INTRODUCTION

The purpose of this report is to describe the results of the Phase I and II archaeological studies of proposed relocations of sections of the Ogletown Interchange and three associated wetland replacement areas. The project areas are located in White Clay Creek Hundred in north-central New Castle County, Delaware (Figure 1, Plate 1). The three proposed wetland replacement areas (Birchwood, Route 141, and Kemeether) are located west of the Salem Church Road\Route 4 intersection, the Route 141\Interstate 295 intersection near New Castle, and on Salem Church road north of Old Baltimore Pike, respectively (Figure 1). The new changes proposed for the Ogletown Interchange include the realignment of Route 273 in the vicinity of Ogletown. The new alignment shifted slightly from the earlier alignment, but remained within 500 to 1000 feet of its original location. Two new connector roads were also added to the Ogletown Interchange design, but are located within the confines of existing Route 273

and Red Mill Road (Figure 2). The field work and report preparation took place between June 1992 and June 1994, and was undertaken by the University of Delaware Center for Archaeological Research (UDCAR) for the Delaware Department of Transportation (DelDOT) and the Federal Highway Administration (FHWA) under Section 106 of the National Historic Preservation Act to evaluate the effects of the project on significant, or potentially significant, cultural resources as defined by the National Register of Historic Places (36CFR60).

Environmental Setting

The project area is located in the east-central portion of New Castle County in a transitional area between the Fall Line and the High Coastal Plain physiographic zone of Delaware. The summary of the local environmental setting presented is abstracted from the work of Custer (1984a:23-25) and Custer and De Santis (1986).

The Fall Line/High Coastal Plain transition zone of Delaware is a northeast-southwest trending zone extending through the northern portion of the Delmarva Peninsula, and is characterized by a combination of features common to both the Fall Line and High Coastal Plain (Spoljaric 1967:3). The Fall Line Zone is itself a transitional zone between the Piedmont Uplands and the flatter Coastal Plain areas to the south. Streams flowing from the Piedmont cross the Fall Line zone, and drop their bed loads in the flatter Coastal Plain (Spoljaric 1967). At present, the bed loads of the Piedmont streams are quite small, but at various times in the past these streams carried tremendous loads and dropped the gravels, cobbles, boulders and various sorted sands that make up the Columbia Formation described by Jordan (1964). These deposits were unconformably deposited on the Potomac Formation, which consists of fluvially deposited silts and clays dating to the early Cretaceous Period. Watercourses from the north and northeast deposited the gravels, sands, silts, and clays of the Columbia Formation sometime during the Quaternary Period. Sands, forming the primary component of these sediments, consist mostly of quartz and feldspar while gravels are dominated by sandstone, vein quartz, and chert (Jordan 1964). These geologic deposits created a series of well-drained soils and interspersed cobble beds throughout the Fall Line Zone. Cobble beds are of special interest because they provide good sources of raw material for the manufacture of stone tools. Water resources are abundant and are comprised of variously sized tributaries of the White Clay Creek, which flows parallel to the Fall Line.

Jordan (1964), distinguishes between the Higher (Upper) Coastal Plain and lower portions of Delaware's Coastal Plain based primarily on textural differences in the Columbia sediments of these two areas. Located between the Fall Line and the Smyrna River, the High Coastal Plain represents the southeastern extension of the very coarse glacial deposits of the Columbia sediments (Jordan 1964:40). In many areas these coarse deposits resisted erosion, creating a rolling topography with up to 16 m

(50 feet) of elevation difference between the headlands bordering the larger streams and the adjacent floodplain marshes. Elevation differences surrounding the project area range up to 52 m (170 feet) from the low floodplains of White Clay Creek to the high edge of the Fall Line. Even though these Upper Coastal Plain elevation differences are considerably less than those of the Piedmont and Fall Line, they are great enough to significantly influence seasonal differences in plant communities (Braun 1967:246-247). Water courses tend to be deeply incised and are lined by a veneer of relatively recent sediments that is thin along the upper reaches of drainages and thickens toward their mouths (Kraft et al. 1976:13). Most streams are tidal, and the saltwater/freshwater mix allows for a wide range of resources. Bay/basin features, noted for other portions of northern Delaware, are present within the project area (Custer 1984a). Soil types present within the project area include a variety of well-drained to poorly drained soils that are distributed in a mosaic pattern across the project area. Various alluvial sediments of the Columbian Formation have served as parent material for all of these soils. The transitional nature of the project area physiographic setting is mirrored by the distribution of the soil associations with the Elsinboro-Delanco-Urban association found in the northern half of the project area and the Sassafras-Fallsington-Matapeake association found in the southern half of the project area.

The twentieth century environment of the Ogletown area bears little resemblance to the overwhelmingly rural nature of the project area during the previous two centuries. Prior to limited residential development which began in 1920 and continued into the 1960s, the project area consisted of dispersed farmsteads, agricultural fields and pastures, woodlots, and limited commercial facilities such as a country store and post office. Over the last three decades, considerable residential and commercial development has taken place and the area has assumed the appearance of a mixed land-use suburban environment including housing subdivisions and small business and commercial complexes. The northern section of the Ogletown Interchange project area and the area surrounding the proposed Kemeether Wetland Replacement Area have not yet been subjected to this development and presently retain their pattern agricultural land use.

Regional Prehistory and History

The prehistory and history of the project area and of northern New Castle County in general were previously summarized in the Phase I and II archaeological survey report of the 1985 and 1986 alignments of the Ogletown Interchange (Coleman, Hoseth, and Custer 1987;13-18). Several other archaeological survey and planning study reports, such as Kellogg (1993a), Custer, Catts, Hodny, and Leithren (1990), Catts, Hodny, and Custer (1989), and Custer, Watson, Hoseth, and Coleman (1988), also provide overviews of the regional prehistory and history.

Background Research and Research Design

In preparation for the archaeological surveys of the proposed changes in the Ogletown Interchange and wetland replacement areas, the initial Phase I and II Route 273 Ogletown Interchange report (Coleman, Hoseth, and Custer 1987), archaeological planning studies and cultural surveys of the surrounding region (Catts, Hodny, and Custer 1989; Varisco and Custer 1992; Kellogg 1993a), more detailed site specific reports for both prehistoric and historical archaeological sites (Custer, Watson, Hoseth, and Coleman 1988; Coleman, Catts, Hoseth, and Custer 1990; Hoseth et al. 1990), and the site files of the State Historic Preservation Office were consulted to identify known archaeological resources within or adjacent to the project areas. Figure 3 shows the location of some of these studies. Historical maps and atlases (Rea and Price 1849; Price and Rea 1850; Beers 1868; Hopkins 1881; Baist 1893), the 1906 and 1953 USGS topographic survey map, and U.S. Soil Conservation Service aerial photographs taken in 1937 and 1954 were also studied to

identify locations of historic cultural resources. Current landowners were queried regarding any observations they may have had concerning cultural resources on their property.

The goal of the Phase I testing was to locate and identify any prehistoric or historical archaeological resources located within the survey areas. Following this initial identification, Phase II survey was undertaken to define the limits of sites and to determine the eligibility of specific sites for inclusion on the National Register of Historic Places. Significance was determined according to the archaeological integrity of the site, particularly the presence of intact sub-surface features and artifacts in undisturbed stratigraphic contexts, and the ability of the site to provide data pertinent to address current archaeological research questions as per Criterion D of the Determination of Eligibility for the National Register of Historic Places.

The new realignment of Route 273 within the Ogletown Interchange remained within the same study area that was examined by the earlier Phase I and II survey of the Ogletown intersection; therefore, the probability zones for prehistoric site locations defined by Coleman, Hoseth and Custer (1987:45) remained valid (Figure 4). Of the three proposed wetland replacement areas, only the Birchwood area was located within the initial 1986 Ogletown study area (Figure 4).

The proposed Wetland Replacement Area on the Kemeether property was located less than 200 feet from the surveyed corridor of the Old Baltimore Pike archaeological project (Catts, Hodny, and Custer 1989:60-77) and was included within the cultural resource planning study of the proposed Route 301 corridor (Kellogg 1993a). No previously known prehistoric or historical archaeological sites were located within the proposed Kemeether Wetland Replacement Area (Kellogg 1993a:40 and 45). Based on distance to water and soil types, this area was determined to have a medium to high probability for prehistoric sites.

The proposed Route 141 Wetland Replacement Area was not included in the original Phase I and II survey of the Ogletown intersection, nor had any the area been the subject of any previous cultural resource surveys. Several cultural resource management studies, planning studies, and other archaeological projects provided excavation and survey data on sites in the nearby area (Figure 3).

The research potential and the site significance of any prehistoric site located in the project area can be determined and evaluated by referring to the preservation plan for prehistoric resources of northern Delaware (Custer and De Santis 1986). Within the proposed Route 273 realignment area and the proposed Birchwood Wetland Replacement Area, the research possibilities include a medium to low significant probability for

site location and have medium site data quality (Figure 5). The proposed Kemeether Wetland Replacement Area lies within a zone of medium significant site probability with high data quality. The proposed Route 141 Wetland Replacement Area is located within a region of high to medium probability for site location and an area that has poor data quality (Custer and De Santis 1986:89). The proposed Route 273 realignment within the Ogletown Interchange, and the proposed Route 141 Wetland Replacement Area are located within a zone of great sensitivity and high research priority, due to the high potential for development, and high to medium significant site probability within the area. The proposed Kemeether and Birchwood Wetland Replacement Areas are located within a zone of medium to low significant site probabilities and development pressure (Custer and De Santis 1986:90-92).

Due to gaps in the coverage of the previous archaeological surveys, the results of several predictive models developed for the area were used to enhance gaps in the data base. For prehistoric sites, predictive models generally assume that archaeological site distributions could be modeled primarily on the basis of environmental factors during the prehistoric period. Several studies have illustrated the use of environmental factors in predictive models for prehistoric sites in both the High and Low Coastal Plain (e.g. - Custer et al. 1986; Eveleigh 1984; Galasso 1983; Custer and Galasso 1983; Custer et al. 1984; Gardner 1982, 1987; Kellogg 1993a) and these models have proven to be both accurate and precise (Custer and Bachman 1986; Custer, Bachman and Grettler 1986). For the most part, these models focus on the availability of surface water and productive swamp, marsh, and bog settings. A predictive model based solely on surface water availability was successfully applied to the Route 896 Corridor (Lothrop, Custer and De Santis 1987). Social factors in prehistoric site location have also been considered (Custer et al. 1984), but their applicability is limited to Woodland I specialized base camps, and their accuracy and precision have not been evaluated.

Analyses of prehistoric site locations in Delaware have shown that surface water and soil moisture conditions are the most important correlates to prehistoric sites outside of the coastal zone (Custer and Bachman 1986:126-131; Custer et al. 1986:172-177). Custer and Bachman (1986:126-131), for example, note that locations adjacent to streams characterize 71 percent of all sites in all time periods, and Lothrop, Custer and De Santis (1987:28-31) found that 31 of 34 sites in the Route 896 Corridor were within 200 m of water, and 18 of those 31 sites were within 100 m of water. Soil moisture is another important correlate to prehistoric settlement, especially the presence of "bay/basin" features where poorly drained soils occur and standing water may be found on a seasonal basis (Custer and Bachman 1986:129, 145-149; Lothrop, Custer and De Santis 1987:33). The predictive model for prehistoric sites was therefore generated by taking the minimum distance to a drainage of any type or to the wet/dry soil ecotone (Figure 4).

Based on the statistical analyses of known site locations and the results of previous archaeological studies, Kellogg (1993a:66) established High, Medium, and Low probability zones for the Route 301 Corridor. The locations of the proposed Kemeether and Birchwood Wetland Replacement Areas fall within the area examined by Kellogg, and both are located in high site probability zones (Figure 6).

Prehistoric site location predictions are most accurate when they are made for specific time periods because human adaptations and settlement patterns changed through time in northern Delaware. Management plans for prehistoric cultural resources in Delaware indicate the potential for specific archaeological

resources for each prehistoric time period (Custer 1986; Custer and De Santis 1986). Beginning in the Paleo-Indian Period and continuing throughout all periods, an important factor for the availability of lithic resources was the Delaware Chalcedony Complex, including Iron and Chestnut hills, located approximately four miles west of the project area (Custer, Ward, and Watson 1986). The extreme western portion of the project area is located within a major study unit of quarry sites related to the Delaware Chalcedony Complex (Figure 7). Expected site types include a range of quarry related sites and supporting hunting/gathering sites. Examples of Paleo-Indian sites near the project area include 7NC-D-12 and 7NC-D-72 (Figure 7).

For the Archaic Period, the project areas are located within a general study unit of areas located outside the Hockessin Lowlands/Churchman's Marsh area (Figure 8). Focus on resource-rich settings such as bay/basin features and poorly-drained swamp settings are expected during the Archaic Period (Custer 1986:65). Procurement sites and base camps may be present adjacent to the larger, poorly drained swamps and bay/basin features. An example of such as site setting is 7NC-D-11, located one mile north of the project area.

The Woodland I Period in northern Delaware is characterized by a shift to site locations along major river floodplains and estuarine swamps. Custer and De Santis (1986:42) place the northern portion of the Ogletown Interchange area within the Major Drainage Floodplains Study Unit for the Woodland I Period. Base camps or procurement sites are expected to occur adjacent to major tributaries of the Christina river (Figure 9). Cool Run is located within the project area and the White Clay Creek is located less than 300 m (990 feet) to the north. The southern portion of the proposed Route 273 realignment area, the proposed Birchwood and Kemeether Wetland Replacement Areas are located within the Interior/Uplands Study Unit. In the project area, ephemeral sites such as procurement sites and micro-band base camp occupations are expected near well-drained locations adjoining swamps and streams (Figure 9). The proposed Route 141 Wetland Replacement Area is located within the Lower Christina/Churchman's Marsh Woodland I Study Unit (Figure 9). The area lies within a poorly drained swamp and on the twentieth century channelized portion of Nonesuch Creek.

Study units for the Woodland II Period remain the same as those of the Woodland I, because many of the Woodland I base camp locations continued to be occupied during the subsequent period with little change in artifact assemblages (Figure 10). Site 7NC-D-52, located less than one mile from the proposed Kemeether Wetland Replacement Area, yielded material from both the Woodland I and Woodland II periods.

The identification and evaluation of historical archaeological sites within the proposed Ogletown Route 273 realignment and the proposed Wetland Replacement Areas was aimed at providing data germane to current research questions as defined by the **Management Plan for Delaware's Historical Archaeological Resources** (De Cunzo and Catts 1990). The management plan identifies five chronological periods and four primary research domains, or themes, in the field of historical archaeology that can be investigated through research on sites in Delaware. Consisting of Landscape, Domestic Economy, Social Group Identity and Interaction, and Manufacture and Trade, these themes guided historical archaeological research in the Ogletown and wetland replacement survey areas.

In contrast to prehistoric sites, explicit predictive models have not been regularly applied to historical archaeological sites due to the general effectiveness of archival research and documentation as a predictive tool, particularly after the mid-nineteenth century. However, recent analyses of historical site locations in Delaware and other regions have indicated that factors such as topography, surface water, soil quality and productivity, and access to transportation facilities and

markets had significant influences on historic site locations (Custer, Bachman and Grettler 1986; Catts, Custer and Hoseth 1991; Custer and Grettler 1991; Kellogg 1993a, 1993b; Lukezic 1990; McGregor 1991; Sprinkle 1991).

The recent study of the Route 301 Corridor (Kellogg 1993a, 1993b) used a broad range of data sources to identify potentially significant standing structures and predict the locations of potential historical archaeological sites, and portions of the proposed Route 273 project area and the proposed Kemeether and Birchwood wetlands replacement areas are located within Kellogg's study area. Specifically, Kellogg used published historical maps and atlases (Heald 1820; Rea and Price 1849; Price and Rea 1850; Beers 1868; Hopkins 1881; Baist 1893) as well as unpublished maps (Latrobe 1803), county road plats, and other land records to plot changes over time in historic site locations. Besides individual dwellings, these historic maps document roads, drainages, public buildings, individual farms, businesses, and churches. For sites dating prior to 1800, Kellogg relied on the unpublished plat maps and road papers. The proposed Birchwood Wetland Replacement Area is located within a medium probability zone for pre-1730 historic sites and in a low probability zone for pre-1770 historic sites (Kellogg 1993a:77-80). The proposed Kemeether Wetland Replacement Area is located within the lowest probability zone for pre-1730 historic sites and within a low probability zone for pre-1770 historic sites (Kellogg 1993a:77-80).

In the last decade, the excavation of archaeological sites within the Ogletown Interchange Improvements project area has greatly enlarged the data base of both prehistoric and historical sites in northern Delaware. The present Phase I and II survey of the Route 273 realignment and the three proposed wetland replacement areas has the potential to augment this archaeological data base. In an area that is rapidly being developed and urbanized, this archaeological data base will prove especially valuable in understanding Delaware's past.

Field and Laboratory Methods

Phase I field methods used within the various project areas varied somewhat from area to area. Fieldwork in the proposed wetland replacement areas (Birchwood, Route 141, and Kemeether) consisted of pedestrian survey and selective shovel testing of areas of low, medium, and high site potential. Sub-surface testing of woodlots, fallow fields, and areas of poor surface visibility in the Ogletown Interchange area consisted of the excavation of shovel test pits at 10 and 20 m intervals oriented toward landscape features and placed within measured grid systems. The standard excavation procedure was to place shovel test pits at 10 m intervals along the centerline of the right-of-way. The shovel test pit lines were also extended at angles to the centerline and line segments were placed parallel to the centerline at measured distances when conditions were favorable.

For all project areas, the Phase II archaeological field methods included a mixture of shovel test pits and 1 x 1 m test unit excavation within and around potential archaeological sites. Testing was concentrated in, but not confined to, the limits of the proposed right-of-way because one of the primary goals of the Phase II survey was determination of site limits. Other goals of this testing method were to gather data on artifact distributions, site stratigraphy, and the stratigraphic context of artifacts and features.

All excavated soils were screened through 1/4-inch mesh, and all cultural materials recovered were bagged according to the individual shovel test or test unit, and natural or arbitrary excavation level. Stratigraphic soil data and a record of all cultural materials found were kept for each shovel test and test unit on standardized forms. Shovel tests and test units were excavated to culturally sterile soils unless cultural features were encountered. Several small cultural features were completely excavated while larger features were sampled. All feature soils were excavated and screened separately. Black and white and color slide film were used to photograph cultural features and representative soil profiles.

Standard artifact processing procedures of the Delaware Bureau of Museums were applied to all artifacts recovered from the Phase I and II excavations. All artifacts were cleaned with plain water, or, in the case of deteriorating bone, shell, or metal, were damp- or dry-brushed. Bone and shell were then placed in labeled bags. All other artifacts were labeled with a three digit provenience number. Artifacts were sorted in categories for cataloging based on their material composition, and an artifact inventory for each site and loci was prepared.

All site locations were transferred to cultural resource maps in the possession of the Delaware State Historic Preservation Office in Dover, Delaware. All new sites were assigned Cultural Resource Survey (CRS) numbers, and CRS forms were completed for each site.