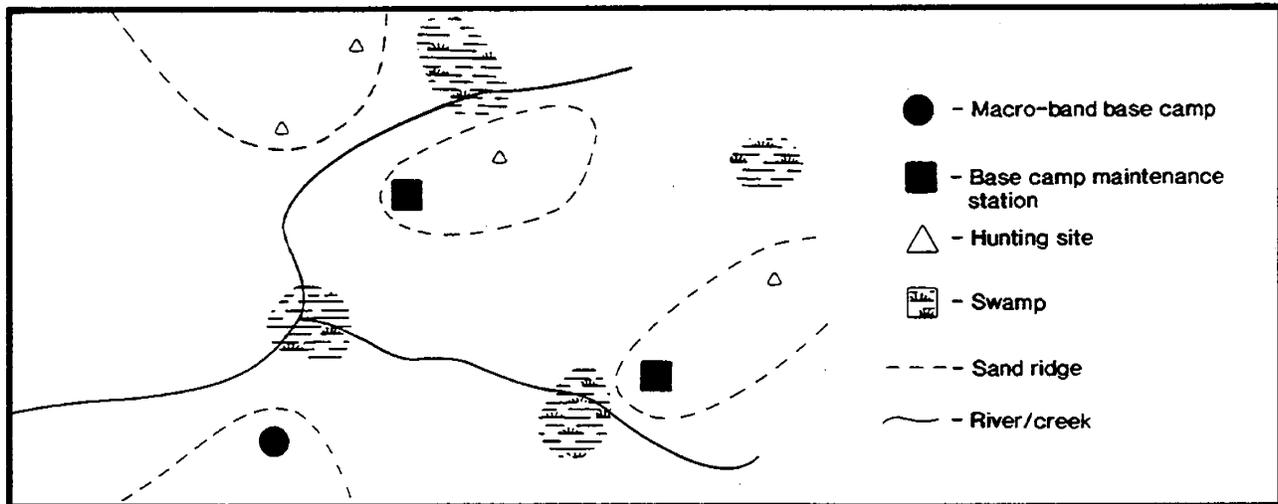


FIGURE 6

Paleo-Indian Non-Quarry Settlement Pattern



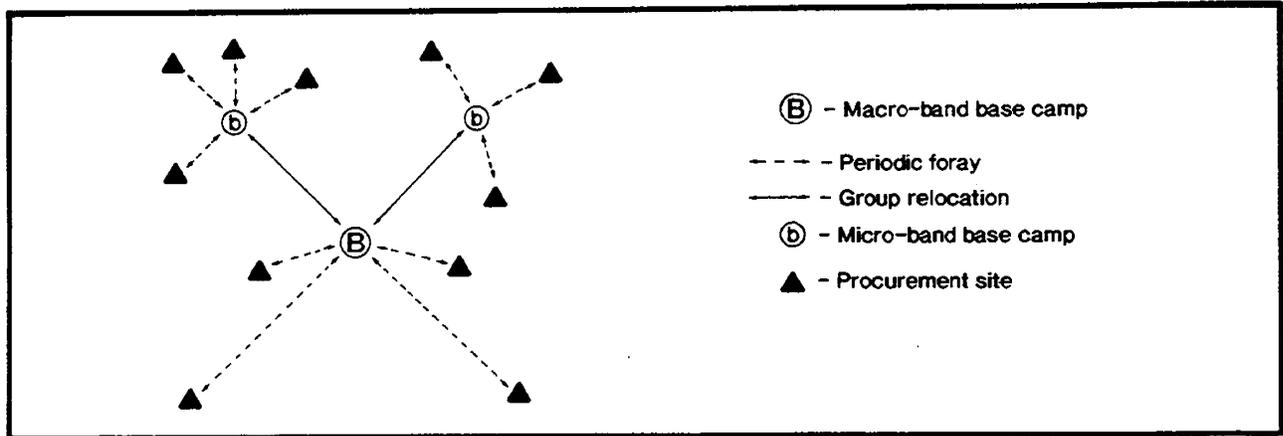
Susquehannock Indians of southern Lancaster County, Pennsylvania. The Contact Period ends with the virtual extinction of Native American lifeways throughout the Middle Atlantic region, save for a few remnant groups.

RESEARCH DESIGN

The primary goal of Phase II testing was to determine if any of the 32 sites within the State Route 1 right-of-way are eligible to the National Register of Historic Places. Furthermore, Phase II subsurface testing was intended to help define the site types, their temporal contexts, and their distributions across the project area in order to help illuminate and explain adaptive patterns of behavior in Delaware's Mid-Drainage Zone during each period of prehistory. It was further expected that such patterns could be considered in light of climatic changes and physical features of the landscape (e.g., bay/basins) to help explain adaptive strategies. Such data would add significant information to the sparse data base for the Paleo-Indian and Archaic periods in central Delaware and would be useful in providing comparative data for the study of social transformation in the Woodland Period complexes. The data's significance and the site distribution configuration were also important in considering how the sites would be affected by the proposed road construction.

The Mid-Drainage Zone, as discussed above, contains pockets of poorly-drained areas along the tributaries of the major drainages that would have been game attractive and would have supported cold- and wet-adapted plant species during the Paleo-Indian Period. Nevertheless, the Paleo-Indian sites in the Mid-Drainage Zone, as in all of Delaware, are relatively rare. Therefore, the identification of such sites was an important goal of the Phase II survey. Data from sites in other parts of the Middle Atlantic region have helped to produce models of Paleo-Indian adaptation to environments similar to those reconstructed for Delaware (Gardner 1974, 1977). These models suggest that within the mosaic parkland settings of the Late Glacial episode and boreal forest settings of the Pre-Boreal/Boreal episodes, the Paleo-Indian lifestyle is assumed to have been one of hunting and gathering, with an emphasis on hunting (Gardner 1977:12). Therefore, tool assemblages from these sites are expected to be dominated by projectile points and biface knives for the killing and butchering of animals. Flake tools for working bone or hide are also expected (Custer 1984a). Existing Paleo-Indian site location models (Figure 6) which stress poorly drained settings as a focus of game attraction were, therefore, employed in the Phase II survey (Gardner 1977; Custer, Cavallo, and Stewart 1983). In addition to areas of poorly drained terrain in the project area, bay/basin features are also prominent on the landscape. A goal of the Phase II survey was to attempt to gain a

FIGURE 7 Archaic Settlement System



clearer understanding of human utilization of these features during all phases of prehistory (Custer and Bachman 1986a; Bachman 1987).

The only site in the present survey that produced cultural material dating to the Paleo-Indian Period was the Dover Downs site, 7K-C-365A, located on a low knoll surrounded by poorly-drained terrain. The Paleo-Indian artifact recovered from the site was a rhyolite Kirk stemmed point dating to the Late Paleo-Indian Period, and it is one of very few Paleo-Indian artifacts recovered from a subsurface context in Delaware. No sites in the Phase II survey produced fluted points.

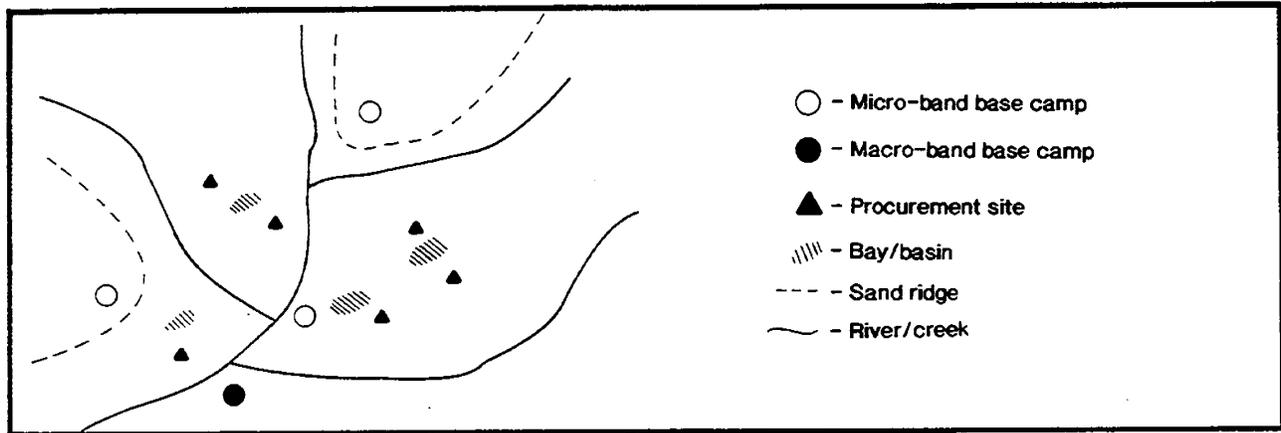
The beginning of the Archaic Period in Delaware coincides with the emergence of Holocene environments and is characterized by a shift in human adaptation strategies. A general warming trend with increased precipitation favored the expansion of mesic forests dominated first by hemlock and later by oak (Carbone 1976:76). Although hunting remained important throughout the Archaic, increasing emphasis was placed on the use of plant food resources. As a result, in the Archaic we see a more diffuse adaptation to an increasing variety of environmental settings and resources available from a more seasonally influenced exploitation (Cleland 1976). Consequently, as noted by Custer (1986b), there was an expansion in the number of site location types during the Archaic Period. The settlement model for the Archaic Period is shown in Figure 7. However, as was the case in the Paleo-Indian Period, Archaic Period sites are not common in the local archaeological record (Custer, Bachman, and Grettler 1987:34). Because there are few Archaic sites known, the main research goal of the Phase II survey for this period was basic site recording and description within a problem oriented format (Custer, Bachman, and Grettler 1987; Custer 1984b:134-135).

It has been suggested by Gardner (1978) and Custer (1986b) that interior swamps would have been favorable settings for macro-band base camps in the Archaic Period as would be found in the Churchman's Marsh area of northern Delaware and Cedar Swamp and Burnt Swamp areas in the southern part of the state. There has been no data to date that would suggest the presence of Archaic macro-band base camps in central Delaware. Although such sites may have existed along the floodplains of major drainages, these sites would most likely have been inundated by sea level rise and are now buried below fairly recent sediments, or have been destroyed by dredging (Custer 1986b).

Archaic micro-band camp sites are expected at sheltered locales along smaller streams which maximize access to hunting and gathering locales or access to lithic resources. The settlement pattern model for the Archaic Period in the Drainage Divide is shown in Figure 8. Many such settings appear in the project area and another goal of the Phase II survey was to identify and test such sites in order to estimate their size and settlement configuration.

FIGURE 8

Archaic Drainage Divide Settlement Pattern



Archaic Period procurement sites are another important focus of Phase II research. Hunting, gathering, and lithic procurement were activities critical to successful adaptation in the Archaic. In general, throughout the Coastal Plain areas, Archaic procurement sites seem to be scattered on small areas of relatively higher elevation adjacent to swampy, poorly drained ground, or large and small drainages (Custer 1986b:74). A settlement pattern model showing the projected setting and locations of Archaic procurement sites appears in Figure 9. The project area offers many such settings, and a small number of procurement sites are known from central Delaware in the vicinity of the project area. As in the case of micro-band base camps, a goal of the present research is to identify and test such sites in order to estimate their size and settlement configuration.

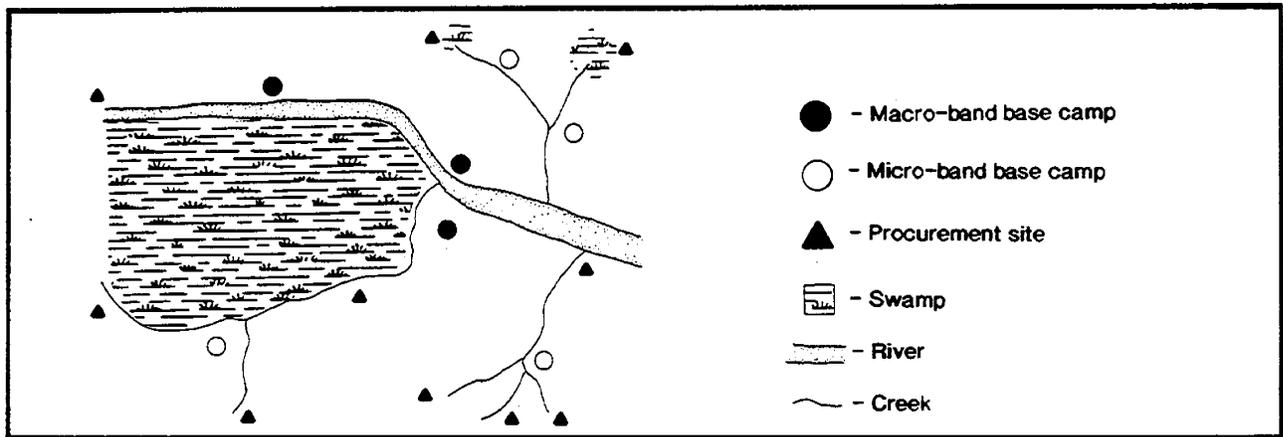
Many of the Archaic Period sites located in the project area are associated with bay/basin features (Custer et al. 1984; Custer, Bachman, and Grettler 1986). This association also provided a research question for investigation in the Phase II survey. Information regarding Archaic utilization of bay/basins in light of the environmental changes that resulted in a reduction in fresh water availability would provide valuable insight into adaptive behavior in the local area during the Archaic Period.

The Woodland I Period coincides with certain dramatic paleoclimatic changes. One of the hypothesized conditions is the so-called mid-postglacial xerothermic, or warm, dry period or periods occurring sometime after 3000 B.C. These dry periods may have caused episodic, scattered vegetation denudation and redeposition of surface soils by aeolian transport as well as alterations of local forest composition and vegetation distribution patterns. These landscape changes may have caused changes in settlement/subsistence systems of prehistoric peoples which may be reflected in the archaeological record. The Phase I survey indicated that Woodland I sites were prominent in the project area. The Phase II survey, therefore, presented an ideal opportunity to test hypotheses and models about the prehistoric adaptations in the Delaware Coastal Plain in association with the Woodland I paleoenvironmental change.

Unlike the Paleo-Indian and Archaic periods, the Woodland I Period is well documented and probably the best understood period in Delaware prehistory. The relatively large number of known sites highlights the wide variety of research questions that can be addressed for the Woodland I archaeological record. Probably the most interesting feature of this record is that it provides an especially good opportunity to study the processes of social change; it includes numerous examples of early semi-sedentary communities that were undergoing socio-cultural evolutionary transformations from simple egalitarian societies to more complex incipient ranked social organizations (Custer 1982). All of these communities began to develop, grow in size, and participate in supra-local exchange networks at the same time. The settlement pattern shift that signals their development and the subsequent appearance of exchange systems and more complex social organizations may be related to the changes

FIGURE 9

Archaic Swamp Settlement Pattern



in the biosocial environment initiated by the onset of the mid-postglacial xerothermic (Custer 1978, 1984b, 1989; Braun and Plog 1982). The diversity in the environment during the Woodland I Period and the complexity in social organization would be reflected in the archaeological record. Artifact assemblages from this period would contain a wider variety of tool types, including those for the processing of plant foods. In addition, ceramic technologies which emerged in the Woodland I Period enabled the production of storage vessels with particular ceramic styles that can be used as temporal markers of the various culture complexes of the Woodland I Period. Furthermore, a wider variety of raw materials was exploited during this time, including a range of non-local materials. Caches of late stage bifaces in a variety of imported materials have also been identified at Woodland sites in central Delaware (Custer 1984c) and can be expected in the project area.

The study of bay/basin features is also important in the Woodland I Period because it represents the most intensive utilization of the bay/basins (Custer, Bachman, and Grettler 1987:39). It was during this period that the Delmarva Peninsula and the Middle Atlantic region in general experienced the warmest and driest climatic conditions of the entire Holocene, resulting in dramatic changes in surface water availability (Curry and Custer 1982; Custer 1984a). One of the major settlement pattern changes seen in the Coastal Plain area was the utilization of a wide variety of interior environmental settings on an ephemeral basis (Custer and Galasso 1983:12-14). The increase in bay/basin utilization during this time may be part of this trend. Excavation of a sample of bay/basin sites over a wide area would provide extensive comparative data on the use of this type of setting through time and was, therefore, a goal of the Phase II survey.

Woodland II settlement patterns in central Delaware are a topic of some controversy. For many years, numerous authors have suggested that there is a relative absence of Woodland II sites in southern New Castle County and northern Kent County. By the same token, up until 1980 the nature of the northern New Castle County Woodland II occupations was also very poorly understood. Nonetheless, the southern New Castle County and northern Kent County area was viewed as a "buffer zone" or "fever belt" (Withoft 1984) separating two distinctive ethnic groups. The original Route 13 planning study analyzed extant artifact collections and noted numerous Woodland II sites in the supposed "buffer zone" making the whole concept somewhat invalid (Custer et al. 1984:220-221). The "discovery" of these sites was due to the fact that previous analyses had not recognized the Woodland II Minguannan ceramics in the collections because the type was not defined in the literature prior to 1981 (Custer 1981).

The discovery of Woodland II sites in a later survey of central Delaware (Custer, Bachman, and Grettler 1986) reveals a similar bias in previous studies which caused Woodland II sites to be under-represented in the data base. Most of the Woodland II sites, and all of the sites with Minguannan pottery, were discovered during sub-

surface testing of wooded areas dividing plowed fields from bluffs along the major drainages. The sites are small and appear along most of the major stream headlands studied. Furthermore, they are almost all unplowed and would have been, and were, missed in previous studies which focused primarily on surface survey of cultivated fields. Thus, there really is no absence of Woodland II sites in the study area and there is no need to invent a "buffer zone."

It can be noted that Woodland II sites in the northern portions of the study area are generally smaller than the Woodland II sites found farther south on the Delmarva Peninsula (Custer 1984a:157-171; Custer and Griffith 1986). However, the Woodland II sites of the study area fall well within the range of site sizes seen among Woodland II sites of the Minguannan and Slaughter Creek complexes (Custer 1984a:155-157; Stewart et al. 1986).

There seems to be little difference in site location preferences between the Woodland I and Woodland II periods (Custer et al. 1986). This implies that there was no Woodland II shift to more agriculturally productive soils and that the Woodland I intensive gathering/hunting subsistence pattern was continued into the Woodland II Period. Comparison of Woodland II settlement/subsistence systems is an important research topic in order to understand culture change in Delaware during late prehistoric times, and was, therefore, a goal of the present survey.

FIELD, LAB, AND RESEARCH METHODS

The Phase II archaeological field methods included the excavation of a mixture of shovel test pits (STPs) and 1m x 1m test units within and around areas defined as prehistoric archaeological sites by the Phase I survey (Bachman et al. 1988). Testing was concentrated, but was not confined to the limits of the proposed right-of-way because one of the primary goals of the Phase II survey was to determine site limits.

The standard excavation procedure used to determine site limits and gather initial archaeological data was to place shovel test pits at 10 meter intervals in a grid pattern over the site. The interval was reduced to 5 meters in areas of high artifact density or areas with a high potential for prehistoric features. The goal of shovel testing was to gather data on artifact distributions, site stratigraphy, and the stratigraphic context of artifacts and features. Special emphasis was placed on the detection of cultural features and the identification of intact, artifact-bearing stratigraphic contexts.

Shovel test pits were laid out and described according to grid coordinates established by transit. All soils excavated were passed through 1/4-inch mesh and all cultural materials recovered were bagged according to the individual shovel test pits and the arbitrary or natural excavation levels. Stratigraphic soil data and a record of all cultural materials found were kept for each shovel test on standardized log sheets.

Measured 1m x 1m test units were excavated in areas of high artifact density or atop prehistoric features identified by archaeological testing. All of the test units were excavated to sterile soil unless large prehistoric features were encountered. Small prehistoric features such as hearth areas were completely excavated, while larger features such as habitation and storage pit features were sampled. All excavated soil was screened through 1/4-inch mesh and detailed stratigraphic and prehistoric feature records were kept on standardized forms. Charcoal samples were collected for radio carbon dating, soil samples were taken for chemical and flotation analysis, and drawings were made of all soil profiles. All subsurface excavations were executed according to natural soil levels or systematic arbitrary levels. All feature soils were excavated and screened separately.

Test units were located and described by the coordinates of their southwest corners as determined by the same transit grid as the Phase II shovel test pits. All subsurface tests were mapped on 1/600th scale, one-foot contour field maps (scale: 1 inch equals 50 feet) provided by the Division of Highways. These highly accurate maps were keyed to the centerline surveyors stations (STA) and allowed for the accurate placement of finds made during the Phase II survey.

Prior to a detailed artifact analysis, the standard artifact processing procedures of the Delaware Bureau of Museums were applied to all artifacts recovered from the Phase II excavations. All artifacts were cleaned in the lab