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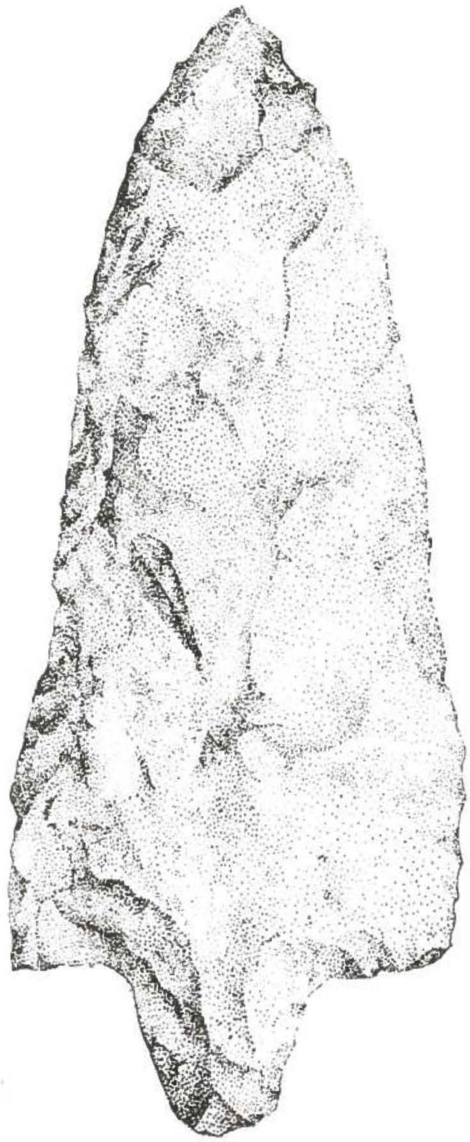
ARCHAEOLOGICAL SURVEY
IN SOUTHWESTERN DELAWARE, 1987–1988

by

Jay F. Custer and Glen R. Mellin



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INTRODUCTION

The purpose of this report is to describe the results of an extensive survey of the Nanticoke drainage area in southwestern Delaware (Figure 1). This area was chosen for survey because the Nanticoke drainage area, especially in the vicinity of Seaford, had been targeted in the state-wide plan for the management of prehistoric archaeological resources (Custer 1983a:206, Figure 41) as an area with a high potential for significant archaeological sites and high pressures on these resources from modern development. Also, this area was very poorly known archaeologically. Therefore, one of the main goals of the survey was to gather a body of reconnaissance-level archaeological survey data on a wide variety of environmental settings throughout the Nanticoke drainage area. These data would then form the basis for the development of a regional management plan for the local prehistoric archaeological resources.

This report will: 1) describe the local area's environmental setting and culture history; 2) describe the methods of the survey; 3) summarize the results of the survey; 4) analyze the patterns of site locations in the study area; 5) analyze some aspects of the artifact assemblages collected during the survey; and 6) note the implications of the survey's results for local and regional prehistory.

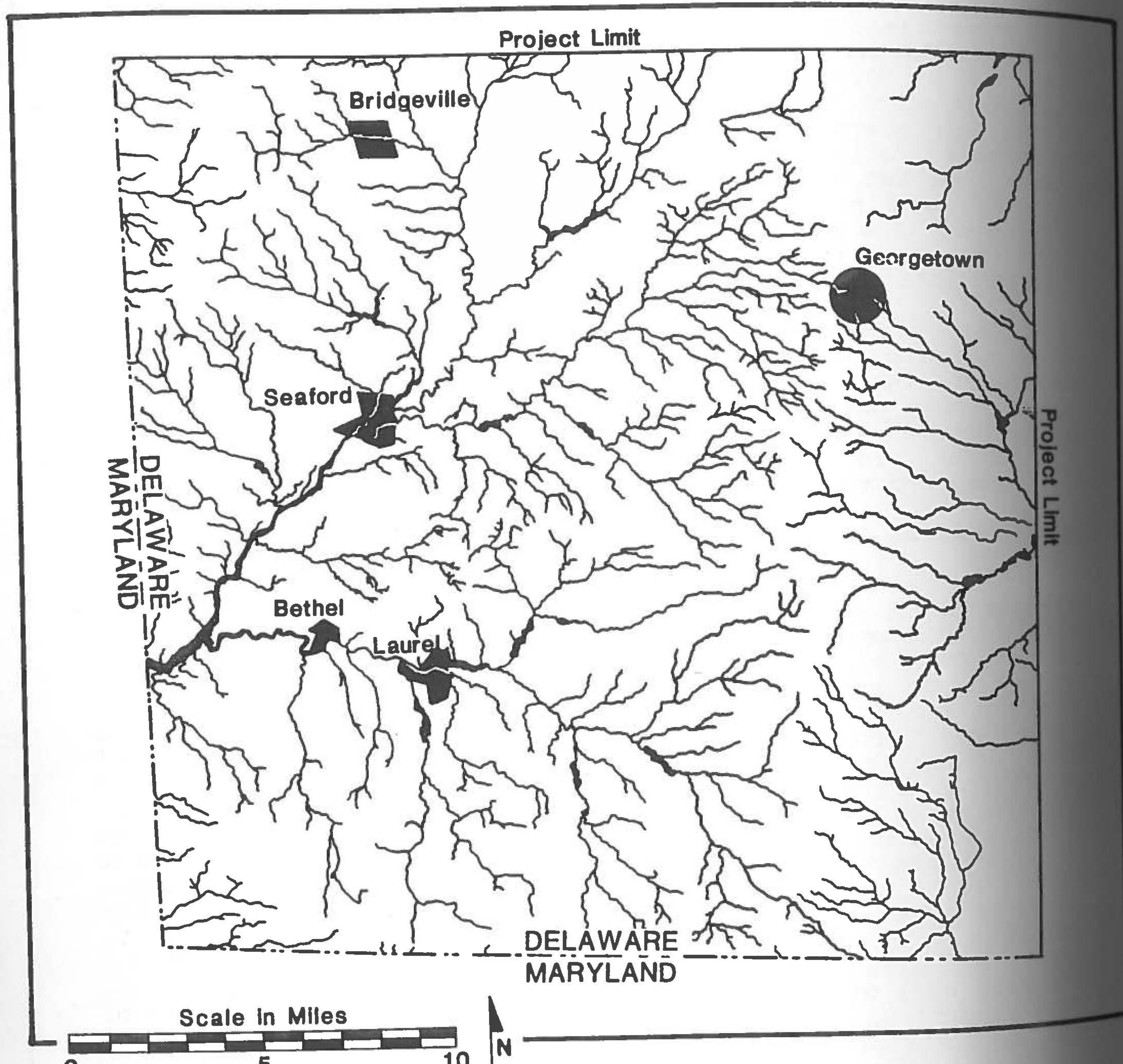
Environmental Setting

The survey area falls within the Low Coastal Plain physiographic zone (Figure 1), which includes most of Kent and Sussex Counties. The Low Coastal Plain is underlain by the sands of the Columbia Formation (Jordan 1964; Delaware Geological Survey 1976) and these sands have been extensively reworked by various geological processes. The result is a very flat and relatively featureless landscape with elevation differences that range up to 10 meters (30 feet). These small differences in elevation are further moderated by long and gradual slopes. Surface water settings have been severely affected by rising sea level and most river systems, including much of the Nanticoke River and its tributaries in the study area, are tidal in their middle and lower reaches. In general, the watercourses of the study area, particularly the main course of the Nanticoke River and some of its larger tributaries, such as Deep Creek, Broad Creek, and Clear Brook, provide a richer range of resources than the less well watered interior. Therefore, for the purposes of this report two basic environmental zones, the riverine settings and the interior, will be delimited for the survey area.

The segment of the Nanticoke River included in the study area is the upstream portion of the main drainage channel which flows from southern Kent County, Delaware, a distance of more than 100 km to its confluence with the Chesapeake Bay. Within the study area there are approximately 27 km of the main channel shoreline. Most of the banks of the Nanticoke River in the study area between Sharptown and Seaford have an associated fringing

FIGURE 1

Study Area Location



tidal marsh characterized as the Arrow-Arum - Pickerel Weed Marsh Type (Zone VI - Daiber et al. 1976:86-87, Figure 25). These marshes occur within tidal mud flats where the water salinity ranges between fresh and slightly brackish. The prominent plants are Arrow-arum and pickerel weed and reed grass, marsh mallow, and wild rice are also common. Many species of duck and muskrat are found in the area and various species of fish, including anadramous species, use these marshes as spawning areas. In

general, these marshes provide a plethora of faunal and floral food sources not seen in other parts of the study area. Adjacent to the fringing marsh there is usually a steep bluff which is undergoing continual erosion. Cultivation often extends right up to the bluff, but in some cases a fringing woodland of hydrophytic species such as loblolly pine, sweet gum, mixed oaks, and Virginia pine (Ireland and Matthews 1974), is present. In a few places, such as near Seaford and Sharptown, there are some developed floodplain settings, but these geomorphological settings are rare. For the most part, movement of the main channel of the Nanticoke River has been constrained between the present river-edge bluffs over the course of the last 10,000 years.

Cypress swamps along some of the higher order tributaries of the Nanticoke, such as in the vicinity of James Branch, Hitch Pond, and Trussum Pond provide a unique environmental setting within the riverine area. In the study area, as is the case throughout the Delmarva Peninsula, cypress swamps are located just upstream of the tidal marshes. Bald cypress, swamp black gum, and red maple are the dominant tree species (Braun 1967:93; Brush et al. 1980:83) and there are many associated edible aquatic plants. Deer, and many other game animals frequent these swamps and they are highly productive environmental settings for hunters and gatherers. Unfortunately, the antiquity of these swamps is not known.

In contrast to the well watered and environmentally diverse riverine areas of southwestern Delaware, the interior is not as well watered. Certainly, the diversity of the tidal wetlands is not found in the interior. However, studies of environmental diversity in the Middle Atlantic Coastal Plain (Brush, Lenk, and Smith 1980; Braun 1967) note the importance of soil drainage in determining environmental composition and there are many patches of poorly drained soil settings in the interior (Ireland and Matthews 1974). These poorly drained areas are now characterized by woodlands of either deciduous or coniferous species, with the later developmentally older. Common species include willow oak, white oak, sweet gum, red maple, water oak, cow oak, black gum, sweet oak, holly, and dogwood (Braun 1967:268). Thus, the interior, prior to the artificial draining of agricultural fields, was probably at one time a rich mosaic of poorly drained, fresh water swamps and bogs, and well drained sand ridges. The poorly drained woodlands would have been productive settings for hunters and gatherers and would have been attractive settlement locations even though they were not as productive as the riverine areas. In sum, the study area can be generally characterized as a contrast between the very rich and productive riverine settings which included the oligohaline ecotone and a less rich, but still very productive, interior zone.

Numerous sources of data indicate that there were marked climatic and environmental changes over the past 12,000 years in both riverine and interior areas. Detailed discussions have been presented elsewhere (Custer 1983a:17-24; 1984a:30-37, 44-48, 62-

TABLE 1

PALEOENVIRONMENTS IN THE STUDY AREA

Episode	Interior Well-Drained	Poorly Drained	Riverine
Late Glacial (12,000 BC - 6500 BC)	Boreal forest, limited grasslands	Bogs and swamps with deciduous gallery forest	Deciduous gallery forest with some floodplain grasslands
Pre-Boreal/ Boreal (8000 BC - 6500 BC)	Boreal forest	Bogs and swamps with deciduous gallery forest	Deciduous gallery forest and boreal forest
Atlantic (6500 BC - 3000 BC)	Oak-hemlock mesic deciduous forest	Extensive bogs and swamps with deciduous gallery forest	Mesic deciduous forests
Sub-Boreal (3000 BC - 800 BC)	Oak-hickory-pine xeric forests and grasslands	Few bogs and swamps	Deciduous gallery forests with fringing wetlands
Sub-Atlantic /Recent (800 BC - recent)	Oak-pine forest with mixed mesophytic communities	Bogs and swamps with deciduous gallery forests	Deciduous gallery forests with fringing wetlands

64, 89-93, 154) and only a summary will be presented here. It should be noted that there are numerous relevant sources of paleoenvironmental data for Delaware's Low Coastal Plain including the Dill Farm Site (Custer and Griffith 1984), a series of cores from the Nanticoke drainage (Brush 1986), cores from a bay/basin feature near 7NC-H-20 (Custer and Bachman 1986) and other bay/basin sites (Webb, Newby, and Webb 1988), and a series of cores from the mouth of the Chesapeake Bay (Harrison et al. 1965). Table 1 summarizes the changing environments through time and notes their distributions in the riverine and interior portions of the study area. It should also be noted that the productivity of the riverine zone has changed through time as post-Pleistocene sea level rise (Belknap and Kraft 1978) inundated the drainage and pushed tidal and brackish water settings into the study area from the southwest. Perusal of Table 1 shows that the basic dichotomy between the riverine and interior areas probably was present for much of the Holocene and was an important factor in prehistoric settlement decisions.

Regional Prehistoric Background

The prehistoric archaeological record of the study area, and the Delmarva Peninsula in general, can be divided into four major periods: Paleo-Indian Period (ca. 12,000 B.C. - 6500 B.C.), the Archaic Period (6500 B.C. - 3000 B.C.), the Woodland I Period (3000 B.C. - A.D. 1000), and the Woodland II Period (A.D. 1000 - A.D. 1650). A fifth time period, the Contact Period, may also be considered and includes the time period from A.D. 1650 to A.D. 1750, the approximate date of the final Indian habitation of southern Delaware in anything resembling their pre-European Contact form. The descriptions of these periods noted below are derived from Custer (1983a; 1983b; 1984a; 1988).

Paleo-Indian Period (12,000 B.C. - 6500 B.C.). The Paleo-Indian Period encompasses the time period of the final disappearance of Pleistocene glacial conditions from Eastern North America and the establishment of more modern Holocene environments. The distinctive feature of the Paleo-Indian Period is an adaptation to the cold, and alternately wet and dry, conditions at the end of the Pleistocene and the beginning of the Holocene. This adaptation was primarily based on hunting and gathering, with hunting providing a large portion of the diet. Hunted animals may have included now extinct megafauna and moose. A mosaic of deciduous, boreal, and grassland environments would have provided a large number of productive habitats for these game animals throughout southern Delaware, and watering areas would have been particularly good hunting settings.

Tool kits of the people who lived at this time are oriented toward the procurement and processing of hunted animal resources. A preference for high quality lithic materials has been noted in the stone tool kits and careful resharpening and maintenance of tools was common. A recent analysis of fluted points from the Delmarva Peninsula, including some from the study area, shows this preference (Custer 1984b). A lifestyle of movement among the game-attractive environments has been hypothesized with the social organizations being based upon single and multiple family bands. Throughout the 5500 year time span of the period, the basic settlement structure remained relatively constant with some modifications being seen as Holocene environments appeared at the end of the Paleo-Indian Period.

The main types of Paleo-Indian sites expected for the study area are base camps, base camp maintenance stations, and hunting sites. The riverine settings of the Nanticoke and its major tributaries would be the expected locations for base camps while poorly drained interior swamps and bogs would be the foci of maintenance and hunting sites.

Archaic Period (6500 B.C. - 3000 B.C.). The Archaic Period is characterized by a series of adaptations to the newly emerged full Holocene environments. These environments differed from earlier ones and were dominated by mesic forests of hemlock and oak. A reduction in open grasslands in the face of warm and wet conditions caused the extinction of many of the grazing animals hunted during Paleo-Indian times; however, browsing species such as deer flourished. Adaptations changed from the hunting focus of the Paleo-Indians to a more generalized foraging pattern in which plant food resources would have played a more important role.

Tool kits were more generalized than earlier Paleo-Indian tool kits and showed a wider array of plant processing tools such as grinding stones, mortars, and pestles. A mobile lifestyle was probably common with a wide range of resources and settings utilized on a seasonal basis. A shifting band-level organization which saw the seasonal waxing and waning of group size in relation to resource availability is evident. A recent study of Archaic site distributions on the Delmarva Peninsula (Custer 1986a) indicates that although there were changes in adaptations between the Paleo-Indian and Archaic time periods, the basic site location patterns remained the same.

Woodland I Period (3000 B.C. - A.D. 1000). The Woodland I Period can be correlated with a dramatic change in local climates and environments that seems to have been a part of events occurring throughout the Middle Atlantic region. A pronounced warm and dry period set in and lasted from ca. 3000 B.C. to 1000 B.C. Mesic hemlock-oak forests were replaced by xeric forests of oak and hickory, and grasslands again became common. Some interior streams dried up, but the overall effect of the environmental changes was an alteration of the environment, not a degradation. Continued sea level rise created extensive brackish water marshes which were especially high in productivity throughout much of southern Delaware.

The major changes in environment and resource distributions caused a radical shift in adaptations for prehistoric groups. Important areas for settlements included the major river floodplains and estuarine areas. Many large base camps with fairly large numbers of people are evident in many parts of the Delmarva Peninsula. These sites supported many more people than previous base camp sites and may have been occupied on nearly throughout the year. The overall tendency was toward a more sedentary lifestyle with increases in local population densities.

Woodland I tool kits show some minor variations as well as some major additions from previous Archaic tool kits. Plant processing tools became increasingly common as would be expected in the face of an intensive harvesting of wild plant foods that may have approached the efficiency of horticulture by the end of the Woodland I Period. Chipped stone tools changed little from the preceding Archaic Period; however, more broad-bladed knife-like processing tools became prevalent. Also, the presence of a number of non-local lithic raw materials indicates that trade and exchange systems with other groups were beginning to develop (Custer 1984c). The addition of stone, and then ceramic, containers is also seen. These items allowed more efficient cooking of certain types of food and may also have functioned as storage containers for surplus food resources.

Social organizations also seem to have undergone radical changes during this period. With the onset of relatively sedentary lifestyles and intensified food production, which might have produced occasional surpluses, incipient ranked societies began to develop (Custer 1982b). One indication of these early ranked societies is the presence of extensive trade and exchange and some caching of special artifact forms.

Woodland II Period (A.D. 1000 - A.D. 1650). In many areas of the Middle Atlantic, the Woodland II Period is marked by the appearance of agricultural food production systems and large-scale village life (Custer 1986b). In southern Delaware, however, the change in lifeways is not as marked. There have been some finds of cultivated plants in the southern Delaware (Custer 1984a:165; Doms et al. 1986), but cultivated food remains are far less common than wild, gathered plant foods (Custer and Griffith 1986:44-49). In general, the Woodland II subsistence patterns in southern Delaware are similar to those of the Woodland I Period with the likely addition of minor amounts of cultivated plant food resources.

Changes in ceramic technologies and projectile point styles can be used to recognize archaeological sites from the Woodland II Period. Triangular projectile points appeared in stone tool kits immediately before the beginning of the Woodland II Period and by A.D. 1000, triangular projectile points are the only styles seen in prehistoric tool kits. Woodland II ceramics of southern Delaware are classified within the Townsend series (Griffith 1982) and show certain technological similarities with the preceding Woodland I ceramics. However, the appearance of more complex decorations including incised lines and cord-wrapped stick impressions distinguish the Townsend ceramic styles.

Contact Period (A.D. 1650 - A.D. 1750). The Contact Period is an enigmatic portion of the archaeological record of southern Delaware which began with the arrival of the first substantial numbers of Europeans in Delaware. The time period is enigmatic because only one Native American archaeological site that clearly dates to this period has yet been discovered in Delaware (7NC-E-42 - Custer and Watson 1985). In southern Delaware, Contact occupations have been reported for the Townsend Site (Omwake and Stewart 1963); however, the associations of European and Native American artifacts are problematic (Custer 1984a:177). Nevertheless, numerous Contact Period sites are evident in southeastern Pennsylvania and on the Maryland Eastern Shore (Davidson 1982; McNamara 1985; Davidson, Hughes, and McNamara 1985). It seems clear that the Native American groups of Delaware did not participate in much interaction with Europeans and were under the virtual domination of the Susquehannock Indians of southern Lancaster County, Pennsylvania, who lived during the same time period (Kent 1984). The Contact Period ended with the virtual extinction of Native American lifeways in the Middle Atlantic area except for a few remnant groups.

Survey Research Design and Methods

As was noted earlier, the basic goal of the survey was to quickly gather a sample of data on prehistoric site locations in southwestern Delaware in the Nanticoke River drainage. Because numerous studies of Delmarva Peninsula prehistoric site locations (Custer and Bachman 1986; Custer, Bachman, and Grettler 1986; Custer, Eveleigh, Klemas, and Wells 1986; Gelburd 1988) have shown that available surface water is a prime determinant of prehistoric site locations and that the larger sites are found along the higher order watercourses, the initial focus of the survey was along the main channel of the Nanticoke and its higher order tributaries. Also, we tried to focus on the area around the town of Seaford because of the rapid development and destruction of prehistoric sites in this area.

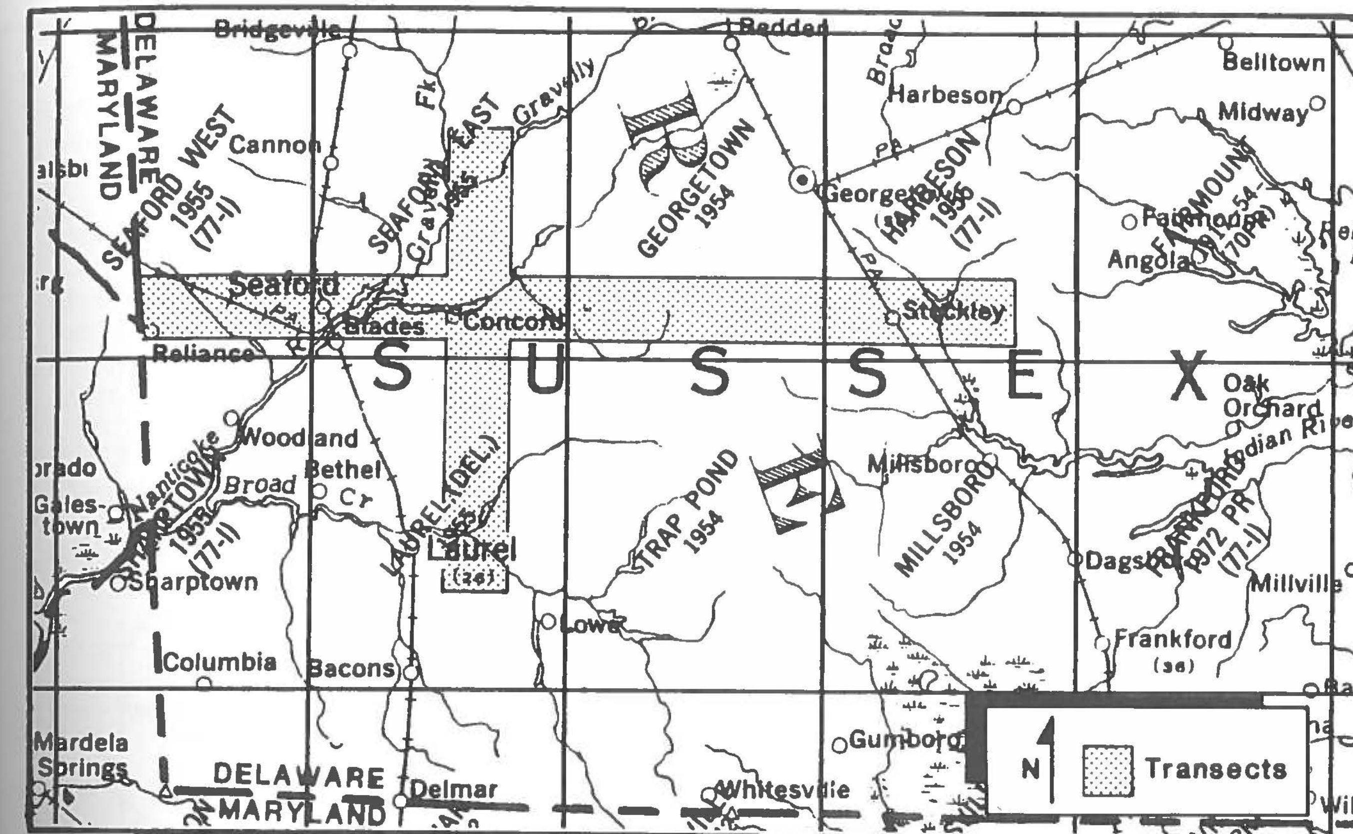
As the survey progressed, however, it was very clear to us that we were getting a very biased view of site locations by focusing only on the riverine zone and we expanded our coverage into the interior areas. A focus on the lower order drainages was continued and at the same time we also tried to look at a variety of interior site settings away from the lower order drainages. These interior settings included poorly drained woodlands, swamps, and bogs as well as well-drained knolls and sand ridges with no associated surface water. In order to control for our coverage of these interior environmental settings, two major transects (Figure 2) were surveyed. A north-south transect between Gulley Camp Ditch and James Branch and an east-west transect connecting the present survey of the Nanticoke with a past study of the Upper Indian River drainage (Custer and Mellin 1987) were surveyed.

The archaeological survey was confined primarily to plowed fields due to time and money constraints. Therefore, there is a bias in the survey data against some of the small sites that are found in the unplowed wooded fringes of some of the low and high order drainages. Nonetheless, the site data generated from this survey provide coverage of the majority of the variation in site locations found in southwestern Delaware. Furthermore, the actual survey data from this project were supplemented by the existing site location data for the area as recorded in the Delmarva Archaeological Data System (DADS) maintained at the University of Delaware Center for Archaeological Research (UDCAR).

Field methods consisted of simple pedestrian survey. Site boundaries were delimited as closely as possible and the presence of various classes of artifacts was noted. Diagnostic bifaces and samples of the range of ceramics from sites were collected. The various types of lithic raw materials present in the surface assemblages were also noted. A variety of locational data were also recorded for all sites and an attempt was made to provide a preliminary assessment of the function of the sites based on site size, artifact assemblage diversity, artifact density, and environmental location.

FIGURE 2

Transect Locations



SURVEY RESULTS

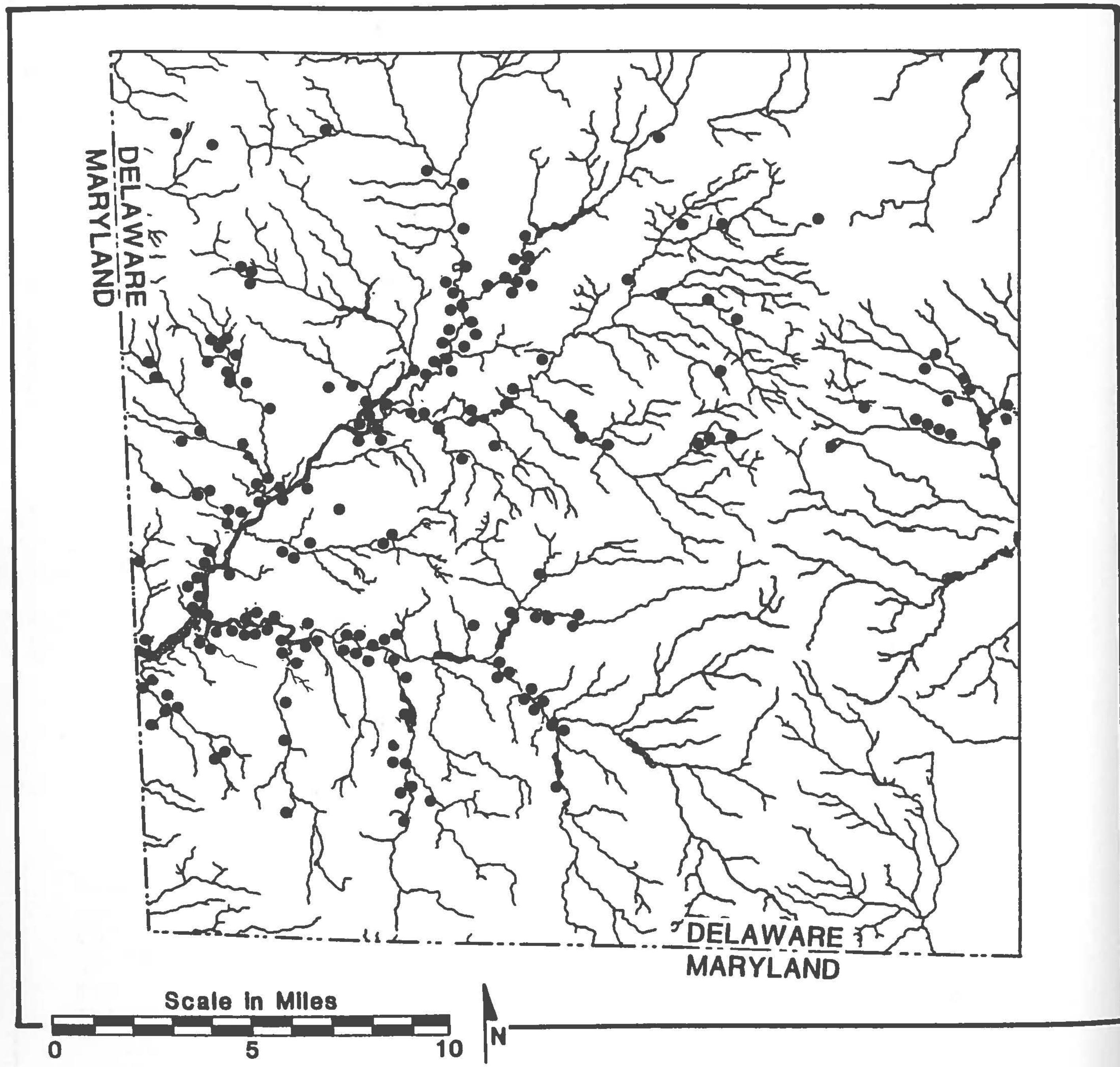
A total of 210 prehistoric archaeological sites were identified and recorded during the survey in addition to 106 known sites and Figure 3 shows a map of the site locations. Appendix I lists all of the sites and the data on site function and cultural-historical affiliation. Appendix II lists all of the sites and their associated locational information and Appendix III lists the diagnostic artifacts found at each of the sites. It can be seen that a large number of sites of varied functions in varied locations with differing time periods of occupation were discovered during the survey. These sites provide a useful data base for the study of prehistoric adaptations in southwestern Delaware.

SETTLEMENT PATTERN AND SITE LOCATION ANALYSIS

The large number of sites identified by the survey allows the analysis of locational variables to look for patterns in archaeological site locations for all of the sites in general and for individual time periods. The analysis of locational variables presented here uses the same variables and methods of

FIGURE 3

Study Area Site Locations



analysis applied in other settlement patterns analyses for the Delaware Coastal Plain (Custer and Bachman 1986; Custer, Bachman, and Grettler 1986; Custer, Eveleigh, Klemas, and Wells 1986; Gelburd 1988). Also, site location patterns for the southwestern Delaware study area will also be compared to the Delmarva Peninsula Low Coastal Plain site location data base recorded in DADS and the site location data for the St. Jones and Murderkill drainages. The St. Jones/Murderkill site data were chosen for

comparison with the Nanticoke data because the St. Jones and Murderkill drainages have been extensively studied with several controlled surveys (Custer, Bachman, and Grettler 1986; Gelburd 1988; Custer and Galasso 1983) and provide a comparable data set of site locations from a Low Coastal Plain Delaware Bay drainage.

A large number of locational variables can be considered in analyzing prehistoric settlement patterns; however, past studies of prehistoric site locations in the Delaware Coastal Plain have shown that only a few variables were truly important in prehistoric settlement location selection decisions. For example, a multivariate statistical analysis of Delaware Low Coastal Plain site locations, which was used to generate a logistical regression predictive model of site locations (Custer, Eveleigh, Klemas, and Wells 1986), showed that variables related to access to surface water and wetlands accounted for more than 80% of the variance of prehistoric site locations. Similar results were obtained by additional studies of Delaware Low Coastal Plain site locational data (Gelburd 1988) and studies of Delaware High Coastal Plain site location data (Wells 1981). Consequently, the variables of type of surface water, distance-to-water, presence/absence of stream confluences, geomorphological setting, and soil series were recorded for all sites (Appendix II) to study access to surface water and wetlands. Site aspect was also recorded because earlier studies (Custer and Bachman 1986:137-140) had shown interesting variability in this attribute when sites of different time periods and functions were considered. Recording of these site location attributes also allows direct comparison with other studies of Delaware Coastal Plain site locations.

Before considering the site location attributes it is necessary to consider the effects of sample biases in the site location data base. As was noted earlier, the present survey is biased toward major drainage locations at the expense of interior settings. However, the two transect sub-samples (Figure 2) were thought not to be as badly biased. Table 2 shows site location data for surface water type, presence/absence of confluences, and geomorphological setting for the total Nanticoke sample and the two transects. These data can then be compared to evaluate the sample data bases. A difference-of-proportion test (Parsons 1974) was used to compare the total Nanticoke survey data and the transects' data to check for significant differences (Table 3).

For the variable of surface water type, the north-south transect contained significantly fewer low order and more high order stream settings than the total data set. Given the inherent bias in the total data set, this finding would indicate that with respect to surface water type, the north-south transect is more biased than the total data set probably because the transect runs parallel to and within 2 km of the main channel of the Nanticoke River. The east-west transect is thought to be relatively unbiased with respect to coverage of interior areas. Therefore, the absence of significant differences between this transect and the total data set indicates that the total data set

TABLE 2

SITE LOCATION DATA BIASES

Water Type

Site Group	Interior Swamp	Low Order Stream	High Order Stream	Total
Total Nanticoke	22 (7)	78 (25)	216 (68)	316
NS Transect	1 (3)	1 (3)	31 (94)	33
EW Transect	1 (2)	9 (17)	49 (81)	54

Confluences

Site Group	No Confluence	Confluence	Total
Total Nanticoke	178 (56)	138 (44)	316
NS Transect	19 (58)	14 (42)	33
EW Transect	37 (68)	17 (32)	54

Geomorphological Setting

Site Group	Sand Ridge	Int. Flat	Terrace	Bluff	Floodplain	Total
Total Nanticoke	187 (59)	24 (8)	20 (6)	55 (17)	30 (9)	316
NS Transect	11 (33)	2 (6)	2 (6)	14 (42)	4 (12)	33
EW Transect	26 (48)	10 (18)	5 (9)	10 (18)	3 (6)	54

Value in () = row percent

is not too badly biased in favor of riverine settings at the expense of interior settings.

With respect to the stream confluence variable, no significant differences were noted between the total data set and either set of transect data. For the variable of geomorphological setting, three significant differences were noted: 1) the total data set contains more sand ridge settings

TABLE 3

TRANSECT AND TOTAL DATA COMPARISON

Variable	Value	Comparison	Test Statistic
Water Type	Interior Swamp	Total vs NS	.86
		Total vs EW	1.43
	Low Order Stream	Total vs NS	2.82*
		Total vs EW	1.28
	High Order Stream	Total vs NS	3.07*
		Total vs EW	1.95
Confluence	Present	Total vs NS	.14
		Total vs EW	1.67
Geomorph. Setting	Sand Ridge	Total vs NS	2.85*
		Total vs EW	1.51
	Interior Flat	Total vs NS	.32
		Total vs EW	2.57*
	Terrace	Total vs NS	.06
		Total vs EW	.79
	Bluff	Total vs NS	3.43*
		Total vs EW	.20
	Floodplain	Total vs NS	.48
		Total vs EW	.37

* - significant difference at 5% level

than the north-south transect; 2) the total data set contains significantly fewer interior flat settings than the east-west setting; and 3) the total data set contains significantly fewer bluff settings than the north-south transect. The differences between the total data set and the north-south transect data again reflect the greater biases in the north-south transect. The significant difference between the total data set and the east-west transect is the only one in ten comparisons. Therefore, the total data set from the Nanticoke survey is not thought to be too badly biased and can be used to analyze site location trends.

Surface Water Variables

The first surface water variable considered was distance-to-water. For the Nanticoke, DADS Low Coastal Plain, and St. Jones/Murderkill data sets, at least 95% of the sites were within 50 m of water. Analyses of other High and Low Coastal Plain data sets (Custer and Bachman 1986:131-132; Custer, Bachman, and Grettler 1986:176-177) showed similar results and no further analysis was undertaken for this variable. It can be noted, however, that the proximity of most of these sites to surface water underscores the previously noted importance of this variable as a site location factor in the Delmarva Coastal Plain.

TABLE 4

STREAM CONFLUENCE DATA

Site Group	Nanticoke	St. J./Murder.	Low C.P.
Total	138 (44)	86 (22)	494 (20)
Pro.	103 (42)	3 (10)	7 (15)
BC	26 (53)	5 (17)	10 (15)
P.I.	0	3 (23)	17 (33)
Ar.	3 (33)	2 (18)	13 (21)
W.I	72 (44)	15 (24)	79 (22)
W.II	44 (51)	14 (25)	80 (24)
C.F.	15 (48)	11 (28)	46 (22)
W.N.	38 (48)	9 (19)	41 (16)
E.C.	25 (37)	8 (24)	41 (15)
L.C.	9 (45)	6 (20)	25 (22)
P.I.BC	0	0	1 (8)
Ar.BC	0	0	1 (8)
W.IBC	23 (53)	8 (15)	8 (15)
W.IIBC	16 (53)	3 (16)	8 (17)
C.F.BC	8 (53)	5 (26)	8 (21)
W.N.BC	15 (50)	4 (20)	6 (15)
E.C.BC	17 (55)	4 (25)	6 (15)
L.C.BC	2 (25)	3 (19)	6 (20)

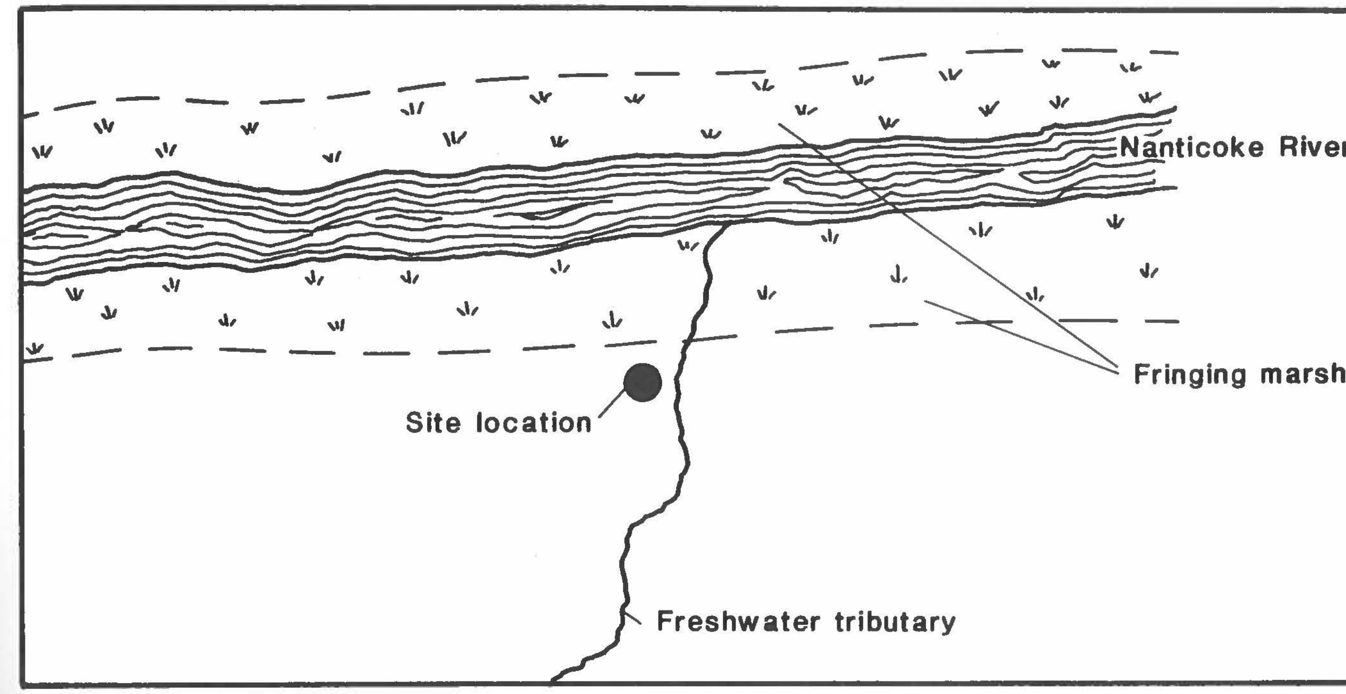
KEY: Pro.=procurement sites, BC=base camps, P.I.=Paleo-Indian, Ar.=Archaic, W.I=Woodland I, W.II=Woodland II, C.F.=Clyde Farm (and/or Barkers Landing), W.N.=Wolfe Neck, E.C.=Early Carey, L.C.=Late Carey

Counts are sites with presence of stream confluences in each data set. Values in () are corresponding percentages for each data set.

Table 4 shows the frequency with which sites are associated with stream confluences for the Nanticoke, St. Jones/ Murderkill, and Low Coastal Plain data sets. Data are noted for individual time periods, sites of varied functions, and base camps of different time periods. When the total site assemblages for each area are compared, the Nanticoke sites are associated with stream confluences twice as frequently as is the case for the St. Jones/Murderkill and Low Coastal Plain data sets. The Nanticoke site sample may contain more confluence settings because the section of the river surveyed contains many more areas with broad and brackish tidal marshes compared to the other areas. Although these marshes are productive settlement locations, potable water is limited. Therefore, the confluences of the main channel with its brackish marshes and incoming freshwater streams would be attractive settlement locations (Figure 4). The Nanticoke data set has a larger proportion of these settings than the entire Low Coastal Plain sample because the Low Coastal Plain sample covers a variety of drainages which do not have such extensive fringing brackish marshes. A comparison of the USGS quadrangle maps for

FIGURE 4

Nanticoke Marsh Site Locations



the Nanticoke and St. Jones/Murderkill drainages shows that the St. Jones/Murderkill drainages have fewer tributaries, most of which are confined to the south bank of the rivers, than the Nanticoke. Therefore, confluence settings for sites are more common in the Nanticoke drainage compared to the St. Jones/Murderkill drainage due to local topographic factors and the simple availability of these settings. Nonetheless, in all data sets, there is no overwhelming preference for confluence settings. Similar patterns were noted for the Delaware High Coastal Plain (Custer and Bachman 1986).

The frequency of stream confluence settings among procurement sites and base camp sites was also analyzed using a difference-of-proportion test and no significant differences are present. Neither base camps nor procurement sites are more frequently associated with stream confluences. Changes in the frequency of use of stream confluence settings through time were also considered using difference-of-proportion tests for varied time periods on a serial basis. Although numerous changes through time can be seen in Table 4, application of difference-of-proportion tests shows that none of these differences are statistically significant. Small and varied sample sizes account for the fact that differences which intuitively seem to be significant are not statistically

TABLE 5

NANTICOKE SURFACE WATER SETTING DATA

Site Group	Low Order Stream	Interior Swamp	High Order Stream
Total	78 (25)	22 (7)	216 (68)
Pro.	67 (27)	17 (7)	160 (66)
BC	3 (6)	4 (8)	42 (86)
Ar.	1 (11)	1 (11)	7 (77)
W.I	32 (20)	11 (7)	121 (74)
W.II	13 (15)	3 (3)	70 (81)
C.F.	5 (55)	2 (22)	2 (22)
W.N.	8 (10)	4 (5)	67 (85)
E.C.	7 (10)	6 (9)	55 (81)
L.C.	5 (25)	2 (5)	13 (65)
W.IBC	3 (7)	4 (9)	36 (84)
W.IIBC	3 (10)	1 (3)	26 (87)
C.F.BC	1 (7)	1 (7)	13 (86)
W.N.BC	2 (7)	3 (10)	25 (83)
E.C.BC	2 (6)	4 (13)	25 (81)
L.C.BC	1 (12)	1 (12)	6 (76)

TABLE 6

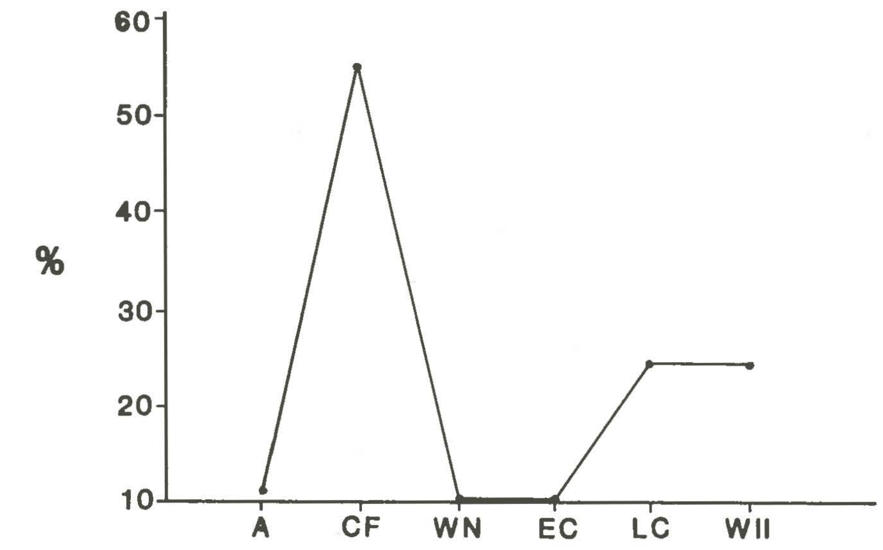
SURFACE WATER SETTING DATA - LOW COASTAL PLAIN DRAINAGES

Site Group	Swamp-Bay/Basin Nan.	Swamp-Bay/Basin St.J./Mur.	Swamp-Bay/Basin LCP	Stream Nan.	Stream St. J./Mur.	Stream LCP
Total	22(7)	30(7)	141(5)	294(93)	351(91)	2158(89)
Pro.	17(7)	0	0	217(93)	29(100)	48(100)
BC	4(8)	4(14)	5(8)	45(92)	25(86)	58(88)
P.I.	0	3(23)	3(4)	0	10(77)	67(89)
Ar.	1(11)	2(18)	3(5)	8(89)	9(82)	56(92)
W.II	3(3)	10(18)	20(6)	83(96)	45(82)	297(90)
C.F.	2(22)	4(10)	6(3)	7(78)	34(90)	192(91)
W.N.	4(5)	5(10)	13(5)	75(75)	42(89)	234(89)
E.C.	6(9)	4(12)	11(4)	62(91)	30(88)	239(89)
L.C.	2(5)	4(14)	6(6)	18(95)	26(86)	102(90)
P.I.BC	0	2(32)	2(16)	0	4(68)	11(84)
Ar.BC	0	2(50)	2(15)	0	2(50)	11(84)
W.IIBC	1(3)	3(16)	3(6)	29(97)	16(84)	40(87)
C.F.BC	1(7)	3(16)	3(8)	14(93)	16(84)	33(87)
W.N.BC	3(10)	3(15)	3(8)	27(90)	17(85)	35(90)
E.C.BC	4(13)	2(12)	3(8)	27(87)	14(88)	35(88)
L.C.BC	1(12)	3(18)	3(10)	7(88)	13(82)	25(86)

KEY: Pro.=procurement sites, BC=base camps, P.I.=Paleo-Indian, Ar.=Archaic, W.I=Woodland I, W.II=Woodland II, C.F.=Clyde Farm (and/or Barkers Landing), W.N.=Wolfe Neck, E.C.=Early Carey, L.C.=Late Carey, Value in () = percentage

FIGURE 5

Nanticoke Low Order Stream Utilization Through Time

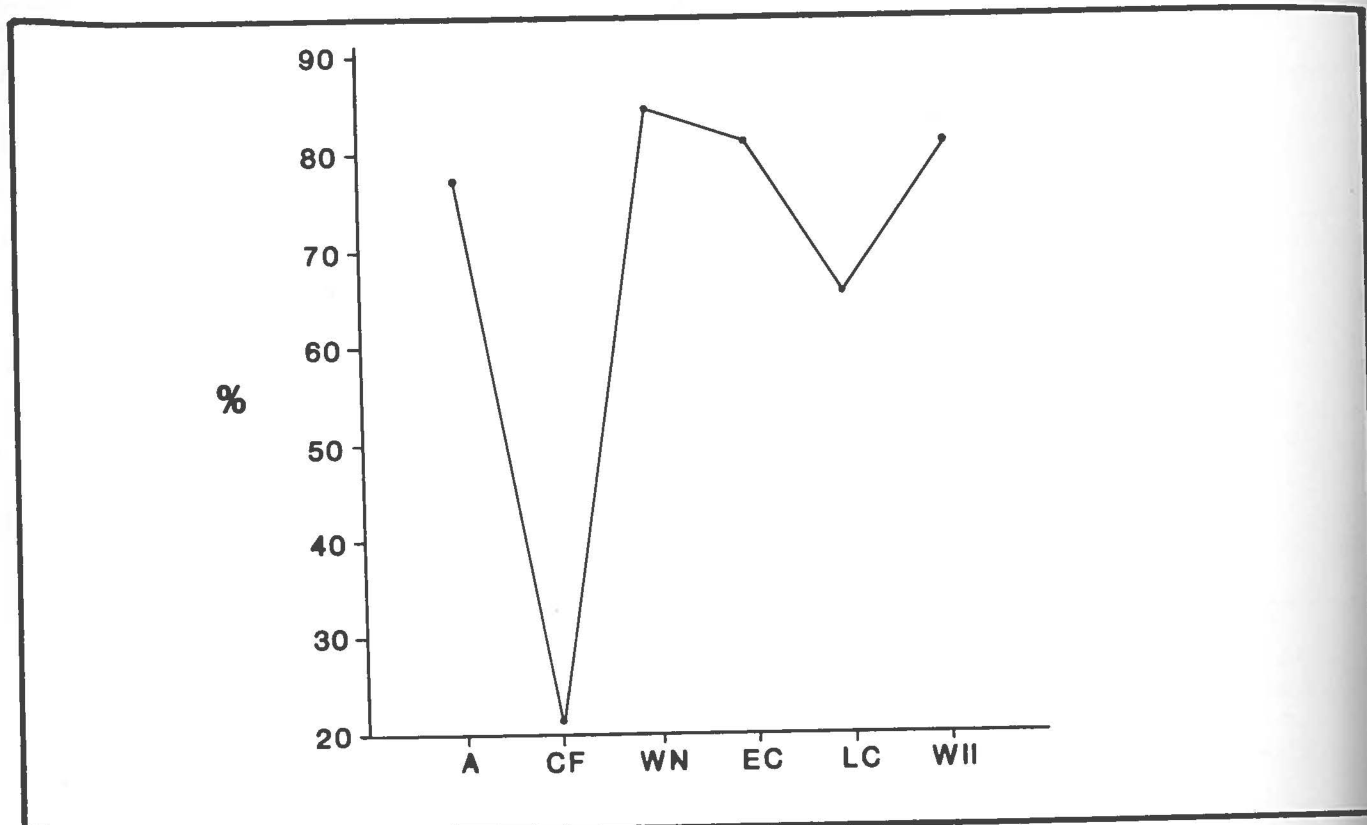


significant. This effect of small and varied sample sizes is seen throughout this analysis of site locations. The absence of any significant changes through time underscores the notion that the presence of stream confluence settings is not a critical variable in determining prehistoric site locations in the Delmarva Low Coastal Plain.

The types of surface water settings with which sites are associated were analyzed for the Nanticoke, St. Jones/Murderkill, and Low Coastal Plain data sets. Table 5 lists the surface water association data for the Nanticoke area and Table 6 lists the data for all three data sets. The main comparison is between flowing streams of varied order and interior freshwater swamps and bay/basin features. When the Nanticoke drainage data are considered, there is a clear preponderance of higher order stream settings compared to other surface water settings for all site types of all time periods. When the time series trends in surface water settings for the Nanticoke data were compared using the difference-of-proportion tests, no significant differences were present. Similar trends are also seen for the St. Jones/Murderkill and Low Coastal Plain data and no significant differences are noted in the time series data. The absence of significant differences in stream and interior swamp use through time underscores the importance of water sources for settlement locations throughout the prehistoric period. It should be noted that analyses of settlement locations in the High Coastal Plain (Custer and Bachman 1986:127-131) show significant variation in the use of interior swamps and bay/basin features through time. The absence of such significant variation in the Nanticoke area is most likely due to the fact that interior swamps and bay/basin

FIGURE 6

Nanticoke High Order Stream Utilization Through Time



features are not as numerous, or as important for prehistoric site locations, in the Nanticoke area. Thus, the large concentration of bay/basin features in the High Coastal Plain has a significant effect on their importance for prehistoric site locations.

Within the Nanticoke area, frequency of use of high and low order streams through time was investigated for all sites and for base camps using the difference-of-proportion test. No significant differences were noted for base camps; however, significant differences were noted when the total site assemblage was studied (Figures 5 and 6). There is a significant increase in the use of low order streams during Clyde Farm Complex times (ca. 3000 BC - 500 BC) and a corresponding reduction in high order stream use at the same time. These lower order stream settings are primarily located away from the main stem of the Nanticoke; however, they are still fairly substantial, perennially flowing third and fourth order streams. Therefore, the significant changes in the use of high and lower order streams during initial Woodland I times can be interpreted as an increased use of the smaller, yet still perennially running, stream settings. A similar trend was noted in the adjacent Atlantic Coast drainage (Custer and Mellin 1987) and this

TABLE 7

GEOMORPHOLOGICAL SETTING DATA - NANTICOKE STUDY AREA

Site Group	Sand Ridge	Int. Flat	Terrace	Bluff	Floodp.	Total
Total	187(59)	24(8)	20(6)	55(17)	30(9)	316
Pro.	152(62)	18(7)	12(5)	45(18)	17(7)	244
BC	25(51)	3(6)	4(8)	8(16)	9(18)	49
Ar.	7(77)	0	0	2(22)	0	9
W.I	100(70)	13(8)	8(5)	24(16)	19(12)	154
W.II	44(51)	2(2)	4(5)	21(24)	15(17)	86
C.F.	16(52)	1(3)	2(6)	4(13)	8(26)	31
W.N.	39(49)	6(8)	6(8)	14(18)	14(18)	79
E.C.	34(50)	6(9)	5(7)	12(18)	11(16)	68
L.C.	13(65)	2(1)	0	1(1)	4(2)	20
W.IBC	24(56)	1(2)	4(9)	5(12)	9(21)	43
W.IIBC	14(47)	0	2(7)	7(23)	7(23)	30
C.F.BC	8(53)	0	0	2(13)	5(33)	15
W.N.BC	14(47)	1(7)	4(13)	4(13)	7(23)	30
E.C.BC	16(52)	1(3)	2(6)	5(16)	7(23)	31
L.C.BC	4(50)	0	0	1(12)	3(37)	8

TABLE 8

GEOMORPHOLOGICAL SETTING DATA - ST. JONES/MURDERKILL STUDY AREA

Site Group	Sand Ridge	Int. Flat	Terrace	Bluff	Floodp.	Total
Total	6(2)	16(5)	151(12)	36(12)	88(30)	297
Pro.	0	1(3)	15(52)	6(21)	7(24)	29
BC	3(10)	1(3)	1(3)	18(62)	6(21)	29
P.I.	1(8)	1(8)	3(25)	5(42)	2(17)	12
Ar.	2(20)	2(20)	2(20)	3(30)	1(10)	10
W.I	4(7)	3(5)	20(34)	20(34)	12(20)	59
W.II	4(8)	2(4)	16(32)	14(28)	14(28)	50
C.F.	3(9)	2(6)	9(26)	17(49)	4(12)	35
W.N.	3(6)	2(4)	15(32)	17(36)	10(21)	47
E.C.	4(12)	3(9)	7(21)	12(35)	8(24)	34
L.C.	3(10)	1(3)	8(27)	11(37)	7(23)	30
P.I.BC	1(17)	0	0	5(83)	0	6
Ar.BC	2(50)	0	0	2(50)	0	4
W.IBC	4(8)	3(6)	0	31(60)	14(27)	52
W.IIBC	3(16)	1(5)	0	12(63)	3(16)	19
C.F.BC	3(16)	1(5)	0	13(68)	2(11)	19
W.N.BC	3(15)	1(5)	0	14(70)	2(10)	20
E.C.BC	3(19)	1(6)	0	10(62)	2(12)	16
L.C.BC	2(12)	1(6)	0	11(69)	2(12)	16

KEY: Pro.=procurement sites, BC=base camps, P.I.=Paleo-Indian, Ar.=Archaic, W.I=Woodland I, W.II=Woodland II, C.F.=Clyde Farm (and/or Barkers Landing), W.N.=Wolfe Neck, E.C.=Early Carey, L.C.=Late Carey, Value in () = percentage

TABLE 9

GEOMORPHOLOGICAL SETTING DATA - ALL LOW COASTAL PLAIN SITES

Site Group	Sand Ridge	Int. Flat	Terrace	Bluff	Floodp.	Total
Total	18(1)	67(3)	846(39)	167(8)	1045(49)	2143
Pro.	1(2)	2(4)	26(54)	8(16)	11(23)	48
BC	4(6)	3(5)	1(2)	39(59)	19(29)	66
P.I.	4(6)	6(9)	28(40)	11(16)	21(30)	70
Ar.	3(5)	6(10)	21(36)	9(15)	20(34)	59
W.I	9(3)	14(4)	119(35)	48(14)	150(44)	340
W.II	9(3)	10(3)	91(30)	32(11)	157(53)	299
C.F.	5(3)	10(5)	55(28)	40(21)	85(44)	195
W.N.	6(2)	8(3)	91(36)	43(17)	106(42)	254
E.C.	9(3)	11(4)	81(31)	42(16)	120(46)	263
L.C.	6(5)	1(1)	38(35)	22(20)	43(39)	110
P.I.BC	1(8)	1(8)	0	9(69)	2(15)	13
Ar.BC	2(15)	2(15)	0	6(46)	3(23)	13
W.IBC	4(8)	3(6)	0	31(60)	14(27)	52
W.IIBC	4(9)	3(7)	0	25(54)	14(30)	46
C.F.BC	4(11)	3(8)	0	23(61)	8(21)	38
W.N.BC	4(10)	2(5)	0	24(62)	9(23)	39
E.C.BC	4(10)	2(5)	0	23(58)	11(28)	40
L.C.BC	2(7)	1(3)	0	19(66)	7(24)	29

KEY: Pro.=procurement sites, BC=base camps, P.I.=Paleo-Indian, Ar.=Archaic, W.I=Woodland I, W.II=Woodland II, C.F.=Clyde Farm (and/or Barkers Landing), W.N.=Wolfe Neck, E.C.=Early Carey, L.C.=Late Carey, Value in () = percentage

settlement pattern shift may be indicative of crowding and excessively high population levels along the larger riverine and estuarine settings such as the main stem of the Nanticoke. Evidence of such a shift in land use patterns supports earlier contentions about initial Woodland I settlement shifts on the Delmarva Peninsula and throughout the central Middle Atlantic (Custer 1982b; 1984a; 1984d; 1988).

Geomorphological Setting

Tables 7 - 9 list the data on geomorphological settings for the Nanticoke study area, the St. Jones/Murderkill study area, and the total Low Coastal Plain data set. For all three data sets there is a clear association of base camp sites of all time periods with floodplain and river-edge bluff settings. Procurement sites are more commonly found on sand ridge and interior flat settings as has been noted in previous studies (Custer and Bachman 1986; Custer, Bachman, and Grettler 1986). Application of difference-of-proportion tests on the time series data shows no significant variation in these trends through time.

TABLE 10

ASPECT DATA - NANTICOKE STUDY AREA

Site Group	N	NE	E	SE	S	SW	W	NW
Total	75(24)	5(2)	85(27)	4(1)	79(25)	2(1)	64(20)	2(1)
Pro.	53(22)	4(2)	75(31)	3(1)	53(22)	1(1)	53(22)	2(1)
BC	19(39)	0	7(14)	1(2)	14(29)	1(2)	7(14)	0
Ar.	2(22)	0	1(11)	0	3(33)	0	3(33)	0
W.I	48(29)	2(1)	42(26)	1(1)	36(22)	1(1)	33(20)	1(1)
W.II	23(27)	2(2)	21(24)	0	23(27)	0	17(20)	0
C.F.	10(32)	0	6(19)	0	11(35)	0	4(13)	0
W.N.	23(29)	1(1)	19(24)	0	22(28)	0	14(18)	0
E.C.	25(37)	0	13(19)	1(1)	16(24)	1(1)	11(16)	1(1)
L.C.	5(25)	0	7(35)	0	6(30)	0	2(10)	0
W.IBC	18(42)	0	5(12)	1(2)	13(30)	1(2)	5(12)	0
W.IIBC	13(43)	0	3(10)	0	9(30)	0	5(16)	0
C.F.BC	7(47)	0	1(7)	0	6(7)	0	1(7)	0
W.N.BC	12(40)	0	3(10)	0	12(40)	0	3(10)	0
E.C.BC	14(45)	0	4(13)	1(3)	8(26)	1(3)	3(10)	0
L.C.BC	2(25)	0	1(12)	0	4(50)	0	1(12)	0

TABLE 11

ASPECT DATA - ST. JONES/MURDERKILL STUDY AREA

Site Group	N	NE	E	SE	S	SW	W	NW
Total	57(15)	42(11)	48(13)	0	93(25)	37(10)	57(15)	41(11)
Pro.	6(21)	5(17)	2(7)	0	9(31)	1(3)	3(10)	3(10)
BC	3(10)	5(17)	6(21)	0	2(7)	5(17)	5(17)	3(10)
P.I.	3(23)	1(7)	1(7)	0	1(7)	4(31)	3(23)	0
Ar.	4(36)	0	0	0	1(9)	4(36)	2(18)	0
W.I	6(10)	10(16)	8(13)	0	7(11)	7(11)	12(20)	11(18)
W.II	5(9)	8(15)	7(13)	0	9(16)	7(13)	15(27)	4(7)
C.F.	5(14)	3(8)	5(14)	0	5(14)	6(17)	9(25)	5(14)
W.N.	7(15)	5(11)	8(17)	0	6(13)	6(13)	8(17)	6(13)
E.C.	3(9)	6(18)	4(12)	0	3(9)	5(15)	7(21)	6(18)
L.C.	3(10)	6(20)	5(17)	0	4(13)	2(7)	4(13)	6(20)
P.I.BC	1(17)	0	1(17)	0	0	3(50)	1(17)	0
Ar.BC	2(50)	0	0	0	0	2(50)	0	0
W.IBC	6(12)	5(10)	12(24)	0	5(10)	9(18)	7(14)	7(14)
W.IIBC	2(11)	4(21)	4(21)	0	1(5)	4(21)	2(11)	2(11)
C.F.BC	2(11)	2(11)	4(21)	0	1(5)	3(16)	4(21)	3(16)
W.N.BC	2(10)	2(10)	5(25)	0	1(5)	3(15)	4(20)	3(15)
E.C.BC	2(12)	2(12)	3(19)	0	1(6)	3(18)	3(18)	2(12)
L.C.BC	1(6)	3(18)	4(25)	0	1(6)	2(12)	2(12)	3(18)

KEY: Pro.=procurement sites, BC=base camps, P.I.=Paleo-Indian, Ar.=Archaic, W.I=Woodland I, W.II=Woodland II, C.F.=Clyde Farm (and/or Barkers Landing), W.N.=Wolfe Neck, E.C.=Early Carey, L.C.=Late Carey, Value in () = percentage

TABLE 12

ASPECT DATA - ALL LOW COASTAL PLAIN SITES

Site Group	N	NE	E	SE	S	SW	W	NW
Total	332(14)	206(9)	418(17)	0	616(26)	207(9)	410(17)	203(8)
Pro.	7(15)	9(19)	4(8)	0	12(25)	7(16)	6(12)	3(6)
BC	8(12)	6(9)	15(23)	0	7(11)	11(17)	10(15)	8(12)
P.I.	9(12)	3(4)	13(17)	0	19(25)	13(17)	14(19)	4(5)
Ar.	12(20)	1(2)	12(20)	0	13(21)	11(18)	8(13)	4(7)
W.I	59(16)	27(8)	58(16)	0	71(20)	37(10)	65(18)	40(11)
W.II	45(14)	24(7)	68(21)	0	67(20)	34(10)	66(20)	26(8)
C.F.	37(18)	8(4)	36(17)	0	39(19)	21(10)	42(20)	27(13)
W.N.	42(16)	18(7)	43(17)	0	56(22)	23(9)	45(17)	32(12)
E.C.	39(15)	24(9)	48(18)	0	54(20)	29(11)	46(17)	26(10)
L.C.	19(15)	9(7)	20(16)	0	19(15)	14(11)	15(12)	17(14)
P.I.BC	2(15)	0	3(23)	0	2(15)	4(30)	2(15)	0
Ar.BC	4(30)	0	2(15)	0	2(15)	3(23)	2(15)	0
W.IBC	6(12)	5(10)	12(24)	0	5(10)	9(18)	7(14)	7(14)
W.IIBC	6(13)	4(9)	11(24)	0	4(9)	10(22)	5(11)	5(11)
C.F.BC	5(14)	2(5)	10(27)	0	2(5)	6(16)	7(19)	5(14)
W.N.BC	6(15)	3(8)	8(21)	0	1(3)	8(21)	7(18)	6(15)
E.C.BC	5(12)	3(8)	8(20)	0	5(12)	9(22)	5(12)	5(12)
L.C.BC	3(10)	4(14)	7(24)	0	2(7)	6(21)	3(10)	4(14)

TABLE 13

SOILS DATA - NANTICOKE STUDY AREA

Site Gr.	Evesboro	Fallsington	Pocomoke	Rumford	Sassafras	Woodstown
Total	264(87)	6(2)	5(2)	14(5)	5(2)	11(4)
Pro.	198(85)	6(3)	5(2)	13(6)	5(2)	7(3)
BC	45(94)	0	0	1(2)	0	2(4)
Ar.	9(100)	0	0	0	0	0
W.I	136(87)	2(1)	3(2)	6(4)	2(1)	7(4)
W.II	74(92)	0	1(1)	4(4)	0	1(1)
C.F.	25(86)	0	0	1(3)	1(3)	2(6)
W.N.	68(91)	1(1)	0	3(4)	1(1)	2(3)
E.C.	57(88)	1(2)	0	2(4)	1(2)	4(2)
L.C.	17(89)	0	1(5)	0	0	1(5)
W.IBC	39(93)	0	0	1(2)	0	2(5)
W.IIBC	28(96)	0	0	1(3)	0	0
C.F.BC	13(93)	0	0	1(7)	0	0
W.N.BC	27(93)	0	0	1(3)	0	1(3)
E.C.BC	27(90)	0	0	1(3)	0	2(6)
L.C.BC	7(100)	0	0	0	0	0

KEY: Pro.=procurement sites, BC=base camps, P.I.=Paleo-Indian, Ar.=Archaic, W.I=Woodland I, W.II=Woodland II, C.F.=Clyde Farm (and/or Barkers Landing), W.N.=Wolfe Neck, E.C.=Early Carey, L.C.=Late Carey, Value in () = percentage

TABLE 14

SOILS DATA - ST. JONES/MURDERKILL STUDY AREA

Site Gr	Evesboro	Fallsington	Pocomoke	Rumford	Sassafras	Woodstown
Total	19(5)	15(4)	3(1)	27(8)	279(80)	6(2)
Pro.	5(17)	0	0	4(14)	20(69)	0
BC	1(4)	2(9)	0	2(9)	18(78)	0
P.I.	0	0	0	1(9)	10(91)	0
Ar.	0	0	0	1(10)	9(90)	0
W.I	5(9)	4(7)	1(2)	5(9)	41(73)	0
W.II	3(6)	2(4)	0	4(8)	39(81)	0
C.F.	1(3)	0	0	3(8)	32(89)	0
W.N.	3(7)	2(4)	1(2)	7(16)	31(72)	0
E.C.	4(14)	3(11)	0	3(11)	18(64)	0
L.C.	3(12)	3(12)	0	1(4)	18(72)	0
P.I.BC	0	0	0	0	5(100)	0
Ar.BC	0	0	0	1(25)	3(75)	0
W.IBC	10(23)	2(4)	2(4)	7(16)	23(52)	0
W.IIBC	1(7)	1(7)	0	2(13)	11(73)	0
C.F.BC	1(6)	0	0	2(12)	13(81)	0
W.N.BC	1(5)	1(5)	0	2(11)	14(78)	0
E.C.BC	1(7)	1(7)	0	2(15)	9(69)	0
L.C.BC	1(8)	1(8)	0	1(8)	9(75)	0

TABLE 15

SOILS DATA - ALL LOW COASTAL PLAIN SITES

Site Gr	Evesboro	Fallsington	Pocomoke	Rumford	Sassafras	Woodstown
Total	230(15)	135(9)	54(4)	81(5)	966(63)	72(5)
Pro.	6(15)	1(2)	2(5)	4(10)	27(66)	1(2)
BC	12(22)	3(5)	4(7)	8(15)	28(51)	0
P.I.	6(10)	6(10)	7(12)	3(5)	34(57)	4(7)
Ar.	4(8)	4(8)	5(10)	5(10)	32(63)	1(2)
W.I	58(23)	14(6)	12(5)	21(8)	135(54)	9(4)
W.II	44(20)	11(5)	8(4)	15(7)	136(61)	8(4)
C.F.	15(11)	11(8)	9(7)	11(8)	84(62)	5(4)
W.N.	40(22)	17(9)	10(6)	20(11)	88(49)	6(3)
E.C.	40(24)	16(10)	5(3)	13(8)	81(49)	11(7)
L.C.	18(22)	6(7)	3(4)	6(7)	46(55)	4(5)
P.I.BC	0	1(9)	2(18)	1(9)	7(64)	0
Ar.BC	0	1(8)	1(8)	4(31)	7(54)	0
W.IBC	10(23)	2(5)	2(5)	7(16)	23(52)	0
W.IIBC	8(22)	2(5)	3(8)	5(14)	19(51)	0
C.F.BC	4(13)	1(3)	3(10)	5(16)	18(58)	0
W.N.BC	8(22)	1(3)	1(3)	7(19)	19(53)	0
E.C.BC	9(26)	2(6)	1(3)	6(18)	16(47)	0
L.C.BC	4(17)	1(4)	1(4)	3(13)	14(61)	0

TABLE 16

SOILS SERIES DISTRIBUTION DATA

Soil Series	Sussex County	Kent County	Total
Evesboro	29%	2%	19%
Fallsington	14%	23%	17%
Pocomoke	11%	8%	10%
Rumford	9%	4%	7%
Sassafras	11%	31%	19%
Woodstown	9%	9%	9%

Source: Matthews and Ireland 1971; Ireland and Matthews 1974

Aspect

Tables 10 - 12 list the data on site aspect for the Nanticoke study area, the St. Jones/Murderkill study area and all Low Coastal Plain sites. Examination of these tables shows that there are no clear aspect preferences in any data set of for any time period or site type. Likewise there is no significant variation through time shown in the application of the difference-of-proportion tests. Thus, aspect is not a critical site location variable in the Low Coastal Plain due to the region's low relief. In contrast, site aspect did seem to be of some importance in the High Coastal Plain (Custer and Bachman 1986:137-140).

Soils

Tables 13 - 15 show the data on distribution of sites across the major Low Coastal Plain soil series for the three data sets and Table 16 shows the natural distribution of these soil series in the study areas. It is clear that the frequency with which sites are associated with the major soil series is related to the natural distribution and frequency of these soil types. There is no significant variation in this trend through time as seen through the application of difference-of-proportion tests for any site types. Similar results were noted in site location analyses in the High Coastal Plain (Custer and Bachman 1986:140; Custer, Bachman, and Grettler 1986:176).

In sum, analysis of site locational variables for the Nanticoke site sample and other Low Coastal Plain data sets shows that access to surface water and wetlands is the major variable affecting prehistoric site locations. This result underscores findings from earlier studies.

PREDICTIVE MODEL DEVELOPMENT AND TESTING

An important objective of the Nanticoke survey project was to test the applicability of a LANDSAT-based predictive model for prehistoric site locations in the Delaware Coastal Plain. A complete description of the model, its development, and how it works is provided in Custer, Eveleigh, Klemas, and Wells (1986). The model was applied to the Nanticoke area by first classifying a LANDSAT image of the project area into a series of 13 previously determined environmental zones based on surface water, soils, and wetlands. This classification was accomplished by applying a series of algorithms that had been previously developed on an ERDAS computer for use in Low Coastal Plain settings in Kent County, Delaware. The classification was checked by comparison to air photos, USDA soil maps, wetland atlases, and USGS topographic maps, and was seen to be accurate.

The next step in the application was to compile a 50m quadrat-based Geographical Information System (GIS) consisting of distance measures to the 5 major variables used in the Kent County study. These 5 distance measures mainly noted distances to surface water and wetlands. The distance measures were then used as independent variables in a logistical regression equation which took the form:

$$P = .092 - .022(X1) - .193(X2) - .397(X3) + .001(X4) + .653(X5)$$

where:

P = the probability of occurrence of a prehistoric site in a given quadrat

X1 = distance to turbid water

X2 = distance to clear water

X3 = distance to brackish marshes

X4 = distance to freshwater marshes

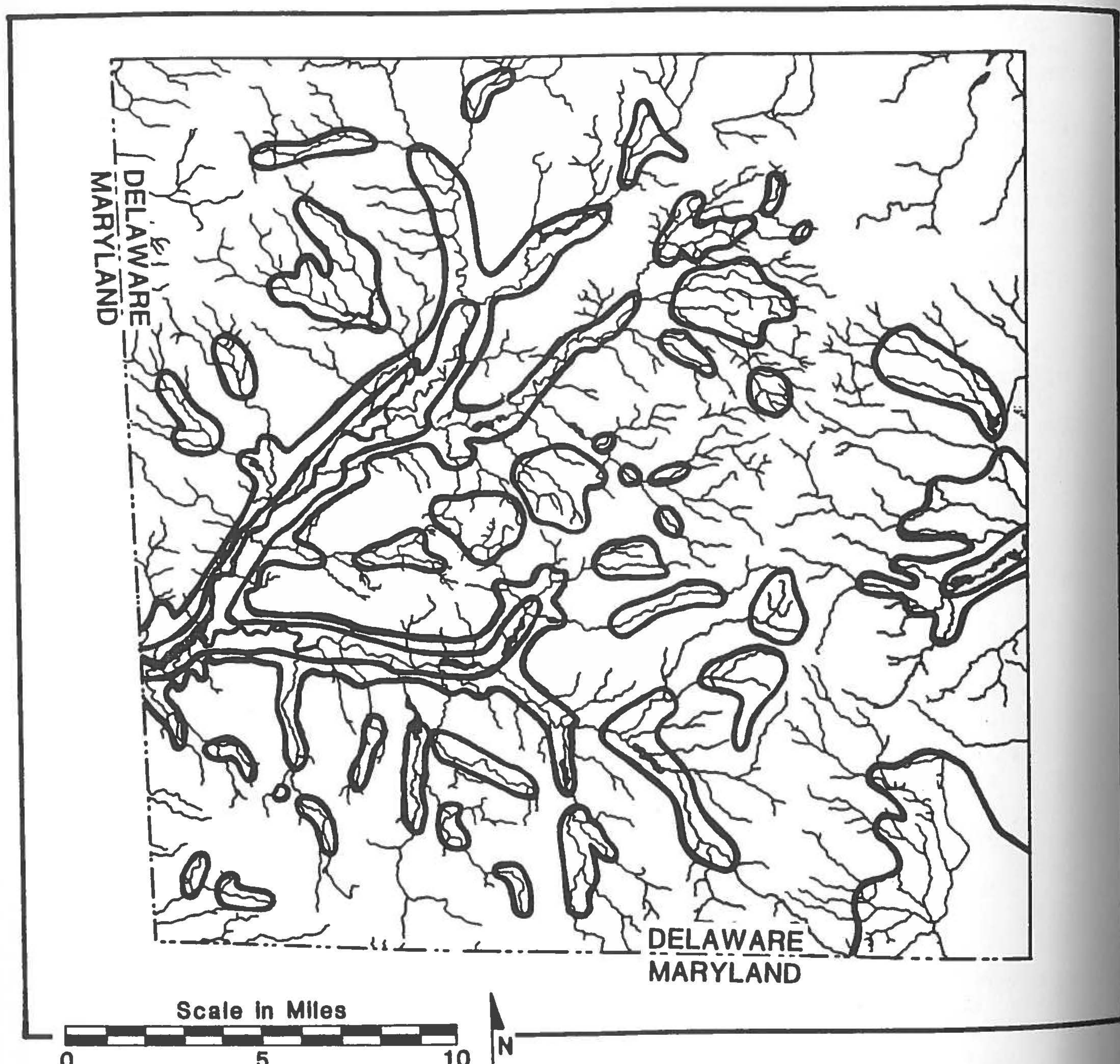
X5 = distance to trees.

The coefficients used in the logistical regression equation were those developed in the Kent County study.

The logistical regression equation was then applied to the distance measures for each 50m quadrat in the GIS yielding a value (P) between 0 and 1 for each quadrat which is roughly equivalent to the probability of a prehistoric site being present in the quadrat (Wells 1981). These values were then grouped into one of three categories: high (p>.75), medium (.75>p>.50), and low (p<.50) and a contour map of the probability values was then prepared (Figure 7). The high probability zones are primarily

FIGURE 7

Site Prediction Probability Zones



located along the major drainages, as would be expected given the results of the site location analyses. Medium probability zones are found along lower order streams and in interior areas with freshwater swamps. Low probability areas are primarily found in the interior areas.

TABLE 17

COMPARISON OF PREDICTIVE MODEL AND SURVEY RESULTS

	Probability Zones		
	High	Medium	Low
Expected	147	71	15
Observed	146	68	20

Chi-square=1.39 D.O.F.=2 p>.50

The sites found in the survey can be used to test the predictive model. A simple comparison of Figures 3 and 7 shows that indeed most of the sites fall in the high and medium probability zones, indicating that the model is probably accurately predicting site locations. A more rigorous test of the model was undertaken by using the GIS grid system. The probability values were multiplied by the numbers of quadrats within each probability class to generate an expected number of quadrats which should contain sites. This expected value was then compared to the actual number of quadrats which did contain sites. Table 17 shows the comparison of the expected and observed values and a chi-square test showed that there were no significant differences between the observed and expected values. In sum, the LANDSAT model seems to accurately predict site locations in the Nanticoke region. However, the site survey data used in this test of the model are somewhat biased and further testing of the model is desirable. Nonetheless, the preliminary tests of the model indicate that it can be used to guide future surveys and cultural resource management decisions in the Nanticoke region.

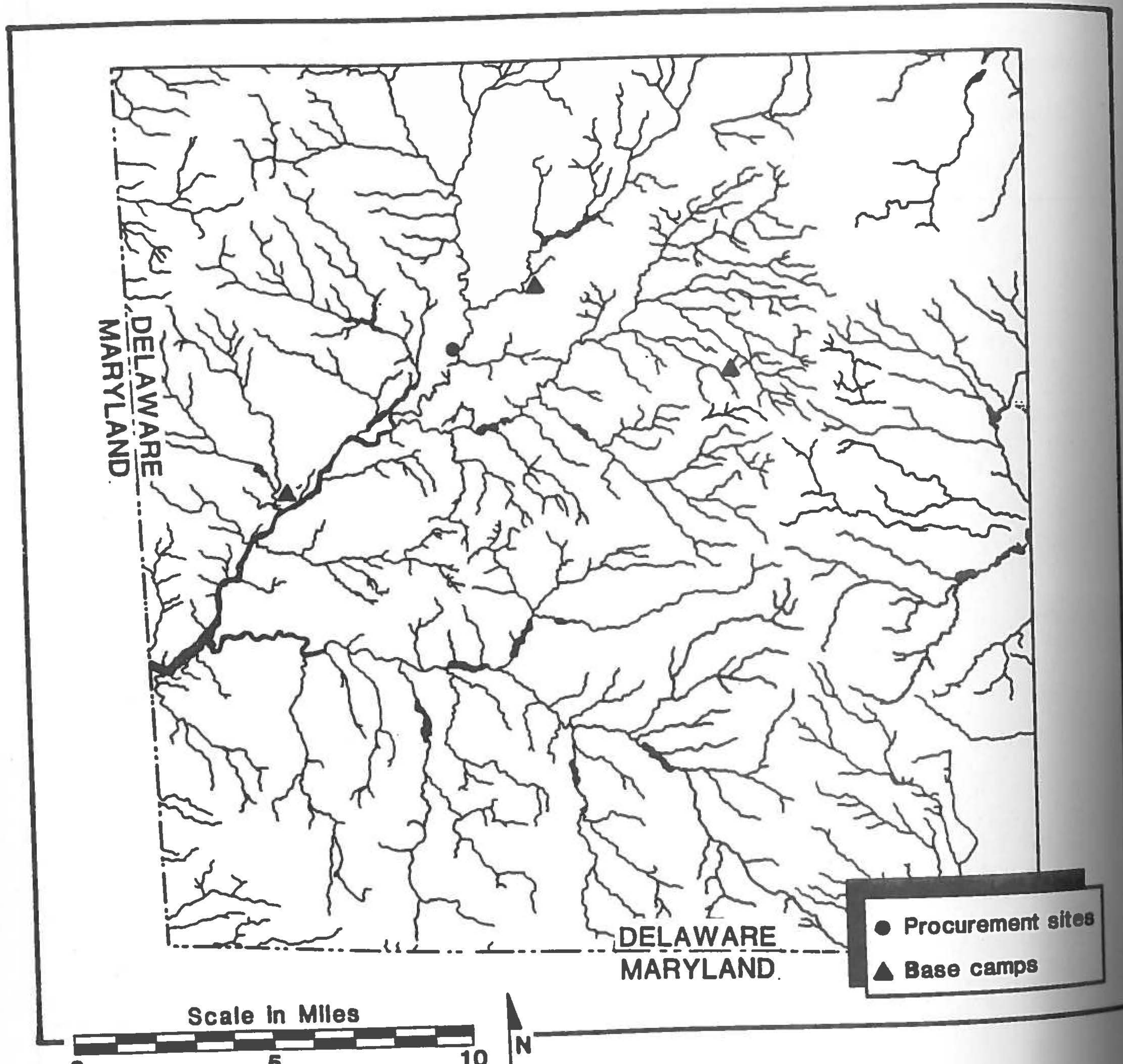
It can also be noted that the predictive model's probability zones also separate sites by functional categories. Ninety percent of the base camps are found in the high and medium probability zones. Because most of the known site data base dates to the Woodland I and Woodland II time periods, it is difficult to assess the model's applicability for earlier time periods, or particular culture complexes within the Woodland I time period. However, because the analyses of site location attributes showed few differences through time, the predictive model is most likely equally applicable for all time periods and culture complexes.

SPATIAL ANALYSIS

In addition to considering the relationships between site locations and environmental variables on a site-by-site basis, the large size of the Nanticoke site data base allows the analysis of the distribution of different types of sites from

FIGURE 8

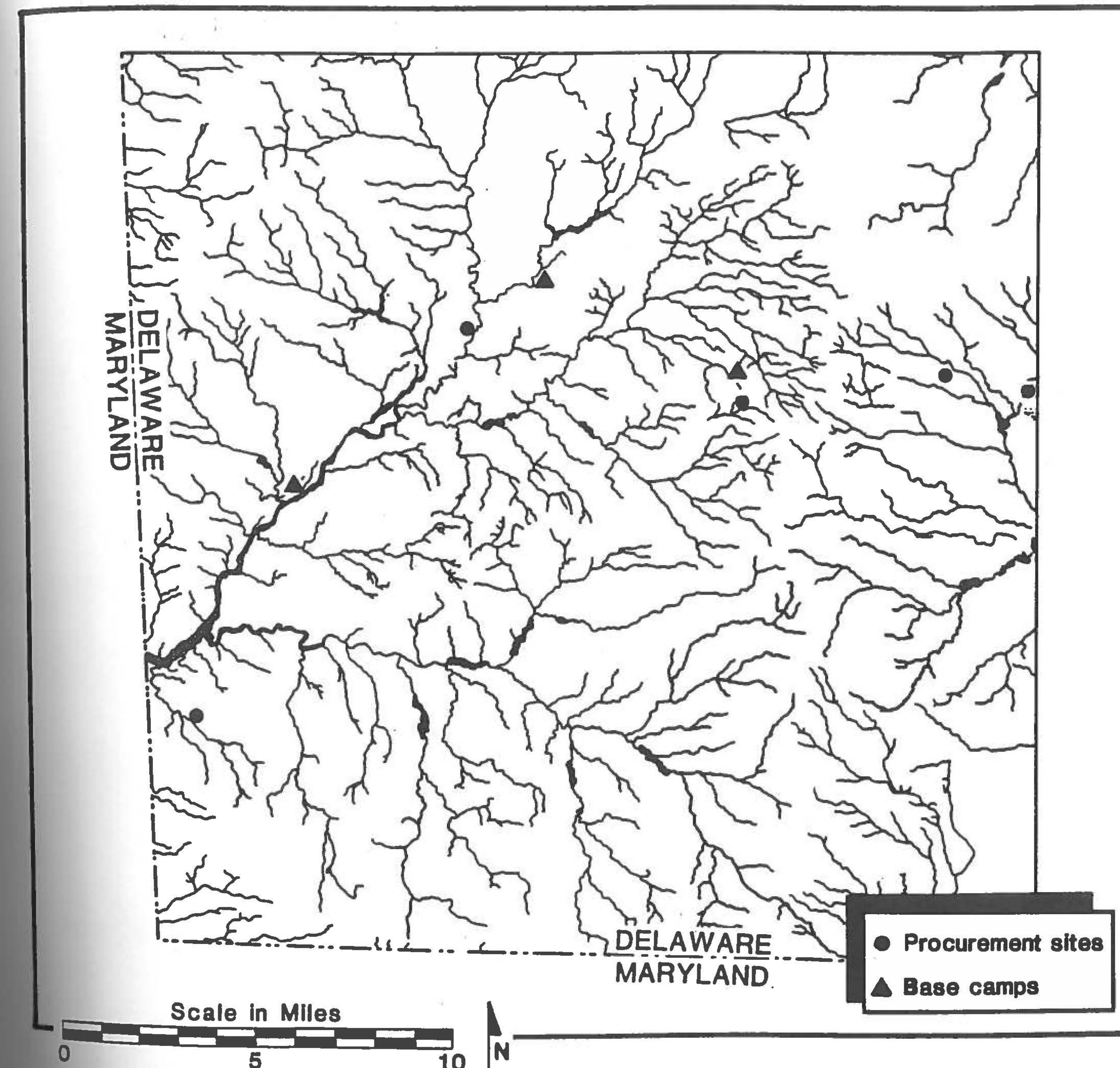
Paleo-Indian Site Locations



different time periods throughout the Nanticoke region. Figures 8 - 15 show the distribution of sites in the study area by time periods and complexes. Although these data are limited, especially for the Paleo-Indian and Archaic time periods, and although the functional interpretation of the sites is tenuous given the current level of investigations, some patterns in site distributions can be noted.

FIGURE 9

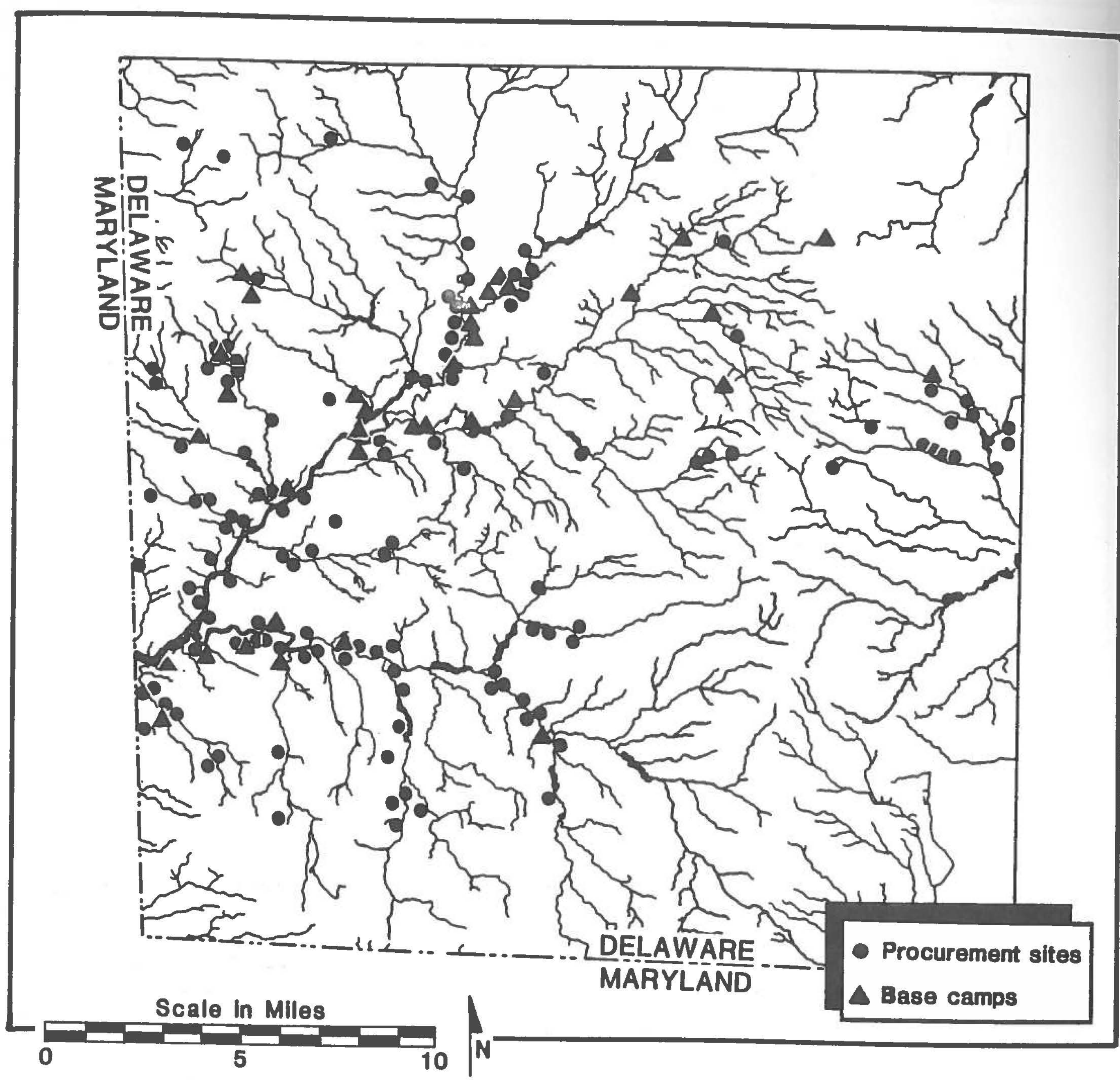
Archaic Site Locations



Paleo-Indian sites (Figure 8) are located along the main branch of the Nanticoke as well as in the drainage divide area between the Nanticoke and Indian River drainages. Archaic sites (Figure 9) show a similar distribution. Figure 10 shows all of the Woodland I period sites and the increased intensity of settlement along the major drainage compared to earlier time periods is readily apparent. There are important increases in

FIGURE 10

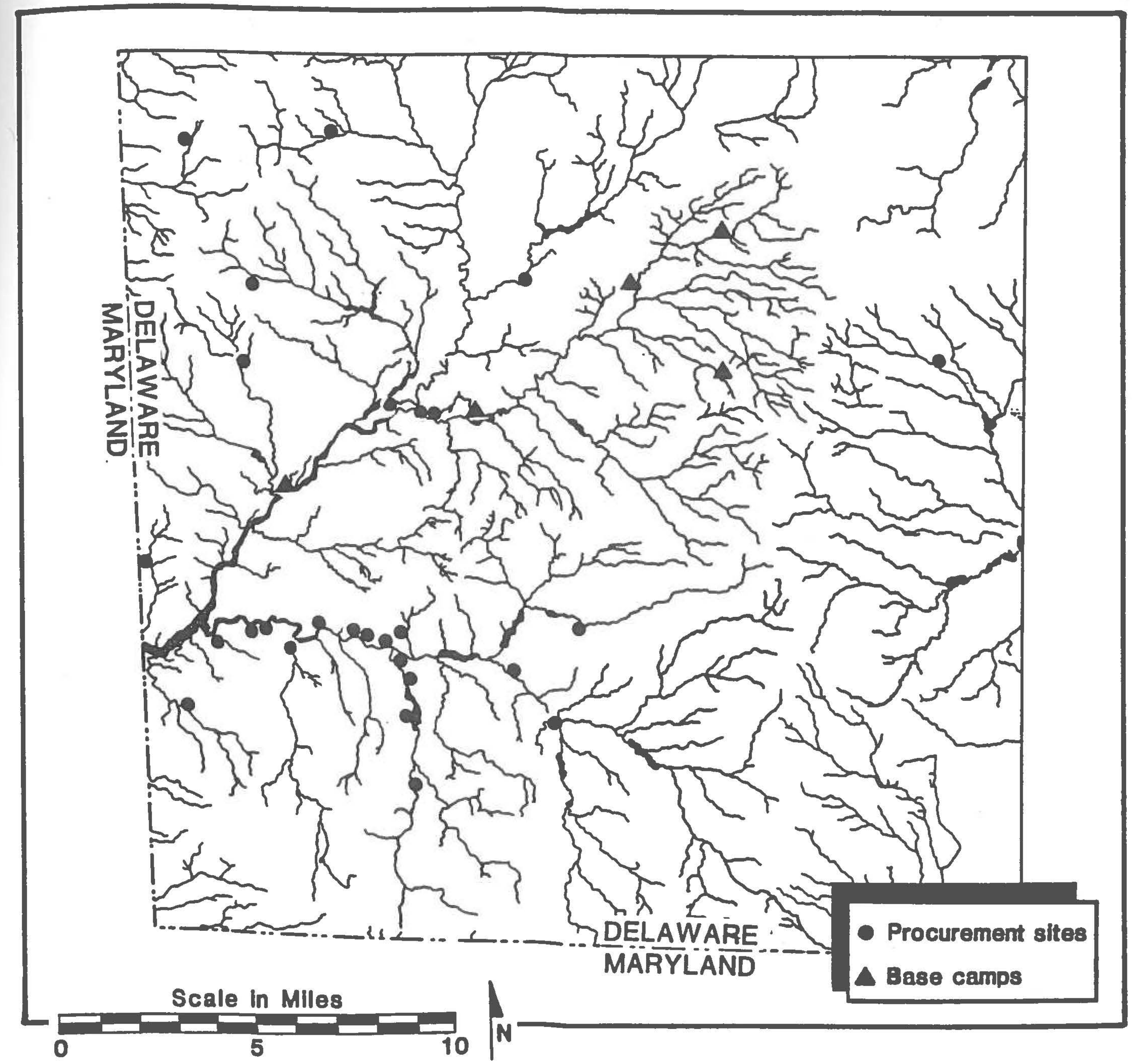
Woodland I Site Locations



both procurement and base camp sites in these areas. Although some of the increase is undoubtedly due to increased archaeological visibility for the more recent sites, the large magnitude of the increase is probably also due to population increases and increasingly intensive settlement patterns. Examination of Figure 10 also shows the focus of Woodland I base camps along the main branch of the Nanticoke. In general,

FIGURE 11

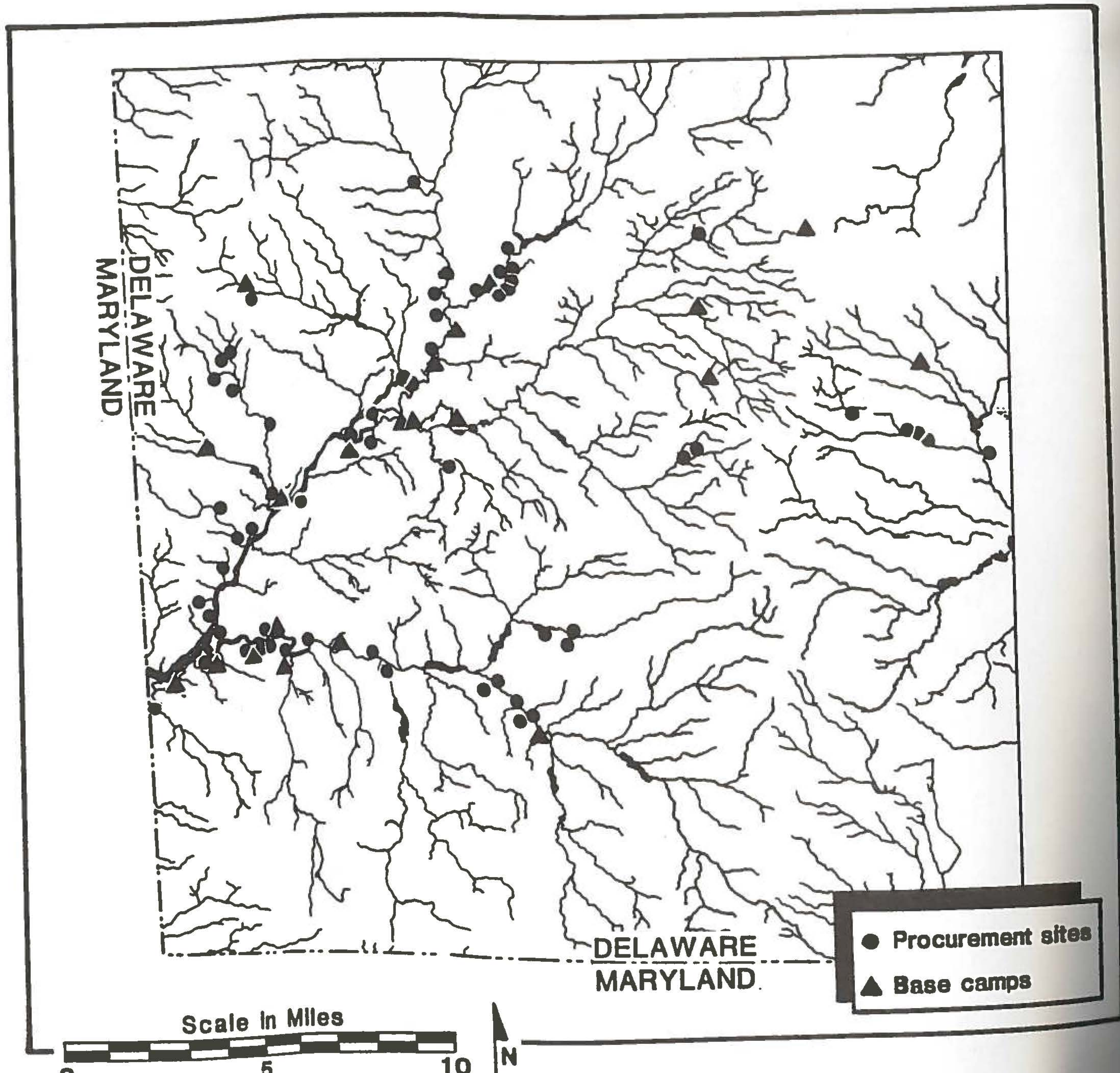
Clyde Farm Site Locations



procurement sites are found along the lower order tributaries. Also, a series of base camps are found in the drainage divide area to the east of the main branch of the Nanticoke. It may be that Woodland I settlement systems in this area involved a seasonal shift between base camps in riverine and drainage divide areas. However, this hypothesis needs to be tested with future fieldwork.

FIGURE 12

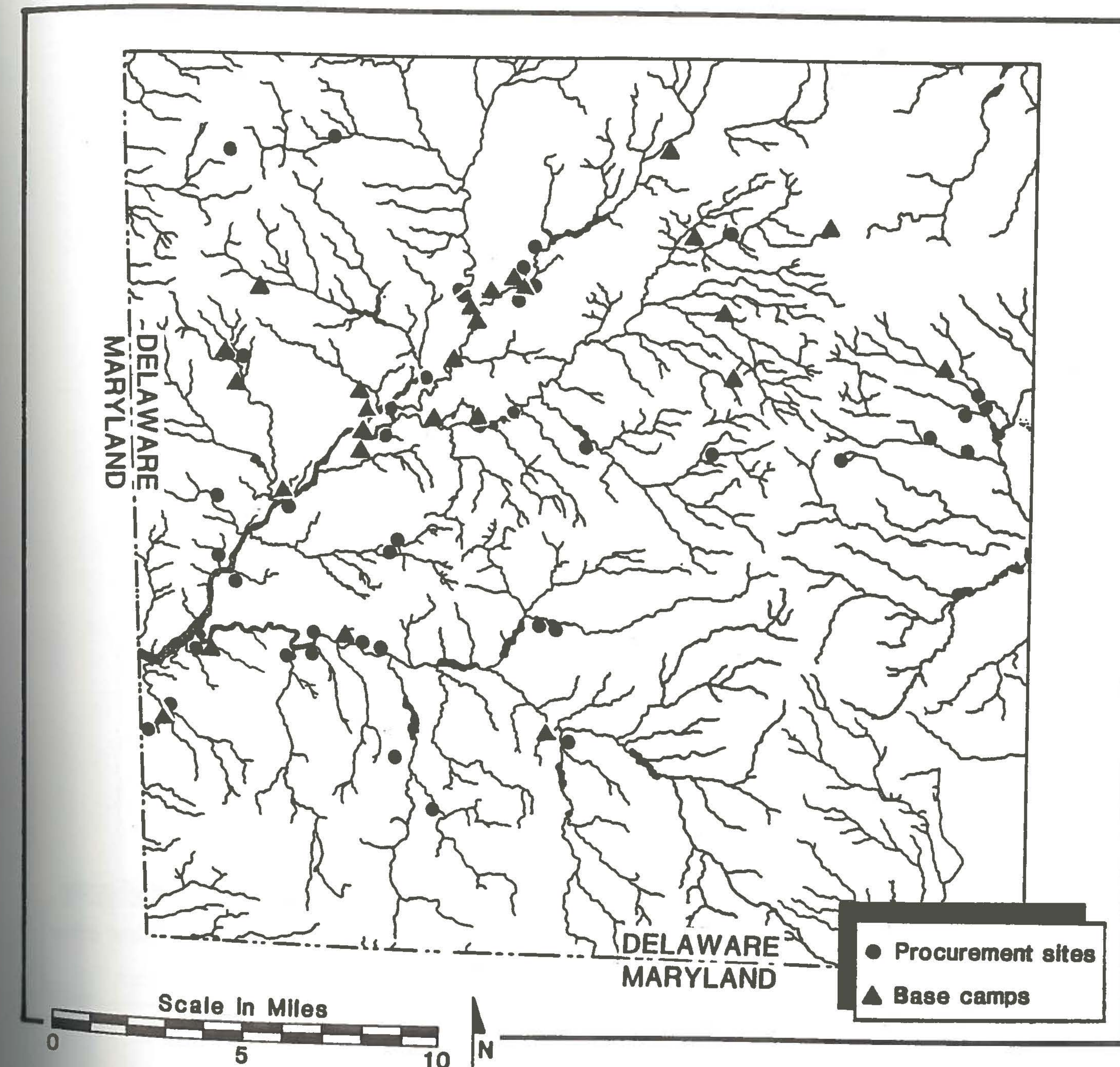
Wolfe Neck Site Locations



Figures 11 - 14 show the site distributions for the four major cultural complexes of the Woodland I Period. During the Clyde Farm Complex of initial Woodland I times (3000 - 500 BC), the base camp distribution is the same as that of the general Woodland I time period. However, there does seem to be an especially large number of Clyde Farm Complex procurement sites along Broad Creek, especially between Records Pond and the

FIGURE 13

Carey Site Locations



Nanticoke River. Figure 12 shows a pronounced increase in the number of sites in the study area moving into Wolfe Neck Complex times (500 B.C. - 0 A.D.) and there is an increased intensity of settlement along the main branch of the Nanticoke and in the drainage divide zone. Base camps are seen on the upper reaches of Broad Creek, an area that was the location of only procurement sites during the preceding Clyde Farm Complex.

FIGURE 14

Late Carey Site Locations

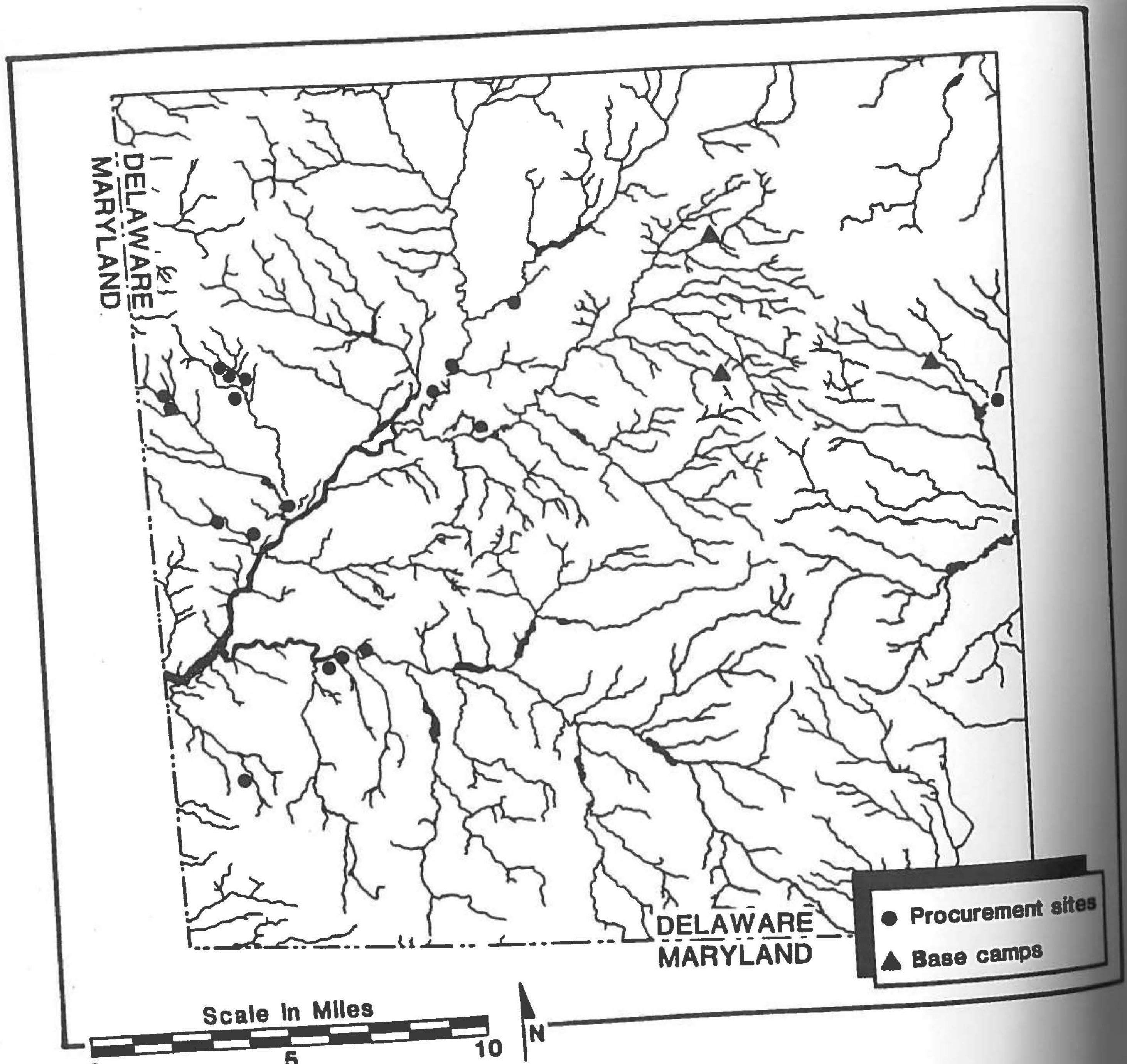
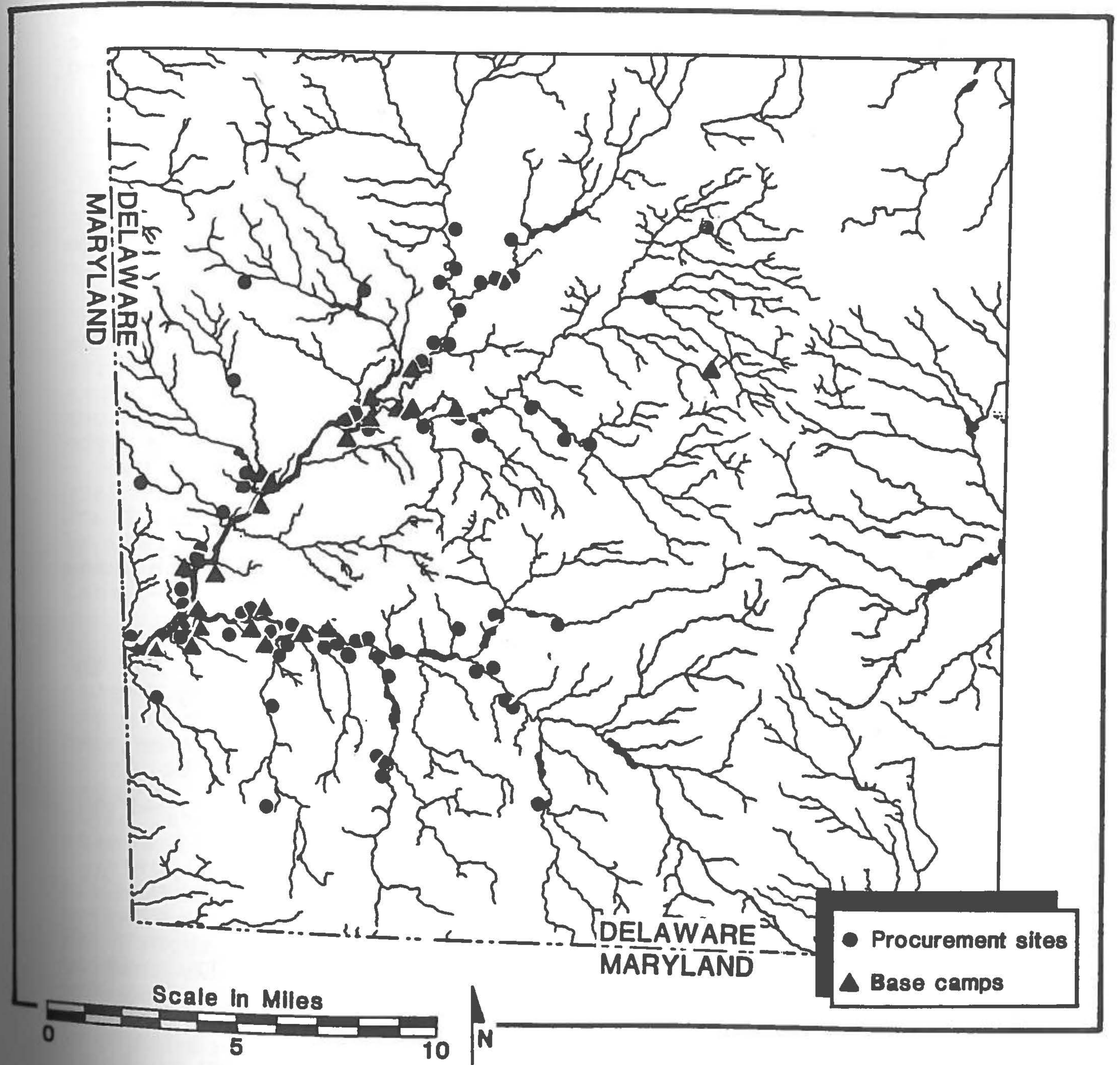


Figure 13 shows the distribution of Carey Complex (0 A.D. - 500 A.D.) sites. The settlement pattern and its intensity during this time period are identical to the preceding Wolfe Neck Complex. However, the Carey Complex base camps tend to be located further upstream than Wolfe Neck base camps. This upstream settlement shift is probably due to the movement of limits of brackish water marshes with sea level rise. The sites

FIGURE 15

Woodland II Site Locations



dating to the time period of the Late Carey Complex are shown in Figure 14. There is a definite reduction in the number of sites in the region, but this reduction may be related more to problems in the identification of diagnostic artifacts from this time period. Nevertheless, the reduction in the number of sites is very dramatic and may be related to population disruptions and migrations hypothesized for the region (Custer 1988; 1987; Fiedel

1987). Figure 15 shows the distribution of Woodland II Period (A.D. 1000 - 1600) sites and the settlement intensity seems to have returned to levels comparable to those seen during Wolfe Neck and Carey Complex times. A major difference between Woodland I and Woodland II settlement patterns is the concentration of Woodland II base camps on the main branch of the Nanticoke and Broad Creek. The diversity of base camp locations is certainly reduced moving from the Woodland I into the Woodland II Period.

DIAGNOSTIC ARTIFACTS AND EXOTIC LITHIC MATERIALS

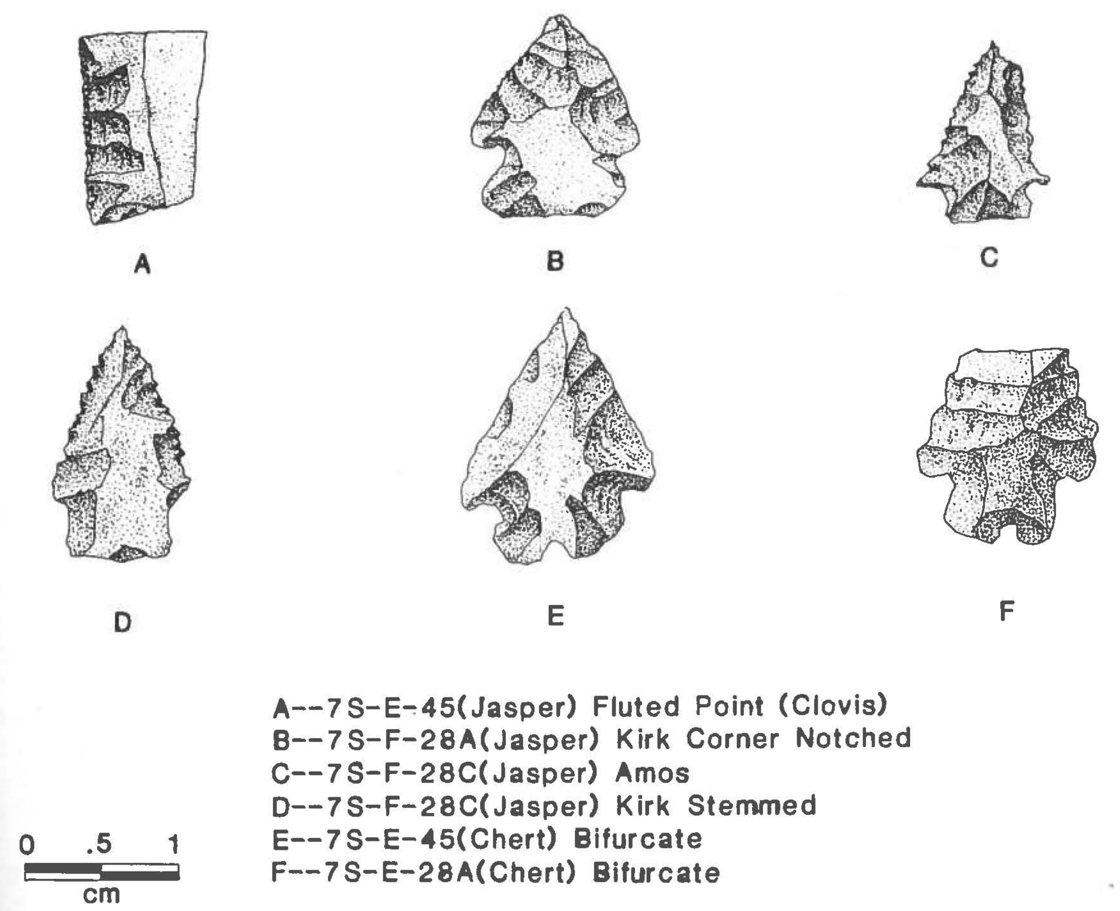
Only a limited number of artifacts were collected during this phase of the field research; therefore, only a limited range of observations can be made. Appendix III lists the diagnostic artifacts recovered.

The Paleo-Indian and Archaic projectile points are of some interest (Figure 16). All are manufactured from high quality cryptocrystalline materials and are somewhat small in size compared to the size ranges noted from more extensive collections from the Delmarva Peninsula (Custer 1986a). Most likely, the small size of the points is due to extensive resharpening (e.g. - Fig. 16B and 16C) and the small size of the available secondary cobble deposits in the Nanticoke area. The later Woodland I and Woodland II projectile points are manufactured from a variety of locally available secondary cobbles of cryptocrystalline materials, quartz, and quartzite. Some use of non-local materials is also evidenced and will be described later.

The Woodland Period ceramics found during the survey for the most part fit within the range of types described by Custer (1985). The preponderance of sites with early Dames Quarter ceramics (N=9) compared to other Experimental wares (N=1) also confirms observations about style and interaction zones in southern Delaware during early Woodland I times (Custer 1985:149). Two varieties of ceramics recovered from local sites differ somewhat from traditional types. A series of sherds tempered with large amount of finely crushed and fired pottery, or hematite, was noted in the collections from Prickly Pear Island (7S-H-18 - Custer 1984a:167) and at sites from the Barnes Woods Nature Preserve (Wise 1985). These wares are thought to date to Late Carey Complex times and may be typologically related to Hell Island wares. Another interesting ceramic sherd was recovered from 7S-E-104 (Figure 17). The sherd has punctated designs, which are only rarely found on prehistoric ceramics from Delaware. The rim sherd resembles the Clemson Island Punctate type of the Susquehanna Valley and probably dates to the Woodland I/Woodland II transition time period. In general, the terminal Woodland I time period in the Nanticoke region is one of considerable ceramic variability. At least four distinct ceramic varieties are present: refined Mockley (Claggett), Hell Island, Clemson Island, and the finely crushed hematite/grog tempered wares.

FIGURE 16

Paleo-Indian and Archaic Projectile Points



A--7S-E-45(Jasper) Fluted Point (Clovis)
B--7S-F-28A(Jasper) Kirk Corner Notched
C--7S-F-28C(Jasper) Amos
D--7S-F-28C(Jasper) Kirk Stemmed
E--7S-E-45(Chert) Bifurcate
F--7S-E-28A(Chert) Bifurcate

As is the case with most Delmarva Peninsula artifact collections, a series of lithic artifacts, including bifaces and debitage, are manufactured from non-local argillite and rhyolite. The presence of these non-local materials indicates the existence of some kind of trade and exchange systems and the changing intensity of these systems through the Woodland I period for the Nanticoke region has been noted elsewhere (Custer 1988; 1984c). Figure 18 shows the location of the sites with argillite and rhyolite artifacts and these sites are found throughout the Nanticoke study area in both the riverine and interior drainage divide areas. Table 18 shows the distribution of argillite and rhyolite at sites of varied function and it can be seen that occurrences of individual artifacts manufactured from exotic raw materials are evenly divided between base camp and procurement sites. However, occurrences of both argillite and rhyolite together are found primarily at base camps.

FIGURE 17

Punctate Ceramic Sherd

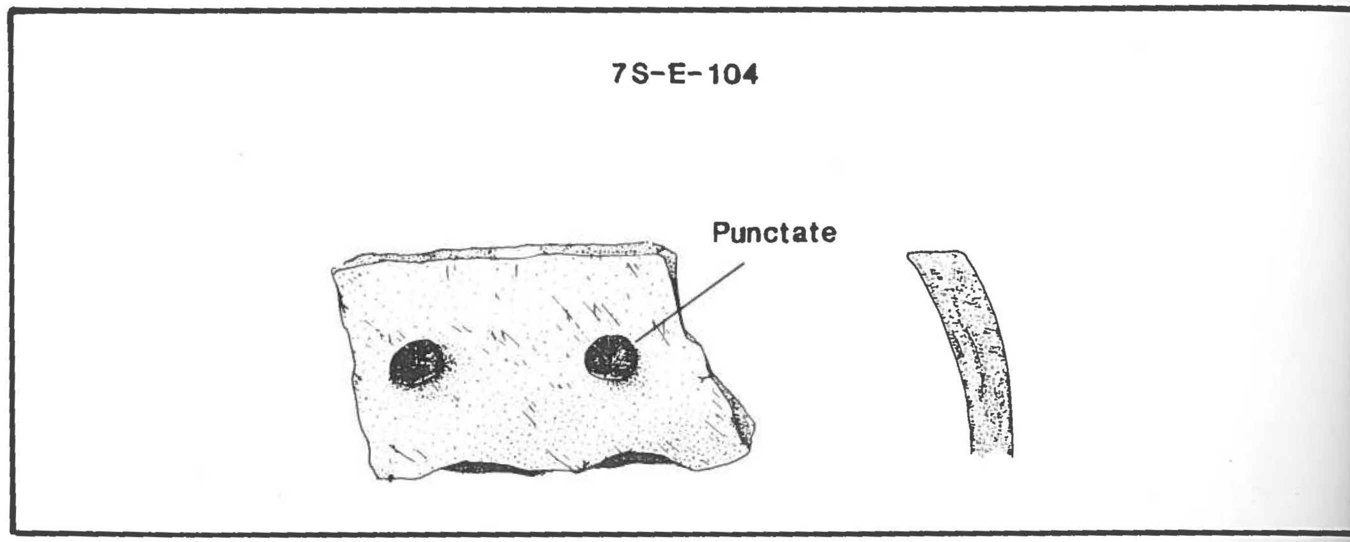


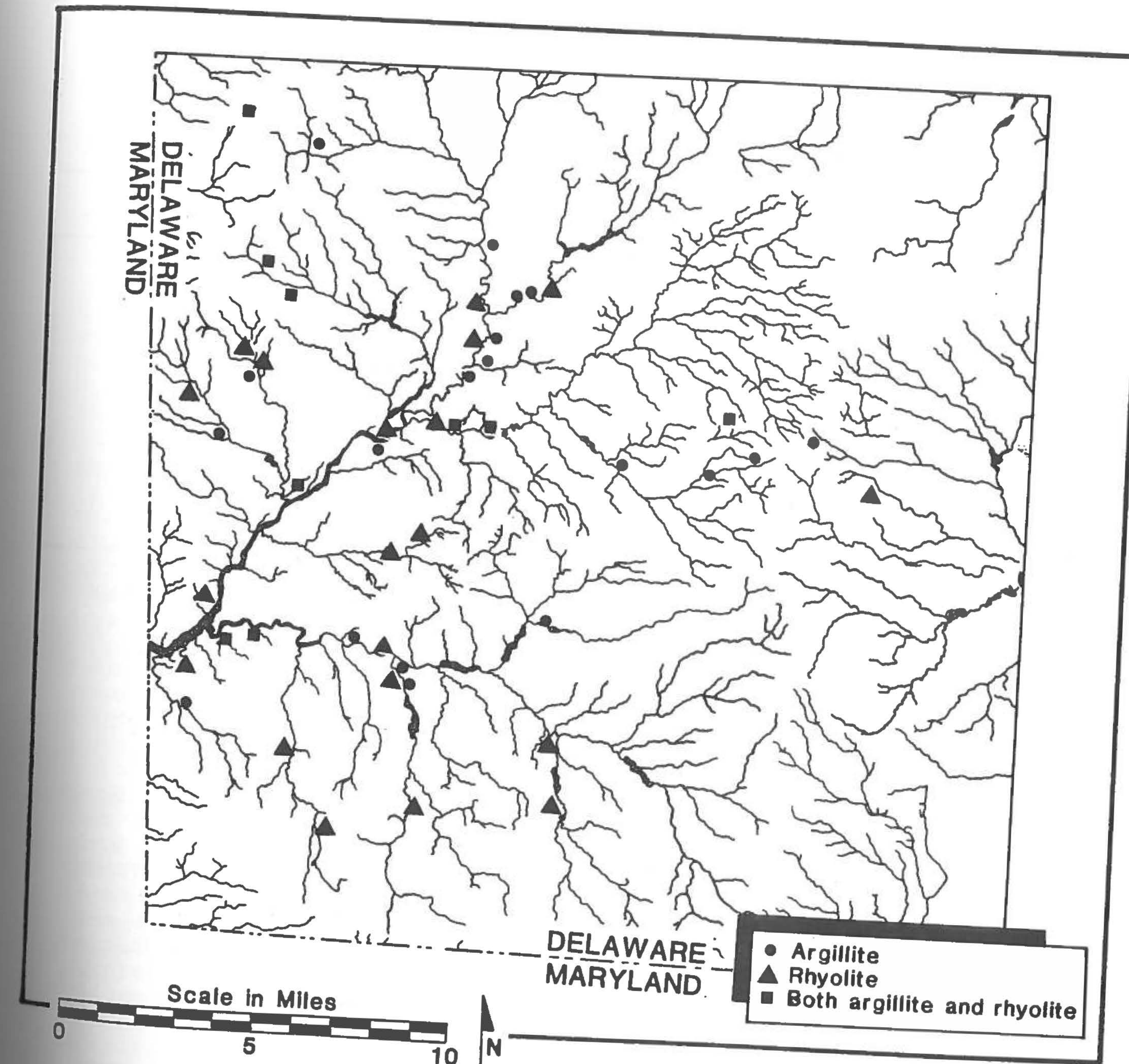
Table 19 shows the frequencies of various diagnostic artifact types manufactured from argillite and rhyolite. It can be seen that the frequencies are relatively constant throughout the Woodland I time period indicating a relatively constant flow of both argillite and rhyolite. Interestingly, previous studies (Custer 1988:Figs. 61-64, 78-81) showed that there is also a relatively constant preference for the mottled varieties of rhyolite throughout the Woodland I period in the Nanticoke region. Because this variety of rhyolite is found only in Pennsylvania (Stewart 1984), a trade link via the Potomac drainage is suggested. Also, all of the argillite bifaces were in late stages of reduction indicating that the argillite and rhyolite artifacts came into the Nanticoke region in their finished forms, or at least in late stages of reduction.

CONCLUSIONS

This survey of the Nanticoke region of southwestern Delaware has resulted in the identification of more than 210 new sites. The riverine area adjacent to the main branch of the Nanticoke and its higher order tributaries is the focus of base camp settlements throughout the prehistoric period. Nevertheless, interior areas and lower order streams were also used extensively, but less intensively than the riverine area. Analysis of site location variables shows that for the most part, preferred site locations changed little through time. Access to surface water and wetlands is the most critical site location variable as shown by both analyses of site locations and the LANDSAT predictive model. And there appears to be little change in the importance of these variables through time. The constant major importance of water and wetland access in the Nanticoke study area in particular, and the Low Coastal Plain in general,

FIGURE 18

Sites with Argillite and Rhyolite



is probably due to the interior/riverine and poorly drained/excessively well drained dichotomies seen in Low Coastal Plain environments. In the Delmarva Low Coastal Plain the contrast between well-watered and poorly-watered settings is particularly stark. Studies of vegetation communities in this area (Brush et al. 1980) also note that the soil moisture retention capacity is the major variable affecting vegetation

TABLE 18

ARGILLITE AND RHYOLITE USE AND SITE TYPES

	Base Camp	Procurement
argillite	14	16
rhyolite	14	13
rhyolite and argillite	7	1

TABLE 19

ARGILLITE AND RHYOLITE DIAGNOSTIC ARTIFACTS

	Argillite	Rhyolite
stemmed	12	10
notched	3	10
broadspear	13	17
Fox Creek	19	19
biface fragments	18	18

community distributions. Therefore, no matter what the paleoenvironmental and paleoclimatic conditions, access to surface water was the most critical site location variable. Certain paleoenvironmental conditions could act to exacerbate these edaphic contrasts; however, it does not seem likely that any paleoenvironmental changes ever greatly moderated the edaphic contrasts.

By contrasting the site location patterns seen in the Low Coastal Plain with those of the High Coastal Plain, it is possible to understand the effects of local geomorphology and edaphic factors on prehistoric site locations. Although both areas showed generally similar site location characteristics and a constant importance of water and wetland access through time, some differences can be noted. For example, use of bay/basin features and interior swamps is more frequent in the High Coastal Plain than in the Low Coastal Plain and varies significantly through time. The reason for the greater importance of these features in the High Coastal Plain is simply the fact that there are more of them in this area. In the Low Coastal Plain the interior swamp settings are fewer in number and, thus, never were important site locations. Variability in the use of interior swamps through time in the High Coastal Plain, as opposed to their consistently infrequent use in the Low Coastal Plain probably reflects both their relative importance in settlement systems and their changing productivity through time (Webb et al. 1988).

Differences in site aspect significance also shows similar factors at work in the determination of site locations. In the High Coastal Plain, site aspects show some meaningful variation in different areas and through time. However, in the Low Coastal Plain aspect is virtually meaningless. Simple differences in topography account for this variability. The Low Coastal Plain is so flat that topographic aspect is not at all critical. Most likely, location with respect to shade was more important. However, in the High Coastal Plain, there is sufficient relief to make aspect a variable of some limited importance. The important point to note is that the local topographic and geomorphological settings must be considered in discussing site location variables and their importance through time.

Even though locational characteristics of sites were relatively constant through time, there are interesting patterns in the spatial locations of sites throughout the Nanticoke drainage. Beginning with the Clyde Farm Complex of initial Woodland I times (ca. 3000 B.C.), a focus on the riverine and drainage divide areas for base camps is noted. It is possible that there was a seasonal movement between the riverine and interior base camps, but further fieldwork is necessary to test this hypothesis. Moving from Clyde Farm to Wolfe Neck Complex times (ca. 500 B.C.), the number of base camps increased dramatically in the riverine area. There is a definite shift from use of lower Broad Creek as a procurement site area to a base camp area. This kind of shift and the dramatic increase in the number of base camp sites indicates increasing population densities in the riverine area. Similar settlement pattern trends are seen throughout the Delmarva Peninsula during Clyde Farm and Wolfe Neck times (Custer 1984a:94-130; 1988) and are thought to be related to environmental changes that occurred at this time (Custer 1984a:89-91). In general, these environmental changes exacerbated the well-watered/poorly-watered dichotomy of the environment and made riverine settings even more attractive than they were during earlier time periods.

With the onset of the Carey Complex (ca. A.D. 0), the basic settlement pattern of the Wolfe Neck Complex remained with little or no change in intensity. Presumably, population densities did not increase at this time. However, Carey Complex base camps tended to be located even further up the drainage than Wolfe Neck Complex base camps. Similar settlement shifts are noted for the St. Jones drainage (Custer 1984a:144) and are thought to be related to the upstream movement of the brackish/freshwater transition zone due to sea level rise.

By Late Carey Complex times (ca. A.D. 500 - 1000), there is a pronounced decrease in the number of sites in the Nanticoke drainage. It is possible that some of this decrease in settlement intensity is due to problems with identifying some ceramics from this time period. For example, the shell tempered refined-Mockley, or Claggett, ceramics (Custer 1984a:88-89) easily grade into earlier Mockley and late Townsend wares

(Griffith 1982). However, there are other easily recognizable diagnostic artifacts from this time period such as Hell Island ceramics and Jacks Reef projectile points. Also, the reduction in numbers of sites is so dramatic that it is unlikely that it is exclusively an artifact of archaeological visibility. Therefore, there seems to be a real population reduction, or settlement disruption, in the Nanticoke drainage during terminal Woodland I times.

The Nanticoke population reduction and settlement disruption is not an isolated phenomenon and can be related to other regional events documented in the archaeological record of the central Middle Atlantic region. In Kent County, Delaware, there seems to be a fissioning of groups who inhabited large macroband base camps and an expansion of smaller microband base camps during Carey Complex times. This settlement pattern change has been linked to changes in social organizations and environmental circumscription (Custer 1982b); however, the Carey Complex settlement shift in Kent County and the later population reduction in the Nanticoke area may be part of a single sequence of population disruption moving from north to south down the Delmarva Peninsula. Recent analyses of linguistic data (Feidel 1987; Luckenbach et al. 1987) suggest that migrations of various groups were taking place at this time and the terminal Woodland I population disruptions may be related to these migrations. The increased ceramic variability observed in the terminal Woodland I assemblages of this time period may also be related to population reductions. There is a definite north-to-south trend in the appearance of grit-tempered Hell Island wares (Custer 1986a:84). In southern Delaware, Hell Island wares appear to be a short-lived technological intrusion which appears with no immediate technological antecedents. Gleach's (1988) analysis of the Mockley ceramic chronology also notes a hiatus in Mockley dates coincident with such an intrusion. Furthermore, the potential appearance of northern Clemson Island ceramics and the newly-noted similarities of the Island Field site with Clemson Island sites (Custer and Rosenberg 1988) also suggest a south-north movement of populations during terminal Woodland I times. Although the data and interpretations are confusing at this time, it is clear that people were on the move during terminal Woodland I times and these population disruptions seem to be reflected in the Nanticoke area survey data.

By Woodland II times (A.D. 1000 - 1600), settlement intensity and population levels returned to levels comparable to those of the Woodland I period. If anything, the settlement focus on the main stem of the Nanticoke and its major tributaries was even greater during Woodland II times. Temperature and moisture perturbations noted in the paleoenvironmental record for late prehistoric times (Brush 1986; Custer and Watson 1987) may be related to the settlement focus on the higher order streams.

A final comment can be made concerning the distribution of exotic raw materials in the Nanticoke region. The use of exotic raw materials in the Nanticoke seems to be focused primarily on

finished artifacts and tools in late stages of reduction. Likewise, the overall amount of exotic raw materials is smaller than the large quantities found on the St. Jones, Murderkill, and Choptank drainages. The Nanticoke region is similar to the northern Delaware High Coastal Plain and Piedmont in terms of trade and exchange systems, especially during initial Woodland I times. This similarity underscores the validity of placing the initial Woodland I cultures of northern and southern Delaware in the single Clyde Farm culture complex with the central Delaware region differentiated as a separate Barker's Landing Complex (Custer 1984a:107) on the basis of its more extensive trade and exchange networks.

In conclusion, this survey demonstrates the vast archaeological potential of the Nanticoke drainage in southwestern Delaware. One can only hope that these archaeological resources will be protected in years to come so that the area's potential can be realized.

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APPENDIX I: SITE FUNCTION AND CULTURAL HISTORICAL INFORMATION

SITE NUMBER	PALEO INDIAN	ARCHAIC	WOOD. I	WOOD. II	CLYDE FARM	WOLFE NECK	CAREY	LATE CAREY	SITE TYPE
7S-E-1	Y	Y	Y	Y	Y	Y	Y	-	MICROBAND
7S-E-2	-	-	Y	Y	Y	Y	Y	-	MICROBAND
7S-E-3	-	-	Y	Y	Y	Y	Y	-	MICROBAND
7S-E-4	-	-	-	-	-	-	-	-	P/P
7S-E-5	-	-	Y	Y	Y	Y	-	-	MICROBAND
7S-E-6	-	-	Y	Y	Y	Y	Y	Y	MICROBAND
7S-E-7	-	-	-	-	-	-	-	-	HISTORIC
7S-E-8	-	-	Y	Y	-	Y	Y	-	MICROBAND
7S-E-9	-	-	Y	Y	-	Y	-	Y	MICROBAND
7S-E-10	-	-	-	Y	-	-	-	-	P/P
7S-E-11	-	-	-	Y	-	-	-		P/P
7S-E-12	-	-	Y	-	-	Y	-	-	P/P
7S-E-13	-	-	Y	Y	-	-	Y	-	MICROBAND
7S-E-14	-	-	Y	Y	-	-	-	-	P/P
7S-E-15	-	-	Y	-	-	Y	-	-	P/P
7S-E-16	-	-	Y	-	-	Y	Y	-	P/P
7S-E-17	-	-	Y	-	-	Y	-	-	P/P
7S-E-18	-	-	Y	Y	-	Y	Y	-	MICROBAND
7S-E-19	-	-	Y	-	-	Y	Y	-	MICROBAND
7S-E-20	Y	Y	Y	-	-	-	Y	-	MICROBAND
7S-E-21	-	-	Y	-	-	-	-	-	MICROBAND
7S-E-22	-	-	Y	Y	-	Y	Y	-	P/P
7S-E-23	-	-	Y	-	-	-	Y	-	MICROBAND
7S-E-24	-	-	Y	-	-	-	-	-	P/P
7S-E-25	-	-	-	-	-	-	-	-	P/P
7S-E-26	-	-	Y	Y	-	-	Y	-	MICROBAND
7S-E-27	-	-	Y	-	-	-	-	-	P/P
7S-E-28	-	-	Y	-	Y	-	Y	-	P/P
7S-E-29	-	-	Y	-	-	-	Y	-	P/P
7S-E-30	-	-	-	-	-	-	-	-	P/P
7S-E-31B	-	-	Y	-	-	-	Y	-	P/P
7S-E-31A	-	-	-	Y	-	-	-	-	MICROBAND
7S-E-32	-	-	Y	Y	-	-	-	-	P/P
7S-E-33	-	-	Y	-	-	-	Y	-	P/P
7S-E-34	-	-	-	-	-	-	-	-	P/P
7S-E-35	-	-	Y	Y	Y	Y	Y	-	MICROBAND
7S-E-36	-	-	-	-	-	-	-	-	UNKNOWN
7S-E-37	-	-	-	-	-	-	-	-	HISTORIC
7S-E-38	-	-	Y	Y	-	-	-	-	UNKNOWN
7S-E-39	-	-	Y	Y	-	-	-	-	UNKNOWN
7S-E-40	-	-	Y	-	-	-	-	-	UNKNOWN
7S-E-41	-	-	-	-	-	-	-	-	P/P
7S-E-42C	-	-	-	-	-	-	-	-	P/P
7S-E-42B	-	-	-	-	-	-	-	-	P/P
7S-E-42A	-	-	Y	Y	-	Y	-	Y	P/P
7S-E-43C	-	-	Y	-	-	-	Y	-	P/P
7S-E-43A	-	-	Y	-	-	Y	-	-	P/P
7S-E-43B	-	-	-	-	-	-	-	-	P/P
7S-E-43D	-	-	Y	Y	-	Y	Y	-	P/P
7S-E-44	-	-	Y	Y	-	Y	Y	-	MICROBAND

SITE NUMBER	PALEO INDIAN	ARCHAIC	WOOD. I	WOOD. II	CLYDE FARM	WOLFE NECK	CAREY	LATE CAREY	SITE TYPE
7S-E-46	-	-	Y	-	-	Y	-	-	MICROBAND
7S-E-47	-	-	Y	-	-	-	-	-	P/P
7S-E-48	-	-	-	-	-	-	-	-	P/P
7S-E-49	-	-	-	-	-	-	-	-	P/P
7S-E-50	-	-	-	-	-	-	-	-	P/P
7S-E-51	-	-	-	-	-	-	-	-	P/P
7S-E-52	-	-	-	-	-	-	-	-	P/P
7S-E-53	-	-	Y	-	-	-	Y	-	P/P
7S-E-54	-	-	-	-	-	-	-	-	P/P
7S-E-55	-	-	Y	-	-	-	Y	-	MICROBAND
7S-E-56	-	-	-	Y	-	-	-	-	P/P
7S-E-57	-	-	-	-	-	-	-	-	P/P
7S-E-58	-	-	Y	Y	-	Y	Y	-	MICROBAND
7S-E-59A	-	-	Y	Y	-	Y	Y	-	MICROBAND
7S-E-59B	-	-	Y	Y	-	Y	Y	Y	MICROBAND
7S-E-60	-	-	Y	-	-	Y	Y	-	P/P
7S-E-61	-	-	Y	Y	-	Y	Y	-	P/P
7S-E-62	-	-	Y	-	-	-	-	-	P/P
7S-E-63	-	-	Y	-	-	-	Y	-	P/P
7S-E-64	-	-	Y	-	-	Y	-	-	P/P
7S-E-65	-	-	Y	-	-	Y	-	-	P/P
7S-E-66	-	-	-	-	-	-	-	-	P/P
7S-E-67	-	-	-	Y	-	-	-	-	P/P
7S-E-68	-	-	-	-	-	-	-	-	P/P
7S-E-69	-	-	-	-	-	-	-	-	P/P
7S-E-70	-	-	-	-	-	-	-	-	P/P
7S-E-71	-	-	-	-	-	-	-	-	P/P
7S-E-72	-	-	-	-	-	-	-	-	P/P
7S-E-73	-	-	-	-	-	-	-	-	P/P
7S-E-74	-	-	-	Y	-	-	-	-	P/P
7S-E-75	-	-	-	Y	-	-	-	-	P/P
7S-E-76	-	-	-	-	-	-	-	-	P/P
7S-E-77	-	-	-	-	-	-	-	-	P/P
7S-E-78	-	-	-	-	-	-	-	-	P/P
7S-E-79	-	-	-	-	-	-	-	-	P/P
7S-E-80	-	-	-	-	-	-	-	-	P/P
7S-E-81	-	-	-	-	-	-	-	-	P/P
7S-E-82A	-	-	Y	-	-	-	-	-	P/P
7S-E-82B	-	-	Y	-	-	-	-	-	P/P
7S-E-83	-	-	Y	-	-	-	-	-	P/P
7S-E-84	-	-	-	-	-	-	-	-	P/P
7S-E-85	-	-	-	-	-	-	-	-	P/P
7S-E-86	-	-	-	-	-	-	-	-	P/P
7S-E-87	-	-	-	-	-	-	-	-	P/P
7S-E-88	-	-	-	-	-	-	-	-	P/P
7S-E-89	-	-	-	Y	-	-	-	-	P/P
7S-E-90	-	-	Y	-	-	-	-	Y	P/P
7S-E-91	-	-	Y	-	-	Y	-	-	P/P
7S-E-92	-	-	Y	-	-	Y	-	-	P/P
7S-E-93	-	-	-	-	-	-	-	-	P/P

SITE NUMBER	PALEO INDIAN	ARCHAIC	WOOD. I	WOOD. II	CLYDE FARM	WOLFE NECK	CAREY	LATE CAREY	SITE TYPE
7S-E-95	-	-	-	-	-	-	-	-	P/P
7S-E-96	-	-	-	Y	-	-	-	-	MICROBAND
7S-E-97	-	-	Y	-	Y	-	-	-	P/P
7S-E-98	-	-	Y	-	-	Y	Y	-	P/P
7S-E-99	-	-	Y	-	-	-	-	Y	P/P
7S-E-100	-	-	-	-	-	-	-	-	P/P
7S-E-101	-	-	-	-	-	-	-	-	P/P
7S-E-102	-	-	Y	Y	-	-	-	-	P/P
7S-E-103	-	-	-	Y	-	-	-	-	P/P
7S-E-104	-	-	-	-	-	-	-	-	P/P
7S-E-105	-	-	-	-	-	-	-	-	UNKNOWN
7S-E-106	-	-	Y	Y	-	Y	-	-	P/P
7S-E-107	-	-	Y	-	-	Y	-	-	P/P
7S-E-108	-	-	-	-	-	-	-	-	P/P
7S-E-109	-	-	-	-	-	-	-	-	P/P
7S-E-110	-	-	-	-	-	-	-	-	P/P
7S-E-111	-	-	-	-	-	-	-	-	P/P
7S-E-112	-	-	Y	-	-	Y	-	-	P/P
7S-E-113	-	-	-	-	-	-	-	-	P/P
7S-E-114	-	-	-	-	-	-	-	-	P/P
7S-E-115	-	-	Y	-	-	-	-	-	P/P
7S-E-116	-	-	Y	-	-	Y	-	Y	P/P
7S-E-117	-	-	Y	-	-	-	Y	-	MICROBAND
7S-E-118	-	-	-	Y	-	-	-	-	P/P
7S-E-119	-	-	Y	-	Y	-	-	-	P/P
7S-E-120	-	-	Y	-	-	-	Y	Y	P/P
7S-E-121	-	-	-	-	-	-	-	-	P/P
7S-E-122	-	-	-	-	-	-	-	-	P/P
7S-E-123	-	-	-	-	-	-	-	-	P/P
7S-E-124	-	-	Y	-	-	-	-	-	P/P
7S-E-125	-	-	-	-	-	-	-	-	P/P
7S-E-126	-	-	-	-	-	-	-	-	P/P
7S-E-127	-	-	-	-	-	-	-	-	P/P
7S-E-128	-	-	Y	-	-	-	-	Y	P/P
7S-E-129	-	-	Y	-	-	-	-	Y	P/P
7S-E-130	-	-	-	-	-	-	-	-	P/P
7S-E-131	-	-	-	-	-	-	-	-	P/P
7S-E-132	-	-	Y	-	-	Y	-	-	P/P
7S-E-133	-	-	-	-	-	-	-	-	P/P
7S-E-134	-	-	Y	-	Y	-	-	-	P/P
7S-E-135	-	-	Y	-	-	-	Y	-	P/P
7S-E-136	-	-	Y	-	-	Y	-	Y	P/P
7S-E-137	-	-	-	-	-	-	-	-	P/P
7S-E-138	-	-	-	-	-	-	-	-	P/P
7S-E-139	-	-	-	-	-	-	-	-	P/P
7S-E-140	-	-	-	-	-	-	-	-	P/P
7S-E-141	-	-	-	-	-	-	-	-	P/P
7S-E-142	-	-	Y	-	-	-	-	-	P/P
7S-E-143	-	-	Y	-	-	Y	-	-	MICROBAND
7S-E-144	-	-	Y	-	-	-	Y	Y	MICROBAND

SITE NUMBER	PALEO INDIAN	ARCHAIC	WOOD. I	WOOD. II	CLYDE FARM	WOLFE NECK	CAREY	LATE CAREY	SITE TYPE
7S-E-146	–	–	Y	–	–	–	Y	–	P/P
7S-E-147	–	–	Y	–	–	–	–	–	P/P
7S-F-2	–	–	Y	–	–	–	Y	–	MICROBAND
7S-F-3	–	–	Y	–	–	Y	Y	–	MICROBAND
7S-F-4	–	–	–	–	–	–	–	–	UNKNOWN
7S-F-9	–	–	Y	–	–	–	Y	–	MICROBAND
7S-F-10	–	–	–	–	–	–	–	–	UNKNOWN
7S-F-14	–	–	–	–	–	–	–	–	UNKNOWN
7S-F-15	–	–	–	–	–	–	–	–	UNKNOWN
7S-F-16	–	–	–	–	–	–	–	–	UNKNOWN
7S-F-18	–	–	–	–	–	–	–	–	UNKNOWN
7S-F-19	–	–	–	–	–	–	–	–	UNKNOWN
7S-F-20	–	–	–	–	–	–	–	–	UNKNOWN
7S-F-21	–	–	–	Y	–	–	–	–	UNKNOWN
7S-F-22	–	–	–	–	–	–	–	–	UNKNOWN
7S-F-23	–	–	Y	–	–	Y	Y	–	MICROBAND
7S-F-24	–	–	Y	–	–	–	–	–	UNKNOWN
7S-F-25	–	–	Y	Y	Y	Y	Y	Y	UNKNOWN
7S-F-27	–	–	Y	–	Y	–	–	–	MICROBAND
7S-F-28	Y	Y	Y	Y	Y	Y	Y	Y	MICROBAND
7S-F-29	–	–	Y	–	–	–	Y	Y	P/P
7S-F-30A	–	–	Y	–	–	–	Y	–	P/P
7S-F-30B	–	–	Y	–	–	–	Y	–	P/P
7S-F-31A	–	–	–	–	–	–	–	–	P/P
7S-F-31B	–	–	–	–	–	–	–	–	P/P
7S-F-32	–	–	Y	–	–	–	Y	–	P/P
7S-F-33A	–	–	Y	–	–	Y	–	–	P/P
7S-F-33B	–	–	Y	–	–	Y	–	–	P/P
7S-F-33C	–	–	–	–	–	–	–	–	MICROBAND
7S-F-34	–	–	Y	–	–	Y	Y	–	P/P
7S-F-35	–	Y	Y	–	–	–	–	–	P/P
7S-F-36	–	Y	Y	Y	Y	Y	Y	Y	MICROBAND
7S-F-37A	–	–	Y	–	–	Y	–	–	P/P
7S-F-37B	–	–	–	–	–	–	–	–	P/P
7S-F-38A	–	–	–	–	–	–	–	–	P/P
7S-F-42	–	Y	Y	–	–	–	–	–	P/P
7S-F-49	–	–	–	–	–	–	–	–	P/P
7S-F-50	–	–	–	–	–	–	–	–	P/P
7S-F-51	–	–	Y	–	–	Y	–	–	P/P
7S-F-52	–	–	–	–	–	–	–	–	P/P
7S-F-53	–	–	–	–	–	–	–	–	P/P
7S-F-54	–	–	–	Y	–	–	–	–	P/P
7S-F-55	–	–	Y	Y	–	–	Y	–	P/P
7S-F-56	–	Y	–	–	–	–	–	–	P/P
7S-F-57	–	–	Y	–	–	–	–	–	P/P
7S-F-58	–	–	Y	–	–	Y	Y	–	P/P
7S-F-59	–	–	Y	–	–	Y	–	–	P/P
7S-F-60	–	–	Y	–	–	–	Y	–	P/P
7S-F-61	–	–	–	–	–	–	–	–	P/P
7S-F-62	–	–	–	–	–	–	–	–	MICROBAND

SITE NUMBER	PALEO INDIAN	ARCHAIC	WOOD. I	WOOD. II	CLYDE FARM	WOLFE NECK	CAREY	LATE CAREY	SITE TYPE
7S-H-2	–	–	Y	Y	Y	Y	Y	–	P/P
7S-H-3	–	–	Y	Y	Y	Y	Y	Y	MICROBAND
7S-H-4	–	–	–	Y	–	–	–	–	P/P
7S-H-5	–	–	Y	Y	Y	Y	Y	–	MICROBAND
7S-H-6	–	–	Y	Y	–	Y	–	–	MICROBAND
7S-H-7	–	–	–	Y	–	–	–	–	P/P
7S-H-8	–	–	Y	Y	–	–	–	Y	MICROBAND
7S-H-9	–	–	Y	Y	–	Y	–	–	P/P
7S-H-10	–	–	Y	Y	–	–	Y	–	P/P
7S-H-11	–	–	Y	Y	–	–	–	Y	P/P
7S-H-12	–	–	Y	Y	Y	Y	Y	–	P/P
7S-H-13	–	–	Y	Y	Y	Y	–	–	P/P
7S-H-14	–	–	Y	–	–	–	Y	–	UNKNOWN
7S-H-15	–	–	–	–	–	–	–	–	BURIAL OSSUARY
7S-H-16	–	–	Y	Y	Y	Y	–	–	MICROBAND
7S-H-17	–	–	Y	–	–	–	–	–	P/P
7S-H-18	–	–	Y	Y	–	Y	–	–	MICROBAND
7S-H-19	–	–	–	–	–	–	–	–	P/P
7S-H-21	–	–	Y	Y	–	Y	Y	–	P/P
7S-H-22	–	–	Y	–	Y	Y	–	–	P/P
7S-H-23	–	–	–	–	–	–	–	–	AGCX
7S-H-25	–	–	–	–	–	–	–	–	P/P
7S-H-26	–	–	–	–	–	–	–	–	P/P
7S-H-27	–	–	Y	–	Y	–	–	–	P/P
7S-H-28	–	–	Y	–	Y	–	Y	–	P/P
7S-H-29	–	–	–	–	–	–	–	–	P/P
7S-H-30	–	–	–	Y	–	–	–	–	P/P
7S-H-31	–	–	Y	–	–	–	–	–	P/P
7S-H-32	–	–	–	Y	–	–	–	–	P/P
7S-H-33	–	–	–	Y	–	–	–	–	P/P
7S-H-34	–	–	–	–	–	–	–	–	P/P
7S-H-35	–	–	Y	Y	Y	–	–	–	P/P
7S-H-36	–	–	–	–	–	–	–	–	P/P
7S-H-37	–	–	–	–	–	–	–	–	P/P
7S-H-38	–	–	–	Y	–	–	–	–	P/P
7S-H-39	–	–	–	Y	–	–	–	–	P/P
7S-H-40	–	–	Y	–	Y	–	–	–	P/P
7S-H-41	–	–	–	–	–	–	–	–	P/P
7S-H-42	–	–	–	–	–	–	–	–	P/P
7S-H-43	–	–	Y	–	–	–	–	–	P/P
7S-H-44	–	–	Y	–	–	–	–	–	P/P
7S-H-45	–	–	Y	–	–	–	–	–	P/P
7S-H-46	–	–	–	–	–	–	–	–	P/P
7S-H-47	–	–	–	Y	–	–	–	–	P/P
7S-H-49	–	–	Y	Y	Y	Y	–	–	P/P
7S-H-50	–	–	Y	–	–	Y	Y	–	P/P
7S-H-51	–	–	–	–	–	–	–	–	P/P
7S-H-52	–	–	Y	–	–	–	Y	–	P/P
7S-H-53	–	–	–	–	–	–	–	–	P/P

SITE NUMBER	PALEO INDIAN	ARCHAIC	WOOD. I	WOOD. II	CLYDE FARM	WOLFE NECK	CAREY	LATE CAREY	SITE TYPE
7S-H-55	-	-	Y	-	-	Y	-	-	P/P
7S-H-56	-	-	Y	Y	Y	Y	-	-	P/P
7S-H-57	-	-	Y	-	-	Y	-	-	P/P
7S-H-58	-	-	-	-	-	-	-	-	P/P
7S-H-59	-	-	Y	-	-	Y	-	-	P/P
7S-H-60	-	-	Y	-	Y	Y	Y	-	MICROBAND
7S-H-61	-	-	Y	Y	-	Y	-	-	P/P
7S-H-62	-	-	-	Y	-	-	-	-	P/P
7S-H-63	-	-	Y	-	-	-	Y	-	P/P
7S-H-64	-	-	-	Y	-	-	-	-	P/P
7S-H-65	-	-	-	-	-	-	-	-	MICROBAND
7S-H-66	-	-	Y	-	-	-	-	-	P/P
7S-H-67	-	-	Y	-	-	-	-	-	P/P
7S-H-68	-	-	-	-	-	-	-	-	P/P
7S-H-69	-	-	-	-	-	-	-	-	P/P
7S-H-70	-	-	-	-	-	-	-	-	P/P
7S-H-71	-	-	Y	-	-	-	-	-	P/P
7S-H-72	-	-	-	-	-	-	-	-	P/P
7S-H-73	-	-	-	-	-	-	-	-	P/P
7S-H-74	-	-	-	Y	-	-	-	-	P/P
7S-H-75	-	-	Y	-	-	-	Y	-	P/P
7S-H-76	-	-	-	Y*	-	-	-	-	P/P
7S-H-77	-	-	-	-	-	-	-	-	P/P
7S-H-78	-	-	-	-	-	-	-	-	P/P
7S-H-79	-	-	-	-	-	-	-	-	P/P
7S-H-80	-	-	-	-	-	-	-	-	P/P
7S-H-81	-	-	Y	-	-	-	Y	-	MICROBAND
7S-H-82	-	-	Y	Y	-	-	Y	-	P/P
7S-H-83	-	Y	Y	-	Y	-	-	-	P/P
7S-H-84	-	-	Y	-	-	-	Y	-	P/P
7S-H-85	-	-	-	-	-	-	-	-	P/P
7S-H-86	-	-	-	-	-	-	-	-	AGCX
7S-H-87	-	-	Y	-	-	-	-	Y	P/P
7S-H-88	-	-	Y	-	-	-	-	-	P/P
7S-H-89	-	-	Y	Y	-	-	-	-	P/P
7S-H-90	-	-	-	-	-	-	-	-	P/P
7S-H-91	-	-	-	-	-	-	-	-	P/P
7S-H-92	-	-	-	-	-	-	-	-	P/P
7S-H-93	-	-	-	-	-	-	-	-	P/P
7S-H-94	-	-	-	-	-	-	-	-	P/P
7S-H-95	-	-	-	-	-	-	-	-	P/P
7S-H-96	-	-	-	-	-	-	-	-	P/P
7S-H-97	-	-	Y	-	-	-	-	-	P/P
7S-H-98	-	-	Y	-	-	Y	-	-	P/P
7S-H-99	-	-	-	-	-	-	-	-	P/P
7S-H-100	-	-	-	-	-	-	-	-	P/P
7S-H-101	-	-	-	Y	-	-	-	-	MICROBAND
7S-H-102	-	-	-	-	-	-	-	-	P/P
7S-H-103	-	-	Y	-	-	Y	-	-	P/P
7S-H-104	-	-	Y	Y	-	Y	-	-	MICROBAND

SITE NUMBER	PALEO INDIAN	ARCHAIC	WOOD. I	WOOD. II	CLYDE FARM	WOLFE NECK	CAREY	LATE CAREY	SITE TYPE
7S-H-106	-	-	-	-	-	-	-	-	P/P
7S-H-107	-	-	-	-	-	-	-	-	P/P
7S-H-108	-	-	Y	Y	-	Y	-	-	MICROBAND
7S-H-109	-	-	-	Y	-	-	-	-	P/P
7S-H-110	-	-	Y	Y	-	Y	-	-	P/P
7S-H-111	-	-	Y	-	-	Y	-	-	P/P
7S-H-112	-	-	Y	Y*	-	-	-	-	P/P
7S-H-113	-	-	Y	-	-	Y	-	-	P/P
7S-H-114	-	-	-	Y	-	-	-	-	P/P
7S-H-115	-	-	-	Y	-	-	-	-	P/P
7S-H-116	-	-	-	Y	-	-	-	-	P/P

APPENDIX II: LOCATIONAL INFORMATION

Key:

Geomorphological Setting

1 - sand ridge
2 - interior flat
3 - terrace
4 - bluff
5 - floodplain

Soil Series

1, 6, 7 - Evesboro
2 - Rumford
3 - Pocomoke
4 - Fallsington
5 - Woodstown
8 - Matawan
9 - Tidal Marsh
10 - Kenansville
11 - Keyport
12 - Sassafras

Surface Water Type

1 - low order stream
2 - interior swamp
3 - high order stream

Aspect

1 - north
2 - northeast
3 - east
4 - southeast
5 - south
6 - southwest
7 - west
8 - northwest

Stream Confluence

1 - yes
0 - no

SITE NUMBER	GEOMORPH. SETTING	SOIL SERIES	SURF. WATER TYPE	ASPECT	CONFL.
7S-E-1	4	1	3	5	1
7S-E-2	5	1	3	1	1
7S-E-3	5	2	1	1	1
7S-E-4	1	1	1	1	0
7S-E-5	5	1	3	5	0
7S-E-6	4	1	3	5	0
7S-E-7	5	1	3	7	0
7S-E-8	1	1	3	5	1
7S-E-9	1	1	1	5	1
7S-E-10	3	1	3	3	1
7S-E-11	1	1	3	7	1
7S-E-12	3	1	3	7	0
7S-E-13	1	1	3	1	1
7S-E-14	1	6	3	1	1
7S-E-15	1	1	3	7	1
7S-E-16	1	1	3	7	0
7S-E-17	1	1	3	3	0
7S-E-18	4	1	3	1	0
7S-E-19	3	6	3	1	1
7S-E-20	4	7	3	3	0
7S-E-21	1	1	3	5	0
7S-E-22	1	1	3	3	0
7S-E-23	1	1	3	4	1
7S-E-24	1	10	3	1	0
7S-E-25	1	1	3	5	1
7S-E-26	1	1	1	1	1
7S-E-27	1	1	3	7	1
7S-E-28	1	12	3	5	1
7S-E-29	1	1	3	1	0
7S-E-30	1	1	3	7	1
7S-E-31B	4	1	3	1	1
7S-E-31A	4	1	3	1	1
7S-E-32	2	1	3	7	1
7S-E-33	1	6	3	5	0
7S-E-34	1	1	3	1	0
7S-E-35	1	7	3	5	1
7S-E-36	1	1	1	2	1
7S-E-37	1	1	3	1	0
7S-E-38	1	1	1	5	1
7S-E-39	1	1	1	3	0
7S-E-40	1	6	1	3	0
7S-E-41	1	6	1	3	0
7S-E-42C	1	1	3	3	0
7S-E-42B	1	1	2	3	0
7S-E-42A	1	1	1	3	0
7S-E-43C	4	1	3	3	0
7S-E-43A	4	1	3	3	0
7S-E-43B	4	1	3	3	1
7S-E-43D	4	1	3	3	0

SITE NUMBER	GEOMORPH. SETTING	SOIL SERIES	SURF. WATER TYPE	ASPECT	CONFL.
7S-E-45	1	1	3	7	1
7S-E-46	3	1	3	3	1
7S-E-47	1	6	2	7	0
7S-E-48	1	6	2	5	1
7S-E-49	2	1	1	1	0
7S-E-50	1	1	3	5	1
7S-E-51	1	1	2	1	0
7S-E-52	2	4	2	1	0
7S-E-53	1	6	1	1	0
7S-E-54	1	1	1	3	0
7S-E-55	5	1	3	6	1
7S-E-56	4	1	3	5	0
7S-E-57	4	1	3	7	0
7S-E-58	4	6	3	3	0
7S-E-59A	3	1	3	1	0
7S-E-59B	5	1	3	1	0
7S-E-60	5	1	3	3	1
7S-E-61	4	1	3	3	0
7S-E-62	1	1	3	3	0
7S-E-63	4	7	3	8	0
7S-E-64	1	1	3	7	1
7S-E-65	4	1	3	7	1
7S-E-66	1	2	3	5	1
7S-E-67	1	1	3	7	1
7S-E-68	1	2	3	7	1
7S-E-69	5	2	1	7	0
7S-E-70	3	1	3	3	0
7S-E-71	1	2	1	3	1
7S-E-72	4	1	3	1	0
7S-E-73	3	11	1	5	0
7S-E-74	4	1	3	3	1
7S-E-75	1	1	1	3	0
7S-E-76	4	1	3	3	0
7S-E-77	4	1	3	5	0
7S-E-78	4	1	3	5	1
7S-E-79	1	1	3	3	1
7S-E-80	4	1	1	3	0
7S-E-81	1	1	2	4	0
7S-E-82A	1	1	1	1	1
7S-E-82B	1	1	1	1	1
7S-E-83	1	1	1	5	0
7S-E-84	1	1	1	7	0
7S-E-85	1	1	1	4	0
7S-E-86	1	1	1	6	1
7S-E-87	4	1	3	7	1
7S-E-88	5	1	1	3	1
7S-E-89	1	1	1	5	1
7S-E-90	1	1	1	5	0
7S-E-91	4	12	1	3	1

SITE NUMBER	GEOMORPH. SETTING	SOIL SERIES	SURF. WATER TYPE	ASPECT	CONFL.
7S-E-93	4	1	1	1	0
7S-E-94	4	2	3	5	1
7S-E-95	1	7	1	3	1
7S-E-96	4	1	3	3	1
7S-E-97	1	1	1	3	1
7S-E-98	2	1	1	7	0
7S-E-99	1	1	3	1	1
7S-E-100	1	1	1	5	0
7S-E-101	1	7	1	1	0
7S-E-102	1	1	1	3	0
7S-E-103	4	1	3	1	0
7S-E-104	4	1	3	5	0
7S-E-105	4	1	3	5	1
7S-E-106	4	6	3	3	0
7S-E-107	1	7	3	1	1
7S-E-108	1	6	3	1	1
7S-E-109	1	1	3	5	1
7S-E-110	1	3	2	1	0
7S-E-111	1	7	3	3	1
7S-E-112	1	1	3	7	0
7S-E-113	4	2	3	3	0
7S-E-114	5	1	3	7	0
7S-E-115	1	1	1	5	0
7S-E-116	1	7	3	3	1
7S-E-117	1	1	3	1	1
7S-E-118	1	1	1	7	0
7S-E-119	1	1	1	7	1
7S-E-120	1	1	1	1	1
7S-E-121	3	5	3	3	0
7S-E-122	1	1	1	7	0
7S-E-123	3	12	3	1	0
7S-E-124	1	1	1	1	0
7S-E-125	3	1	3	1	1
7S-E-126	1	5	2	2	0
7S-E-127	1	12	3	5	0
7S-E-128	1	1	3	3	1
7S-E-129	1	1	3	3	1
7S-E-130	1	1	1	3	1
7S-E-131	1	5	3	7	1
7S-E-132	1	1	1	1	0
7S-E-133	1	12	1	3	1
7S-E-134	1	5	1	3	1
7S-E-135	1	4	2	7	0
7S-E-136	5	1	3	3	1
7S-E-137	1	4	3	1	1
7S-E-138	1	5	2	5	0
7S-E-139	5	1	1	5	1
7S-E-140	5	4	3	1	0
7S-E-141	1	2	1	5	0

SITE NUMBER	GEOMORPH. SETTING	SOIL SERIES	SURF. WATER TYPE	ASPECT	CONFL.
7S-E-143	1	1	3	5	1
7S-E-144	1	1	3	3	1
7S-E-145	1	10	1	5	1
7S-E-146	1	1	3	7	0
7S-E-147	2	1	2	3	0
7S-F-2	1	5	2	1	0
7S-F-3	1	1	2	5	0
7S-F-4	2	1	1	3	0
7S-F-9	1	1	3	7	1
7S-F-10	1	1	3	5	1
7S-F-14	5	1	3	5	1
7S-F-15	1	1	3	5	1
7S-F-16	1	1	3	1	1
7S-F-18	3	1	3	7	0
7S-F-19	3	1	3	7	0
7S-F-20	3	1	3	5	0
7S-F-21	1	1	3	5	1
7S-F-22	3	1	1	5	0
7S-F-23	2	5	2	5	0
7S-F-24	2	5	1	5	0
7S-F-25	2	5	2	5	0
7S-F-27	1	1	3	1	0
7S-F-28	1	1	2	1	0
7S-F-29	2	1	3	7	0
7S-F-30A	1	1	3	7	0
7S-F-30B	1	1	3	5	0
7S-F-31A	3	1	3	3	1
7S-F-31B	3	1	3	3	1
7S-F-32	2	1	1	3	0
7S-F-33A	2	1	3	5	0
7S-F-33B	2	1	3	5	0
7S-F-33C	2	1	3	5	0
7S-F-34	2	1	3	5	0
7S-F-35	1	1	3	1	0
7S-F-36	1	1	3	5	0
7S-F-37A	1	1	3	7	1
7S-F-37B	1	1	3	7	1
7S-F-38A	2	1	3	1	0
7S-F-42	1	1	3	7	0
7S-F-49	2	1	3	5	1
7S-F-50	2	1	3	5	1
7S-F-51	1	2	3	1	0
7S-F-52	1	1	1	3	0
7S-F-53	1	1	1	1	0
7S-F-54	1	1	3	7	0
7S-F-55	1	2	3	1	0
7S-F-56	1	1	1	5	0
7S-F-57	1	3	1	5	0
7S-F-58	1	1	3	5	0

SITE NUMBER	GEOMORPH. SETTING	SOIL SERIES	SURF. WATER TYPE	ASPECT	CONFL.
7S-F-60	1	5	3	1	0
7S-F-61	1	4	3	5	0
7S-F-62	2	1	3	3	0
7S-H-1	1	1	3	1	1
7S-H-2	5	9	3	3	0
7S-H-3	5	9	3	5	0
7S-H-4	4	1	3	5	0
7S-H-5	1	1	3	3	0
7S-H-6	1	1	3	7	1
7S-H-7	5	0	3	5	1
7S-H-8	5	1	3	7	0
7S-H-9	5	1	3	1	0
7S-H-10	5	10	3	1	0
7S-H-11	1	1	3	1	1
7S-H-12	3	1	3	5	0
7S-H-13	5	1	3	1	0
7S-H-14	5	1	3	7	0
7S-H-15	5	1	3	1	0
7S-H-16	1	1	3	1	1
7S-H-17	5	1	3	2	0
7S-H-18	1	1	3	1	1
7S-H-19	1	1	3	3	0
7S-H-21	1	1	3	1	0
7S-H-22	1	1	3	1	1
7S-H-23	4	1	3	5	1
7S-H-25	1	1	3	1	1
7S-H-26	1	1	3	5	0
7S-H-27	1	1	1	3	0
7S-H-28	3	7	3	5	0
7S-H-29	1	1	3	5	1
7S-H-30	4	8	3	7	1
7S-H-31	1	1	3	1	0
7S-H-32	5	1	3	1	1
7S-H-33	1	7	3	3	1
7S-H-34	4	1	3	1	1
7S-H-35	4	1	3	7	0
7S-H-36	4	1	3	3	0
7S-H-37	2	1	1	3	0
7S-H-38	5	2	1	3	1
7S-H-39	1	1	3	3	1
7S-H-40	4	7	3	3	0
7S-H-41	4	2	1	3	0
7S-H-42	2	1	3	7	1
7S-H-43	2	1	3	7	1
7S-H-44	4	1	3	3	1
7S-H-45	4	1	3	3	0
7S-H-46	2	1	3	5	1
7S-H-47	4	1	3	3	0
7S-H-49	1	1	3	1	1

SITE NUMBER	GEOMORPH. SETTING	SOIL SERIES	SURF. WATER TYPE	ASPECT	CONFL.
7S-H-51	1	1	3	1	0
7S-H-52	4	1	3	1	0
7S-H-53	1	1	3	5	1
7S-H-54	2	5	2	1	0
7S-H-55	5	1	3	7	1
7S-H-56	5	1	3	5	0
7S-H-57	1	1	3	5	1
7S-H-58	1	7	3	5	1
7S-H-59	1	2	3	1	1
7S-H-60	5	1	3	1	1
7S-H-61	1	7	3	2	1
7S-H-62	1	7	3	2	1
7S-H-63	1	1	3	3	1
7S-H-64	1	1	3	3	1
7S-H-65	1	1	3	7	0
7S-H-66	1	1	3	3	0
7S-H-67	1	1	2	5	0
7S-H-68	1	1	1	5	1
7S-H-69	1	1	2	4	0
7S-H-70	4	1	1	3	0
7S-H-71	1	1	3	3	1
7S-H-72	1	1	3	8	1
7S-H-73	1	1	1	7	0
7S-H-74	1	1	1	7	0
7S-H-75	3	1	3	1	1
7S-H-76	1	1	1	7	1
7S-H-77	4	1	3	7	0
7S-H-78	1	6	1	3	0
7S-H-79	1	6	1	3	0
7S-H-80	1	6	1	3	1
7S-H-81	1	1	3	1	1
7S-H-82	1	1	3	7	1
7S-H-83	1	1	3	7	1
7S-H-84	1	1	1	3	0
7S-H-85	4	6	1	3	0
7S-H-86	1	1	1	5	0
7S-H-87	1	3	1	3	0
7S-H-88	1	10	1	7	0
7S-H-89	1	3	2	7	0
7S-H-90	1	3	2	7	0
7S-H-91	1	6	2	7	0
7S-H-92	1	1	1	7	0
7S-H-93	1	1	3	3	0
7S-H-94	1	1	3	1	0
7S-H-95	1	1	3	3	0
7S-H-96	1	1	1	7	0
7S-H-97	1	1	3	7	0
7S-H-98	1	1	3	7	0
7S-H-99	1	1	1	3	0

SITE NUMBER	GEOMORPH. SETTING	SOIL SERIES	SURF. WATER TYPE	ASPECT	CONFL.
7S-H-101	4	1	3	7	1
7S-H-102	1	1	3	1	0
7S-H-103	4	1	3	1	0
7S-H-104	3	1	3	1	0
7S-H-105	4	1	3	3	1
7S-H-106	1	1	3	5	0
7S-H-107	4	1	3	5	0
7S-H-108	1	1	3	5	0
7S-H-109	4	1	3	5	0
7S-H-110	1	1	3	5	1
7S-H-111	4	1	3	3	1
7S-H-112	1	8	3	3	1
7S-H-113	1	8	3	3	1
7S-H-114	4	1	3	5	1
7S-H-115	1	1	3	5	1
7S-H-116	1	1	3	7	0

APPENDIX III: DIAGNOSTIC ARTIFACT INFORMATION

PROJECTILE POINTS

SITE NUMBER	FLUT.	PALM.	AMOS	KIRK	BIF.	STEM.	NOT.	BROAD SPEAR	FOX CRK.	JACKS REEF	TRI.
7S-E-3	-	-	-	-	-	Y	-	-	Y	-	-
7S-E-6	-	-	-	-	-	-	-	-	Y	-	-
7S-E-13	-	-	-	-	-	Y	-	-	-	-	-
7S-E-14	-	-	-	-	-	Y	-	-	-	-	-
7S-E-18	-	-	-	-	-	-	-	-	Y	-	-
7S-E-19	-	-	-	-	-	Y	-	-	-	-	-
7S-E-20	-	-	-	Y	Y	-	-	-	-	-	-
7S-E-28	-	-	-	-	-	-	-	-	Y	-	-
7S-E-29	-	-	-	-	-	Y	Y	-	-	-	-
7S-E-33	-	-	-	-	-	Y	-	-	-	-	-
7S-E-35	-	-	-	-	-	-	-	Y	-	-	-
7S-E-42A	-	-	-	-	-	-	-	-	-	Y	-
7S-E-43C	-	-	-	-	-	-	-	-	Y	-	-
7S-E-45	-	Y	-	-	Y	-	-	Y	-	-	Y
7S-E-46	-	-	-	-	-	-	Y	-	-	-	-
7S-E-53	-	-	-	-	-	-	-	-	Y	-	-
7S-E-58	-	-	-	-	-	Y	-	-	-	-	-
7S-E-61	-	-	-	-	-	Y	Y	-	-	-	-
7S-E-62	-	-	-	-	-	-	Y	-	-	-	-
7S-E-92	-	-	-	-	-	Y	-	-	-	-	-
7S-E-99	-	-	-	-	-	-	-	-	-	-	Y
7S-E-102	-	-	-	-	-	Y	-	-	-	-	-
7S-E-115	-	-	-	-	-	-	Y	-	-	-	-
7S-E-116	-	-	-	-	-	-	-	-	-	Y	-
7S-E-117	-	-	-	-	-	Y	-	-	-	-	-
7S-E-120	-	-	-	-	-	Y	-	-	-	-	-
7S-E-134	-	-	-	-	-	Y	-	-	-	-	-
7S-E-135	-	-	-	-	-	-	-	-	Y	-	-
7S-E-136	-	-	-	-	-	-	-	-	-	-	Y
7S-E-142	-	-	-	-	-	Y	-	-	-	-	-
7S-E-146	-	-	-	-	-	-	-	-	Y	-	-
7S-E-147	-	-	-	-	-	Y	-	-	-	-	-
7S-F-3	-	-	-	-	-	Y	-	-	-	-	-
7S-F-25	-	-	-	-	-	-	-	Y	-	-	-
7S-F-27	-	-	-	-	-	Y	-	-	-	-	-
7S-F-28C	-	-	Y	Y	Y	-	-	-	-	-	-
7S-F-28A	-	Y	-	-	-	Y	-	-	-	-	-
7S-F-28B	Y	-	-	-	-	-	-	-	-	-	-
7S-F-32	-	-	-	-	-	Y	-	-	-	-	-
7S-F-36	-	-	-	-	Y	Y	-	-	-	Y	-
7S-F-60	-	-	-	-	-	-	-	-	Y	-	-
7S-H-2	-	-	-	-	-	Y	-	-	-	-	-
7S-H-6	-	-	-	-	-	-	-	-	-	-	Y
7S-H-8	-	-	-	-	-	Y	-	-	-	-	Y
7S-H-9	-	-	-	-	-	-	-	-	-	-	Y
7S-H-12	-	-	-	-	-	-	-	Y	-	-	-
7S-H-13	-	-	-	-	-	-	Y	-	-	-	Y
7S-H-16	-	-	-	-	-	-	-	Y	-	-	-

SITE NUMBER	FLUT.	PALM.	AMOS	KIRK	BIF.	STEM.	NOT.	BROAD SPEAR	FOX CRK.	JACKS REEF	TRI.
7S-H-35	-	-	-	-	-	-	-	Y	-	-	-
7S-H-40	-	-	-	-	-	-	-	Y	-	-	-
7S-H-43	-	-	-	-	-	-	-	Y	-	-	-
7S-H-45	-	-	-	-	-	-	Y	-	-	-	-
7S-H-49	-	-	-	-	-	-	Y	Y	-	-	-
7S-H-56	-	-	-	-	-	-	-	Y	-	-	Y
7S-H-62	-	-	-	-	-	-	-	-	-	-	Y
7S-H-64	-	-	-	-	-	-	-	-	-	-	Y
7S-H-74	-	-	-	-	-	-	-	-	-	-	Y
7S-H-76	-	-	-	-	-	-	-	-	-	-	Y
7S-H-82	-	-	-	-	-	-	-	-	-	-	Y
7S-H-83	-	-	-	-	-	-	-	Y	-	-	-
7S-H-87	-	-	-	-	-	-	-	-	-	Y	-
7S-H-89	-	-	-	-	-	Y	-	-	-	-	-
7S-H-104	-	-	-	-	-	-	-	-	-	-	Y

CERAMICS

SITE NUMBER	MARCEY CREEK	DAMES QUART.	WOLFE NECK	COUL.	MOCKLEY	HELL ISLAND	TOWNSEND
7S-E-1	-	-	Y	-	Y	-	Y
7S-E-2	-	-	Y	Y	Y	-	Y
7S-E-3	-	-	Y	-	-	-	-
7S-E-5	-	Y	Y	Y	Y	-	Y
7S-E-6	-	Y	Y	Y	Y	Y	-
7S-E-8	-	-	Y	Y	Y	-	Y
7S-E-9	-	-	Y	-	-	Y	Y
7S-E-10	-	-	-	-	-	-	Y
7S-E-11	-	-	-	-	-	-	Y
7S-E-12	-	-	Y	-	-	-	-
7S-E-13	-	-	-	-	Y	-	Y
7S-E-14	-	-	-	-	-	-	Y
7S-E-15	-	-	Y	-	-	-	-
7S-E-16	-	-	Y	-	Y	-	-
7S-E-17	-	-	Y	-	-	-	-
7S-E-18	-	-	Y	-	-	-	Y
7S-E-19	-	-	-	Y	Y	-	-
7S-E-20	-	-	-	-	Y	-	-
7S-E-21	-	-	Y	-	-	-	Y
7S-E-22	-	-	Y	-	Y	-	Y
7S-E-23	-	-	-	-	Y	-	-
7S-E-26	-	-	-	-	Y	-	Y
7S-E-29	-	-	-	-	Y	-	-
7S-E-31	-	-	-	-	-	-	Y
7S-E-32	-	-	-	-	-	-	Y
7S-E-33	-	-	-	-	Y	-	-
7S-E-35	-	-	Y	Y	Y	-	Y
7S-E-42A	-	-	Y	Y	-	-	-
7S-E-43A	-	-	Y	Y	-	-	-
7S-E-43D	-	-	Y	-	Y	-	Y
7S-E-44	-	-	Y	Y	Y	-	Y
7S-E-46	-	-	Y	-	-	-	-
7S-E-55	-	-	-	-	Y	-	-
7S-E-58	-	-	Y	Y	Y	-	-
7S-E-59A	-	-	Y	Y	Y	-	Y
7S-E-59B	-	-	Y	-	Y	Y	Y
7S-E-60	-	-	Y	-	Y	-	-
7S-E-61	-	-	-	Y	Y	-	-
7S-E-63	-	-	-	-	Y	-	-
7S-E-64	-	-	-	Y	-	-	-
7S-E-65	-	-	Y	-	-	-	-
7S-E-67	-	-	-	-	-	-	Y
7S-E-74	-	-	-	-	-	-	Y
7S-E-75	-	-	-	-	-	-	Y
7S-E-89	-	-	-	-	-	-	Y
7S-E-90	-	-	-	-	-	Y	-
7S-E-91	-	-	Y	-	-	-	-
7S-E-92	-	-	-	Y	-	-	-
7S-E-94	-	-	Y	-	-	-	Y
7S-E-97	-	Y	-	-	-	-	-

SITE NUMBER	MARCEY CREEK	DAMES QUART.	WOLFE NECK	COUL.	MOCKLEY	HELL ISLAND	TOWNSEND
7S-E-102	-	-	-	-	-	-	Y
7S-E-103	-	-	-	-	-	-	Y
7S-E-106	-	-	Y	-	-	-	Y
7S-E-107	-	-	-	Y	-	-	-
7S-E-112	-	-	Y	-	-	-	-
7S-E-117	-	-	-	-	Y	-	-
7S-E-118	-	-	-	-	-	-	Y
7S-E-119	-	Y	-	-	-	-	-
7S-E-120	-	-	-	-	Y	-	-
7S-E-128	-	-	-	-	Y	-	-
7S-E-129	-	-	-	-	-	-	Y
7S-E-132	-	-	Y	-	-	-	-
7S-E-136	-	-	Y	-	-	-	-
7S-E-144	-	-	-	-	Y	-	-
7S-E-145	-	-	-	Y	-	-	-
7S-F-2	-	-	-	-	Y	-	-
7S-F-3	-	-	-	Y	Y	-	-
7S-F-9	-	-	-	-	Y	-	-
7S-F-23	-	-	Y	Y	Y	-	-
7S-F-25	-	Y	-	-	Y	-	Y
7S-F-30B	-	-	-	-	Y	-	-
7S-F-30A	-	-	-	-	Y	-	-
7S-F-33A	-	-	Y	Y	-	-	-
7S-F-33B	-	-	Y	Y	-	-	-
7S-F-34	-	-	-	Y	Y	-	-
7S-F-51	-	-	Y	-	-	-	-
7S-F-54	-	-	-	-	-	-	Y
7S-F-55	-	-	-	-	Y	-	-
7S-F-58	-	-	Y	-	Y	-	-
7S-F-59	-	-	Y	-	-	-	-
7S-H-1	Y	Y	Y	Y	Y	-	Y
7S-H-2	-	-	Y	-	Y	-	Y
7S-H-3	-	Y	Y	Y	Y	Y	Y
7S-H-4	-	-	-	-	-	-	Y
7S-H-5	-	Y	Y	Y	Y	-	-
7S-H-6	-	-	Y	-	-	-	Y
7S-H-8	-	-	-	Y	-	Y	-
7S-H-9	-	-	Y	-	-	-	-
7S-H-10	-	-	-	-	-	Y	Y
7S-H-11	-	-	-	-	-	Y	Y
7S-H-12	-	-	-	-	Y	-	Y
7S-H-13	-	-	Y	-	-	-	Y
7S-H-16	-	Y	Y	-	-	-	Y
7S-H-18	-	-	Y	-	-	-	Y
7S-H-21	-	-	Y	-	Y	-	Y
7S-H-22	-	Y	Y	-	-	-	-
7S-H-27	-	Y	-	-	-	-	-
7S-H-28	-	Y	-	-	Y	-	-
7S-H-30	-	-	-	-	-	-	Y
7S-H-32	-	-	-	-	-	-	Y

SITE NUMBER	MARCEY CREEK	DAMES QUART.	WOLFE NECK	COUL.	MOCKLEY	HELL ISLAND	TOWNSEND
7S-H-35	-	-	-	-	-	-	Y
7S-H-38	-	-	-	-	-	-	Y
7S-H-39	-	-	-	-	-	-	Y
7S-H-47	-	-	-	-	-	-	Y
7S-H-49	-	-	-	-	-	-	Y
7S-H-50	-	-	Y	-	Y	-	-
7S-H-52	-	-	-	-	Y	-	-
7S-H-56	-	-	Y	-	-	-	-
7S-H-57	-	-	Y	-	-	-	-
7S-H-59	-	-	Y	-	-	-	-
7S-H-60	-	-	Y	Y	Y	-	-
7S-H-61	-	-	-	Y	-	-	Y
7S-H-63	-	-	-	-	Y	-	-
7S-H-75	-	-	-	-	Y	-	-
7S-H-81	-	-	-	-	Y	-	-
7S-H-82	-	-	-	-	Y	-	-
7S-H-83	-	Y	-	-	-	-	-
7S-H-84	-	-	-	-	Y	-	-
7S-H-87	-	-	-	-	-	Y	-
7S-H-89	-	-	-	-	-	-	Y
7S-H-98	-	-	Y	-	-	-	-
7S-H-103	-	-	Y	-	-	-	-
7S-H-104	-	-	Y	-	-	-	-
7S-H-105	-	-	Y	Y	-	-	Y
7S-H-108	-	-	Y	-	-	-	Y
7S-H-110	-	-	Y	-	-	-	Y
7S-H-111	-	-	Y	-	-	-	-
7S-H-113	-	-	Y	Y	-	-	-
7S-H-115	-	-	-	-	-	-	Y
7S-H-116	-	-	-	-	-	-	Y