

1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

The Delaware Department of Transportation (DelDOT), in coordination with the Federal Highway Administration and the Delaware State Historic Preservation Office (SHPO), created a planning strategy for cultural resources within the State Route 1 (SR1) project area beginning in 1984. A probability model was developed in order to identify high, medium, and low probability areas for the discovery of archaeological and historical sites (Custer et al. 1984). In 1987, the Advisory Council on Historic Preservation developed a Memorandum of Agreement (MOA) for the execution of Section 106 requirements throughout the SR1 project area. The MOA provided for the mitigation of adverse effects to significant properties and sites if alternative measures such as avoidance proved unfeasible for sites later determined potentially eligible for the National Register of Historic Places (NRHP).

The Smyrna-to-Pine Tree Corners segment of the proposed SR1 corridor is located in New Castle County, where it bypasses and crosses the existing U.S. Route 13 (Figure 1-1). The proposed right-of-way (ROW) is approximately 5 miles long, varying in width from approximately 300 to 500 ft (91–151 m). Parsons conducted Phase II archaeological fieldwork between March and October of 1999, in order to determine eligibility of sites for listing in the NRHP. Highway construction plans as proposed would have a direct and adverse effect on the sites. The sites could not be avoided and were thus subject to the terms of the MOA.

The cultural resource evaluations were conducted in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. The archaeological investigations were carried out in accordance with the standards of the Advisory Council on Historic Preservation, and the National Park Service ((36CFR800: *Guidelines for the Protection of Historical and Cultural Properties*; 36CFR60: *National Register of Historic Places*; 36CFR63: *Determinations of Eligibility for Inclusion in the National Register of Historic Places*). All work was conducted under the "Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation" (48 FR 44716-44742). Fieldwork was conducted in close consultation with the DelDOT and the Delaware SHPO. The work conformed to Delaware SHPO standards as outlined in the *Guidelines for Architectural and Archaeological Surveys in Delaware* (1993). Several reports served as guides to address Native American and historical contexts including: *Delaware Comprehensive Historic Preservation Plan* (Ames et al. 1989), *A Management Plan for Delaware's Prehistoric Cultural Resources* (Custer 1986), *A Management Plan for the Prehistoric Archaeological Resources of Northern Delaware* (Custer and DeSantis 1986), and *Management Plan for Delaware's Historical Archaeological Resources* (DeCunzo and Catts 1990).

1.2 PREVIOUS INVESTIGATIONS

The 5-mile long proposed Smyrna to Pine Tree Corners segment of SR 1 was subject to probability modeling, comprehensive Phase I archaeological investigations, numerous Phase II evaluations and Phase III data recoveries. All of the sites within the study area were identified during previous investigations. Two initial Phase I investigations were undertaken by the University of Delaware Center for Archaeological Research (UDCAR), including a

reconnaissance survey in 1984 (Custer and Bachman 1986) and a combination of surface collection, shovel testing, and test units in 1992 (the latter results were compiled into a management summary by the Cultural Resource Group of Louis Berger & Associates, Inc. [LBA]: Bedell and Busby 1997). Follow-on studies were performed by LBA in new alignments, access denied areas, and in wetland mitigation areas, and included Phase II and III investigations of sites identified as a result of the various surveys (Bedell 1996a, 1996b, 1996c, 1997; LeeDecker et al. 1996; Bedell et al. 1997a, 1997b; Bedell and Jacoby 1998) (Table 1-1).

1.3 PROJECT SCOPE OF WORK AND OBJECTIVES

Factors considered in determining the need for Phase II evaluation of each site included a preliminary assessment of integrity, the likelihood for locating intact, stratified deposits, the variety of artifact types, the presence of diagnostic artifacts, and the potential for the resource to contribute significantly to the understanding of past historical and Native American lifeways in the State of Delaware. Parsons classified each of the sites along the SR1 corridor into one of two groups. Group 1 included those sites located within the ROW and considered to have a greater likelihood to contribute meaningfully to the understanding of Delaware's past (Figure 1-1). Group 2 included those sites constituting an isolated find, some no longer occurring within the ROW, lacking integrity and/or research potential, or located in the DiGiovanni, Lynch, and Osborne wetland properties (Auman and Bupp 2000).

The Phase II archaeological investigations evaluated the NRHP eligibility of the sites along the SR1 corridor, under the Native American and historical research priorities established for Delaware (Custer 1986, 1994; Custer and De Santis 1986; DeCunzo and Catts 1990). Twenty-five sites were classified within Group 1 and were recommended for Phase II study as possibly containing research potential (Table 1-2). The 25 sites were 7NC-H-93B, 7NC-H-95A, 7NC-H-95B, 7NC-H-95D, 7NC-H-95F, 7NC-H-95G, 7NC-H-95H, 7NC-H-95J, 7NC-H-95K, 7NC-H-95L, 7NC-H-95M, 7NC-J-97, 7NC-J-98, 7NC-J-99, 7NC-J-192B, 7NC-J-195A, 7NC-J-195D, 7NC-J-199, 7NC-J-200, 7NC-J-204, 7NC-J-207, 7NC-J-224, 7NC-J-225, 7NC-J-227, and 7NC-J-228. Physical proximity enabled several of the sites to be combined into site complexes. Sites 7NC-H-95F, 7NC-H-95G, and 7NC-H-95H, were combined, as were 7NC-H-95J, 7NC-H-95K, and 7NC-H-95L. Parsons evaluated 7NC-J-199 and 7NC-J-200 as one site. Site 7NC-J-97, 7NC-J-98, and 7NC-J-99 formed the Frederick Lodge Site Complex; Site 7NC-J-227 and 7NC-J-228 constituted the Sandom Branch Site Complex. Sites 7NC-J-97/98/99 (the Frederick Lodge Site Complex), 7NC-J-195D (the Blackbird Creek Site), 7NC-J-204 (the Jones Site), 7NC-J-225 (the Black Diamond Site), and 7NC-J-227/7NC-J-228 (the Sandom Branch Site Complex) proved eligible for inclusion on the NRHP and are discussed separately in individual comprehensive technical reports that include the results for the Phase II evaluation and Phase III mitigation performed on each site.

The Phase II results for those sites not considered NRHP-eligible, sites that were ultimately avoided, and sites that occurred outside the final ROW are presented in this document. These sites include 7NC-H-93B, 7NC-H-95A, 7NC-H-95B, 7NC-H-95D, 7NC-H-95FGH, 7NC-H-95JKL, 7NC-H-95M, 7NC-J-192B, 7NC-J-195A, 7NC-J-199/200, 7NC-J-207 (the Buckson Site), and 7NC-J-224 (the Reynolds Tenancy Site).

Table 1-1. Selected Previous Archaeological Investigations in the Vicinity of Smyrna to Pine Tree Corners

Year of Fieldwork	Year of Report/ Author/Affiliation	Title	Level of Investigation	Results	Management Recommendations
1984	1986/Custer and Bachman/ UDCAR	<i>An Archaeological Planning Survey of Selected Portions of the Proposed Route 13 Relief Route, New Castle County, Delaware</i>	Phase I Reconnaissance survey in Blackbird vicinity; shovel testing at 7NC-J-20	180 sites identified, including 7NC-J-48 to 7NC-J-50 and 7NC-J-92 to 7NC-J-101 in or adjacent to project corridor.	Recommended further archaeological survey and testing.
1992	1997/Bedell and Busby/ Louis Berger & Associates, Inc. (Fieldwork conducted by UDCAR)	<i>Phase I Archaeological Survey of the SR 1 Corridor, Smyrna to Pine Tree Corners, New Castle County, Delaware</i>	Phase I Shovel testing and reconnaissance survey on highway corridor; some test units at historical sites	65 sites identified	Further work recommended for several sites, conducted by Berger & Assoc., Inc. in 1997.
1995	1997a/Bedell et al./ Louis Berger & Associates, Inc.	<i>Phase I and II Archaeological Studies in the Proposed SR 1 Corridor, Scott Run to Pine Tree Corners, New Castle County, Delaware</i>	Phase I Reconnaissance survey of 160 ac. Osborne wetland and 30 ac. Lynch wetland	Osborne wetland: 9 sites identified; Lynch wetland: 4 sites identified.	Osborne wetland: 7NC-J-212 eligible, avoidance recommended. Lynch wetland: Phase II recommended for 7NC-J-50, 7NC-J-219, and 7NC-H-91 Not eligible.
1996	1996a/Bedell/ Louis Berger & Assoc., Inc.	<i>Management Report: Phase II Archaeological Testing of Prehistoric Sites 7NC-J-219, 7NC-J-50, and 7NC-H-91 in the Lynch Wetland Replacement Area, New Castle County, Delaware</i>	Phase II evaluation	Unidentifiable temporal period determined.	Not eligible.
1996	1996/LeeDecker et al./ Louis Berger & Associates, Inc.	<i>Phase I Archaeological Survey of the SR 1 Corridor on the Osborne Property, New Castle County, Delaware</i>	Phase I Reconnaissance survey	4 Native American sites	Recommended further work for 7NC-J-220
1996	1996c/Bedell/ Louis Berger & Assoc., Inc.	<i>Management Report: Phase II Archaeological Testing of 7NC-J-220, the Knotts Site</i>	Phase II evaluation	Paleoindian to Woodland II procurement site and early nineteenth century historical tenant farm	Not eligible.
1996	1996b/Bedell/ Louis Berger & Associates, Inc.	<i>Management Report: Phase I Archaeological Survey of the DiGiovanni Construction Staging Area, New Castle County, Delaware</i>	Phase I survey of 30 acres	Thin Native American artifact scatter throughout area, and late nineteenth century historical farm	Not eligible.
1997	1998/Bedell and Jacoby/ Louis Berger & Associates, Inc.	<i>Management Report: Additional Phase I Archaeological Survey in the SR 1 Corridor Smyrna to Pine Tree Corners, New Castle County, Delaware</i>	Phase I survey of 83 acres not surveyed by UDCAR in 1992	6 additional sites identified in project corridor.	Combining 6 sites and sites identified during UDCAR's 1984 and 1992 surveys, Phase II recommended for 7NC-J-192B, 7NC-J-225, 7NC-J-227, 7NC-J-195D, 7NC-H-93B, 7NC-H-95F/G, and 7NC-J-224.
1997	1997b/Bedell et al./ Louis Berger & Associates, Inc.	<i>Phase I/II Archaeological Investigations at the John Henry Site, 7NC-J-223, SR 1 Corridor, Pine Tree Corners, New Castle County, Delaware</i>	Phase I survey/Phase II evaluation		

Table 1-2. Summary of Site Recommendations along the Smyrna to Pine Tree Corners portion of the SRI corridor

Site ID	Phase I Investigation	Assessment	Recommendation	Further Work	Recommendation
7NC-H-93B	UDCAR	LBA	Phase II	Parsons	Not Eligible
7NC-H-95A	UDCAR	LBA	Not Eligible	Parsons	Not Eligible
7NC-H-95B	UDCAR	LBA	Additional Phase I	Parsons	Not Eligible
7NC-H-95D	UDCAR	LBA	Additional Phase I	Parsons	Not Eligible
7NC-H-95F*	UDCAR	LBA	Phase II	Parsons	Not Eligible
7NC-H-95G*	UDCAR	LBA	Phase II	Parsons	Not Eligible
7NC-H-95H*	UDCAR	LBA	Not Eligible	Parsons	Not Eligible
7NC-H-95J*	UDCAR	LBA	Additional Phase I	Parsons	Not Eligible
7NC-H-95K*	UDCAR	LBA	Phase II	Parsons	Not Eligible
7NC-H-95L*	UDCAR	LBA	Not Eligible	Parsons	Not Eligible
7NC-H-95M	UDCAR	LBA	Not Eligible	Parsons	Not Eligible
7NC-J-97*	UDCAR	LBA	Additional Phase I	Parsons	Potentially Eligible
7NC-J-98*	UDCAR	LBA	Isolated Find	Parsons	Potentially Eligible
7NC-J-99*	UDCAR	LBA	Additional Phase I	Parsons	Potentially Eligible
7NC-J-192B	UDCAR	LBA	Not Eligible	Parsons	Not Eligible
7NC-J-195A	UDCAR	LBA	Additional Phase E I	Parsons	Not Eligible
7NC-J-195D	UDCAR	LBA	Phase II	Parsons	Potentially Eligible
7NC-J-199	UDCAR	LBA	Additional Phase I	Parsons	Not Eligible
7NC-J-200	UDCAR	LBA	Additional Phase I	Parsons	Not Eligible
7NC-J-204	UDCAR	LBA	Not Eligible	Parsons	Potentially Eligible
7NC-J-207	UDCAR	LBA	Not Eligible	Parsons	Not Eligible
7NC-J-224	UDCAR	Parsons	Out of ROW	Parsons	Unevaluated
7NC-J-225	LBA	LBA	Additional Phase I	Parsons	Potentially Eligible
7NC-J-227	LBA	LBA	Additional Phase I	Parsons	Potentially Eligible
7NC-J-228	LBA	LBA	Not Eligible	Parsons	Potentially Eligible

** Note: sites making up a site complex are separated out due to varying recommendations.

1.4 ENVIRONMENTAL BACKGROUND

The proposed Smyrna to Pine Tree Corners 5-mile corridor is located within the Low Coastal Plain of Delaware. This segment of SR 1 begins south of Smyrna Landing Road, in a broad area of Coastal Plains Uplands. Portions of these uplands are well drained and are currently in agricultural use; others are situated in wooded and wetland areas. Numerous bay/basins also are present across the southern portion of the landscape. Some of these features contain surface water; others are dry, broad depressions within actively plowed fields. The bay/basins, together with occasional low, ridge-like knolls, create a gently undulating terrain.

From south to north, the proposed corridor crosses three intermediate-order streams. In contrast to the undulating terrain in the southern end of the corridor, broad, level upland terraces characterize the land north of Sandom Branch. Bay/basins are absent in this portion of the corridor and much of the land is in active agricultural use. North of Sandom Branch, Blackbird Creek is deeply entrenched within these uplands. Further north, the proposed corridor traverses the wooded and poorly drained headwater valley of Herring Run. Numerous small bay/basins are again present, some containing surface water. Minor rises and ridge-like knolls are present along the valley floor.

1.4.1 Paleoenvironment

To assess the character and distribution of Native American occupations within the project area through time, it is necessary to consider the changing characteristics of the environment during the approximately 12,000 years of human occupation of the region. In general, the environment of the Middle Atlantic region has remained relatively stable for the past 5,000 years. Prior to that time, two broad trends are noted, both related to the retreat of the last continental glaciers during a period that coincides with the arrival of Native American populations in the Northeast. These trends are characterized as gradual warming, and the replacement of an open boreal forest, typified by conifers, with temperate, mixed deciduous communities (Gaudreau 1988).

At the end of the last glaciation, much of northeastern North America was considerably colder and wetter than at present, covered by open tundra and boreal forest environments. Sea level at that time has been estimated at as much as 130 m below current levels (Milliman and Emery 1968), with estuary systems such as the Chesapeake and Delaware Bays still consisting of rivers and outwash channels. Accompanying the retreat of the ice sheets was a gradual warming trend, a rise in sea level, the flooding of coastal zones, and the development of new estuary environments extending far up the channels of coastal river systems. In addition, northern forests and their associated faunal communities were gradually replaced with varieties more typical of southern temperate zones. An essentially modern climate and environment had become established by approximately 5000 B.C.

Climatic changes did not occur at a smooth, unvarying rate, but rather consisted of a series of short-term variations within a general trend. The following outline of the various climatic episodes in the Northeast and Middle Atlantic regions is based on the work of Carbone (1976) in the Shenandoah Valley; Rippeteau (1977) in the Upper Susquehanna Valley of New York; Vento and Rollins (1990) in the Susquehanna and Delaware Valleys; Dent's (1979) research from the Upper Delaware Valley; Delcourt and Delcourt's (1981) regional synthesis; and several site-

specific studies, such as Buckles Bog, in Garrett County, western Maryland (Maxwell and Davis 1972); Hartstown Bog, in Mercer County, northwestern Pennsylvania (Walker and Hartman 1960); the New Paris Sinkhole, in Somerset County, southwestern Pennsylvania (Guilday et al. 1964); the Indian Creek V site, in Prince Georges County, Maryland (LeeDecker et al. 1991); and several locations in central Delaware, including Walter's Puddle, in southern New Castle County (Newby et al. 1994; Webb et al. 1994); and the floodplain of St. Jones River at Blueberry Hill, in central Kent County (Brush 1995). The dates used in the presentation approximate those of Dent, who provides a full and detailed sequence based on data closest to the current project area. The initial episode, the Late Glacial, pre-dates the traditionally accepted date of human presence in the Northeast by at least 1,500 years.

Late Glacial ca. 13,000-11,000 B.C. The Late Glacial was a cold and wet period, with tundra-like vegetation present, particularly near the ice front. Further south were abundant open parkland, with sedge and grass interspersed with stands of spruce and fir (Maxwell and Davis 1972; Wright 1981). Pollen records at Marsh Creek, in Chester County, Pennsylvania, indicate a changing mixture of grasses, sedges, and boreal species by approximately 11,500 B.C. (Martin 1958), which suggests the transitional nature of climate and vegetation during the period. Whitehead (1973) has suggested a general zone of displacement approximately 1,000 kilometers in width between the glacial front and boreal forests to the south. Northern faunal species and megafauna ranged freely. Guilday (1982) has noted a distinctly greater variety of faunal species, and in particular, large animal species, in Pleistocene and Late Glacial times, as compared with the later Holocene Period. This variety suggests more open forest and grassland capable of supporting greater numbers of grazing animals. In contrast, Custer (1990) has argued that a relatively undifferentiated boreal forest environment was in place in the Middle Atlantic region, and that herds of large game were probably not present by the time of the first documented human occupations.

Pre-Boreal ca. 11,000-8700 B.C. The Pre-Boreal was primarily a cold and wet period, though with the retreat of the continental ice sheet, regional temperatures increased, creating a gradual warming trend from the preceding Late Glacial episode. The existing mosaic of tundra, open grasslands, and boreal forest may have continued in some areas, with spruce and pine forest becoming dominant. Swamps and remnant peri-glacial lakes were common (Custer 1984). Less varied plant food availability has been suggested (Raber 1985), and a decline in both large and small animal species has been reported (Guilday 1982). Both circumstances have implications for human subsistence practices. Carbone (1976:185), in contrast, suggests a fairly compressed mix of "boreal and austral species side by side," including deer, elk, moose, possibly remnant mastodon, horse, bison, and smaller game.

Boreal ca. 8700-7200 B.C. Initially, this period was marked by an increase in warm air masses, which induced a gradual warming trend. Open grasslands diminished in extent, and spruce woodlands were replaced by pine forest and northern hardwoods, especially oak (Walker and Hartman 1960; Sirkin 1977). Watson and Custer (1989) report the replacement of spruce by hemlock in the Middle Atlantic Coastal Plain. Less varied habitats may have resulted in lower carrying capacity (LeeDecker et al. 1991). Guilday (1982) has indicated that modern faunal species were in place in western Pennsylvania in a mixed, oak/chestnut-dominated forest by at least 7000 B.C. He notes an overall decrease in species diversity among browsing and grazing herbivores, from 75 species during the Late Pleistocene to 51 in the Holocene. The proportion of

large grazers decreased from 35 percent of the total fauna to 12 percent, suggesting development of a closed, deciduous forest. Webb et al. (1994) note an extended period of desiccation in central Delmarva beginning around 9000 B.C. and continuing through the Boreal into the following Atlantic period. Evidence for this is derived from pond sediments suggesting depressed water levels throughout the period.

Atlantic ca. 7200-4600 B.C. The early portion of the Atlantic period was characterized by warm and increasingly wet conditions, signaling the onset of a fully modern climatic regime with associated floral and faunal communities. Oak-hemlock forests expanded, and "mesic forests mantled the landscape from the floodplain to the ridges" (Carbone 1976:189). An oak-hemlock complex was well established at the Mitchell Farm Site (7NC-A-2), in northern New Castle County by about 5900 B.C. (Custer and De Santis 1985). Oak dominance over hemlock is noted in Delmarva by 5000 B.C. (Bernabo and Webb 1977). Wetter conditions may have fostered wetland expansion, but a drying trend is noted near the end of the period (Carbone 1976). Generalized deciduous forests, producing large quantities of mast foods, were in place by 4000 B.C., and deer, small mammal, and turkey populations increased (Custer 1989).

Sub-Boreal ca. 4600 B.C.-A.D. 0. The Sub-Boreal consisted of a warm and dry period, with consequent re-expansion of grasslands and dominance of oak-hickory forests and xerophytic species. Pollen analysis at Walter's Puddle, two kilometers north of the present project area, suggests the presence of a regional forest dominated by oak by 3870 B.C. (Newby et al. 1994). Environmental stabilization near the end of the period is evidenced by a lack of change in forest components, as suggested by pollen cores taken near St. Mary's City, in southern Maryland (Kraft and Brush 1981). These cores indicate the general dominance of oak, hickory, and pine by around 3400 B.C. Additional pollen profiles from Delmarva suggest that hickory was the dominant species in the northern part of the peninsula, and pine in the southern part (Bernabo and Webb 1977). The decrease in hemlock during the Sub-Boreal was widespread in eastern North America during the middle Holocene, but in Delmarva, it may have been as much a result of edaphic conditions—specifically the predominance of dry, sandy soils—as of climate change (Custer 1989). The burial of landscapes through aeolian, or windblown, deposition has also been observed throughout the peninsula, and is presumably associated with a combination of xeric soils and drying climatic conditions (Curry 1980, 1992; Ward and Bachman 1987; Curry and Ebright 1989; Daniels 1993). Increasingly cool and moist conditions prevailed near the end of the Sub-Boreal period.

Sub-Atlantic ca. A.D. 0-present. A general, progressive cooling trend is noted throughout the Sub-Atlantic period. A rise in the incidence of organic debris in sediments along the St. Jones River, in central Delaware, suggests increased precipitation (Daniels 1993). Stratigraphic unconformities associated with both aeolian and alluvial depositional events suggest abrupt shifts in precipitation (Custer 1978, 1989). By approximately A.D. 500, the pattern had stabilized. Modern oak-chestnut forests were well established in the Piedmont and Fall Line Zones, while chestnut-pine communities were common in the High Coastal Plain, particularly in sloping locales (Braun 1950).

The study of the physical environment of the region and the alterations it has undergone provides insights into the nature and availability of habitats suitable to human populations. These

environmental changes provide a background or context for cultural change as observed through artifact and settlement pattern variation.

1.4.2 Modern Environment

Climate. Climate data are used to indicate any restrictions on settlement and land use (e.g., drought conditions, frequent catastrophic storm events) as well as to aid in interpretation of other sources of data such as tree ring growth rates, rates of sedimentation in lakes and land surfaces, and apparent erosional gaps in a depositional sequence. Hot, humid summers and mild winters characterize Delaware's modern climate. Average winter temperatures range from -7 to 5 degrees Celsius ($^{\circ}\text{C}$) with averages approximately 2°C higher in the southern part of the state. Summer highs can exceed 32°C with humidity between 45 and 85 percent. Precipitation averages between 35 to 55 inches and is heavier in the late spring and summer. Although the freeze-free periods are as long as 280 days, snowfall in the central and northern portions of the state averages 14 inches per year. Generally, the freeze-free periods increase from inland areas toward coastal and bay areas (USDA 1981).

Physiographic Setting. The project area is located within the Delmarva High Coastal Plain (Custer 1989), which extends from the Smyrna and Chester Rivers, north to the fall line in northern New Castle County. The High Coastal Plain is typified by a rolling topography, with sufficient relief to influence seasonal differences in plant communities. A separate group of physiographic zones divides the peninsula lengthwise, from north to south. The Smyrna to Pine Tree Corners portion of the SR1 corridor is located at the transition between two of these zones: the Mid-Drainage and Drainage Divide Physiographic Zones. Both regions are abundant in terms of natural resources, due to the combination of freshwater and brackish streams, freshwater swamps, and the range of soils found in them. The transition area between the regions, often referred to as an ecotone, characteristically contains concentrations of resources typical of each zone, and thus would have represented an even richer locale.

Thomas et al. (1975) effectively categorized the Coastal Plain environment and the potential resource base it represented to Native American populations in terms of hydrological conditions. These zones were defined as follows: 1) saltwater bays/ocean; 2) tidal marsh and estuarine environments; 3) well-drained woodlands; 4) poorly drained woods and swamp; and 5) permanent freshwater (rivers/streams). Each zone would have offered a distinctive combination of aquatic and terrestrial animal life, plant foods, and lithic material resources. With the exception of the Delaware Bay shore, which occurs approximately nine kilometers distant, all of these zones occur within the immediate vicinity of the sites investigated along the SR1 corridor.

Geology. Geologically, continental deposits rather than marine sediments underlie the Delaware High Coastal Plain. These Middle Pleistocene sand, gravel, and cobble deposits, known as the Columbia Formation, are the result of glacial outwash from melting continental ice sheets (Groot and Jordan 1999). In addition to sorted sands and boulders, the Columbia Formation contains quartz, quartzite, and chert pebbles and cobbles, which were a source of raw material used by Native American populations for in stone tool manufacture. Outcrops of Columbia Formation deposits are visible locally in exposures along Sandom Branch, Blackbird Creek, and Herring Run, in eroded gullies, and, occasionally, in large tree-throw depressions. The High Coastal Plain contains a high percentage of coarse material that has resisted weathering, which

contributes to a major geomorphological characteristic of the region, moderate relief. Differences of up to 16 m are found, mostly along entrenched tributary streams and creeks.

Soils. The United States Department of Agriculture (Mathews and Lavoie 1970) maps one soil association along the SR1 corridor between Smyrna and Pine Tree Corners, the Sassafras-Fallsington Association. Nearly level, smooth soils with slopes generally less than 5 percent, characterize the Sassafras-Fallsington Association. Sassafras soils of this association generally drain well and are predominately sandy loams. Fallsington soils drain poorly, owing to sandy clay subsoils. A soil association consists of one or more major, and at least one minor, soil series. Soils classified along the SR1 corridor between Smyrna and Pine Tree Corners belong to seven soil series: Elkton silt loam (EmA), Fallsington sandy loam (Fa), Fallsington loam (Fs), Johnston loam (Jo), Keyport silt loam (KeA), Rumford loamy sand (RuB2), Sassafras sandy loam (SaB2), Sassafras sandy loam (SaD2), Woodstown sandy loam (WoA), Woodstown sandy loam (WaB2), and Woodstown loam (WsA) (Table 1-3).

Table 1-3. Characteristics of Soils Mapped for the SR1 Corridor, Smyrna to Pine Tree Corners Portion.

Soil Phase	Slope (%)	Soil Characteristics
EmA	0-2	Silt loam, slightly difficult to drain and work, occurs on upland flats of the coastal plain
Fa	0-2	Sandy loam, nearly flat but occasionally slopes greater than 2%. Minor erosion. Localized dips and depressions.
Fs	0-2	Loam, minor erosion. Most extensive wet soil of the uplands.
Jo	0	Loam, nearly level. Found in mucky areas and areas where silt and sand content higher in the surface layer
KeA	0-2	Silt loam, moderate erosion. More sandy and less silty than normal for the series.
RuB2	2-5	Loamy sand, only minor erosion. Sandy subsoil
SaB2	2-5	Sandy loam, little or no erosion. Gravelly surface layer
SaD2	10-15	Sandy loam, major erosion.
WoA	0-2	Sandy loam, much sandier plowzone than normal for series. Seasonal wetness.
WaB2	2-5	Sandy loam, moderate erosion, fair to good drainage.
WsA	0-2	Loam, impeded drainage, seasonal wetness. Little or no erosion.

Hydrology. Rivers divide Delaware into two main watersheds: the Lower Delaware and the Upper Chesapeake. The Delaware is the largest river in the state. The Delaware River estuary forms the border of the state and the lower portion of the estuary widens to become Delaware Bay. Tributaries of the Delaware River in the northern region of the state include the Christina and its feeder, Brandywine Creek, which merge to form the Wilmington harbor. The Delaware River is fed by the Appoquinimink, Smyrna, and St. Jones Rivers in the central part of the state, and the Mispillion River in southern Delaware. In southwestern Delaware, the Nanticoke River and its tributary, Broad Creek, flow westward through the Eastern Shore of Maryland and empty into the Chesapeake Bay. Many additional short rivers and streams are located in Delaware as well. Although there are no large lakes in Delaware, the state does contain many small lakes and ponds. Small closed depressions, called bay/basins, occur in the north central portion of Delaware, and provide seasonal sources of water.

Within the project area, numerous unnamed creeks and drainages feed Herring Run and Sandom Branch, two tributaries of Blackbird Creek. Blackbird Creek subsequently empties into the Delaware Bay to the east. In addition to the river system, numerous wetlands occur throughout the project area. Bay/basins occur throughout the project area. Though dry during field investigations, these topographical features may have once contained standing or running water providing floral and faunal resources for human exploitation.

Floral and Faunal Resources. Vegetation and faunal diversity data provide information on the available resources in the region. Inland areas of Delaware are home to deciduous trees, principally northern and southern red oak, black oak, hickory, American beech, red maple, sweetgum, yellow/tulip poplar and ash. Coniferous tree species, including Virginia pine and Yellow pine occur in mixed and pure pine stands. Typical understory includes dogwood, holly, greenbriar, blackberry and raspberry, sassafras, arrowwood, sumac, poison ivy and goldenrod. The sandy coastal areas support pitch pine, loblolly pine, slash pine, red cedar, and bayberry. Coastal marshes and swamps are dominated by bald cypress, Atlantic white cedar, and other trees (USDA 1981). Numerous wild flowers include the crocus, violet, azalea, honeysuckle, pink lady's slipper, and aster. The water lily occurs in the freshwater lakes and ponds, the hibiscus is found in salt marshes, and the swamp magnolia is located along the coast.

The only large indigenous animal in Delaware is the white-tailed deer. The state also supports the fox, raccoon, chipmunk, rabbit, mole, muskrat, mink, otter, and some beaver. Migratory birds include duck, geese, and doves. Migratory nongame birds are numerous and include the robin, Carolina wren, starling, wood thrush, purple grackle, cardinal, tufted titmouse, blue jay, and ruby-throated hummingbird. A number of species of warbler, woodpecker, vireo, and sparrow also live in the state. Principal game birds are the turkey and bobwhite (USDA 1981). Birds of the shore and water are the great blue heron, snowy egret, black duck, blue-winged teal, and species of sandpipers, gulls, and terns. Swamps commonly host snapping turtles, and snakes including the hognose snake, the blackrat snake, the garter snake, and the copperhead, which is the only poisonous snake in the state.

Delaware Bay crabs and clams, once quite numerous, have been reduced drastically from earlier years. Blue crab fishing is a staple industry for the state. Croaker, flounder, bass, eel, sturgeon, mackerel and trout can be found along the coast. The state's many lakes, ponds, and smaller streams support various species of fish: Bass, Crappie, Walleye, Northern Pike, Salmon and Trout, Chain Pickerel, Muskellunge.

1.5 CULTURAL BACKGROUND

1.5.1 Regional Native American History

Current interpretation of the Native American past in Delaware is based on the organization of material culture into temporal sequences, and developing from them accurate chronologies of site occupation. To this end, the Native American history of the region is conventionally divided into three general periods, which are seen as reflections of widespread technological and social adaptation to evolving environmental conditions. Following Griffin's (1967) chronology for eastern North America, these periods are referred to as the Paleo-Indian (ca. 12,000-8000 B.C.), the Archaic (ca. 8000-1000 B.C.), and the Woodland (ca. 1000 B.C.-A.D. 1600). The latter two

periods are typically subdivided into early, middle, and late subperiods. An alternative chronology has been proposed by Custer (1984, 1989) for the Delmarva Peninsula. Much of the existing database for Delmarva, as well as various settlement pattern models derived from that data, result from work conducted by Custer and his associates (e.g., Custer 1982; Custer and Bachman 1984; Custer and DeSantis 1985; Custer and Cunningham 1986). Thus, in the present study, the regional Delmarva chronology is used in tandem with the conventional model for comparative purposes. The Delmarva chronology defines the Paleo-Indian period as extending from 12,000-6500 B.C., and the Archaic period from 6500-3000 B.C. Two later periods are recognized: Woodland I, from 3000 B.C. to A.D. 1000; and Woodland II, from A.D. 1000 to 1600. Figure 1-2 summarizes the correspondence between the two chronologies, along with their relationships to the climatic periods.

	CLIMATIC EPISODES	TRADITIONAL EASTERN CHRONOLOGY	DELMARVA CHRONOLOGY	WOODLAND COMPLEXES OF THE HIGH COASTAL PLAIN AND PIEDMONT / FALL LINE PROVINCES
1600 AD	SUB-ATLANTIC	LATE WOODLAND	WOODLAND II	MINGUANNAN
1000 AD		MIDDLE WOODLAND	WOODLAND I	WEBB-- DELAWARE PARK
500 AD				CAREY -- BLACK ROCK
0 AD	BLACK ROCK-- DELMARVA ADENA			
500 BC	SUB-BOREAL	EARLY WOODLAND	ARCHAIC	CLYDE FARM-- BARKER'S LANDING
3000 BC		LATE ARCHAIC		
4500 BC		MIDDLE ARCHAIC		
6500 BC	ATLANTIC	EARLY ARCHAIC	PALEO-INDIAN	
8500 BC	BOREAL			
10500 BC	PRE-BOREAL			
12000 BC	LATE GLACIAL	PALEO-INDIAN		

Figure 1-2. Comparison of Native American Historic Chronologies with Climatic Episodes (adapted from Custer 1984)

Paleo-Indian. About 15,000 years ago, during climatic episodes known as the Late Glacial and Pre-Boreal, the climate in the region was considerably colder and wetter than it is at present. Tundra-like conditions were prevalent near the edge of the glaciers. The ice front did not extend beyond central New Jersey, and to the south, in regions like Delmarva, lay abundant open grassland interspersed with stands of spruce and fir. Large grazing animals and now extinct megafauna ranged across a patchwork of parkland and boreal forests. The retreat of the glaciers brought a fairly rapid warming trend throughout the Middle Atlantic, a phenomenon that was directly reflected in the replacement of northern plant and animal species by those more characteristic of temperate zones to the south. Like much of the Middle Atlantic region, New Castle County was characterized by a relatively complex set of overlapping environmental zones, providing a variety of subsistence resources for Native American populations entering the area. By the time of the arrival of humans some 14,000 years ago, most of the large grazing and

browsing fauna associated with the Pleistocene had disappeared from the Middle Atlantic region—the woods and forest margins supported a wide range of plant and small animal species.

Archaeological sites from this time period are usually identified by the presence of finely crafted stone projectile points, or spear tips, usually made of cryptocrystalline stone such as chert or jasper. The points were characterized by a single, long channel flake, or flute, removed from each face to aid in attaching the point to a spear shaft. Relatively few Paleo-Indian sites have been reported throughout the Middle Atlantic, a phenomenon that may be due in part to the fact that sites once located in coastal areas or along streams are now submerged by the rise in sea level that accompanied the melting of the ice sheets.

Archaic. The traditional chronology for eastern North America describes a break in cultural patterns at about 8000 B.C., which corresponds approximately with the warming trend signaling the Boreal and subsequent Atlantic climatic episodes. Open grasslands diminished in extent, and boreal forests were replaced by pine and northern hardwoods, and in particular, oak. The new cultural pattern, referred to as the Archaic period, is usually recognized as ranging from around 8000 to 1000 B.C. It was characterized by adaptations to environmental conditions which rapidly approached that of the present. Most Middle Atlantic archaeologists agree that there was a degree of continuity between the Paleo-Indian and the Early Archaic periods in patterns of settlement and subsistence, where people lived and how they supported themselves. In the Delmarva regional chronology, the Paleo-Indian and the Early Archaic periods are combined under the single rubric of Paleo-Indian. Populations remained highly mobile, while intensive foraging and transitory use of resource areas is indicated by the presence of many small sites. Specialized, transient procurement sites visited on a seasonal basis have also been identified, suggesting the beginning of scheduled, logistically planned use of the landscape.

One of the most important environmental changes affecting Native American populations throughout eastern North America during the Archaic period was the gradual rise in sea level resulting from the melting of the continental ice sheets. Rising sea levels produced widespread lowland flooding, which extended up many Pleistocene river valleys, such as the Delaware and Susquehanna, giving rise to the term "drowned" river valley. It is estimated that inundation of the Susquehanna River system, which culminated in the formation of the Chesapeake Bay, began as early as 14,000 B.C. Among the effects of inundation were a marked rise in local water tables, the development of complex estuary systems, and a consequent increase in floral and faunal resources in newly formed marsh or wetland areas. Large marshes and swamps became an important focus of occupation during the period. Generalized deciduous forests, made up of hardwoods such as oak and hickory, were in place by 4000 B.C., near the start of the Sub-Boreal climatic episode. The forests produced large quantities of mast foods—acorns, beechnut, and chestnut—which fostered an increase in populations of deer, small mammal, and game birds such as the wild turkey. Unlike the Paleo-Indian period with its distinctive fluted spearpoint, a variety of projectile point styles occurred in the Archaic period. But perhaps most importantly, the lithic tool kit was marked by the appearance of groundstone tools, the first artifactual evidence of extensive plant processing.

Woodland I. Around 3000 B.C., the rate of sea level rise slowed, allowing riverine and estuarine environments to stabilize enough to support significant and seasonally predictable populations of shellfish and anadromous fish—salt water fish, such as salmon or, on the East

Coast, sturgeon, that spawn in freshwater streams. An increase in the number of archaeological sites at this time indicates population growth, while the size and complexity of settlements along rivers and estuaries suggests a trend toward sedentism, or more settled occupation, as well as organized strategies for resource acquisition. The apparent development of sedentism forms the basis for distinguishing the Archaic and Woodland I periods in the Delmarva region. Near the fall line, in areas similar to Lums Pond, the spring and summer months saw large base camps situated along major streams, like St. Georges Creek, at which anadromous fish were harvested. During the fall and winter months, smaller base camps were occupied along inland tributaries. More transient, special purpose camps, used for the harvesting or procurement of specific resources, were employed to support the base camp occupations.

Certain tool associations were common throughout the region, particularly in the Piedmont, to the west and north of the study area, where several styles of broad-bladed point were manufactured from specific types of stone: Susquehanna broadspears, for example, were made from rhyolite, while a broad, contracting stem point known as Koens-Crispin was made from argillite. Based on artifact associations, it has been inferred that wide-bladed points such as these were designed in part for use in exploiting riverine resources. The points are often found in association with vessels carved from steatite, another characteristic artifact of the period. Around 1000 B.C., techniques for pottery manufacture were introduced across the region. The earliest known ceramic in the area, used from about 1200 to 800 B.C., is a steatite-tempered variety referred to as Marcey Creek ware, after its type site on the Potomac River in Arlington County, Virginia. Beginning at about this same time, a series of regional complexes has been recognized (Custer 1989). These complexes consist of groups of sites that are limited in distribution and time span and have similar characteristics based on the artifact assemblages they contain. For example, an early ceramic ware known as Dames Quarter, is typically found in combination with long-stemmed projectile points, broadspears, and fishtail points, and comprises a cultural complex designated as Barker's Landing in the High Coastal Plain and as Clyde Farm in the Piedmont/Fall Line zone.

Recent evidence suggests that distinctive residential patterning, including the use of a form of shallow pit house, developed during early in the Woodland I period (Custer 1994). There are indications that population was on the increase in the latter portions of the period, as semi-sedentary base camps, referred to as macro-band base camps, increased in size. A shift is noted in the locations of these base camps from small, creek floodplains to larger, riverine floodplains. Yet the pattern of deliberate and intensive foraging for food and other resources that was evident earlier in the period appears to have remained essentially unchanged. Increased participation in trade and exchange networks is also noted, as is an increase in societal complexity. Both of these processes are inferred from the appearance of exotic lithic raw materials as well as artifacts and burial ceremonialism that are associated with cultures from the Mississippi and Ohio River Valleys (Custer 1989).

Later Woodland I complexes in Delmarva include Black Rock, Delmarva Adena, Carey, Webb, and Delaware Park (Custer 1994). The Black Rock Complex, which appears to have been related to cultures in southeastern Pennsylvania, is characterized by a relatively thick ceramic ware known as Wolfe Neck, along with artifacts made of argillite and rhyolite, types of stone acquired from Pennsylvania, New Jersey, or Maryland. Delmarva Adena sites contain numerous burials, caches of bifaces made of chert from Flint Ridge, in Ohio, along with beads, pipes, and

other characteristic grave goods, all apparently related to the Adena culture centered in the Ohio River Valley. The Carey Complex occurs late in the Woodland I period and is marked by the retreat of Adena influence on the peninsula, including the abandonment of mortuary centers. Carey is distinguished by a thick-walled, shell-tempered ceramic ware known as Mockley, and lanceolate or stemmed Fox Creek projectile points, often made of argillite or rhyolite. Other complexes recognized late in the Woodland I in Delmarva include the Delaware Park Complex in the north and the Webb Complex in the south, both characterized by crushed quartz-tempered Hell Island ceramics and Jack's Reef pentagonal points. The Webb Complex includes evidence of mortuary ceremonialism that suggests the re-emergence of contact with groups outside the region.

Woodland II. By approximately A.D. 900, horticulture began to achieve a significant role in subsistence practices across much of the Middle Atlantic region. Yet direct evidence of plant cultivation is rare on the Coastal Plain, and has yet to be recorded on the Delaware Coastal Plain. Agriculture is thus presumed to have remained at best a secondary activity. The absence of tools made from non-local stone and the disappearance of non-local influences on mortuary practices imply a breakdown of the extensive trade and exchange networks operating during the early portions of the Woodland I. Cultural stability is also inferred from the relative lack of variability in ceramic wares throughout the period.

These changes are distinct across Delmarva and represent a cultural break defined as Woodland II, a period that extended through the date of European Contact. In the Piedmont/Fall Line and High Coastal Plain zones, the main Woodland II cultural complex is known as Minguannan, distinguished by a ceramic ware of the same name, and several small, triangular projectile points, which served as either dart or arrow tips. In contrast to settlements to the south, on the Low Coastal Plain, there is little indication of widespread sedentism associated with Minguannan Complex sites—there were no large villages, nor was there a marked shift to fertile bottomlands.

1.5.2 Ethnohistory

The specific types of data used to develop the inventory and description of groups present at Contact include primary sources such as colonial government documents, individual accounts, missionary accounts, and maps from the seventeenth century. Also utilized were later synthetic works aimed at identifying spatial organization of Native peoples of the Delmarva through the use of land records, wills, deeds, and other primary documents, particularly the work of William Marye (Marye 1936a, 1936b, 1937a, 1937b, 1938, 1939a, 1939b, 1940, 1944) and Leon DeValinger (De Valinger 1940, 1941, 1944). Narrative histories written during the twentieth century that utilized sound research of primary documents also were consulted. C.A. Weslager's histories of the Delaware and the Nanticoke provided narrative historical data (Weslager 1943, 1959, 1972, 1983). Additionally, several published ethnohistoric (or historical anthropological) works concerning Native Peninsular peoples were consulted, including the work of Herbert Kraft (Kraft 1986), Helen Rountree (Rountree 1989, 1993), and Thomas Davidson (Rountree and Davidson 1997). The ethnological symbolic analyses of Eastern Woodland culture by George Hammell (Hammell 1983, 1987) and the work of Kathleen Bragdon (Bragdon 1981, 1996) concerning southern New England Native peoples also provided important interpretive insights as well as information on material practices. Less systematic speculations about pre-Contact and

Contact period Native culture contained in ethnographic accounts made in post-Contact times were not used.

Contact Groups. A sketch of Delmarva Native groups and their territories at the time of Contact is reviewed here. No attempt was made to trace movements and changes in tribal identities prior to or past the Contact period, rather the goal was to provide a context for understanding the historical and cultural landscapes of the Delmarva region at the time of Contact.

The majority of information on tribal settlement patterns and territorial boundaries for this period comes from John Smith's accounts, other Virginia explorers, and information from the Virginia colony records (Figure 1-3). The Accomac and the Occohannocks were the two dominant groups of the southern Delmarva and were allied with the Powhatan of the Virginia mainland for at least the early portion of the seventeenth century (Smith 1986a:150-151, 1986b:224-225). According to Smith, the Occohannocks (Acohanock) possessed forty men while the Accomac possessed at least eighty (Smith 1986a:150), an observation that provided a relative population size estimate.

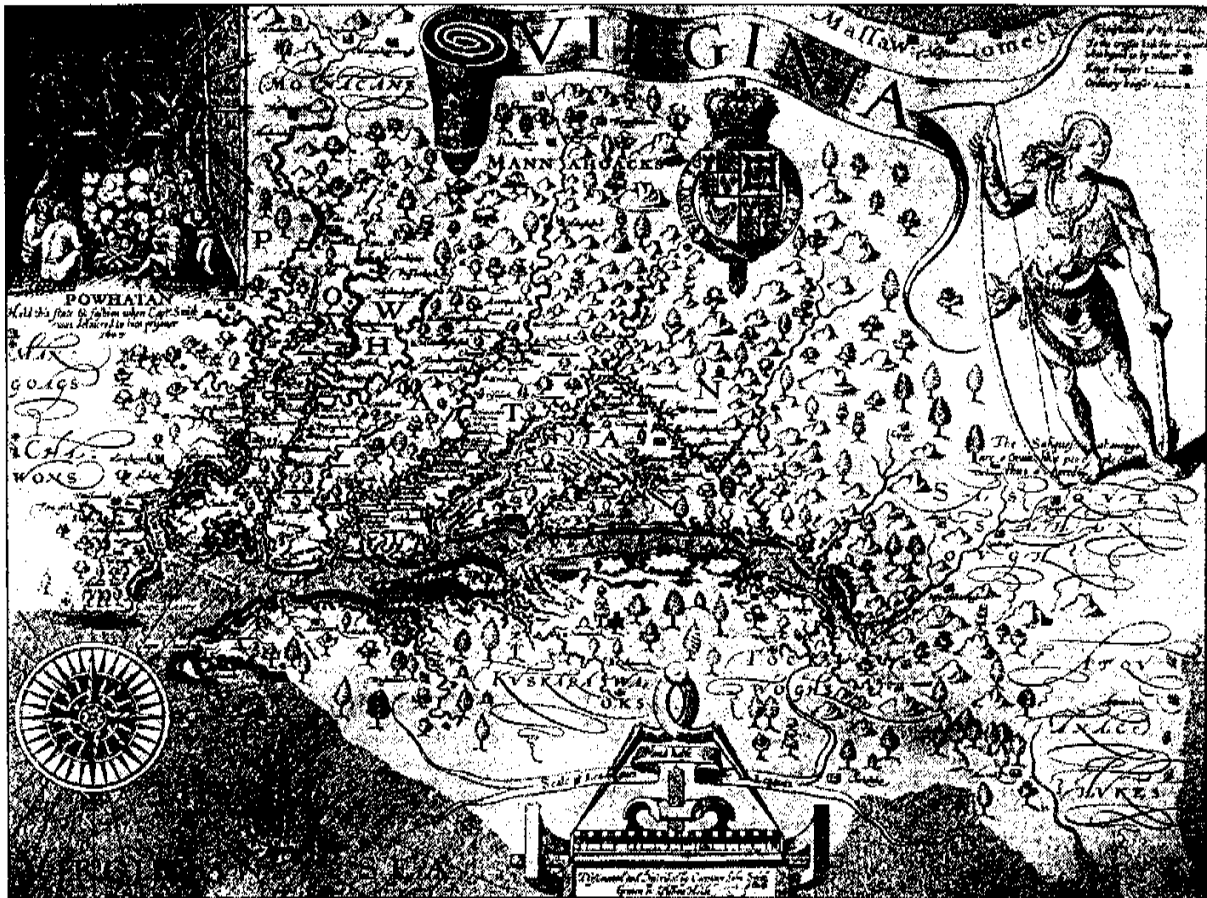


Figure 1-3. Capt. John Smith's 1608 Map of the Chesapeake Region and the Delmarva

The Native groups near the present-day Maryland-Virginia boundary, especially those along the Atlantic Coast, were poorly identified in early seventeenth century accounts. However, the Gingoteague, affiliated in some manner with the mainland Powhatan, are known to have

inhabited that area around the 1650s (Marye 1939a:21, 1940:24). North of this area, near present-day Assawoman Inlet, was the settlement of Kickotank, also occupied in the 1650s (Marye 1940:24). Land sale records from the early 1680s attest to the presence of the Assawomacks or Assawomen in the Assawoman Inlet area at this time; it is possible that they could be the same as the earlier referenced Kickotanks (Marye 1939a). In the early eighteenth century, a group of Assateague moved to the Assawoman Inlet location and temporarily occupied that area (Marye 1940).

On the Chesapeake Bay side of the Delmarva, Smith encountered the Wighcocomoco Indians who became known as the Pocomokes. The Pocomokes inhabited the present-day Pocomoke River drainage, called "Tants Wighcocomoco" in Smith's account (Smith 1986a:150). Their warrior count was estimated at 100 men (Smith 1986a:150). By the late seventeenth century, the Pocomokes had become an amalgamation of several tribes along the Pocomoke and Annemessex River drainages who lived predominantly at a place called Askiminikansen (Rountree and Davidson 1997:96). After the 1730s, references to the Pocomokes and their sometimes allies, the Assateague, become rare.

The Assateague appear for the first time in Maryland records in 1659 as residents on the Atlantic coast near the head of the Pocomoke River (Browne 1885:379-380). Around this time, the Assateague had several villages along the seaboard side of present-day Worcester County, Maryland between the Pocomoke River and the ocean bays and inlets (Marye 1939a:20). Prior to the mid-seventeenth century, the Assateague could have been one of the groups resident along the Atlantic Coast (Rountree and Davidson 1997:96). By 1677, they were residing at the headwaters of the Pocomoke River at a settlement called Queponqua. Assateagues also were living at Askiminikansen along with, but separate from, the Pocomokes (Browne 1887:480). Portions of the Assateague moved east to the Assawoman Inlet area in the later seventeenth century and then north to Indian River where they established a settlement called Askecksy or Ashquesonne Town some time in the last quarter of the seventeenth century but at least by 1705 (Marye 1939a:18). The settlement of Askecksy was considered reserved land. Around the 1680s, this group of Assateague became known as the Indian River Indians (Browne 1904:442-444, 1908:264-265; Marye 1939a). Land sales and other records can trace the presence of Indian River Indians here through the 1740s (DeValinger 1940, 1941; Marye 1939a, 1940).

The Kuskarawaok, who became known as the Nanticoke Indians, inhabited the area along the "Kus flu" or Nanticoke River drainage, occupying between 5-10 villages contemporaneously during the seventeenth century (Browne 1905:256; Smith 1986a:150, 185, 189; 1986b:226). This group was the largest and strongest on the Delmarva with Smith estimating their warrior count at 200 (Smith 1986a:150). He described their language as different from the Powhatan, and acknowledged them as significant participants in the indigenous prestige goods trade through their manufacture of white shell beads. They also were known for their abundance of furs (Smith 1986a:150; 1986c:164-165, 168). The Nanticoke remained a strong presence on the Peninsula throughout the Contact period, maintaining possession of significant portions of their core territories (Busby 2000; Porter 1979).

North of the Nanticoke, along the Choptank River drainage, were the Choptank Indians. Although Smith did not specifically mention these people in his description, the Maryland colonial government initiated interaction with them in the first half of the seventeenth century

(Browne 1885:362-364; Marye 1936a:15). They were divided into three bands, each with a territorial base but resided predominantly within a definable, contiguous area in the vicinity of present-day Cambridge, Maryland (Browne 1896:260; Marye 1936a:15; McAllister 1962). This group also maintained possession of their core territories throughout the Contact period primarily by cooperating with the colonial Maryland government (Busby 2000; Porter 1979).

The Siconesse were an Atlantic seaboard group associated with the large Lenape entity of the Delaware/New Jersey/Pennsylvania area (Figure 1-4). At the time of Contact, they inhabited the area around Cape Henlopen and Lewes, Delaware. The Siconesse were recognized as early as 1629 when Lindstrom referred to them as “a powerful nation rich in maize plantations” (Weslager 1972:35). The Dutch identified two divisions of this group: the Great Siconesse were resident in Delaware and the Small Siconesse inhabited locations across Delaware Bay in New Jersey (Weslager 1972:36) (Figure 1-4). The Great Siconesse’s territory stretched from Bombay Hook, near Duck Creek, south to Lewes (De Valinger 1940, 1941). A 1630s land transfer listed three Sackamackers or chiefs representing their village on the south hook of the South River Bay (presumably the Cape Henlopen) (De Valinger 1940, 1941; Fernow 1877:16-17; Hazzard 1850:23). Evidence suggests that this group ceased to exist as a separate Native entity after the Duke of York period and, that by 1671, most had moved over to New Jersey (Becker 1988; Kraft 1986; Weslager 1972:150). However, the Siconesse town of Checonnesseck, in the Lewes vicinity, was a viable entity until at least 1677 (Browne 1896:146).

The interactions of the Siconesse attest to the complex construction of group identity and alliances that took place prior to and during the colonial era. While their connection to other Lenape peoples is evident, the Siconesse often were allied with western Peninsula groups such as the Wicomiss and the Nanticoke. The Whorekill or Wicomiss Path was a frequently traveled artery linking the Siconesse settlements with the territories of the Wicomiss on the western side of the Delmarva. It has been postulated that subsequently displaced Wicomiss joined with the Siconesse at the settlement of Checonnesseck in the last half of the seventeenth century (Marye 1938:150).

The Wicomiss, originally termed the Ozines by Smith, were described as possessing 60 warriors (Marye 1938, 1939b; Smith 1986a:150). They resided along the Chester River and their territory extended from its headwaters southward along the mid-Peninsular drainage divide as far south as the Wicomico River (Marye 1938:151; Smith 1986a:150). The alliances, travails, and settlements of this group also reveal the malleability and creative actions taken by Native peoples in this period of great change. The Susquehannocks displaced this group southward after the 1630s (Marye 1939b). In the last quarter of the seventeenth century, Maryland pursued a war against the Wicomiss because of their alliance with the “Delaware Indians.” Many captives were sold into slavery in Barbados in 1669 (Browne 1883:196; 1887:136). In their southward displacement, they found refuge among the Nanticoke on the Bay side. In 1668, they inhabited a settlement near or within the Nanticoke village of Chicone (Steiner 1915:355). Their continued existence with a distinct identity is attested with a reference to Wicomiss people living at the Siconesse town of Checonnesseck in 1677 (Browne 1896:146).

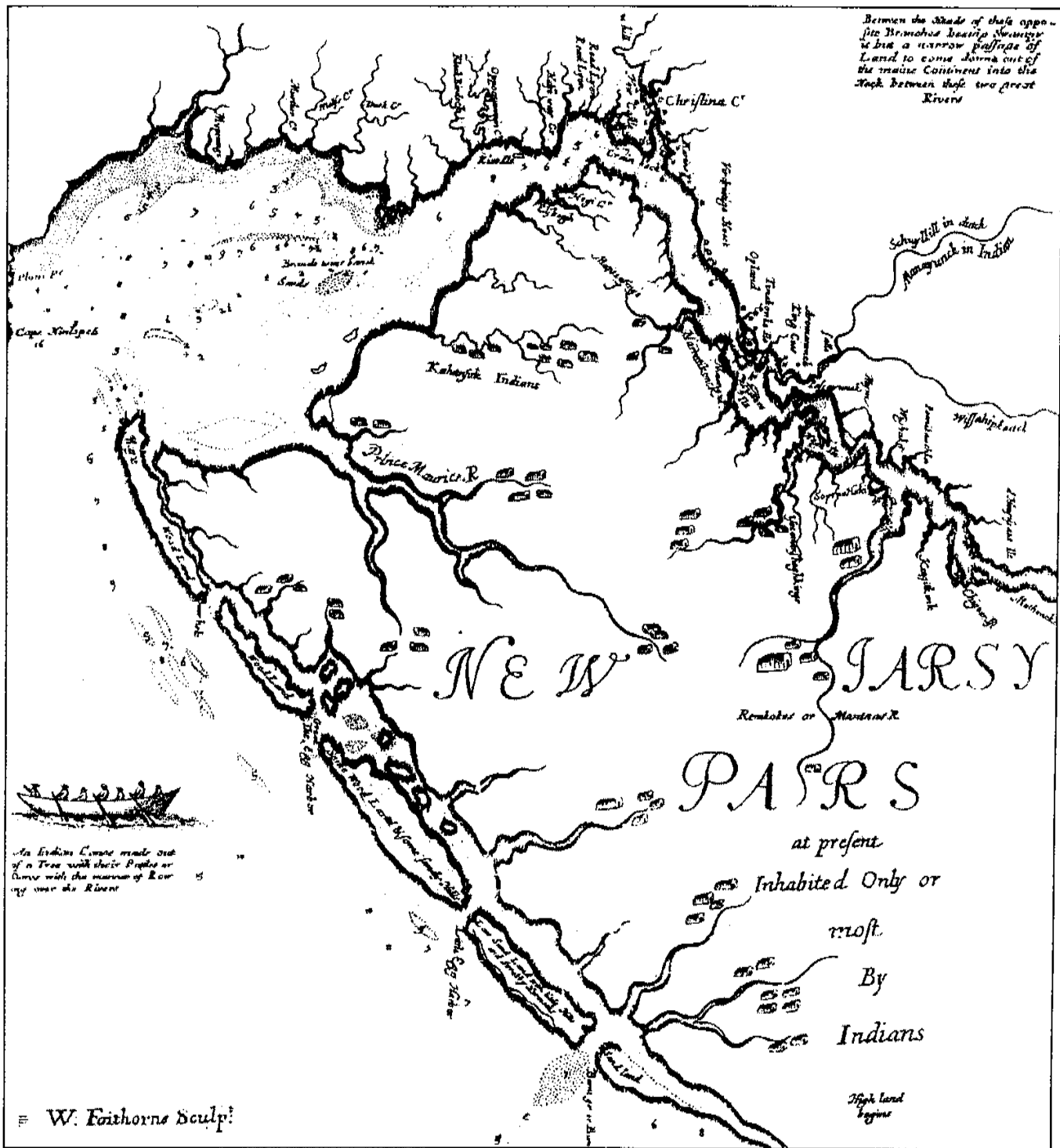


Figure 1-4. Augustine Herrman's 1659 Map of the Chesapeake Region

The Tockwogs resided along the Sassafras River, the next drainage north of the Chester River (Smith 1986a:150). Not much detail beyond what Smith recorded in 1608 is known of these people. They possessed a palisaded village, no doubt necessitated by the frequent onslaughts of the Susquehannocks and the Massawomecks (Smith 1986c:231). To the west were the Monoponsons, a group who resided on Kent Island during the early seventeenth century (Browne

1885:362-364; Marye 1938). The last references to a group called the Tockwoghs describe their participation in a 1659 treaty with the Maryland government along with the Choptanks; this treaty permitted colonial settlement of the upper portion of the western Peninsula area (Browne 1885:362-364).

In addition to the Siconesse, other Native groups associated with the larger Lenape group designation were resident on the extreme northern sections of the Delmarva. The larger group designation of Lenape can be divided along linguistic lines with a relatively homogenous dialect spoken north and east of the Raritan River and the Delaware Water Gap, and a more diverse group of dialects spoken south of this line (Goddard 1979). The northern people, inhabitants of northern New Jersey, Manhattan Island, and the area of the North River (Hudson River), are generally defined as Munsee. Unami speakers inhabited areas along the South River (Delaware River) encompassing central and southern New Jersey, eastern Pennsylvania, and northern Delaware at the time of Contact (Kraft 1986:xv).

The 1608 map of John Smith depicted two groups, the Macocks and the Chickahokin, on the western side of the Delaware River within what appears to be present-day New Jersey (Figure 1-3) (Smith 1986a:189). Another group, the Atquanachuks, are depicted on Smith's map to the north of the Macocks and Chickahokin. Smith recorded that Chief Powhatan described these groups as being resident on the ocean; thus, they may possibly correlate with the Aquaachuques later recorded in middle New Jersey (Smith 1986a:172, 183; 1986c:107). Overall, Smith's accounts provide little information on the Lenape people, providing no detail of how these people interacted with the Kuskarawaoks (Nanticokes) of the more southern part of the Peninsula or how they interacted with the northwestern groups such as the Ozinies and Tockwoghs. Their relation to the Susquehannocks, the Massawomecks, and other more northern groups similarly was overlooked. Later in the seventeenth century, other Europeans recorded southern Unami inhabitants' names including: Armewamex, Big Siconese, Little Siconese, Brandywine, Mantaes, Naraticonck, Okehoking, Remkokes, Sankhikan, Schuykill, and Sewapois (Kraft 1986:xv).

The Native groups resident near present-day New Castle County, Delaware in the Brandywine River Valley included the Quenomysing and the Minguannan who were collectively referred to at times as the Brandywine Indians (Figure 1-5) (Weslager 1972:34, 38). The Brandywine Indians maintained a separate identity from other Unami-speaking Lenape to south and east and from Munsee speakers to the north through their patterns of settlement, land transactions, and within and cross-cultural associations (Weslager 1972:178-179). The Swedes made a series of land purchases in this area from 1638-1643 that apparently did not drastically affect the locations of settlements (Weslager 1972:119-120).

Quenomysing, situated at the Big Bend in Delaware County, Pennsylvania, was the largest village on the Brandywine River; smaller towns were located along the tributary streams (Weslager 1972:34). Minguannan village was located along White Clay Creek in Chester County, Pennsylvania. Colonial documents attest to the Quenomysing and Minguannan inhabiting these locations from earliest contact (Weslager 1972:119-120). In 1697, fifty people were reported living at Minguannan with the rest at Brandywine (Big Bend) and Upland Creeks (location not determined) (Browne 1899:520). At this time, the Brandywine were reported to be subject to the Susquehannocks and, sometime after 1729, moved to live with them along the Susquehanna River (Weslager 1972:187).

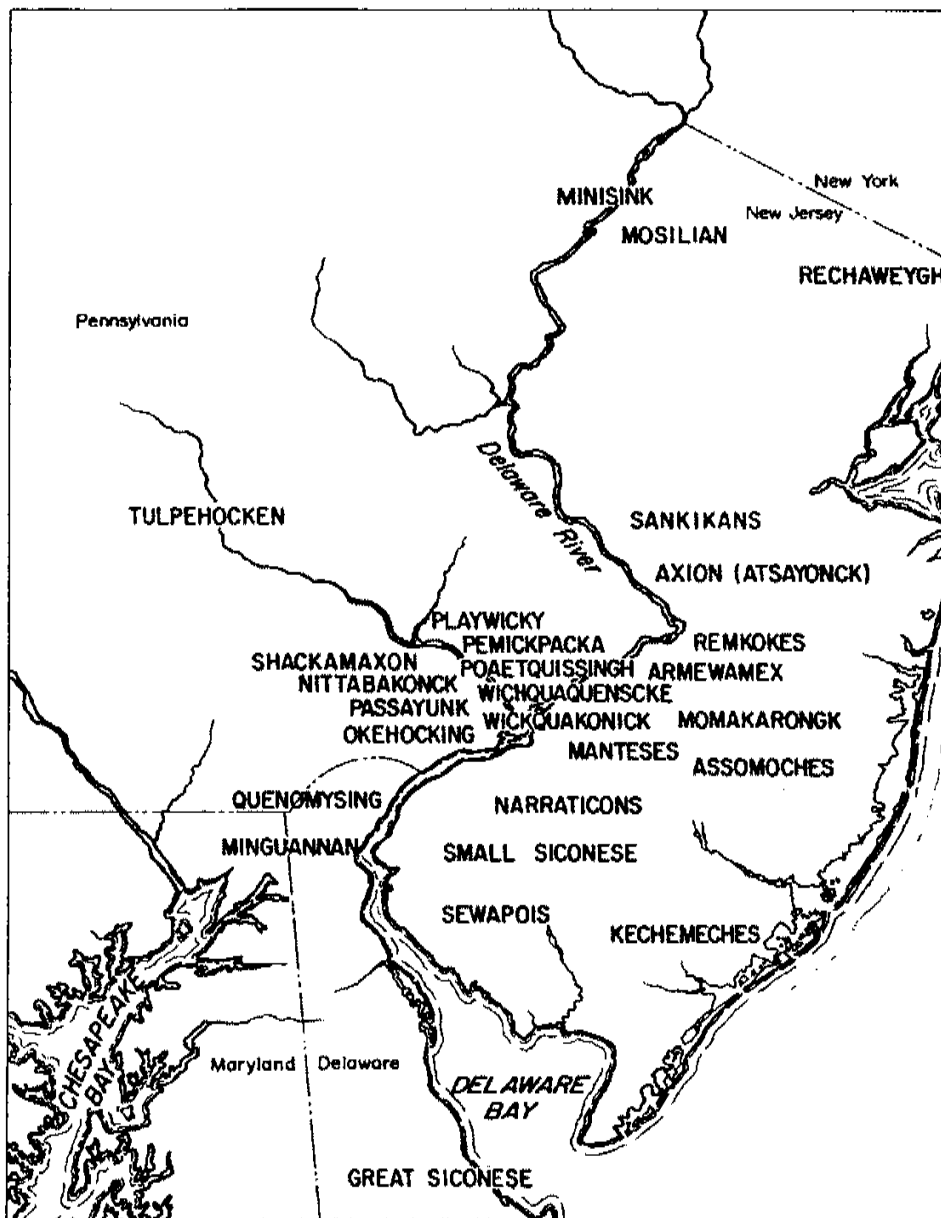


Figure 1-5. Lenape Groups at Contact (Weslager 1972:Figure 8)

The Susquehannock Indians entered the Delmarva around 1608, making forays from their villages along the Susquehanna River in Lancaster County, Pennsylvania. By the late 1650s, they expanded their fur trading territory to the north shore of the Choptank River (Jennings 1968; Myers 1912:38-42; Smith 1986a:149-150; 1986c:231). Their presence affected the form and substance of Lenape life and pushed other groups, such as the Monoponsons of Kent Island and Wicomiss of Maryland's side of the Peninsula, southward with sustained hostilities (Jennings 1968; Marye 1938:147, 150; Rountree and Davidson 1997:80).

The Massawomecks were another hostile presence who frequently attacked local groups at the upper reaches of the Peninsula during the early Contact period. Their movement into the area appears to also have been predicated on the fur trade. The origin of this group of people is subject to debate by anthropologists, but many believe them to have been Iroquian and related to

the Five Nations living somewhere near the Niagara River in the early seventeenth century (Kent 1984:26; Pendergast 1991; Rountree 1989:142; Smith 1986c:119). The Tockwoghs suffered numerous onslaughts by the Massawomecks, but the Nanticokes were said to be awed by them (Smith 1986c:105-106, 119, 165).

Post Contact Period Populations. For the southern Unami-speaking Lenape, including those of the northern Peninsula, the 1640s saw the end of the profitable fur trade (Kraft 1986:224-225; Printz 1912:103). By the mid-1660s, significant movements of people occurred first into the interior of New Jersey and then into western Pennsylvania (Kraft 1986:224-225; Weslager 1972). While pockets of people remained in New Jersey and Pennsylvania, from the eighteenth century onward, groups of Lenape continued westward to Ontario as early as 1783 (Weslager 1972). Others went on more lengthy migrations punctuated with settlement and resettlement in Pennsylvania, Ohio, Indiana, Wisconsin, Missouri, Kansas, Texas, and Oklahoma (Kraft 1986:233-235; Weslager 1972).

The Nanticoke and related groups of the southern Peninsula experienced the same land pressures and decline in the fur trade. Displaced peoples coalesced into smaller areas. Many resided within several reservations that were created by the Maryland and Virginia colonies in the later seventeenth century. Some of these survived into the late eighteenth century including: Chicone (Maryland State Archives 1785); Choptank/Locust Neck (McAllister 1962:109-11); and Askeksy (Marye 1940:25). The Gingaskin (Accomac) reservation continued into the mid-nineteenth century (Rountree and Davidson 1997:166-202).

By the mid-eighteenth century, a large number of people had migrated to Pennsylvania to live among the Six Nations (Weslager 1983). Some Nanticoke people migrated with the Delawares attached to the Moravians going to Ohio and Ontario, while others found a home with the Delawares who moved to Oklahoma (Fliegal 1970; Harrington 1921; Weslager 1983).

Some of the people who chose to stay melded into the dominant society while others moved to lands in the mid-Peninsular drainage divide and other marginal areas and managed to survive (Porter 1979; Rountree and Davidson 1997). Numerous published accounts attest to a continual Indian presence on the Delmarva throughout the late eighteenth and nineteenth centuries (Anonymous 1948/9; Babcock 1899; Fisher 1929; Humphreys 1730:159-168; Perry 1878; Porter 1986:162-163; Scharff 1888; U. S. Census 1890:5-35, 231; Weslager 1943). Ethnographies of the twentieth century identify the continued presence of Native people of the Delmarva (Porter 1978; Speck 1915; Weslager 1972, 1983).

1.5.3 Regional History

The project area was situated in the southern portion of New Castle County, Delaware. The boundaries of New Castle County were set by an act of the General Assembly in 1775 (Heald 1820). The county was divided into nine hundreds, the largest of which was Appoquinimink Hundred at the county's south edge. Appoquinimink Hundred was bounded on the north by the creek bearing the same name. Blackbird Hundred, bounded by Duck Creek on the south and by Blackbird Creek on the north, was created from the Appoquinimink Hundred in 1875 (Conrad 1908:565 and 571). The project area for historic sites was situated within Blackbird Hundred.

The Blackbird Hundred region was densely wooded until the mid- to late 1800s and historically has been referred to as the Forest of the Appoquinimink.

Almost 400 years have passed since Henry Hudson sailed up the Delaware River into the Delaware Bay during a voyage in 1609 on his way to discovering the Hudson River to the north. Soon afterwards, colonists began arriving in the peninsula and establishing a permanent presence. Dutch Captain Cornelis Hendricksen visited Delaware many times from 1614 to 1629, and in 1629, Patroons began to colonize near Cape Henlopen (Doherty 1997:3). Attempted settlement of the region of Delaware south of Bombay Hook, called Swaanendael (or Zwaanendael), by Dutch in 1631 failed (Heite and Heite 1985:5). Swedish immigrants erected Fort Christina on the Upper Peninsula to the north in 1638, and the Dutch established a settlement at Fort Casimir on the Delaware River near modern-day New Castle to block a Swedish advance into the rest of Delaware (De Cunzo and Catts 1990:9).

New Amstel (New Castle) became the county seat under Dutch rule in 1654, and a Dutch military presence forced the Swedes to relinquish power to them in 1655, although many of the Swedish and Finnish settlers remained. The Dutch were soon inundated by English settlers, and tension between the two factions flared for many years. As early as 1669, proprietors were encouraging settlers from northern New Castle County and eastern Maryland to come to the Apoquemini (Appoquinimink) region (Scharf 1888:1015).

In 1669, Lord Charles Calvert I, third baron of Baltimore, created Durham County as part of Maryland encompassing much of present-day Delaware creating a hostile atmosphere between Maryland and Pennsylvania (Doherty 1997:51; Demars and Richards 1980:4-5). The Dutch began to regain control of the area and New Castle County (originally titled New Amstel) was organized in 1673, extending from Christina Creek to near Leipsic Creek (Long 1996:13). However, Holland ceded many of its possessions extending from New York to Delaware to the English in 1676, when Delaware was placed under the jurisdiction of the Duke of York, with the top seat of government in New York (Harbeson 1992:17).

The Duke of York, James Stuart (also a brother to Charles II), granted a large tract of the Delmarva peninsula to William Penn in 1682, which Penn referred to as the lower three counties of Pennsylvania (Doherty 1997:3-4; Custer et al. 1987:43). Penn divided Delaware into townships that would contain 100 families, each of which contained approximately ten members. The townships were referred to as “hundreds”, a political designation originating in the Roman Empire over 1000 years ago, and have remained intact in Delaware to modern times (Zippe 1968:2). Appoquinimink Hundred, named after a Native American term *Appoquinimi*, meaning wounded duck, and Duck Creek Hundred were two of the 12 original hundreds created for Delaware; presently there are 33 hundreds in the State (Doherty 1997:5; Conrad 1908:565).

Both Penn and Lord Baltimore claimed the Blackbird area (Bedell 1996c:5-6). Dispute over control of Delaware between Pennsylvania and Maryland clouded the regional land patents for many years, and as a result, the south and west portions of Delaware were granted many Maryland patents (Russ 1966:12-13). Pennsylvania authorities contested Baltimore’s grants well into the eighteenth century, by which time Lord Baltimore’s son lost the claims (Demars and Richards 1980:4).

Mechaeksit, *sachem* for the local Native Americans, sold land to many early settlers that came to the Appoquinimink area prior to the Penn family land sales (Conrad 1908:571-572). It is assumed these land tracts were honored by Penn and the local governments, as a few of the identified men, such as Morris Liston of Liston's Point on the Delaware River, were prominent local citizens in the late 1600s (Conrad 1908:572). The land grants issued in the Delaware prior to the 1750s, were mainly the result of the influx of the Swedish and English immigrants in the upper Delaware and Philadelphia, Pennsylvania region (De Cunzo and Catts 1990:11-12).

The road connecting Cantwell's Bridge (Odessa) on the Appoquinimink River north of Blackbird to Bohemia to the west, was constructed in the 1660s, the first major road in the region, and this created an opportunity for immigration from that region to Appoquinimink Hundred (Passmore 1978:10). The King's Road was the main thoroughfare between Dover and the northern portions of the state. A review of the land tracts between Blackbird Creek and Smyrna Creek Landing indicates that the term "King's Road" was used predominately throughout the 1700s. The labels of "Great Road" or "Main Road" were used sporadically in the latter half of the eighteenth century, and State Road or Public Road was utilized during the entire nineteenth century. After the road was improved for modern traffic use, it was referred to as DuPont Boulevard or Dual State Highway.

Appoquinimink Hundred contained approximately 80,000 acres in 1816, almost twice as much as the next largest hundred (St. Georges). Appoquinimink Hundred had the most roads by length of any hundred, at 98.8 miles of roadways (Figure 1-6; Heald 1820). When road mileage was measured proportionately to the surface area of each hundred, Appoquinimink Hundred still outnumbered any other hundred by almost 2:1 (Table 1-4). Perhaps part of the reason for this pattern is that Appoquinimink Hundred was the widest part of the county, so was more likely to need roads crossing the hundred from east to west, while travel in the other hundreds was mainly oriented from north to south. Another factor could be the length of creeks in Appoquinimink Hundred, since roads often led from ship landings on the creeks to the main north-south roads.

The water transportation routes from the Duck Creek and Smyrna landings to the Delaware River, as well as the King's Road, allowed the farmers on either side of Duck Creek, including the present study area, to participate in the growing agricultural economic growth in the region. Several plausible canals were proposed to connect the Chesapeake Bay to the Delaware Bay around 1800, including one to connect the Chester River in Maryland to the Appoquinimink Creek just east of Cantwell's Bridge, but only the Delaware Canal was ever constructed across the entire state (Munroe 1986:Figure 1).

Blackbird, the only large settlement in the Forest of Appoquinimink, was founded around 1738 where the King's Road crossed Blackbird Creek (Bedell 1996c:6). Two roads came into the Blackbird community from the north, one from Newark and Glasgow, and one from St Georges and Cantwells Bridge (Odessa). One road (the King's Road) left Blackbird for Smyrna on Duck Creek and Dover on the St. Jones River. Edward Fitz Randolph, an officer in the French and Indian War, was one of the first residents of the Blackbird Community (Pryor 1975:24).

Delaware had a population estimated at 25,000 in 1770, which more than doubled by 1790 to 59,046, but did not double again until 1860 (Unknown 1989:6 and 57). By 1900, Rhode Island had a population of more than three times that of Delaware, even though the latter was almost

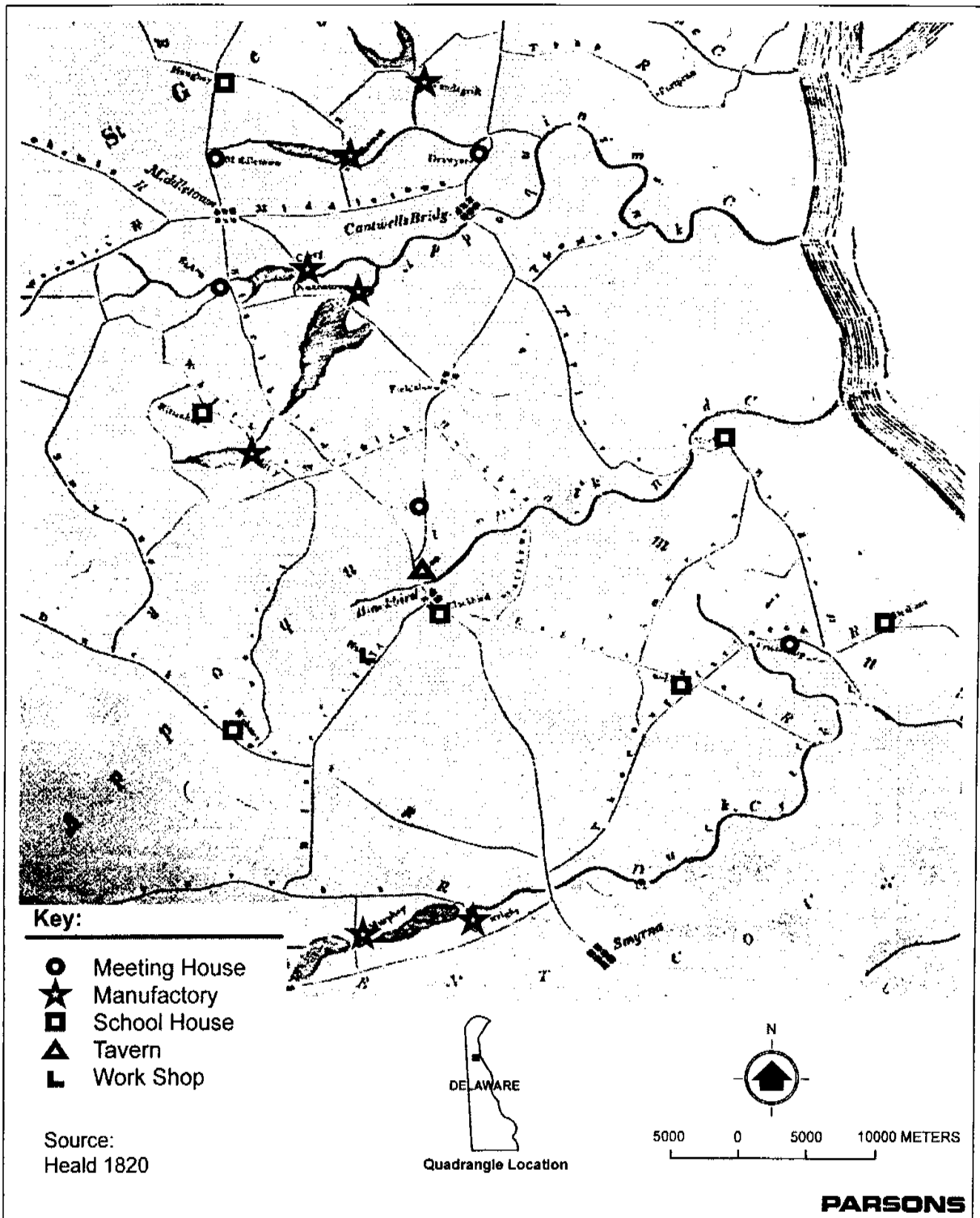


Figure 1-6. Southern New Castle County in 1820 (Heald 1820)

Table 1-4. Road Development in New Castle County by 1816

Hundred	Acres of Land in 1816	Miles of Road in 1816	Proportion of Roads to Surface
Appoquinimink	80,000	98.8	134.6
Brandywine	21,800	46.5	35.9
Christiana	23,800	71.0	40.1
Millcreek	25,500	74.5	43.2
New Castle	23,500	39.0	40.0
Pencader	27,800	28.5	46.7
Red Lion	12,200	15.0	20.7
St. Georges	42,400	60.8	70.3
White Clay Creek	18,400	28.5	31.1

Source: Heald 1820

twice as large in area, another indicator of the slow economic and population growth of Delaware (Unknown 1989:57).

Much of southern New Castle County has been continuously cultivated for over 300 years (Passmore 1978:8). Most of the residents of New Castle County in the 1700s were farmers, growing corn, rye, and wheat as principal crops. The rise of agriculture in Delaware was encouraged in that each farmstead could be located within twelve miles of a navigable river or creek (Munroe 1954:27). According to contemporary periodical advertisements, Kent County and New Castle County farmers in the early to mid eighteenth century cleared an average of 30 percent of their land parcels; the rest of the tract was left in marsh, meadow or woods (Catts et al. 1995:98). Many farms were owned by absentee landowners, and the houses on the land were rented or leased to tenants. Advertisements appeared in the local paper to rent entire farms with descriptions of the land and buildings (Hancock 1987:46-47).

Grist mills were some of the earliest industries in the area, and many became the hub of small hamlets or towns as early as 1658 in New Castle (O'Connor et al. 1985:13-14; Shaffer 1988:15). The first recorded mill in the Appoquinimink Hundred was at Noxontown prior to 1736 (Scharff 1888:1022). The farms were successful and slowly the northern part of Kent and New Castle counties were able to shift from a subsistence oriented economy to a market-based economy by the middle of the eighteenth century. The grist and flour mills of Brandywine Hundred near Wilmington, in particular the Thomas Lea and Joseph Tatnall families, helped to bring financial growth to northern Kent and southern New Castle counties in the mid-1700s, and are credited with helping establish milling interests in the United States (Welsh 1973:79; Scharff 1886:786-787). Early mills were first constructed on the Brandywine in 1729, but it was not until Lea and Tatnall's attempts in the 1760s, that the waters of the river could be fully utilized for mill works (Conrad 1908:563-564). The mills controlled most of the exports to the West Indies and other places in the late 1700s, as a result of stiffer regulations and taxes in Pennsylvania and Philadelphia (Scharff 1886:787).

Cantwell's Bridge received local grains and other products for export from a 12 to 15 mile radius (Schwartz 1980:32; Kushela n.d.:7). Six granaries with a total capacity of over 30,000 bushels were along the Appoquinimink Creek by 1825, and between 1820 and 1840, over 400,000 bushels of wheat were shipped through the community (Schwartz 1980:32). The harvested grains from the Blackbird community were shipped to Cantwell's Bridge on the Appoquinimink

Creek five miles to the north, as well as Duck Creek Landing and Smyrna Landing on Duck Creek five to eight miles to the south.

Farmers learned in the early 1700s to rotate crops, and tobacco was grown on freshly cleared ground while grains, such as wheat, corn, and rye, were grown mainly on previously tilled ground (Passmore 1978:22). However, farming practices in Delaware had still quickly leached the sandy soils of the major nutrients and led to the almost complete destruction of the topsoils by the 1830s (Passmore 1978:16). James C. Booth's "*Geological Survey of Delaware*" provided wonderful insight to the Delaware farmers to reconstitute their soils, and he is praised with saving agriculture in the region. Booth correctly identified that the nutrients in the soils of the entire Delmarva Peninsula were being depleted and he encouraged farmers to add burned and crushed oyster shell and marl to their fields (Passmore 1978:17). Marl, a compact clay-sand deposit containing ancient sea shells, had been discovered in New Castle County while dredging canals. From the early 1840s to the Civil War, marl increased crop productivity on almost all areas of application, sometimes as much as 400 percent (Passmore 1978:17). By the 1880s, other fertilizers, such as improved lime and ground crab, were used, and modern technological advancements in crop rotations and nitrogen fertilizers helped bring Delaware into the world agricultural markets (Passmore 1978:7-19).

Iron deposits were discovered in New Castle County in the mid-1700s, and soon processing sites were established (Harbeson 1992:18-19; Heite 1974:18). Samuel James established a forge in New Castle County in 1723, supposedly the first in the mid-Atlantic (Shaffer et al. 1988:21). The forges required an immense amount of fuel, and since coal was not locally available, the primary forests were harvested to produce charcoal (Passmore 1978:14). Mine owners either purchased thousands of acres outright or at least the rights to work the land solely for the harvest of the timber.

The coming of the Philadelphia, Wilmington, and Baltimore Railroad through Blackbird in 1856 enabled the non-coastal central regions of Delaware to be settled (Figure 1-7; Passmore 1978:7; Zippe 1968:83-84). The smaller towns in rural central Delaware were then able to send their goods directly to interstate markets by train rather than by wagon and carts via the nearby seaports, such as New Castle and Wilmington. The railroad allowed all industries to expand at a fast growth rate (Harbeson 1992:21).

Since the early settlements, residents of the State of Delaware have desired to drain the low lying swampy regions and expand the agricultural prospects of the region. As early as 1680, Delawareans have constructed drainage systems to accommodate the wet areas (Passmore 1978:19). Many of the ditch systems constructed in the 1700s and early 1800s were deepened and cleaned out in the 1930s by the Work Projects Administration (WPA)(Passmore 1978:19). Marshes and swamps still covered more than 50 percent of Blackbird Hundred by 1875 (Zippe 1968:73). By the end of the nineteenth century, draining the numerous marshes to reclaim the land for producing grain products was one of the most important aspects of the Hundred (Scharff 1888:1023-1024). In the 1930s, more drainage ditches were cleaned and fixed (Passmore 1978:20).

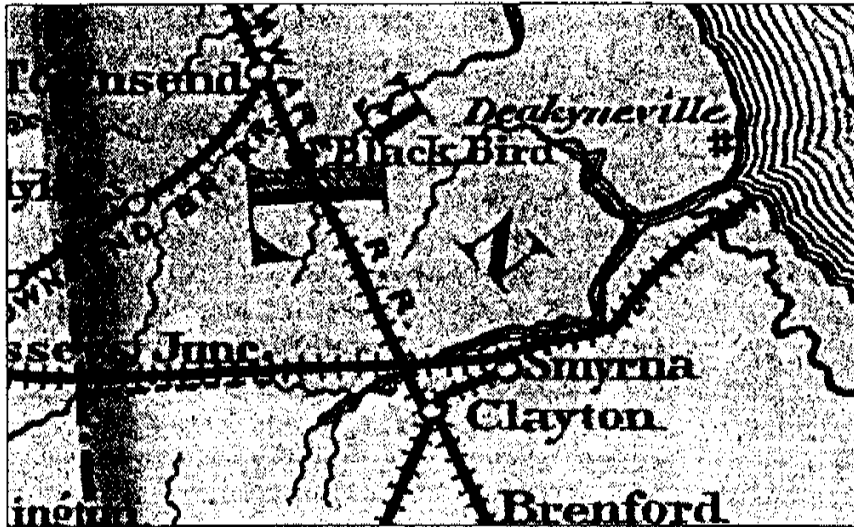


Figure 1-7. 1876 map showing the railroads near Blackbird, Delaware (Gray 1876)

Wheat was the main agricultural crop in New Castle County during the colonial period, but as early as 1839, it was beginning to be replaced by the fruit industry (Passmore 1978:24; Schwartz 1980:32). The center for the peach industry was primarily in New Castle County, but by the 1880s, blight was destroying the industry (Zippe 1968:78). Kent County was known for apples, and the berry industry became popular in Sussex County. Sussex County grew more strawberries in 1902 than any other county in the country (Passmore 1978:72-73). People immigrated to Delaware for the new agricultural industry from as far away as Forest, Ontario, including many Irish (personal communication with Michael McGrath in September 1999). Richard Brockson operated a peach dryer at Blackbird, which employed over 30 people during the height of the peach picking time (Pryor 1975:25). Migrant workers, referred to as Peach Plucks, harvested the fruits for 75 cents a day with meals and a place to sleep, usually on a haystack or in a barn. The Just Right Canning Company operated to the west of Blackbird at Blackbird's Station, and another cannery was located to the south of town near Greenspring. Tomato blight and competition after World War II ended the large scale fruit industries in the community (Pryor 1975:25).

The 1920s and 1930s saw the development of the famous Delmarva broiler chicken industry in southern Delaware, which, since 1934, has produced over half of the farm income for Delaware farmers (Passmore 1978:58). The success of the chicken industry has been credited for helping the local farmers, even in New Castle County, to weather the Great Depression, as the poultry industry relied on the grains produced in the region to thrive, keeping the grain producers financially afloat. The Soil Conservation Service established districts in Sussex County in 1944, and most farmers then had farm plans on file with the district, greatly enhancing their yields, making Delaware known as one of the agricultural centers of the central Atlantic seaboard (Passmore 1978:108).