ARCHAEOLOGICAL INVESTIGATIONS

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ARCHAEOLOGICAL INVESTIGATIONS

James Branch Watershed Heritage Study

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Introduction

Until recently, very little was known about the archaeological resources of the James Branch Watershed. Prior to 1987, no comprehensive archaeological survey had been conducted in the project area, or even in adjoining areas of the Nanticoke drainage, of which the James Branch Watershed is a part. However, the increasing pace of development in southwestern Sussex County, Delaware, led the Delaware Division of Historical and Cultural Affairs to make this a priority area for archaeological survey under the Historic Preservation Grants-in-Aid program. At the same time, the Division of Parks and Recreation's Office of Nature Preserves was making an effort to strengthen the protection of the remaining bald cypress stands in Delaware through the expansion of the James Branch Nature Preserve. In an effort to expand our understanding of the development of this threatened vegetational community and to provide cultural information which can help us to interpret it to the general public, the Division of Parks and Recreation applied

to the Division of Historical and Cultural Affairs for an Historic Preservation grant to survey Trap Pond State Park, which is located in the James Branch Watershed, and to the Coastal Management Program, first for a grant to produce an overview of the prehistory and history of the study area (Wise 1987), and then for a grant to conduct an archaeological survey of parts of the James Branch Watershed not covered under the Historic Preservation grant. This grant has also been used to provide a preliminary pollen study of cores taken from two areas of the James Branch floodplain and from one location in Cypress Swamp in order to obtain paleo-environmental data to supplement the archaeological data. Although this study is not yet complete, a preliminary report on the cores is attached as Appendix A. At the same time, the University of Delaware Center for Archaeological Research, under the direction of Dr. Jay F. Custer, received an Historic Preservation grant to conduct a reconnaissance survey of much of the Nanticoke drainage, including the James Branch Watershed, and produce a prehistoric archaeological resources management plan for the region. These studies have greatly increased our understanding of the ways in which human groups have lived in the James Branch area in the past, although additional environmental information is still needed in order to understand to what extent these patterns were influenced by the presence of the cypress swamps. Of particular significance for both archaeology and natural resource management is the fact that we can now document that over the last 3000 to 4000 years, there has been an accumulation of 50 to 60 cm. of soil in the zone bordering the James Branch Watershed. Where cultivation has occurred, approxi-

mately 50 to 60 cm. of soil has eroded over the last 200 years.

In this report, we will outline the results of the archaeological investigations undertaken by the Division of Parks and Recreation in the James Branch Watershed over the last year. The format of the report is that of a standard archaeological field report. Figure 1 is attached to provide a summary of the periods of Delaware prehistory, a narrative discussion of these periods is attached as Appendix B, and a glossary is attached as Appendix C to explain the archaeological terms. In later phases of this project, we will conduct a more detailed analysis of the cultural material recovered, and revise the prehistory prepared for the overview based on the new data.

Survey: Methods and Results

Surveys in the Delmarva coastal plain indicate that prehistoric sites are unlikely to be located in upland areas away from water sources. A review of the preliminary results of a recent surface survey of part of the James Branch drainage conducted by the University of Delaware Center for Archaeological Research indicates that prehistoric settlement was strongly focused on the major stream channels (Custer and Mellin 1988). Based on this information, the fieldwork for this project was limited primarily to the upland areas along the edges of James Branch and Trap Pond, which occupies what was formerly the floodplain of Hitch Pond Branch, a tributary of James Branch. The fieldwork strategy consisted of two levels: survey and intensive testing.

The survey strategy consisted of the excavation of 1 meter X 1 meter test units placed along transect lines parallel to the

Figure 1

CULTURE COMPLEXES OF THE JAMES BRANCH WATERSHED*

Dates	Period	Culture Complex	Ceramic Type
A.D. 1600	Woodland II	Slaughter Creek Complex	Townsend Killens
A.D. 1000			
		Late Carey Complex	Prickly Pear Hell Island Mockley
A.D. 500			
		Carey Complex	Mockley
A.D. 0	Woodland I		
		Wolfe Neck/Delmarva Adena Complex	Coulbourne Wolfe Neck
500 B.C.			
		Clyde Farm Complex	Experimental Marcey Creek
3000 B.C.			
	Archaic	(No Special Complexes)	
6500 B.C.			
	Paleo-Indian	(No Special Complexes)	
12,000 B.C.			

*Based on Custer & Mellin 1988, Table 3.

bank of the drainage and not more than 30 meters inland. The attached map (Figure 2) shows the location of these survey transects. Most often, this distance was 10 - 20 meters. At least one test unit was placed on each landform which had a high probability of having been occupied during prehistoric times, and additional units were excavated at intervals which generally did not exceed 100 meters. Each unit was excavated in 10 cm. arbitrary levels, and the soil was screened through 1/4 inch hardware cloth. Artifacts were kept separate by unit and level. Profiles were recorded for selected excavation units, using using Munsell soil color designations. Each test unit is located with respect to a lettered datum point, and designated by a number. Because the letter and number designations were repeated on each transect line, different catalog numbers were used to separate the collections.

Excavations at Trap Pond State Park

Excavations at Trap Pond State Park were conducted between January and July, 1988, and were funded primarily through an Historic Preservation Grant from the National Park Service through the Delaware Division of Historical and Cultural Affairs. The excavations units were placed along two survey transects, one on each side of the pond. In addition, a previously identified site located on the east side of the pond, 7S-J-12, was intensively tested. The first survey transect ran along the east side of the pond in the campground area. Fourteen units were excavated, and prehistoric cultural material was recovered from

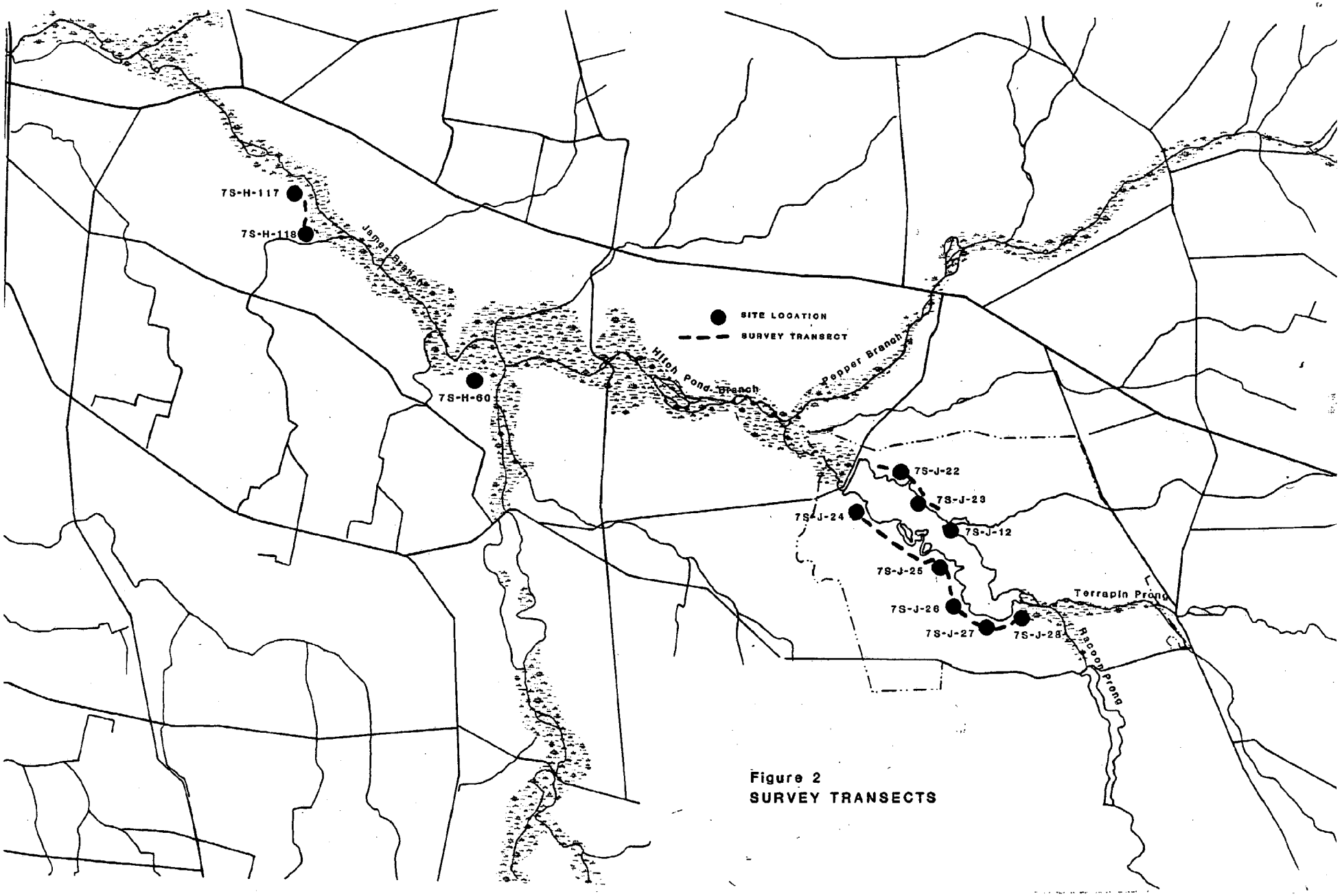

Figure 2
SURVEY TRANSECTS

five units. Two previously unreported sites were identified.

Site 7S-J-22 is located in the main campground area, northwest of the confluence of a small stream with the pond. Temporally diagnostic artifacts include a straight-stemmed point and Townsend ceramics. No other stone tools were found, and very little debitage was recovered.

Site 7S-J-23 is located on what is now a small island, but which was once a narrow neck of land projecting into the Hitch Pond Branch floodplain. Only one unit was excavated here, but the density of artifacts was greater than at any other location tested on the east side of the pond. Temporally diagnostic material includes Wilgus, Mockley, and Townsend ceramics. No projectile points were recovered and the only stone tool recovered was a utilized flake, but there was a much greater density of debitage than at other sites in the park.

Only one site, 7S-J-12, was subjected to intensive testing. A total of ten 1 meter X 1 meter test units were excavated, with units designated in terms of an arbitrary grid. This grid is oriented parallel to the pavillions and parking lot developed on Cypress Point, and approximately parallel to the crest of the ridge which forms the point. The 0,0 point is located northwest of Cypress Point so that all excavation units in this area will fall within the southeast quadrant of the grid.

Like the survey units, the intensive testing units were excavated in 10 cm. levels, unless natural levels were apparent, and the soil removed was sifted through 1/4 inch mesh screen. All of the test units were concentrated in the area of the swings, where prehistoric ceramics had been recovered in the

past. Seven of the test units were excavated by the Kent County Archaeological Society, a chapter of the Archaeological Society of Delaware. Five of these units showed clear evidence of cutting and filling on the north side of the ridge. No prehistoric material in undisturbed contexts was recovered from these five units.

The remaining five units all produced prehistoric cultural material. Mockley, Hell Island, and Killens ceramics were recovered from four units, one of which was only excavated to a depth of 20 cm. A feature consisting of an outer ring of charcoal and burned pebbles and a core of ashy soil was encountered in this unit (S101/E160). This feature extends into three adjoining units, so it was decided to cover the feature with plastic and backfill the unit until a later time. Rhyolite flakes were also recovered from the units containing Mockley and Hell Island ceramics.

The second survey transect ran along the west side of the pond. Sixty-eight test units were excavated, of which 47 contained prehistoric cultural material and four contained historic period cultural material. Three units (#2, #10, and #11) were abandoned after encountering a feature identified as a utility line. Five previously unreported sites were identified on the basis of this survey. In addition, a single core was found in Unit #19. The location, however, is topographically distinct from the nearest defined site, and this unit has, therefore, not been included with it. Additional testing is needed to determine whether a separate site number should be assigned.

Site 7S-J-24 extends along the edge of the pond between the office and the swimming beach. A small amount of historic period material dating to the first quarter of the nineteenth century was recovered from Units #1, #3, #5, and #10, located between Datum A and Datum B. A small number of flakes were recovered from Unit #4, which has been included in this site designation, although no other prehistoric material was recovered from this area.

Site 7S-J-25 is located on a neck of land projecting into the pond and is currently used as a "primitive" campground for scouts and other groups. Prehistoric cultural material was recovered from ten units. Temporally diagnostic material includes soapstone bowl fragments, Mockley and Townsend ceramics, and a corner-notched projectile point. Although several of the excavation units showed that the site had been significantly disturbed by the excavation of tent trenches, fire pits, and trash pits, vertical separation between the early Woodland I soapstone bowl fragments and the later Woodland I and Woodland II Mockly and Townsend ceramics was noted. In addition to the projectile point, stone tools included a bifacial scraper, an argillite preform base, and a tiny unifacial pebble scraper. Very little debitage was recovered.

Sites 7S-J-26 and 7S-J-27 are both procurement sites with a very low dentisty of cultural material. Site 7S-J-26 is located north of a small stream near its confluence with Trap Pond, and includes units #38, #39 and #40. Lithic artifacts included a contracting stem projectile and a pebble core, both of heat-treated jasper from levels 6 and 7. Site 7S-J-27 was a more

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diffuse occupation area with occassional flake debris found in units 44 to 48, with flake densities highest in unit 48. Artifacts from this interval included a contracting stem projectile base and a pebble core, both from level 5. Additionally, 3 prehistoric sherds were found in the upper levels of unit 45.

One historic charcoal pit was also identified in unit 44. It contained a layer of cross-tied split logs intersecting horizontally at right angles. This pattern extended down in a pit from 40-80 cm below surface. At the base of the pit two charred logs intersected vertically in a v-shaped pattern. This feature was without further association. The significance of this feature was not determined.

Site 7S-J-28 is located south of a small stream flowing into Trap Pond and north of a borrow pit located along the edge of Racoon Prong, including Units #49 through #68. Prehistoric cultural material was recovered from 16 of the 18 excavated units. As at 7S-J-25, vertical separation of cultural periods was noted. Contracting stemmed points, steatite bowl fragments, Marcey Creek pottery, and a fragment of a bannerstone, all associated with the Clyde Farm Complex of the Woodland I Period, were found at the bottom of level 4 (30 to 40 cm. below the surface) and in levels 5 and 6 (40 to 60 cm. below the surface.) Townsend, Killens Pont, and Prickley Pear ceramics were found in levels 1 through 3 (0 to 30 cm. below the surface.) Most of the ceramics were concentrated in units 56, 57, 58 and 63, and occurred primarily in levels 2 and 3. Lithic distributions did not conform to this same pattern. Instead lithics occurred in units 60, 61, 62, 63,

and 68, and had their highest densities in level 5. They included a side-notched projectile, a contracting stem point, an ovate stemmed point, 4 tested pebbles, 3 preform fragments, 2 biface fragments, 1 end scraper, and 1 utilized flake. Lithic tools, like the flake debris, were most frequently from level 5.

Excavations at the Phillips Tract
James Branch Nature Preserve

The Phillips Tract is located on the south side of James Branch approximately 1 km. northwest of its confluence with Hitch Pond Branch (the stream on which Trap Pond is located.) Part of the tract was recently purchased by the Department of Natural Resources and Environmental Control from Mr. Eugene Phillips. The remaining area is still owned by Mr. Phillips, although DNREC is negotiating to acquire this part of the tract as well. Mr. Phillips graciously gave his permission for our work.

A total of 50 test units were placed along the surveyed transect which ran northwest along James Branch from its confluence with Old Forge Branch (locally known as Nancy Thompson Branch.) Test intervals averaged 20 m apart over a distance of

the units. Two sites (7S-H-117, and 7S-H-118) were identified based on the distribution of cultural material.

Site 7S-H-117 is located at the confluence of Old Forge Branch and James Branch. Ten test units (1-9, and 13) were excavated, and cultural material was found in all units except #3. Two features and most of the cultural material were concentrated along the south terrace edge. At 20 to 30 cm. below the present

surface (level 3), evidence of a small late Woodland I occupation was recovered from several units. The remains consisted of a compacted surface associated with Hell Island ceramics, a grinding stone, and biface fragments, an ashy silt deposit of undetermined function, and a triangular projectile point. An occupation date of A.D. 800 to A.D. 1000 is indicated. A few historic period artifacts dating to the early nineteenth century were also recovered from the upper levels of some units.

North of unit #12 the survey transect turned to follow the terrace bank northeast to unit #36, then curved back northwest to unit #49. The site area (7S-H-118) identified along this transect spanned an interval of 400 m. Cultural material was recovered from 35 of 37 units. Prehistoric cultural material appeared to be concentrated in two zones. The upper 3 levels (0 to 30 cm. below the present surface) contained the greatest density of ceramics, including Prickley Pear, Killens, and Townsend wares, as well as two triangle points. This indicates an occupation dating to approximately A.D. 800 to A.D. 1500. The second zone occurred between 40 and 70 cm. below the surface (levels 5 through 7). These levels contained more than 60% of the lithic material from the site. The presence of Experimental ceramics, soapstone fragments, contracting stemmed points, and a fragment of a bannerstone in levels 5 and 6 indicates an occupation dating from about 3000 B.C. to 500 B.C. and perhaps earlier.

A number of features were found at the center of the site where the terrace is closest to the channel of James Branch. in units 32, 33, 34, 37, and 46. Three features were identifed

because sherds belonging to the same vessels occurred in several levels, even though no soil color change could be identified. These features all originated in the upper cultural zone and contained Townsend, Killens, and/or Prickley Pear ceramics. One feature was a small pit beginning at 45 cm. below the present surface and extending to 70 cm., with increased amounts of burned bone and charred wood at the base of the pit. However, not all the features excavated appear to have been of cultural origin. One feature, consisting of a concentration of loose burned ash, was determined to be the remains of a thoroughly burned tree when the ash deposit tapered to a charred root.

Excavations at the Truitt Site

The Truitt Site (7S-H-60) was identified during a reconnaissance survey conducted by the University of Delaware Center for Archaeological Research. The majority of sites identified along James Branch as a result of this survey were classified as procurement sites. 7S-H-60, on the other hand, was classified as a base camp. We decided to excavate a limited number of units in undisturbed wooded areas along the terrace edge in order to obtain a sample from a known base camp that was comparable, in terms of the technique of recovery, to the sample we had obtained from 7S-H-118, which we believed to be a base camp.

Our field examination showed that virtually the entire site had been disturbed. The western end had been destroyed by a borrow pit, and the remainder of the site had been cultivated to

the edge of the terrace, so that no upland wooded fringe remained. However, there was a narrow strip of woods between the cultivated field and the borrow pit, and there was also a remnant of a knoll at the north end of the borrow pit which was undisturbed. Five units were excavated in the wooded strip and three on the knoll. Surface collections were made in the plowed field and along the sides of the borrow pit.

The surface collection in the plowed field indicated that there were a number of concentrations of cultural material, with a thin scatter over much of the rest of the site. Fire-cracked rock and lithic debris were common. Ceramics included Dame's Quarter Experimental, Mockley, Prickley Pear, Killens Pond, and Townsend wares, representing a range of about 3500 years. Flaked stone tools were not frequent, but several plant processing tools were found, including a mortar and a muller, as well as several battered stone tools whose function could not be determined. A fragment of worked slate was also found.

A similar range of ceramics was found in collections from the edge of the borrow pit, including Dames Quarter Experimental ceramics. In addition, two temporally diagnostic projectile points were found: a contracting stemmed point, contemporary with the Experimental ceramics, and a Fox Creek point, contemporary with Mockley ceramics.

Units in the test areas were excavated to at least 50 cm. In the wooded strip between the borrow pit and the plowed field, the topsoil (approximately 15 - 25 cm. thick at undisturbed sites) appeared to have been removed. No temporally diagnostic

artifacts were recovered from either test location except Wolfe Neck ceramics. In the wooded strip, sherds that appeared to be from the same vessel were found in several levels, indicating the presence of a feature. It should be noted that the Wolfe Neck ceramics which were found buried below the surface in the uncultivated parts of the site are later in date than the Experimental ceramics found on the surface in the plowed field.

Conclusions

Over the past seven years, excavations in undisturbed wooded areas at several state parks and nature preserves (Wise 1983, 1984, 1985) have shown that cultural material could be found at depths well below what was generally expected. However, none of these excavations were able to demonstrate vertical differentiation of cultural periods, and it was thought possible (even probable) that artifacts were carried to such depths by natural agencies such as roots and burrowing animals. In the excavations at Trap Pond State Park and the Phillips Tract of the James Branch Nature Preserve, we have been able to demonstrate clearly that earlier cultural material occurs vertically below later cultural material. This means that although the soil matrix appears to be homogeneous, it has been accumulating over the last 4000 to 5000 years.

At the Truitt site (7S-H-60), artifacts have been found on the surface which date to the same time period (Woodland I/Clyde Farm Complex) as those which are buried under approximately 50 cm. of soil at the Phillips Tract and Trap Pond sites. It is unlikely that localities on the same drainage, with similar

topographic characteristics, and within a short distance of each other would have distinctly different patterns of soil accumulation without some evidence that different processes were at work. Indeed, the presence of Wolfe Neck ceramics (indicative of the Woodland I/Wolfe Neck Complex) at 20 to 30 cm. below the surface in the less disturbed parts of the site indicates that at least some accumulation has occurred at this location. This in turn suggests that some 40 to 60 cm. of soil have been removed from the site, most likely as a result of cultivation, because this is the one characteristic which differentiates the Truitt site from the other sites studied.

It is difficult to judge, on the basis of information currently available, how long it took for this amount of erosion to occur. Certainly, parts of 7S-H-60 have been under cultivation for much of the last two centuries. However, large areas of the site bordering James Branch have been cleared only recently. In the past, farming practices have maintained wooded borders along the streams, as well as hedgerows between fields. This not only protected archaeological sites from disturbance, but also limited to some degree the extent of both wind and water erosion. Today, both the hedgerows and the wooded borders are increasingly being cleared to open new farmland or to make mechanized farming more efficient. Not only does this pose a threat to archaeological sites which contain all that remains of past human activities, but the soil which erodes from the sites washes or is blown into the streams and stream valleys, altering the ecological setting. This suggests that the protection of

undisturbed archaeological sites will also serve to protect the natural resources in the stream valleys which served as the focus for human settlement in the past.

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Appendix A

Report on Cores from Cedar Bog in Southern Delaware

Three cores were collected from different subdenvironments of bald cypress communities from southern Delaware. The cores measured 164, 200, and 165 cm. in length. Bottom sediments from each of the cores have been submitted for carbon 14 analyses. Additional carbon 14 dates will be obtained, as the pollen analyses proceed.

Stratigraphy of the cores is as follows:

Core CS-1:

1 - 18 cm: peat of a dark reddish brown color;
18 - 20 cm: mud of a less fine texture than the overlying sediment, containing plant fragments;
20 - 68 cm: black mud;
68 - 74 cm: transitional mud and sand;
74 -106 cm: finely uniform sand, gray to dark gray in color;
106-164 cm: marbled sand and mud mixture, with darker mud bands from 162-164 cm.

Core HP-1:

0 - 36 cm: mud, with leaves and twigs; germinating seeds at 1.5, 33, 35, 39 and 40 cm;
36 - 58 cm: light gray sand;
58 - 70 cm: mud as from 0 to 36 cm;
70 - 75 cm: transition from mud to sand;
75 - 79 cm: sand;
79 - 83.5 cm: mud;
83.5 - 134 cm: sand with some marbling of organics;
134 - 195 cm: mud, with a chunk of wood from 100 to 103.5 cm;
195 - 200 cm: gravel and sand with mud.

Core TP-1:

The bottom of this core was highly disturbed below 165 cm and not useful for pollen analyses.

0 - 30 cm: dark reddish brown to black peat with large stems; (a 4 cm gap occurs at this level due to coring difficulties);
34 - 64 cm: mud with less peat;
64 - 89 cm: sand and mud with very large twigs, stems and wood chips;
89 - 145 cm: sand with small amounts of gravel;
145 - 159 cm: sand with larger gravel; striations; and marbling with darker bands, which may not be organic;
159-165 cm: white clay with yellow patches and bits of carbon.

Very large stems or wood chunks occur at 77 to 81 cm, 85 to 92 cm, and 100 to 104 cm.

Insofar as possible, all 3 cores have been divided into 1 cm subsamples, and pollen has been extracted from roughly one-half of all subsamples. Preliminary pollen analyses indicate that at least in some levels, there is good pollen and seed preservation.

APPENDIX B

Prehistory

James Branch Watershed

Paleo-Indian Period (10,000 B.C. to 6,500 B.C.

Although archaeologists are not yet certain exactly when the first human groups entered the Delmarva Peninsula, we can say with certainty that people were living in the area by at least 12,000 years ago, during the Late Glacial climatic episode. These earliest inhabitants lived by hunting animals, particularly large game such as mastodons, mammoths, and other Pleistocene megafauna, and by gathering plant foods. Because hunting was so important to their way of life, these people were skilled in making flaked stone projectile points, as well as other stone tools for use in processing the meat, hides, and other animal products.

Because of the lack of seasonal variation, the yearly round of the Paleo-Indian hunters focused on the availability of stone materials for tool-making, rather than on the seasonal availability of specific food resources. For Paleo-Indian groups in the central Delmarva area, the nearest source of high quality lithics would have been cobble beds at the confluence of the Nanticoke River with what was then the ancestral Susquehanna River. The stream valleys of the study area as defined here are too narrow to have supported a significant population of megafauna. It is unlikely, therefore, that recognizable Paleo-

Indian sites will be found in most of the project area. However, the James Branch Watershed offers a direct route from the Nanticoke gravel beds to the resource-rich swampy areas along the eastern edge of the study area, where it is likely that non-quarry-related base camps, processing sites, and hunting sites will be found.

Because of their reliance on hunting as a major food source, and because of their utilization of high quality stone materials, the tools used by the Paleo-Indian hunters are exceptionally well-made, in comparison with the tools of later periods. The most distinctive tools of the period are the projectile points, which for most of this period were lanceolate to triangular points with a shallow groove, called a flute, running down both faces. These projectile points appear to have been used on thrusting spears. Toward the end of the period, smaller projectile points with notches at the sides were made. Some archaeologists have suggested that these smaller points were used with an atlatl, or throwing stick, which was used to give greater distance, accuracy, and thrust to the spear. A variety of cutting and scraping tools were also made to facilitate the processing of meat, hides, and so forth. These tools, which display the same fine craftsmanship as the projectile points, were often made by chipping only one side of a flake of stone. Although we are sure that the Paleo-Indians gathered plant foods as well as hunting, they do not appear to have made special stone tools for processing such resources. Instead, they must have used tools and containers made of perishable materials such as wood and hide.

Archaic Period (6500 B.C. to 3000 B.C.

The Archaic cultural period begins about the same time as the Atlantic environmental episode. The expanding mesic forest had a higher carrying capacity than the pine and spruce forests of the preceding Glacial episode. The disappearance of the glaciers allowed the development of marked seasonal variation, while the rising sea level allowed the development of swamps, which increased the variety of environmental settings available for exploitation (Custer 1981:1-3). Paralleling this increase in the environmental and seasonal diversity, the Archaic Period is marked by an increase in the number and variety of tools in use. The dominant projectile point styles for this period are the bifurcate base types of the early part of the period and the small stemmed types characteristic of the later part. Each of these basic types displays considerable regional diversity. Of particular interest is the introduction of a variety of ground stone tools, including axes, gouges, grinding stones, and other plant processing tools, suggesting an increased dependence on floral resources. Nontheless, a variety of flake and biface tools continued to be made.

The settlement pattern of the Archaic reflects a seasonal round of activities focusing on resources which were seasonally abundant at particular locations. Sources of high quality lithics were no longer of central significance, and a wide variety of materials available in local cobble deposits were used. The locations of macro-band base camps occupied by a number of family groups appear to have been determined by the

locations of particularly rich environmental zones, such as at the confluences of major streams with the Delaware River or Chesapeake Bay. Smaller micro-band base camps, occupied by a small number of family units for shorter periods of time, were located in sheltered locations overlooking lower order streams. Access to sources of lithic material may also have been a factor. Both the macro-band base camps and the micro-band base camps were associated with procurement camps, which were occupied by small numbers of individuals for short periods of time while specific resources were hunted or gathered. A band of related families occupying a particular territory would gather together at macro-band base camps during certain parts of the year when the resources there were particularly abundant. Small groups would make forays to nearby procurement sites to obtain food or raw materials which were not available in the immediate vicinity of the base camp. As the resources near the macro-band base camp became unavailable due to seasonal change, the larger group would break up, and the smaller units would move to micro-band base camps, where other resources would be abundant, but not in sufficient quantities to support the larger band. Again small groups of individuals would make forays to procurement sites. The location of the micro-band base camp might be moved several times, but the following year, the larger band would gather once again at the macro-band base camp (Custer 1981:7-14).

Within the study area, we can expect to see only part of the settlement pattern characteristic of the Archaic Period. Macro-band base camps would have been located to the west at the

confluence of the Nanticoke with the Chesapeake Bay or to the east in association with the developing Great Cypress Swamp. Micro-band base camps are most likely to be found along the eastern edge of the study area, and scattered procurement sites may be found in other parts of the area.

Woodland I Period (3000 B.C. to A.D. 1000)

The beginning of the Woodland I cultural period coincides with the beginning of the Sub-boreal environmental episode, which marks the beginning of a period in which environmental conditions were generally drier than during the preceding Atlantic episode. The most significant environmental change, however, is that period of climatic oscillation was initiated (Custer 1981:20). These oscillations introduced a higher degree of uncertainty into the previously rather stable relationships between seasonality, resource availability, and settlement location. New social structures, as well as new settlement patterns were needed to adapt to this uncertainty.

A number of environmental factors, including the increasingly dry conditions and the appearance of estuarine resources, combined during the Sub-boreal episode to produce a significant change in the settlement patterns of the inhabitants of Delaware and much of the Middle Atlantic area. Although there does not appear to have been a decrease in the total carrying capacity of the region, the focus of reliable resource availability appears to have shifted to the flood-plains of major streams, such as the Nanticoke, and to major swamps, such as the Great Cypress Swamp. Macro-band base camps became larger, and

were probably occupied for longer periods of time. The number of micro-band base camps increased, and the variety of differenct activities carried out at both macro-band and micro-band base camps increased. Isolated procurement camps continued to be used, but they are found in smaller numbers, and fewer activities were carried out at these sites (Custer 1981:33-4).

In order to deal with the periodic uncertainty resulting from the climatic scillations of the Sub-boreal, more structured relationships were developed, both within groups and between groups. These structured relationships are indicated by the extensive use of raw materials by groups which did not have direct access to them in their own territory, and by the presence of non-utilitarian items such as ornaments and pipes. The raw materials were distributed through exchange networks which bound together groups of people in different territories. The non-utilitarian items appear to have been used to symbolize differences in status between members of the same group. During the latter part of this period, these structured relationships can also be seen in the development of an elaborate burial ceremonialism (Custer 1981:30-3).

Both new tool types and new tool techniques were introduced during the Woodland I Period. In particular, there appears to have been an increase in the kinds of specialized ground stone tools found on sites of this period. Furthermore, the broadspear point technology which was developed during this period was different than previous stone-tool-making technologies, and appears to have been designed to produce tools with multiple functions that would have a long use-life. Another major

addition to the technology/artifact inventory of the Woodland I Period were stone bowls, which were later replaced by ceramic vessels. The introduction of stone bowls and ceramic vessels appears to have been related to their increased cooking efficiency and possibly to their use for storage (Custer 1981:21, 24).

Again, we can expect to see only part of the Woodland I settlement pattern in the study area. Both micro-band and macro-band base camps from this period are most likely to be found to the west, along the Nanticoke River floodplain and to the southeast, around the edges of the Great Cypress Swamp. Only procurement sites of this period can be expected within the study area, and they will probably be found in smaller numbers than those of the preceding Archaic Period.

Woodland II Period (A.D. 1000 to A.D. 1600)

Although the beginning of the Woodland II Period is not marked by a significant change in environmental conditions, there are clearly changes which justify the designation of a new cultural period. These changes appear to coincide with the appearance of maize agriculture, at least in some areas of the Middle Atlantic. The trend toward larger base camps, occupied for longer periods of time, continues although the focus of these settlements shifts from locations suitable to the exploitation of estuarine resources to floodplain locations suitable for crops. Despite the introduction of cultivated crops, such as corn, beans, and squash, there continues to be a significant use of wild seed and nut crops. There is an increase in the emphasis on

storage, indicated by the presence of larger storage pits in base camps of this period, as well as at more specialized sites. The size of ceramic vessels increases, which is also probably related to this increased storage emphasis.

Although the larger settlement size implies a fairly complex social organization, there is little evidence of the structured symbolism of the Woodland I Period. Elaborate burial ceremonialism is lacking, and the intensive trade relationships of the earlier period appear to have broken down. High quality cryptocrystalline stone continues to be used, but it appears to come from local cobble sources rather than from distant quarries. The artifact inventory of this period is also considerably less elaborate than that for previous periods. There are fewer flake tools, and less variation in projectile point styles. The triangular point is the universal point style for this period in the Middle Atlantic.

In the study area, only small procurement camps can be expected for this period. Base camps for the Woodland II Period would have been located in the floodplain of the Nanticoke River. As was the case for the Woodland I Period, we can expect that these procurement sites will be less frequent than during the Archaic Period.

Contact Period (1600 to 1750)

The Contact Period is the period of initial contact between European colonists and Native American groups. It begins with the first, indirect, experience of Delaware Native Americans with European trade goods and diseases and ends with the disappearance

from Delaware of Native Americans as recognizable tribal groups. During this period, radical changes were made in the distribution and composition of native groups. All over Delaware, European diseases killed large numbers of Native Americans because they had no natural resistence to these diseases. Pressure from increasing colonization forced many groups into the interior and onto reservations. One of these reservations was located on the western edge of the project area.

This reservation was established in 1711 by the Maryland government to provide for a remnant of the Nanticoke tribe, which had once occupied a large part of the west-central Delmarva Peninsula. Approximately 3500 acres were purchased from the original grantees to establish this reservation in what was then a remote wilderness. By 1748, however, the majority of the Nanticokes had left the reservation and moved north to join the Susquehannocks in Pennsylvania.

Very little is known about the Contact Period in Delaware. The fur trade was dominated by the Susquehannocks to the north in Pennsylvania, so that Delaware groups never accumulated large amounts of readily recognizable trade goods. It is likely that sites of this period will not be easily distinguished from sites of the Woodland II Period. However, because the study area is located on the edge of a known reservation, it is more likely that sites of this period will be found here than in other parts of the state.

References Cited

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Appendix C

GLOSSARY

battered tools: These are cobbles of a resistant material such as quartzite which have been used to hit hard objects, but which have not been used for one purpose long enough either to substantially alter the original shape of the cobble or to leave clear evidence of how the tool was used.

bifacial tools: Bifacial tools are flaked stone tools which have been worked on both sides. These implements tend to be larger than the unifacial scrapers and are frequently roughly ovate in shape. Such tools were used for a variety of chopping, scraping, and cutting purposes, particularly in butchering and woodworking.

corner-removed projectile points: This category includes a variety of triangular to lanceolate bladed points which have been notched at the corners of the base to facilitate hafting. They appear to date to the Woodland I Period.

Coulbourn Ware: Coulbourn Ware is tempered with crushed clay or potsherds. Coulbourn net-impressed is more common than the cord-marked variety, and may be net-impressed on the interior as well as the exterior. This ceramic type dates from about 400 B.C. to about 0 B.C.

debitage: This is a term used by archaeologists to refer to the various kinds of debris produced during the manufacture of stone tools, including chunks, flakes, and cores.

drills: Drills are bifacially worked tools with attenuated tips that appear to have been used to drill holes in stone, bone, or wood. Projectile points are sometimes used for this purpose.

faunal resources: Faunal resources include mammals, birds, fish, and shell fish which can be exploited for food and for bone and hides to be used for tools, clothing, and other items.

fire-cracked rock: Stones which have been broken by heat. For the most part, they appear to have been used in fire-hearths, and can be recognized by a reddish color and angular breaks.

first order stream: This is a small stream which has no tributaries.

floral resources: Floral resources include seeds, nuts, berries, fibers, and other plant products which can be used for food

and medicines or as raw materials for baskets, cordage, and other items.

functionally diagnostic artifacts: These are artifacts which are characteristic of particular activities.

hammerstones: These tools have been extensively battered, so that their shape is roughly spherical. They may be made of quartz, quartzite, or other resistant material. Such tools were important in the early stages of the manufacture of chipped stone tools, but may also have been used for other purposes as well, such as cracking nuts or breaking up bone prior to the manufacture of bone tools.

Hell Island Ware: Hell Island Ware has a fine grained paste with crushed quartz temper. Surfaces may be cord-marked or fabric-impressed. Paddling generally appears to have been done when the vessel was leather hard, rather than wet, and the cording is usually more widely spaced than on earlier ceramic types. Net-impressing rarely, if ever, occurs. The rims of Hell Island cord-marked vessels are frequently flattened and cord-marked. This type dates from about A.D. 600 to about A.D. 1000.

Killens Pond Ware: This is a thin, very fine-grained paste ceramic tempered with finely crushed shell and sand. Proportions of these tempering materials may vary, so that some sherds appear to have little or no sand, while others appear to have little or no crushed shell.

lanceolate projectile points: Lanceolate points have straight to concave bases and straight sides contracting toward the tip, without a stem. It is probably attributable to the end of the Woodland I Period.

macro-band base camp: The macro-band base camp is a major site occupied seasonally by a band of related family groups. These sites are generally located in particularly rich environmental zones, such as the confluences of major streams, where food resources would be particularly abundant during certain parts of the year.

micro-band base camp: Micro-band base camps are smaller sites occupied by a smaller number of family groups than the macro-band base camps. They are generally located in sheltered locations overlooking lower order streams or on the floodplains of larger streams. Resources are seasonally abundant in these locations, but not adequate to support the larger band.

Mockley Ware: Mockley Ware has a coarse paste tempered with large fragments of crushed shell. The surface may be either net-impressed or cord-marked. This ceramic type dates from about 0 B.C. to about A.D. 1000.

pitted stones: These tools are flattish cobbles of a dense material such as quartzite which have shallow depressions on one or both of the flat surfaces. They are usually interpreted as having been used in the processing of nuts. Frequently, they also show evidence of battering along the edges.

processing tools: The majority of the tools found at most prehistoric sites were used in processing raw materials and foodstuffs. These tools may have been shaped through use or they may have been purposely produced. Although tools of bone and wood were certainly used during prehistoric times, they rarely survive.

procurement camps: These sites are small sites occupied by a limited number of people for short periods of time in order to exploit specific resources. Procurement camps are associated with macro-band and micro-band base camps, from which small groups make forays to nearly procurement sites in order to obtain food or raw materials which are not available in the immediate vicinity of the base camp.

procurement tools: Tools used to obtain food or raw materials. Native Americans in Delaware probably possessed a range of procurement tools, including traps and nets made of cordage and other implements made of bone and wood. In most sites, however, these items do not survive, and only chipped stone projectile points can be identified as procurement tools.

straight stem projectile points: These points have straight to slightly contracting stems with straight to convex bases and ovate blades. It is probably attributable to the Woodland I Period.

shallow side-notched projectile points: This category consists of small to medium sized projectile points with shallow side-notches and straight to convex bases. They appear to date primarily from the Woodland I Period.

sherds: This is the term archaeologists use to refer to broken fragments of pottery or ceramics.

temporally diagnostic artifact: Temporally diagnostic artifacts are those which are indicative of particular time periods. They are most likely to be ceramics or projectile points.

Townsend Ware: This is a shell-tempered type with a fine-grained paste and fabric-impressed surfaces. Unlike earlier ceramic types, Townsend Ware is frequently decorated around the rim. This decoration is in the form of geometric patterns produced by incising lines or by pressing a piece of cord or a cord-wrapped stick into the surface of the clay. In general, the more elaborately decorated vessels appear to be earlier than those decorated with parallel lines. This ceramic type dates from about A.D. 1000 to perhaps as late

as the beginning of the Contact Period.

triangular projectile points: Small triangular points are attributable to the Woodland II Period. In the Killens Pond area, they are associated with Townsend ceramics.

unifacial scrapers: These are flaked stone tools which are worked or show evidence of use on only one side. Both utilized flakes and intentionally produced scrapers were used for a variety of cutting and scraping activities, including butchering, hide preparation, and the harvesting and processing of floral materials. Intentionally produced scrapers occur in a variety of shapes, including concave, convex, end, and straight edge. These terms are descriptive of the shape and/or the location of the working edge, and each category appears to have been used in somewhat different ways.

utilized flakes: These are unifacial scrapers which have not been intentionally produced. Instead, the sharp edge of a flake is used for cutting or scraping purposes. In the process, small flakes are removed from the working edge, making it possible to distinguish these tools from flakes which have not been used.

Wolfe Neck Ware: This ceramic type is characterized by a coarse paste tempered with crushed quartz. The surface may be cordmarked, net impressed, or smoothed, although smoothing generally does not occur over an entire vessel. Wolfe Neck Ware appears to date from about 700 B.C. to about 200 B.C.