispersal; but most Etowah sites are quite small, and of the major Etowah components, all but one (Cold Springs) are overlain by still more extensive Lamar components. The change might be due also to an abundance of specialized Lamar extractive sites which were not occupied year round. Nevertheless, the numerical differences are so startling that the author feels justified in suggesting an actual increase in population.

This possible population change may not have been widespread. For instance, in the upper Chattahoochee Valley 100 km northwest of the study area, Lamar sites seem to be less common than Early Mississippian sites, although sample sizes are quite small (Caldwell 1953; Rudolph and Gresham 1979). In the middle Savannah River Valley 100 km to the northeast, both Early and Late Mississippian sites appear to be uncommon (Taylor and Smith 1978:337). However, numerous Lamar sites have been found recently in the upper drainage of the Broad River, a tributary of the Savannah only a short distance east of the Wallace area (D. Blanton, personal communication

1980). Finally, the middle Chattahoochee River Valley near LaGrange, Georgia, appears to have had denser settlement during the Lamar Period than during the earlier Mississippian occupation there (Rudolph and Gresham 1979).

Although few if any Lamar shell middens are known from other areas, the middle Oconee Valley is not unique in the association of demographic changes with increased shellfish consumption. Along the Alabama River, survey data indicate a relatively high frequency of Late Woodland sites and also reveal that shellfish collecting was exclusively a Late Woodland activity (Jeter 1977:127-129). There also seems to have been a population increase during the Weeden Island occupation of northwest Florida (Brose and Percy 1978:89); and during a recent survey just to the north, more freshwater shell middens were found from this period than from any other (White 1979:21). In eastern Tennessee, Late Woodland shell middens are also unusually common, although a population increase has not been linked to their appearance (W.E. Klippel, personal communication 1980).

Several anthropologists have proposed that a causal relationship exists between overpopulation and the exploitation of aquatic resources (Binford 1962:223; Cohen 1977:79; Osborn 1977:171). For example, Harner (1970:71,75) suggests that horticulturalists respond to overpopulation by intensifying cultivation, increasing reliance upon water-based resources, and de-emphasizing land-based resources. Population pressure models of this sort have been criticized frequently when utilized simplistically or deterministically, but total condemnation is unjustified (Glassow 1978:32). Population pressure as a theoretical concept certainly has a descriptive application, especially when its component parts--population size, level of consumption, and resource availability--are considered (Hassan 1978:73,76). Thus, the difficulties in measuring the degree of population pressure, or Economic-Demographic Stress (Hassan 1978), should not blind us to the fact that the situation in the Oconee Valley resembles the general pattern described by Harner (1970).

Proposing that population growth during the Lamar Period may have contributed to subsistence changes need not imply that no other factors were involved. Conceivably, changes in the social and political hierarchy following the Etowah Period might have been important, and so might have been changes in the inter-regional networks of exchange, communication, or warfare. Short-term population displacements might also have been brought about by the intrusions of the Spaniards into the interior Southeast during the sixteenth century. Unfortunately, analysis of Lamar data from the Wallace Reservoir and from other areas is too inadequate to demonstrate which if any of these factors may have been most significant.

Conclusions

This chapter has shown through various lines of reasoning that shellfish consumption increased dramatically during the late Lamar Period occupation in the middle Oconee River Valley. Molluscs were probably no more than a minor food source themselves, but their sudden appearance in the Late Mississippian diet might have been a consequence of a more general shift toward riverine fauna of all types, a shift which is postulated to have been correlated with human population growth. This population increase in the area was probably rapid, for the number of Mississippian sites in the Wallace Reservoir increased more than twenty-fold after A.D. 1400. But the reasons for such an increase are presently unknown. It is hoped that future analysis of settlement data will clarify these developments.

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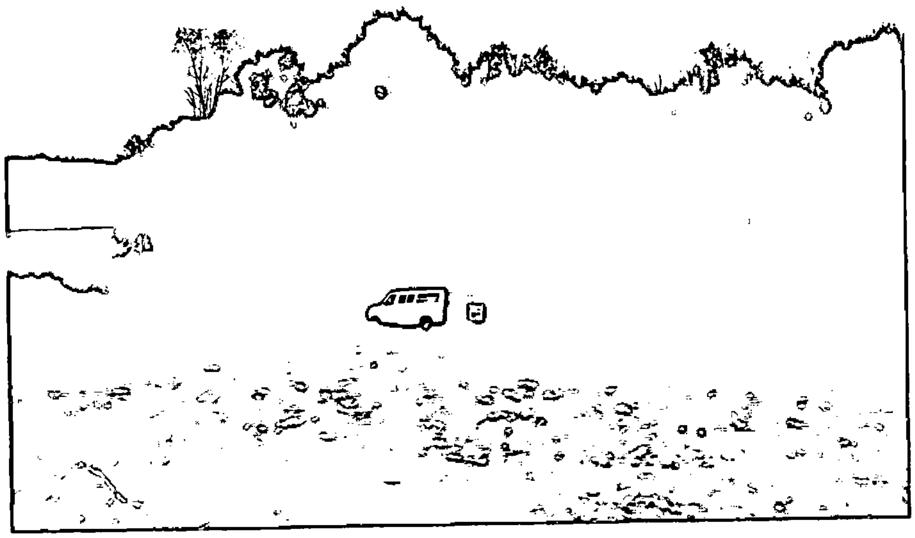

Plate 1. View of PM220 from east. Site is located in trees with the river immediately beyond.

Plate II. North profile of Provenience 1 trench showing upper and lower shell layers.

Plate III. Representative pottery and lithic artifacts from PM220.

Row 1. Folded pinched and punctated rims.
Row 2. Lamar Incised.
Row 3. Lamar Complicated Stamped.
Row 4. 1, unidentified Woodland simple stamped; 2, Stallings Island Punctated; 3, hammerstone.
Row 5. 1, serrated biface fragment; 2-3, biface fragments; 4, quartz crystal core.