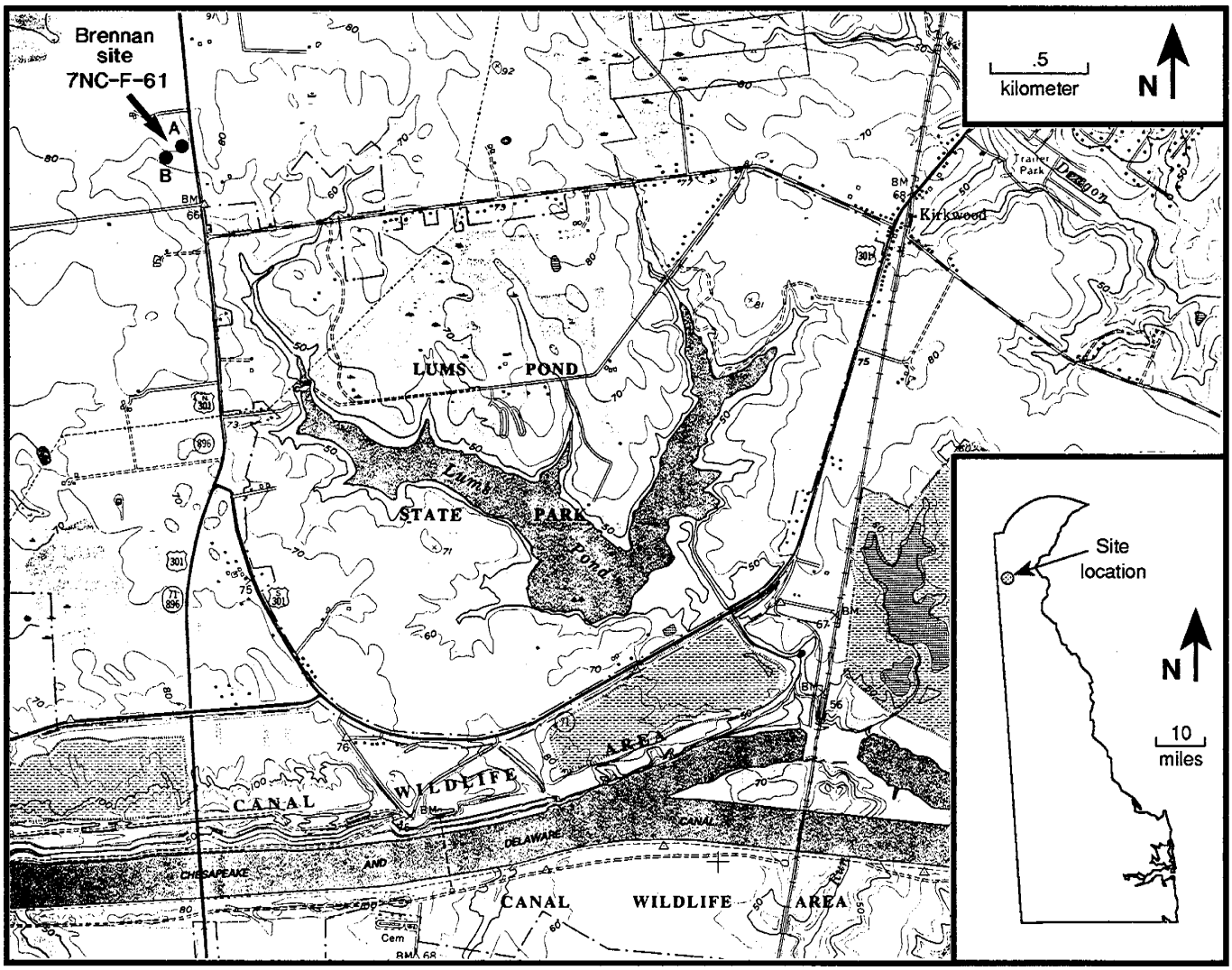
FIGURE 1

Location of the Brennan Site (7NC-F-61A)



INTRODUCTION

The purpose of this report is to describe the results of Phase III data recovery excavations at the Brennan Site (7NC-F-61A) in southwestern New Castle County, Delaware (Figure 1, Plate 1). Field investigations were carried out from December 1989 to March 1990 by the University of Delaware Center for Archaeological Research (UDCAR) for the Delaware Department of Transportation (DelDOT) and the Federal Highway Administration (FHWA) under Section 106 of the National Historic Preservation Act to mitigate the effects of the proposed relocation and dualization of Delaware Route 896 on significant, or potentially significant, cultural resources as defined by the National Register of Historic Places (30CFR60).

Plate 1

Air View of Brennan Site Location in Relation to Route 896

Site Setting and Environment

The Brennan Site is located in the extreme western portion of New Castle County, approximately 2 km east of the Delaware/Maryland state line (Figure 1). The site is located in the Coastal Plain physiographic zone — the most extensive physiographic zone in the state. The Coastal Plain consists of southward dipping sedimentary strata which are underlain by south and southeasterly sloping schists, gneisses, and migmatites of the Wissahickon Formation (Spoljaric 1972:3). Topography in the Coastal Plain is generally flat, with shallow stream valleys and elevations typically between 12 and 24 m above sea level. This topography is in contrast to the deeply incised stream valleys and steeper relief of the Piedmont Uplands, which are located approximately 13 km to the north of the site. The gradients of streams emerging from the Piedmont become greatly reduced upon entering the Coastal Plain, and they consequently deposit a large amount of their bedload. The larger streams in the Coastal Plain are at least partially tidal.

Sediments of the Coastal Plain are fluvial in origin, and are composed of two major formations. The Potomac Formation is composed primarily of fine sediments (clays and silts) which were deposited on the underlying bedrock by streams running through the ancient Delaware River Valley and Piedmont (Spoljaric 1972:1). These sediments were laid down during the early Cretaceous Period and were later reworked by erosional forces which created an unconformity between them and the later Columbia deposits.

The Columbia Formation forms a nearly continuous veneer of sediments over the Coastal Plain, and reaches a thickness of up to 45 m (Jordan 1964). The deposits are primarily composed of unconsolidated, medium and coarse grained sands of quartz and feldspar, with admixtures of sandstone, vein quartz, and chert gravel (Jordan 1964; Thompson 1976:105). The Columbia Formation was formed from the glacial outwash deposits of watercourses emerging from the Piedmont to the north and northeast. The Columbia Formation deposits are bedded in a generally north to south direction; moving south on the Delmarva Peninsula particle sizes decrease and sediments become better sorted (Jordan 1964:14).

Studies by Spoljaric (1967:10) suggest that most of the Delaware Coastal Plain was submerged when glacial floodwaters were at their peak. At other times, interstream areas and islands were present. Two ancient channel systems have been identified in New Castle County (Spoljaric 1967). In the section of the county south of the Chesapeake and Delaware Canal, the Pleistocene channel system has a braided pattern with islands and bars separating the individual channels. North of the canal are two large, prominent channels, which are connected by a shallower interchannel. The western channel runs north to south and includes the location of the Brennan Site. Thompson (1976:14) has postulated that the topographic highs in the vicinity of the site are the result of these channel deposits. While there is no clear consensus on the exact timing of these deposits, there is a general agreement that they derive from episodes of glacial outwash of the Pleistocene Epoch (Jordan 1964).

Custer (1984, 1989) distinguishes between an upper and lower Coastal Plain, based on the extent of the very coarse gravel deposits in Columbia Formation sediments. The boundary between the two zones is located near the Smyrna River, and represents the border between the coarser gravel deposits of the upper Coastal Plain and the finer heavily reworked sands of the lower Coastal Plain. The gravel deposits have a greater resistance to erosion, and have created a more varied and steeper topography, with a correspondingly higher seasonal diversity of plant communities. Water courses are more deeply incised than those of the lower Coastal Plain and are covered with a veneer of Holocene-age sediments which become thicker towards their mouths.

The Brennan Site is located on the northeastern section of the Mid-Peninsular Drainage Divide, a zone of slightly elevated land which runs nearly the entire length of the state. The Divide separates the headwaters of streams which drain eastward into the Delaware River from those which drain westward into the Chesapeake Bay. The region is characterized by headwater drainages, bay/basin features, and both swampy and well-drained areas in close proximity, creating a mosaic of edaphic settings (Custer 1984:26). Elevations of the Drainage Divide are generally between 18 and 24 m above sea level.

Approximately 8 km north of the Brennan Site are Iron and Chestnut hills, which are Piedmont outliers composed primarily of igneous bedrock such as gabbro, norite, and pyroxenite (Spoljaric 1972:11). The exact origin of the bedrock formations is unclear (Spoljaric 1972:11). In addition to the igneous rocks, siliceous jasperoids also occur in the formation, although their origin is also questionable. The cryptocrystalline materials are either secondary replacement jasperoids, or lateritic jaspers produced from the weathering of igneous regolith (Custer, Ward and Watson, 1986:3; Custer and Galasso 1980:2). Regardless, primary outcrops of the micro- to cryptocrystalline jasperoids are available in the vicinity of Iron and Chestnut hills. Although much of the bedrock contains crystalline inclusions and other imperfections that make it unsuitable for stone tool manufacture, a substantial amount of useable jasper is present.

The Brennan Site is on a south facing slope overlooking the headwaters of an unnamed stream 180 m to the southwest. The stream flows southeast into Lum's Millpond, a nineteenth century impoundment, which in turn drains into the Chesapeake and Delaware Canal. Historic maps drawn both before and after the canal was constructed in the 1820s (1824-1829) suggest that this stream is the headwaters of what was once St. George's Creek, a tributary of the Delaware River (Latrobe 1803; Rea and Price 1849). The headwaters of Long Creek, which is in the Chesapeake Bay Drainage, are located less than 1070 m to the northwest, indicating that the site sits in the middle of the very narrow drainage divide. Wooded marshland is presently located 790 m to the northwest of the Brennan Site. Elevations in the immediate vicinity of the site are 24 m above mean sea level, and the area has very low relief.

Soils at the Brennan Site fall into general Matapeake-Sassafras Association, which are nearly level to steep, well and poorly drained soils with medium and moderately coarse textured soils on the uplands (Matthews and Lavoie 1970). The specific soil type of the Brennan Site is Sassafras sandy loam. Soils of the Sassafras Series are deep, well-drained soils on uplands with 2% to 5% slopes, and have developed in beds of older sediments that contain moderate amounts of silt and clay (Matthews and Lavoie 1970). Just to the south of the site is a small area of Elkton

silt loam, which is a poorly-drained soil. To the east and west are extensive areas of poorly-drained Fallisington and Elkton series soils on either side of a discontinuous ridge of well-drained Sassafras and Matapeake series soils (Matthews and Lavoie 1970). The modern limit of tidal marsh is 975 m southeast of the site near the headwaters of St. George's Creek.

In sum, the Brennan Site is located in a diverse and productive environmental setting. It is adjacent to abundant fresh water sources, which are favorable hunting and gathering locales. It is in the vicinity of a freshwater/saltwater interface which allows for a wide range of resources, and primary outcrops of lithic raw material are located a short distance away.

Regional Prehistory

The prehistoric archaeological record of the New Castle County area can be divided into four blocks of time (Table 1): The 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 northern Delaware in anything resembling their pre-European contact form. Each of these periods is described below and the descriptions are summarized from Custer (1984) and Custer and DeSantis (1986).

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 northern Delaware. Watering areas would have been particularly good for hunting.

Tool kits of Paleo-Indian groups were oriented toward the procurement and processing of hunted animal resources. A preference for high quality lithic materials has been noted and careful resharpening and maintenance of tools was common. A life-style of movement among game-rich environments with social units organized around on single and multiple family bands has been hypothesized. Throughout the 5500 year time span of the period, the basic settlement structure remained relatively constant with some modifications as Holocene environments developed at the end of the Paleo-Indian Period.

Numerous Paleo-Indian sites are known for northern Delaware including hunting and processing sites near Hockessin (Custer and DeSantis 1986) and adjacent to the Wilmington Medical Center (Custer, Catts, and Bachman 1982), possible quarry sites near Iron Hill, and

TABLE 1

Cultural Complexes of Delaware

DATE	PERIOD	LOW COASTAL PLAIN	HIGH COASTAL PLAIN	PIEDMONT / FALL LINE
A.D. 1600	WOODLAND II	TRIANGULAR PROJECTILE POINTS **SLAUGHTER CREEK COMPLEX** Townsend Creek ceramics Triangular projectile points	CERAMICS **MINGUANNAN COMPLEX** Minguannan ceramics Triangular projectile points	
A.D. 1000		LARGE TRIANGULAR POINT **LATE CAREY COMPLEX** Mockley / Claggett ceramics Large triangular projectile points	**WEBB COMPLEX** Hell Island ceramics Misc. stemmed points Jack's Reef pentagonal projectile points	ANTLER HARPOON **DELAWARE PARK COMPLEX** Hell Island ceramics Misc. stemmed projectile points
A.D. 500	WOODLAND I	JACK'S REEF ROSSVILLE LAGOON **CAREY COMPLEX** Mockley ceramics Rossville stemmed projectile points Fox Creek projectile points CERAMICS FISHTAIL	FOX CREEK **CAREY COMPLEX** Mockley ceramics Rossville stemmed projectile points PIPE	CACHE BLADES **CAREY COMPLEX** Mockley ceramics Rossville stemmed projectile points
A.D. 0		**WOLFE NECK COMPLEX** Wolfe Neck ceramics Misc. stemmed projectile points	ADENA **DELMARVA ADENA COMPLEX** Adena side and corner notched projectile points Misc. stemmed projectile points Coulbourn ceramics	CACHE BLADES **WOLFE NECK COMPLEX** Wolfe Neck ceramics Susquehanna Series ceramics Misc. stemmed projectile points
500 B.C.		BROADSPEARS **CLYDE FARM COMPLEX** Bare Island / Lackawaxen projectile points Marcey Creek & Dames Quarter ceramics Broadspears Fishtail projectile points Steatite bowls Experimental ceramics	CERAMICS **BARKER'S LANDING COMPLEX** Bare Island / Lackawaxen projectile points Marcey Creek & Dames Quarter ceramics Broadspears Fishtail projectile points Steatite bowls Experimental ceramics Heavy reliance on argillite	BROADSPEAR **CLYDE FARM COMPLEX** Bare Island / Lackawaxen projectile points Marcey Creek & Dames Quarter ceramics Selden Island ceramics Broadspears Fishtail projectile points Steatite bowls Experimental ceramics Long broadpoints
3000 B.C.	ARCHAIC	BARE ISLAND / LACKAWAXEN LE CROY ST. ALBANS KANAWHA	CARVED STEATITE (SOAPSTONE) BOWL	GROUND STONE AXE
6500 B.C.	PALEO-INDIAN	CLOVIS MID-PALEO DALTON-HARDAWAY PALMER KIRK STEMMED KIRK CORNER NOTCHED		
12000 B.C.				

isolated point finds. Although no clear-cut associations have yet been found, it is also hypothesized that bay/basin features may have also attracted Paleo-Indian groups (Custer, Cavallo, and Stewart 1983).

Archaic Period (6500 B.C. - 3000 B.C.). The Archaic Period is characterized by a series of adaptations to new environments. Increased warmth and fluctuations in moisture created a mosaic of forests of oak and hemlock. Many large grazing animals hunted during Paleo-Indian times became extinct. Sea-level rise also became a factor in northern Delaware during the Holocene Period. One impact of sea-level rise was to raise the local water table, which helped to create a number of large swamps, such as Churchmans Marsh. Human adaptations changed from the hunting focus of the Paleo-Indian Period to a more generalized foraging pattern in which plant food resources played a more important role. Large swamps, such as Churchmans Marsh, may have provided enough resources to support large base camps like the Clyde Farm Site. Many small procurement sites at favorable hunting and gathering locales are also known throughout northern Delaware.

Archaic Period tool kits were more generalized than earlier Paleo-Indian tool kits and included a wider array of plant processing tools, such as grinding stones, mortars, and pestles. A mobile life-style was probably common with a wide range of resources and settings exploited seasonally. A shifting band-level social organization with group size waxing and waning in relation to resource availability is evident in the archaeology of the region.

Woodland I Period (3000 B.C. - A.D. 1000). The Woodland I Period can be correlated with dramatic changes in local climates and environments that were part of events occurring throughout the Middle Atlantic region. In general, the climate cooled somewhat and became wetter. However, a warm and dry period occurred from approximately 3000 B.C. to 1000 B.C. Mesic forests were replaced by xeric forests of oak and hickory, and grasslands again became common. Some interior streams dried up, but the overall effect was redistribution of resources across the landscape, and not a deterioration. Continued sea-level rise also transformed many areas of the Delaware River and Bay shore into large, brackish-water marshes especially high in biological productivity.

The major changes in environment and resource distributions caused a radical shift in the adaptations and economies of prehistoric groups. Important areas for settlements included the major river floodplains and estuarine swamp/marsh areas. Large base camps with fairly large numbers of people are evident in many areas of northern New Castle County such as the Delaware Park Site, the Clyde Farm Site, the Crane Hook Site, and the Naamans Creek Site. These sites supported many more people than previous base camp sites and may have been occupied nearly year-round. The overall tendency was toward a more sedentary life-style.

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 and seem to indicate 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, broad-bladed, knife-like processing tools became more

common. Also, non-local lithic raw materials indicate that trade and exchange systems with other groups were beginning to develop. Stone, and then ceramic, containers are also added to the material culture assemblage. Durable containers allowed more efficient cooking of certain types of food and may also have been used to store surplus food. Storage pits and house features during the Woodland I Period are also known from the Delaware Park Site and the Clyde Farm Site. Social organization also seems to have undergone radical changes. With the onset of relatively sedentary life-styles and intensified food production, which might have produced occasional surpluses, incipient ranked societies may have begun to develop, as indicated by the presence of extensive trade and exchange and some caching of special artifact forms. By the end of the Woodland I Period, people in northern Delaware lived a relatively sedentary life-style.

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; however, settlements of the Woodland I Period, especially the large base camps, were also occupied during the Woodland II Period and very few changes in basic life-styles and artifact assemblages are evident (Stewart, Hummer, and Custer 1986). Intensive plant utilization and hunting remained the major subsistence activities up to European contact. Similarly, no major changes are seen in social organization for the Woodland II Period of northern Delaware.

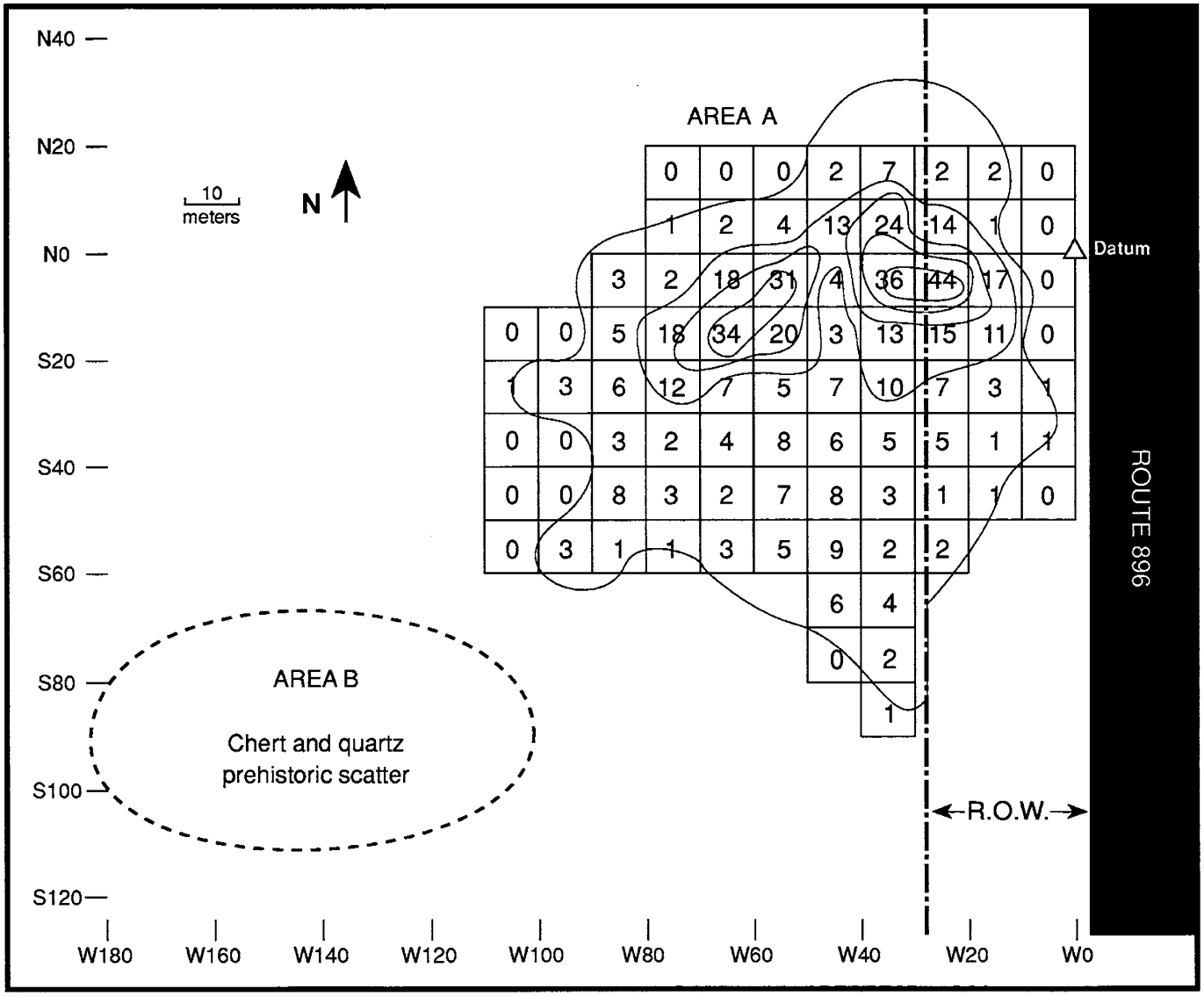
Contact Period (A.D. 1650 - A.D. 1750). The Contact Period is an enigmatic period of the archaeological record of northern Delaware which began with the arrival of the first substantial numbers of Europeans. Few Native American archaeological sites that clearly date to this period have yet been discovered in Delaware, although numerous Contact Period sites are evident in southeastern Pennsylvania. It appears that Native American groups of Delaware did not interact much with Europeans and were under the virtual domination of the Susquehannock Indians of southern Lancaster County, Pennsylvania. The Contact Period ended with the virtual extinction of Native American lifeways in the Middle Atlantic area. Only a few remnant groups remain.

Previous Research

The Brennan prehistoric site (7NC-F-61A) was discovered during a Phase I/II location/ identification survey of the Route 896 corridor from Route 4/West Chestnut Hill Road to the Summit Bridge Approach (Lothrop, Custer, and De Santis 1987). A Phase I surface reconnaissance along the west side of Route 896, 300 m north of Denny Road, revealed an extensive scatter of prehistoric artifacts consisting primarily of jasper debitage. Designated area "A," it extended 100 m west of Route 896, and was bounded on the north by an east-west trending ridge (Figure 2). From this ridge, the artifact scatter extended 70 m to the south downslope. A large portion of the jasper scatter was located within the proposed right-of-way. A second scatter of prehistoric artifacts was also identified at this time, and was labeled Area "B" (Figure 2). Area B consisted primarily of quartz and chert debitage, but was found to lie entirely outside of the proposed right-of-way.

FIGURE 2

Phase I / II Testing, Areas A and B



Phase II investigations in Area A consisted of a controlled surface collection and the excavations of 34 1 x 1 m test units, yielding approximately 1,150 prehistoric artifacts. Two areas of high artifact density were identified from the controlled surface collection around grid points S5W30 and S10W60 (Figure 2). Recovered artifacts included three cores, a unifacial tool, two Woodland I Period projectile points, and jasper flakes. One-half of the easternmost of the two concentrations was located within the proposed right-of-way and was subjected to subsurface testing. Test units were placed in the central portion of the eastern concentration in order to determine stratigraphic context and to test for potential subsurface features. The plow zone was excavated as one level. The remainder of the excavations were by 5 cm arbitrary levels until culturally sterile subsoils were encountered. Table 2 is a summary catalog of the artifact

TABLE 2

Summary Catalogue for Phase I/ II Testing

Debitage Recovered by Raw Material Type (less cores)

	Jasper	Quartz	Quartzite	Chert	Other
Surface collection	501	3	2	2	0
Plow zone excavation	553	0	2	3	1
Sub-plow zone excavation	103	0	0	0	0
Total	1157	3	4	5	1

Tool and Cores Recovered

Surface collection	**Jasper**	**Quartz**
Unifacial tools	1	---
Cores:		
bifacial	2	---
other	1	---
Finished projectile points	1	1
Late stage point preforms	2	---
Utilized flakes	3	---
Total	10	1

Excavation	**Jasper**	**Quartz**
Unifacial tools	1	---
Cores:		
bifacial	1	---
other	1	---
Total	3	0

assemblage from Phase I and II testing at the site. Artifact densities in the excavated units conformed to those of surface collected materials, and the artifacts were of similar types. The majority of artifacts were recovered from the plow zone, but artifacts were found in the sub-plow zone soils in thirteen of the 34 units. In nine of the units, the artifacts were located within 5-10 cm of the plow zone/subsoil interface, but four units produced artifacts at depths of up to 63 cm below surface. The deeper artifacts were associated with a sandy clay and gravel stratum presumably deriving from late Pleistocene or early Holocene Columbia Formation deposits. It was thought that prehistoric artifacts associated with this stratum might predate the Woodland I Period material from the plow zone. Additional testing of the deeper artifact-bearing soils indicated that they were horizontally restricted to the areas around S7W27/S8W27 and S9W32/ S10W32.

FIGURE 3

Phase II Testing, Area A Plow Zone Artifact Frequencies

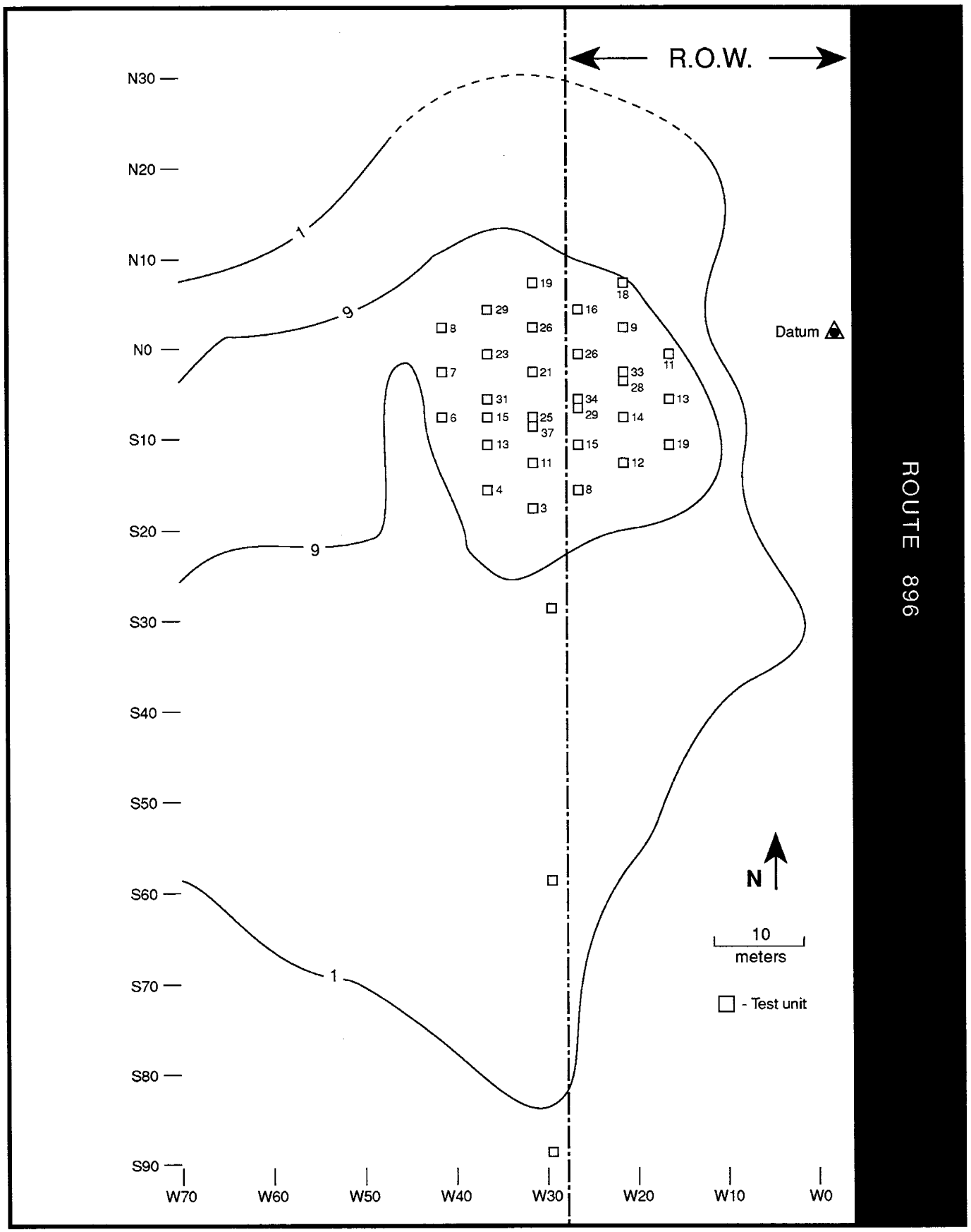
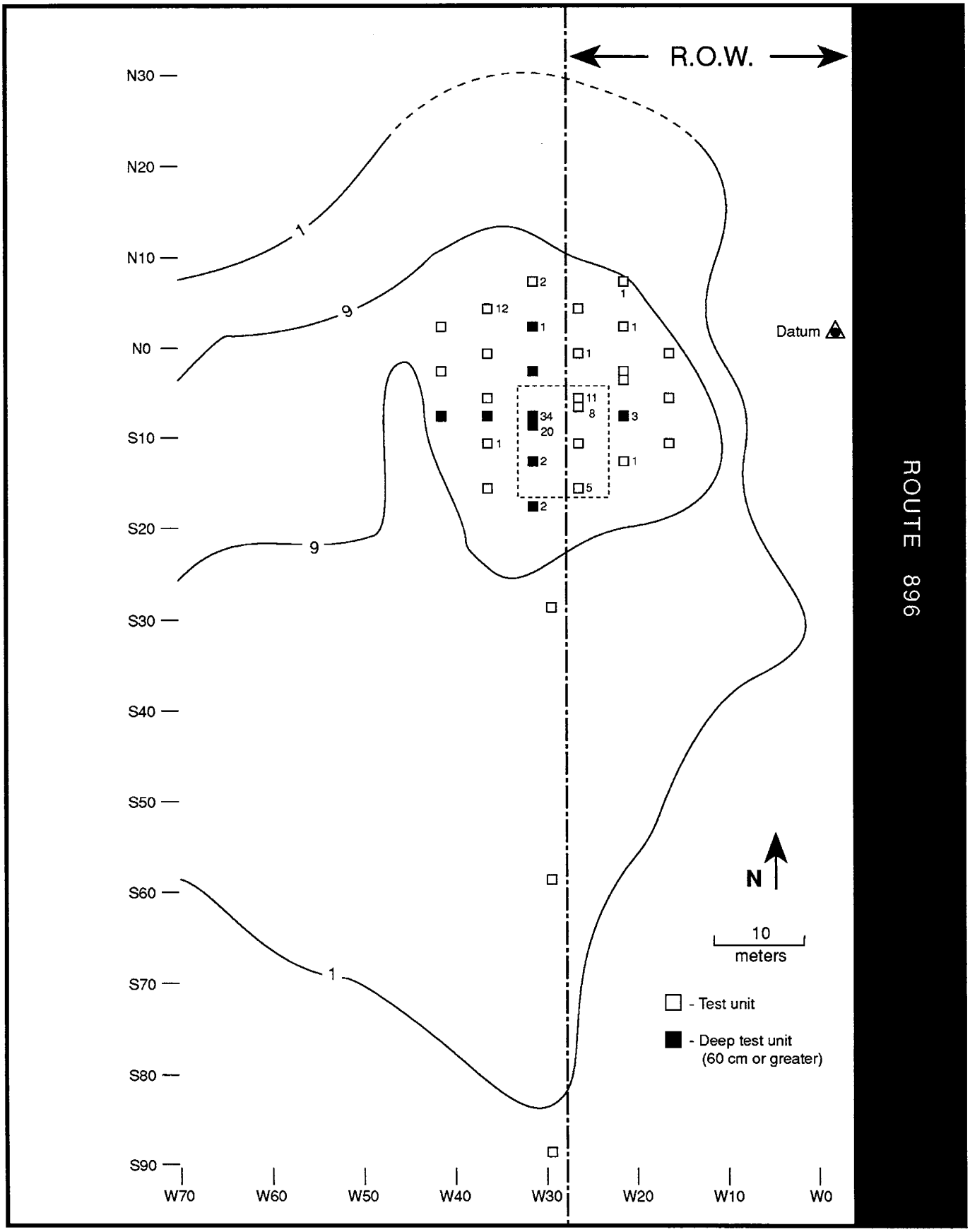


FIGURE 4

Phase II Testing, Area A Subsoil Artifact Frequencies



Area A of the Brennan prehistoric site was thought to be a Woodland I Period procurement site, representing the locus of a specialized station for secondary reduction of Delaware Chalcedony Complex jaspers (Lothrop, Custer and De Santis 1987:95). As such, it was determined to be eligible for inclusion on the National Register of Historic Places under criterion "D." The Brennan Site presented the opportunity to study the procurement and processing of Delaware Chalcedony Complex raw materials at a greater distance from their original source than most previous studies. In addition, the presence of intact sub-plow zone artifact deposits at a prehistoric site located on the Mid-Peninsular Drainage Divide provided a rare opportunity to observe relatively undisturbed artifact patterning in this setting. According to the State Management Plan, the archaeology of the Woodland I Period of the Mid-Peninsular Drainage Divide is poorly-known, and the Brennan Site was thought likely to yield significant data.

Research Questions and Methods

Research Questions. Phase I/II testing in Area A of the Brennan Site revealed the presence of a large scatter of jasper debitage and tools distributed over approximately 10,000 sq. m. Controlled surface collection of the area revealed two adjacent but distinct concentrations of jasper artifacts (Figure 2). Testing of the eastern concentration produced artifacts in plow zone soils and also in buried deposits found at the high density center of the concentration (Figures 3 and 4). This center is bracketed by grid coordinates S5-15 and W25-35, a 100 sq. m area.

The primary goal of Phase III excavations was to collect data on secondary reduction activities and core use at the eastern jasper concentration, an area which will be affected by proposed construction. Two major research issues will be addressed: 1) the specific technological aspects of jasper reduction; and 2) the role of jasper core technology in the overall activities that took place at the site.

Phase III excavations (Plates 2 and 3) were conducted within the central area of Phase II higher artifact density. Using the datum established during Phase II testing, a grid of 100 1 m sq.units was laid in from S5 to S15, and W25 to W35. Phase II test units S9W32 and S10W32 were among six Phase II units included within this grid, and both of these units had produced large numbers of artifacts in the plow zone, as well as artifacts in sub-plow zone soils. Initial Phase III investigations consisted of the excavation of 23 contiguous 1 m sq. units adjacent to these Phase II units (Figure 5). Eighteen additional 1 m sq. units were excavated to the south of this block, around Phase II unit S14W32 (Figure 5). In the eastern half of the 100 m sq. grid, five more 1 m sq. units were dug, primarily along the eastern edge of the grid (Figure 5).

Preliminary findings of the Phase III excavations did not conform with expectations based on Phase II testing of the site. The number of artifacts recovered from sub-plow zone contexts had been reasonably high in Phase II test units S7-8 W27 and S9-10 W32 (Figure 4), and Phase III units in the vicinity of S8-9 W32 also produced high numbers of artifacts below the plow zone (Figure 4). However, Phase III excavation in other parts of the site revealed much smaller numbers of artifacts in Level 2 and below (Figure 6). The 542 artifacts recovered from the subsoil represented 29% of the total number of artifacts found during Phase III excavations up to that point. The majority of the artifacts (69%) were found in the first 10 cm below the

Plate 2

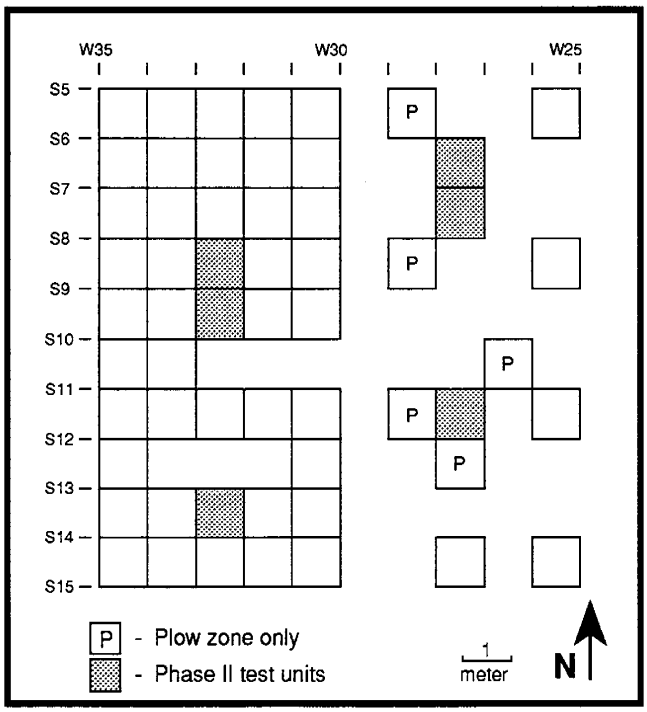
View of Phase III Excavation Units

Plate 3

Phase III Excavations in Progress

FIGURE 5

Phase III Excavations



plow zone; therefore, only 9% of the total artifacts at the site had been recovered from deposits deeper than 10 cm beneath the base of the plow zone. The number of artifacts dropped steadily with each 5 cm level below the plow zone.

The implications of this information were twofold. First, the low number of artifacts found below the plow zone, and their steady decrease in number with depth, suggested that a buried living surface or intact occupation was not present at the site. Secondly, the fact that the majority of artifacts found below the plow zone were located within the first two levels (10 cm) of the subsoil (and steadily decreased in number below that) suggested that the artifacts had migrated through the soil profile as a result of natural processes, such as root or rodent disturbances, and were no longer in their original location. It was also possible that the below-plow zone artifacts were from cultural features that were no longer visible due to pedogenesis.

Additional testing was warranted to determine the origin of below-plow zone artifacts. To accomplish this, standard statistical tables (Selby 1992) were used to determine an appropriate sample size of 50 cm sq. blocks (the minimum provenience unit for subsoil excavations), based on the number of blocks already excavated. These additional sample blocks would be excavated outside the area of high sub-plow zone artifact densities, in sections of the site with soils thought to be too old to contain culturally-deposited artifacts.

Ten 50 cm sq. test units were excavated at two meter intervals to the east of the Phase III excavation area, outside the portion of the site which contained the highest density of artifacts in the subsoil (Figure 7). Most of the units were excavated eleven 5 cm levels below the plow zone, thus creating a sample of 105 - 50 cm sq., 5 cm thick blocks. Six (5.7%) of the blocks had artifacts.

FIGURE 6

Total Artifacts Below Plow Zone

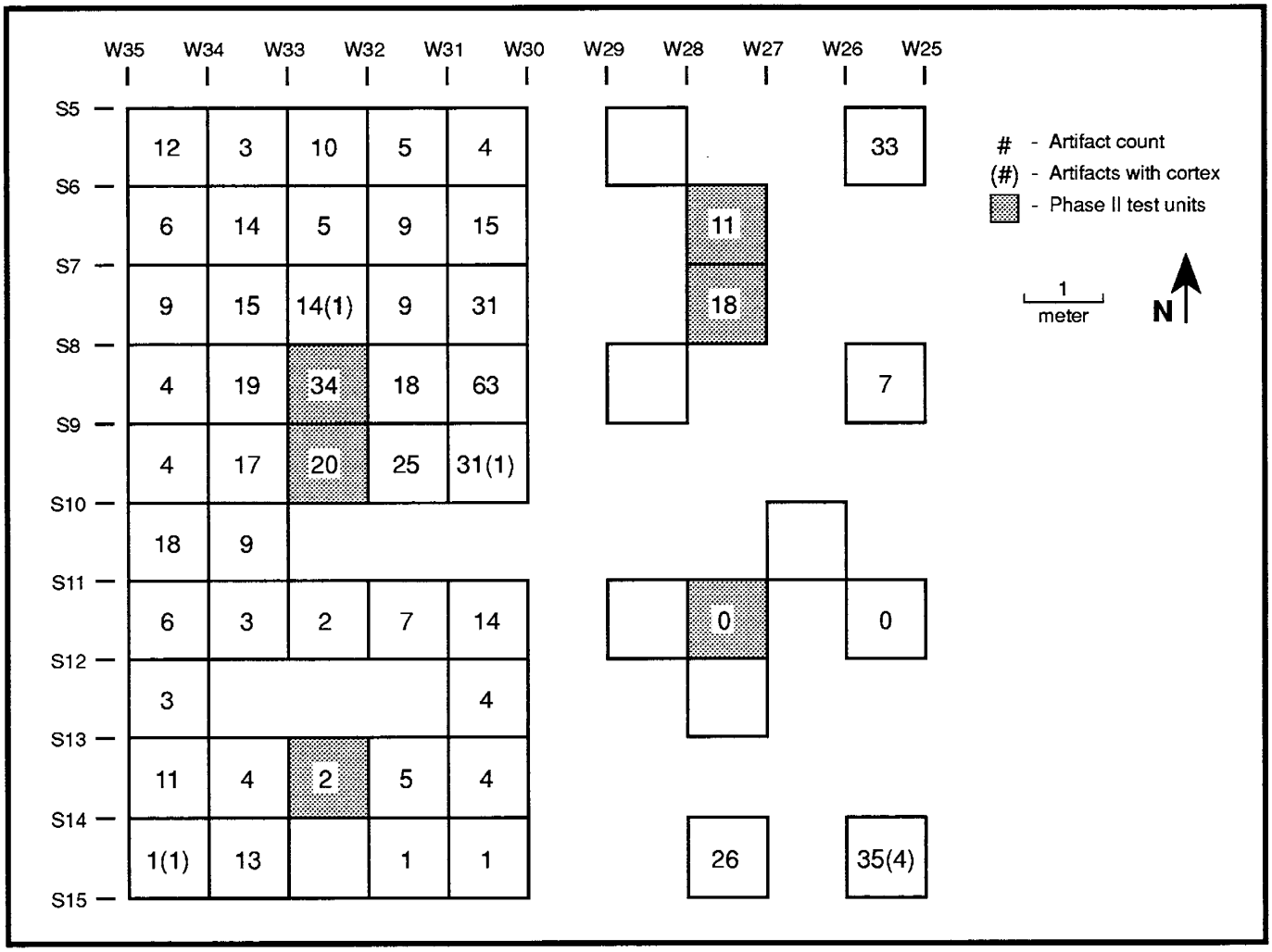
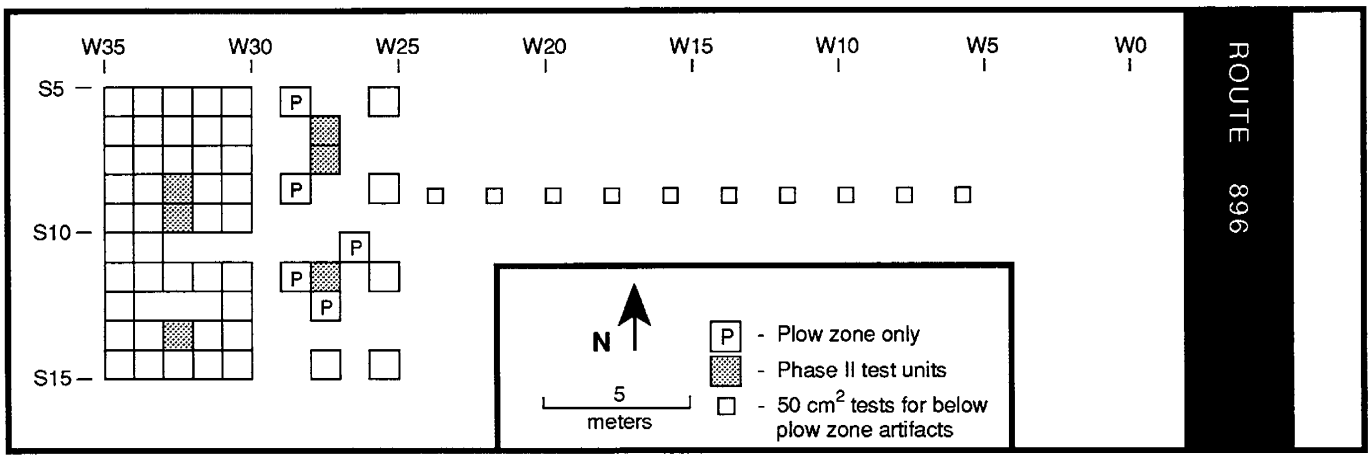


FIGURE 7

Additional Units for Sub-Plow Zone Sample Testing



The recovery of artifacts in Pleistocene-age soils directly below the plow zone in the test area east of the Phase III excavation area indicated that natural movement of artifacts had taken place at the site, and that the concentration of artifacts found in the Phase III section of the site was not unique, even though the subsoils in that area were post-Pleistocene in age. Based on this conclusion, no further excavation of sub-plow zone soils was undertaken at the site.

Methods. The plow zone of all units was removed and screened as a single stratigraphic unit. All levels below the plow zone were excavated in 5 cm arbitrary levels within natural levels. With the exception of the five units in which only the plow zone was excavated in order to obtain a larger sample of artifacts, all units were excavated until Pleistocene-age soils were encountered. If artifacts were found within 10 cm (2 levels) of this boundary, excavations continued until two continuously sterile levels were removed. If four continuous 5 cm levels were found to be sterile, excavation switch to 10 cm levels. In total, 51 1 m sq. test units were excavated within the center of Area A of the Brennan Site during Phase III investigations.

Each 1 m sq. unit was subdivided into four 50 cm sq. quadrants, labeled by the compass coordinates of its southeast corner. The quadrants were the minimum provenience unit. All excavated soils were screened through 1/4-inch mesh screen. A soil sample and one non-cultural rock were recovered from each level in each unit to be used as a control for blood residue analysis. Soil profiles were recorded for all units. Photographs were taken and maps were drawn of all potential features. Two 50 cm sq. quadrants from the north and south halves of the site were retained for flotation analysis, and two soil column samples were recovered from the same areas.

All soil and non-cultural rock samples were tested for false-positive blood residue reaction using protocols established at the University of Delaware Center for Archaeological Research (Custer, Ilgenfritz, and Doms 1988). In areas with no contamination, all tools and a sample of flakes were then tested for blood residue. After this process, all artifacts were washed and labeled according to standards established at the Island Field Museum.

EXCAVATION RESULTS AND INTERPRETATIONS

Site Stratigraphy

Composite profiles of the Brennan Site stratigraphy are shown in Figures 8-11. Horizon I is the plow zone which covers the entire site to a fairly uniform depth of approximately 20 cm. The majority of artifacts recovered at the site came from the plow zone. Horizon II is a B1t soil horizon of yellow brown silty clay, which is underlain in the north by a yellow brown sandy clay/ clay loam — a B2t soil, labeled as Horizon III on the profiles. Both of Horizon II and III contained prehistoric artifacts, although in lesser amounts than the plow zone. Horizon IV is a B3t soil horizon, transitional between Horizon III and the depositional parent material (C soil horizon) below it. Horizon IV is reddish brown clayey sand which contains a moderate to large amount of gravel. Horizon IV has developed on what is most likely a late Pleistocene/Early Holocene gravel with illuviated clays. Under Horizon IV is yellow brown slightly silty sand (Horizon V).